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Poster

Dear colleagues, dear guests,

Welcome to the 6th CEOC Congress in Graz.

MIS techniques are revolutionizing orthopaedic medicine, no wonder this is one of the key topics of this year's congress. Zimmer is one of the leading companies in this field since we have been there from the start.
Over the past years we have continuously developed new joint replacement procedures such as the Zimmer Minimally Invasive Solutions in collaboration with some of the world's leading surgeons. At Zimmer we make sure innovation is on the move.
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We wish you an interesting and successful congress.

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006

High energy tibial plateau fractures treated with minimal internal fixation augmented by small wire external fixation frames. Knee recovery at 7 years follow up

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Purpose:
To assess the function of the knee joint and the development of knee arthrosis, at seven of years postoperatively, in patients in whom a high energy tibial plateau fracture had been treated with minimal internal fixation augmented by small wire external fixation frames.

Material - Methods:
Between October 1989 and November 1999, one hundred twenty nine high energy tibial plateau fractures were treated with hybrid fixation including small wire circular or hybrid frames, minimum internal fixation and occasionally provisional extension of the external fixation to the distal femur. The average patient age was 39 years. There were 69 (53%) C1 fractures, 19 (15%) C2 and 41 (32%) C3 fractures and 49 (38%) fractures were open. Complex injury according to Tscherne-Lobenhoffer classification was recorded in 87 (67%) patients. Clinical, subjective, objective and radiographic results were evaluated after an average follow up of 84 months.

Results:
Results were assessed according to the criteria of Honkonen - Jarvinen. Excellent or good functional result was recorded in 98 (76%) patients. However, only 74 (57.5%) patients retained an excellent or good radiographic result at the final follow up. Compared with the radiographic appearance of the post-traumatic arthritis after an average of 48 months, there was found a statistically significant deterioration of the knee arthrosis ($p<0,001$). Five reconstructive surgeries were performed after the completion of the index procedure.

Conclusion:
A high percentage of radiographic post-traumatic arthritis should be expected, after high energy tibial plateau fractures that had been treated with minimal internal fixation augmented by small wire external fixation frames. However, because all the objectives of the fracture treatment can be obtained, the functional results remain satisfactory over time.

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007

A new technique for arthroscopic assisted percutaneous operative managemant of closed tibial plateau fractures. A pilot study

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Purpose:
Successful operative management of tibial plateau fractures, with the goal of fully restoring daily living activities and a pain free range of motion still proves to be very difficult.
The authors of the present study developed a new minimally invasive, arthroscopic assisted operative treatment, using balloon dilatation for optimal fracture reduction in Type 41B2 fractures of the tibia. The purpose of this study was to prove this new technique to be feasible and highly useful in this cadaver study as well as to assess the best anatomical approach for the upcoming clinical trial.

Methods:
A standardized fracture model in fresh human cadaver, representing tibia plateau impression fractures. Using Laundry et al. fracture model 20 depression fractures were set to the tibia plateau after experimental arthrotomy. After closing the arthrotomy the defects were evaluated through a 3Dâ€"CT scan. Afterwards, a minimal invasive percutaneous surgical arthroscopic assisted approach was performed under X ray control. Reduction, of all fractures, was performed by balloon dilatation. Fixation was provided by application of pmma-cement.Again, a final evaluation using a 3D-CT scan was performed.

Results:
Satisfactory reduction of the tibial defect was seen in eighteen of twenty cases. The average time of the procedure was sixteen minutes. In 3D-CT evaluation, eleven of the 20 cases showed excellent radiologic findings. There was no intraarticular cement leakage seen in any case.

Conclusion:
We found this new technique of minimal invasive balloon dilation and fracture reduction in tibial plateau fractures to be a very useful and easy to handle tool in the successful management of closed tibial plateau impression fractures.
This new minimal invasive surgical technique not only sees a reduction in operating time but also proves to be very effective, overall.

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008

Indications, results and complications using unilateral external fixation for the treatment of tibial fractures without bone defects

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Introduction:
The aim of our report is to present our experience from the use of unilateral external fixation as a definite treatment in tibial fractures without bone defects.

Material:
We treated 192 patients with 203 fractures, 156 were males and 36 females with a mean age of 35 years old. Traffic accident was the cause of the fracture in 152 cases and a fall from height in 40 cases. According to the AO-Muller classification system 102 fractures were type A, 71 type B and 30 type C. Our indications for surgery included extensive soft tissue lesion in 23 patients, threatened compartment syndrome in 27 patients, open fracture type III in 128 and 25 multiinjured patients.

Results:
Mean time of treatment was 26.1 weeks for the open fractures and 20.18 weeks for the closed fractures .Our complications included 18 non-unions, 9 delayed unions, 3 malunions, 5 shortenings, 56 pin infections, 3 osteomyelitis, 3 patients with fat and 5 with pulmonary embolism and 3 deaths. Re-operation was performed in 50 patients (19.70%) and change of method in 28 patients (13.79%). The cases of jointed external fixation as a definite treatment reached 73.64% and the non-jointed external fixation 97.98%.

Conclusion:
In the majority of the cases the use of unilateral external fixation for tibial fracture treatment without bone defects was the definite treatment particularly in the cases where a non-jointed external fixation was used.

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009

Comparison study of high energy tibial pilon fractures treated with internal or external fixation

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Introduction:
High energy tibial pilon fractures are usually associated with malreduction, high rate of infection and poor final results. This study evaluates and compares the long term results of severe pilon fractures which were treated with two different methods.

Material-Methods:
Betwwen 1996 and 2000, 65 high energy pilon fractures were treated and reviewed in our institution. According to the Ovadia-Beals classification, four fractures were type II, seventeen were type III, twenty five were type IV and nineteen fractures were type V. Fourteen fractures were open, and forty three closed fractures had soft tissue lesion grade1 or 2 according to Tscherne classification. Open reduction and internal fixation (ORIF) was performed in twenty six fractures and external fixation combined with minimal internal fixation (EXFIX) in thirty nine fractures. Evaluation was carried out according to the Ovadia-Beals evaluation system.

Results:
The mean average follow up was 6 years. Patients treated with ORIF achieved an excellent or good result in 96% of type II fracture, in 80% of type III, in 55% of type IV and only in 40% of type V fracture. Patients treated with EXFIX achieved an excellent or good subjective result in 91% of type I fracture, in 84% of type II, in 75% of type III and in 73% of type IV fracture ($p<0,001$). Severe complications occurred in fifteen fractures (twelve in the group with ORIF).

Conclusion:
Stable fixation, anatomic reduction and elimination of the complications are necessary in order to achieve a long term satisfactory result after a high energy tibial pilon fracture. External fixation augmented with minimal internal fixation seems to be a more suitable and adjustable technique to these devastating injuries.

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010

Treatment of gunshot injuries of the lower limbs by Ilizarov Fixateur

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Gunshot injuries are still daily events in certain parts of the world. The primary treatment is in therapy, decisive for the outcome which often means preservation of the limb or amputation. The indication for the technique of Ilizarov fixation is given of high velocity injuries.
196 patients with 224 fractures after gunshot injury of the lower limbs were treated in the Almutawakel Hospital in Sana'a/Yemen. The follow up was systemized by the Gustilo classification. 95 patients (42,4%) were healed with different techniques of Ilizarov fixation. The decision for the different Ilizarov techniques was done according to the situation:
1. Fractures stabilization by Ilizarov fixateur in 27 (12%) patients with communicated fractures
2. Closed compression, corticotomy and lengthening in 14 (6,2%) of patients with communicated fractures with bone loss less than 50%.
3. Resection, acute compression, corticotomy and lengthening in 31 (13,8%) of patients.
4. Removal of loose fragments of bone, resection, corticotomy, segmental bone transport to the gap in 23 (10,2%) of communicated fractures with more extensive bone loss.
13 (5,8%) of the patients with fractures caused by high - velocity injury could be treated by AO external fixateur, towed by internal fixateur by LCP plate and autogenous bone wafting.
In Series of 22 fractures type II C with arterial injuries limb preservation was successful in 14 patients. Primary amputation was required in eight cases.

Results:

184 (85,1%) fractures healed with good anatomical alignment and function. Delayed union was observed in 24 (11%) and in 8 (3,7%) patients further treatment was required. Different postoperative complications like loosing of implants, pin track infections 12 (6,1%) deep wound infection and osteomyelitis occurred in 25 (12,7%) of 196 patients.

Conclusion:

Ilizarov fixation, in treatment of high velocity injury, also with large bone defects, is an effective therapy in regard to the limb preservation.

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011

Management of tibial non-unions using Ilizarov frames: Comparing acute shortening and bone transport techniques

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Introduction:

Eighteen patients with tibial shaft non-unions were treated by either acute shortening and lengthening, bone transport or simple frame stabilisation using Ilizarov principles. The purpose of this study was to compare the results of acute shortening and lengthening versus bone transport.

Methods:

Eighteen patients (age range 26 to 63 years) were recruited between March 1995 and September 2001. Three subgroups of six patients each were formed. Group 1 underwent acute shortening and subsequent Lengthening, whereas Group 2 underwent bone transport. Group 3 patients had defects <1cms but were still high energy injuries, therefore underwent application of a frame.

Results:

Ten cases of infected non-unions were present. Most patients had at least two conventional operative interventions prior to referral to us for Ilizarov surgery. The mean bone resection in the acute shortening group (Group 1) was 4.8cms and in the bone transport group (Group 2) was 5.4cms. Patients in Group 2 had more procedures done before union was achieved. In group 1, only one patient required bone grafting at the regenerate site. In Group 2, four patients required bone grafting at the docking site and one at the regenerate site. No patients in group 3 required bone grafting. Eradication of infection and union was achieved in all patients with average time in frame being 12.1 months in the acute shortening group 17.2 months in the bone transport group and 8.0 months in the frame stabilisation group.

Conclusion:

We recommended that where feasible, acute shortening and lengthening is preferable over bone transport due to shorter union time and fewer procedures undertaken to achieve union especially in the form of bone grafting. If this is not possible due to large defects, then a combination of acute shortening with transport to bridge the gap should be considered.

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012

Osteosynthesis of fractured femurs by reamed intramedullary AO nail

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Retrospective study of 33 cases of femoral fractures treated during last five years by reamed intramedullary AO nail of second generation. Purpose was to find out whether or not was necessary to interlock every fractured femur. Operative protocol regarding interlocking was performed according to Winquist-Hansen classification. Middle of the shaft fractured in 25 and proximal femur in 9 cases. First and second degree occured in 51%, third and second degree in 49%. Interlocking was done in 60% of all injured, and among them 55% were dinamic interlocked and 45% static. Dinamic interlocking was performed in third degree and almost on the shorter fragment. Healed 97% and refractured 3%. Among healed 66% healed during 4 months, and only 9% during 9 months. Complications: shortening in 9% and malrotation in 12,5%. Discussion: advantages are greater then complications by usage of reamed i.m. femoral nail. Indication of performing reamed i.m. osteosinthesis is spread. Conclusion: reamed i.m. nail is method of choice for many of fractured femurs, because it has great primary stability, short time of healing and low percantage of comlications. Most important is that in most of casis it is not necessary to interlock fragments, esspecially not those of first and second degree.

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013

Systemic effects of two methods of fixation of intertrochanteric fractures

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Numerous studies have been published regarding the comparison between intramedullary nail and the dynamic hip screw and plate for the fixation of intertrochanteric fractures in elderly patients. In this paper we present a comparative study of these two methods regarding their systemic effects on this group of patients.

Material-Methods:

During a period of 12 months we selected 20 consecutive patients admitted with intertrochanteric fractures and treated by means of extramedullary fixation with a DHS and plate and another 20 consecutive patients with the same diagnosis treated with an intramedullary nail. The parameters that we assessed preoperatively, in addition to their demographics, included their mental state (MMMST), their nutritional state and their pulmonary function. Intra-operatively we calculated the time and amount of radiation during the use of the image intensifier, the amount of blood loss and the length of operative time for each procedure. Postoperatively we repeated the calculation of the mental and pulmonary tests and the blood loss, during days 1, 3, and 10, together with their nutritional state and related them to the ease of the patient's mobilization.

Results:

From the comparison of these parameters we found no significant difference between the two methods of stabilization of these fractures. However there were slightly more patients in the group of intramedullary fixation in whom the MMMST was falling, together with their pulmonary function, suggesting that this method probably predisposes to higher chances of pulmonary dysfunction and the possibility of pulmonary embolism.

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014

Bone tumors 1990-2004

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The ratio of benign to malignant bone tumors treated at Ljubljana Clinical Center Department of Orthopaedic surgery from 1990 to 2004 was explored. Special attention was given to diagnosis-to-treatment interval in malignant bone tumors and histologic types, treatment solutions and outcomes were analyzed in patients with malignant primary bone tumors in this period. Answer to the question of efficacy of neoadjuvant chemotherapy combined with surgical therapy was sought in terms of degree of necrosis of the tumor mass and survival ratio, and differences between results in the nineties and in the first years of the 21st century, together with complications of surgical therapy, were analyzed and discussed.

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015

Survival trends in osteosarcoma of humerus

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Introduction:
Chemotherapy and limb sparing surgery have been introduced to improve survival and quality of life of patients affected by osteosarcoma.
Aim:
We analysed the treatment and survival of osteosarcomas of the humerus over the past 50 years and studied the effect of chemotherapy on survival.
Materials and Methods:
Osteosarcomas that affected the humerus over the past 50 years (1940-2000) were reviewed from the Scottish Bone tumour registry. The software package SPSS was used to produce a series of Kaplan Meier curves on the survival rates of osteos arcoma's affecting the humerus.
Results:
During the period 1950- 2000, 53 cases of osteosarcomas involving the humerus were recorded. We compared the survival pattern of patients from the first half of the period (1950- 1974) to those from the second half (1976-2000) which was characterised by the addition of chemotherapy and limb salvage surgery towards management of these tumors.
1950- 1974
There were 18 patients affected by osteosarcoma of the humerus in this period. 15 patients had radiotherapy. 8 patients had radical excision. One patient was treated by limb salvage by excision of tumour and fibular grafting. 5 year survival was 22%.
1975- 2000
There were 35 patients affected by osteosarcoma of the humerus in this period. Treatment was by chemotherapy for 26 patients. 22 patients had radiotherapy of which 16 patients also received chemotherapy as part of the treatment. 11 patients had radical excision. 11 patients underwent limb salvage surgery of whom 8 had additional chemotherapy and all had additional radiotherapy. 5 year survival of patients who received chemotherapy was 30.7%.
Discussion:
Despite the clear difference in the two survival curves, there is no statistically significant difference in the 5 year survival rates between those who did receive chemotherapy as a form of treatment and those who did not.

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016

Percutaneus CT-guided radiofrequency ablation of Osteoid Osteoma: comparison of an old to a new method

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Aim:
A retrospective analysis of the outcome of the treatment of osteoidosteoma by using en bloc - resection or curettage in comparison to the treatment with CT-guided radiofrequency ablation in our patient collective.
Material and methods:
Between 1966 and 2004 we treated 65 patients who presented the classical clinical and radiographical signs of an osteoidosteoma. 41 patients by using a surgical treatment (22 curettages, 19 en bloc-resections). 24 patients underwent CT-guided drill biopsy and thermo coagulation.
Results:
Until 1998 we treated our patients with an osteoidosteoma surgical by using en bloc-resection or curettage. For better localisation of the nidus we used intraoperative imaging. In 4 cases we also used an intraoperative X-ray of the resected bone. Since 1995 also nuclear techniques for a better intraoperative niduslokalisation. Even so we had about 12% recurrence. Therefore we started in 1998 the CT-guided drill biopsy and thermo coagulation of osteoidosteomas. The patients (n=24) we treated by using this method are free of symptoms without any evidence of recurrence at a mean follow up of 44 months.
Conclusion:
By usage of the CT-guided percutaneus thermo coagulation of osteoidosteoma we have been able to reduce recurrence. Also there are cost saving factors because of the avoidance of using the operating room, short recovery and just one day of hospitalisation.

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017

First clinical observations of a new modular spacer-system for the bridging of diaphyseal bone defects

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Introduction:
At present long-segmental diaphyseal bone defects due to metastases, infections or trauma require extensive methods of treatment (e.g. Ilizarov). A new spacer-system has been developed to replace long diaphyseal defects immediately and long-term stable and allows early full mobilization of the patient.

Methods:
The new spacer-system consists of two semi-circular and cylindrical shells. These are clamped around two nails, which are inserted press fit or with bone cement proximally and distally in the long bone. With its modularity different defect sizes can be bridged. The spacer is hollow in order to use it as a container for antibiotics, anti-tumor drugs or bone induction agents. Dynamic 4-point-bending tests with tumescent straining has been carried out to analyze the fatigue strength of the implant. The results have been compared with in vivo existing loads.
The spacer-system has been implanted in the diaphysis of humerus, tibia and femur in n= 21 patients (January 2006) with extensive bone loss.

Results:
1. Biomechanical testing:
The implant resists physiologically acting bending moments (5 - 70 Nm) with a reliability of 2 over a period of 5*106 cycles without damage.
2. Clinical observations have shown analgesia during immediate weight bearing. First x-ray check up with initial bridging the bone gap. No loss of spacer up to now.

Discussion:
The achieved tightnesses are sufficient for the use in human body and the ability for a long-term stable implant is given. The easy application of the spacer-system fulfills today's clinical requirements. The named indications could be treated with this implant with high success.

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018

Analysis of PDGF and PDGFR and gene mutations in desmoid tumors: Potential therapeutic options

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Purpose:
Desmoid tumors are rare monoclonal neoplasms. They occur sporadically or in association with familial adenomatous polyposis or Gardner syndrome. Although desmoid tumors appear to have no metastatic potential, local infiltrative growth and tissue infiltration result in pain, functional impairment, deformity or even death, when vital organs are involved. Surgical resection and radiotherapy in case of positive surgical margin is the first line treatment. Recurrences are frequent. Treatment effects using nonsteroidal anti-inflammatory agents, antiestrogen compounds and other agents like Imatinib mesylate have been published, investigating mostly a small number of cases. Therapy with Imatinib has been proposed as an option for patients with desmoids tumors, although in most reports desmoids tumors are proposed to be c-kit negative.

Material and methods:
We performed immunohistochemical analysis on 124 archived samples of desmoid tumors using antibodies against PDGFα, PDGFβ, PDGFRα and PDGFRβ according to standardized procedures.

Results:
All desmoid tumors showed a positive reaction with antibodies against PDGFα and PDGFRα (> 80% of the tumor cells strong membranous and cytoplasmic staining). With antibodies against PDGFβ and PDGFR? none of the 124 cases showed a specific reaction. Mutational analysis of PDGFRα (exon 11, 12, 17 and 18) and PDGFRβ (exon 12) on frozen material from 14 patients with desmoid tumors were performed, but no mutations leading to amino-acid changes in the mature protein could be detected.

Conclusion:
Although we found no mutations in the hot spot regions, our observations suggest that Imatinib or other tyrosine kinase inhibitors might be a therapeutic option for patients with desmoid tumors in which established local and systemic approches fail to control disease.

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019

Ectopic ossification prevention by meloxicam, an experimental study in rabbits

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Background-Aim:
There have been clinical trials that showed contradictory results regarding the effectiveness of meloxicam in the prevention of ectopic ossification (EO). The purpose of this study was to show the effectiveness of meloxicam in the prophylaxis against EO, in an animal model.
Method:
12 white mature male rabbits were used, which were divided in two groups of 6, one control group and one group which was administered meloxicam SC. For the induction of EO the Michelson model was used which consisted of immobilization of the right hind knee in a cast for 5 weeks and passive mobilization in the full range of motion for 5 minutes every day, except Sundays, during this period. The drug was administered once daily for the duration of the 5 weeks. Afterwards, the cast was removed and 5 weeks later the animals were tested for range of motion and submitted to a lateral X-ray of the femur and knee. Each X-ray was reviewed and assigned a number according to Scott's classification (0 no EO, 1 periosteal reaction, 2 EO less than half the femur, 3 EO more than half the femur).
Results:
All the rabbits in the control group presented with high degree of stiffness of the knee and Scott's 2 and 3 EO (mean 2.66±0.52) in the lateral X-rays, while the rabbits of the meloxicam group had significantly better range of motion and significantly less production of heterotopic bone (meloxicam mean 0.66±1.03). The two-tailed p value was 0.0127 and considered significant. There was no significant difference between meloxicam and indomethasin, compared to an analogous study from the literature (two-tailed p value 0.1247, considered not significant).
Conclusion:
From this experimental study we concluded that meloxicam is capable of preventing the development of EO and we agree with the few publications that support this.

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020

Ectopic ossification prevention by parecoxib, an experimental study in rabbits

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Background-Aim:
There are no studies in the literature that test the effectiveness of the new injectable COX-2 inhibitor parecoxib in the prevention of ectopic ossification (EO). The purpose of this study was to show the effectiveness of parecoxib in the prophylaxis against EO, in an animal model.
Method:
12 white mature male rabbits were used, which were divided in two groups of 6, one control group and one group which was administered paracoxib SC. For the induction of EO the Michelson model was used which consisted of immobilization of the right hind knee in a cast for 5 weeks and passive mobilization in the full range of motion for 5 minutes every day except Sundays, during this period. The drug was administered once daily for the duration of the 5 weeks. Afterwards, the cast was removed and 5 weeks later the animals were tested for range of motion and submitted to a lateral X-ray of the femur and knee. Each X-ray was reviewed and assigned a number according to Scott's classification (0 no EO, 1 periosteal reaction, 2 EO less than half the femur, 3 EO more than half the femur).
Results:
All the rabbits in the control group presented with high degree of stiffness of the knee and Scott's 2 and 3 EO (mean 2.66±0.52) in the lateral X-rays, while the rabbits of the parecoxib group had significantly better range of motion and significantly less production of heterotopic bone (parecoxib mean 0.83±0.75). The two-tailed p value was 0.0082 and considered very significant. There was no significant difference between parecoxib and indomethasin, compared to an analogous study from the literature (two-tailed p value 0.0888, considered not significant).
Conclusion:
From this experimental study we concluded that parecoxib and consequently its active substance valdecoxib can be used for the prophylaxis against EO.

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021

Our experiences in using autogenous growth factors in the treatment of bone healing disturbances

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Introduction:
Despite of considerably progress of treatment methods, still since 5% until 10% fractures come into disturbances in bone regeneration. In the end of 90s XX ones started to wonder about biological potential of these blood elements in damage tissues treatment. Further experiments allow on preparing platelet concentrate (platelet-rich plasma - PRP) obtained though centrifugation and isolation platelets from autogenous blood. Platelets condensation caused that concentration of PDGF and TGF beta and other adhesive substances in received PRP was higher and after adding thrombin, gelatinous mass origin – platelet-rich gel with released growth factors from trombocyte granules.
Aims:
The aim of experiment was estimation influence of platelet rich plasma on bone tissue regeneration processes. For its realizing we decided to make experiments in patients with disturbances of bone healing processes in the form of nonunion and delayed union.
Material and Methods:
In a period since October 2003 until January 2005 on Department and Clinic Orthopaedics Silesian Medical University in Sosnowiec were performed 39 patients. We obtained permission of Bioethical Commitee on experiments performing. Bone regeneration processes were estimated by clinical, X-ray and dual X -ray examinations before and after operation to 6 months. In cases in which we have not observed finishing bone healing process, observation period lasts until 10 months.
Results:
Patients were in the hospital since 4-10 days after surgery. After operation patients felt good, wounds healed without complications. In 34 patients on X-ray and dual X-ray examinations bone mineralization processes with finishing union were observed.
Conclusions:
On a base of performed experiments we concluded that:
1. Application platelet gel to fracture fissure by percutaneous injection stimulates bone regeneration in delayed union.
2. Platelet-rich plasma can be used with autogenous bone grafts in nonunion treatment.
Acknowledgements: This work was supported by Committee for Scientific Research (MNiI) No. 2P05C00126.

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022

Simple method of reduction and stabilization for subcapital humerous fractures

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The subcapital (multiple pieces) fractures of the humerus head is a severe problem, due to the instability of the osteosynthesis and the inability early mobilization of the shoulder. In older people the problem is more severe.
We introduce reduction and stabilization of such a fracture through a small incision on the lateral surface of the arm. Through a 4mm hole on the lateral cortex we entrance 3-4 thin (2,4 mm) Steinmann needles to reduce the fractured head and stabilize it. The patient starts active exercises from the second post-op day. The callous formation is followed by X-Ray every 10 days up to the 6th week.
A common complication is the retreat of 1-2 needles during the callous formation time.
The method has been applied for the last 3 years on 20 patients with grade I to grade III fractures with excellent results and motion. No pseudarthrosis has been recognized.

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023

Incidence & risk factors of non-union in diaphyseal humeral fractures

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Purpose:
Conservative management of humeral shaft fractures remains common practice in the United Kingdom. With reported rates of non-union between 1% to 39% early identification of those at risk of non-union is imperative for early operative intervention to be considered, however this area has received relatively little attention over the past twenty years. The purpose of our study as to investigate the incidence and obtain up to date risk factors of non-union in diaphyseal fractures.

Methods:
We retrospectively reviewed the case notes of 55 patients who attended with a humeral shaft fracture between the period of 1999 to 2003 in our centre all of whom were treated conservatively. During the retrospective case note review patient demographics such as age, sex & any associated injuries were noted. Particular attention was paid to their past medical history looking for a history of alcohol abuse, drug intake, diabetes mellitus, an immunocompromised state, obesity, osteoporosis or smoking habit.
Results:
Of our initial 55 patients with a humeral shaft fracture 47 (85.5%) went on to have union of the fracture. A stepwise logistic regression model was used to identify the prognostic indicators of non-union, which revealed that the only significant predictor of non-union in our model was the presence of radial nerve injury at the time of the fracture, p = 0.008. Fracture type & location did not have significant bearing on union. Nor did a history of smoking, diabetes or alcohol consumption.
Discussion:
Our data suggests that those presenting with a humeral fracture & a radial nerve palsy with a significant past medical history should be considered for early operative intervention.

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024
Rational treatment of the supracondylar humeral fractures at children
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To one of serious sections of pediatric traumatology concern displaced supracondylar fractures of the humerus.
Purpose:
In time and correctly to reveal all components of displaced fragments supracondylar fractures of humerus and to define adequate treatment.
Material and methods:
For last 8 years under our observation were 269 young patients with supracondylar fractures of humerus with displaced fragments. The boys were 120, the girls - 149. The age of the patients was from 3 till 12 years old. At X-ray investigations were revealed the constant kinds of displacement of distal fragments: on width, lengthwise, on an axis and rotatory. For 237 patients (88,0%) - fractures extension type (displacement to the back); for 32 patients (12,0%) - flexion type (to the front). Rotation displacements - 215 patients (80,0%). The prima complications of nerves were observed for 42 patients (radial nerve - for 25; median - for 17). Compression of humerus artery - for 6 patients.
Results:
Kirshner wire is conducted through proximal metaepiphysis of the ulna and the vertical skeletal traction on Balkan frame. At extension types on a forearm is adjusted superimposed a Zinc-gelatinous traction. In the maiden day - constant control behind oscillation peripheral artery, follow-up injured nerves. At available displacement of distal fragments executed manual reposition on the traction. At the flexion types - the injured arm in a rule of unbending in elbow, is padding to Balkan frame fixed in bracket. Terms of skeleton traction - 14-16 days. Then for 2-3 days superimposed plaster splint and started complex physio-functional therapy. The long terms results of treatment are studied for 200 patients from 2 till 8 years after trauma.
Conclusion:
The adequate treatment for the children with displaced supracondylar fractures of humerus is the constant skeleton traction on Balkan frame.

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025
Long-Term-Follow-Up after reconstruction of the brachial artery in cases of distal fractures of the humerus in childhood
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Introduction:
The distal fracture of the humerus is the most frequent fracture close to the elbow joint in childhood. In 2% of all cases it is associated with an injury of the brachial artery. The goal of this investigation was to present Long-Term-Follow-Up data concerning morphology, growth and blood supply.
Material and methods
Between June 1990 und June 2004 twelve children with distal fracture of the humerus with associated injury of the brachial artery underwent an arterial reconstruction. After a mean follow-up-time of 7.7 years (1.2 - 14.2) length, volume and blood supply (by ultrasound) of the forearm were investigated and compared to the contralateral side.

Results
All reconstructions were open, in half of all cases the reconstructed vessel was ectatic (as an extreme example one woman nowadays 20 years of age had a reconstruction with a diameter of 6mm whereas the normal brachial artery showed a diameter of 2.5mm). There was no significant difference between both forearms concerning length, volume and blood supply.
Conclusion
Reconstruction of the brachial artery in childhood is effective and has an excellent long term prognosis. It tends to ectatic changes and should be followed lifelong.

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026
Gap index – A good predictor of failure of plaster cast in distal third radius fractures
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Objectives:
The aim of this study was to assess the ability of the Cast Index and an indigenously developed Gap Index to predict failure of plaster in distal third radius fractures treated by manipulation under anaesthesia and plaster application.
Design:
Case control study.
Patients:
25 cases of failure of plaster cast for distal third forearm fractures excluding growth plate injuries in children were compared with a control of 75 consecutive similar fractures treated with manipulation under anaesthesia and plaster application.
Outcome measure:
The Cast Index was measured as a ratio of the inside diameter of the plaster in the lateral view to the diameter in the antero-posterior view at the fracture site.
The Gap index is a measure of the space between the plaster and the skin measured as a ratio to the inside diameter of the plaster. The gap index and the cast index of the two groups were compared as predictors of failure.
Results:
The groups were similar in terms of demography and post-reduction alignment. There was a significant difference (<0.001) in the Cast index and the Gap index of both the groups. The sensitivity of the Cast index (>0.8) in predicting failure of plaster was 48% while that of the sum of Gap index (>0.15) in AP & Lat view was 88%. Gap index was found to be more accurate (84%) than Cast index (78%) in predicting failure. At a level of Cast Index of more than 0.8 the relative risk of failure is 6.8 as compared to 35 when the sum of Gap index is more than 0.15
Conclusion:
The gap index is a better predictor of failure than the cast index. A quick assessment of these indices is a good practice before accepting any plaster following a manipulation of distal radial fractures.

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027
The Ulnarcarpale impaction syndrom: Surgical management using ulnar-shortening osteotomy
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Purpose:
Ulnar impaction syndrome can be defined as a degenerative condition of the ulnar aspect of the wrist in patients with congenital or dynamic positive ulnar variance with or without a history of fracture or premature physeal arrest. The purpose of this study was to evaluate the clinical features of ulnar impaction syndrome and the outcomes of ulnar shortening osteotomy.
Material and Methods:
6 patients (2 female and 4 male) with an average age of 43,2 years with ulnar impaction syndrome were treated using ulnar shortening osteotomy from 2003 – 2005. Ulnar variance was measured on an anteroposterior radiograph of the wrist, and radioulnar distance was measured on a lateral radiograph, with the forearm in neutral rotation, to evaluate any displacement of the ulnar head from the distal aspect of the radius. All patients were followed clinically and radiographically for a mean of 26,8 months.
Results:
A painfree wrist rotation was possible post operatively. The DASH score was reduced by 51,6 points and the VAS showed a reduction of 5 points. Radiologic findings showed a slight ulnar negative (–1mm) variance.

Conclusions:
Ulnar shortening osteotomy improved wrist function in patients with ulnar impaction syndrome and reduced the subluxation of the distal radioulnar joint, which is commonly found in these patients. Degenerative cystic changes of the ulnar carpal bones also appear to resolve following the shortening osteotomy. In comparison to the arthroscopic wafer procedure and resection arthroplasty with the result of pressure increase in the fossa sigmoidea, the ulnar shortening osteotomy seems to be the method of choice to treat ulnar impaction syndrome.

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028

Scaphoid fractures – Variation in radiographic views

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Scaphoid is the most commonly injured carpal bone. Recent studies have demonstrated a wide variation in practice between hospitals with regard to initial management of suspected scaphoid fractures.
Materials and methods:
X -ray departments in all acute hospitals in the West of Scotland with an A&E were contacted to ascertain the number and the type of views they performed for the scaphoid. A survey of both consultant orthopaedic surgeons and consultant radiologists from the West of Scotland was conducted asking them the number, and type of views to constitute a standard 'scaphoid series'.
Results:
14 hospitals in the West of Scotland were surveyed. 7.14% routinely performed 5 views, 64.28% performed 4 views and 28.6% used only 3 views. The commonly performed radiographs were, lateral with the wrist neutral (85.7%), postero-anterior [PA] oblique in ulnar deviation (78.5%).
60 consultant orthopaedic surgeons and 60 consultant radiologists from these hospitals were contacted as part of the study. 57.5% of orthopaedic surgeons were of the opinion that 4 views were required, 33.3% felt 3 views were adequate and 9% suggested 5 views. X-rays considered most useful by the surgeons include, a lateral with the wrist neutral (87.8%), PA in ulnar deviation (51.5%). 68.4% consultant radiologists preferred 4 views, and 15.8% required 3 views. Lateral with the wrist in neutral (84.2%), PA in ulnar deviation (52.6%), were the most frequent suggestions
Discussion:
Our study has highlighted the lack of uniformity among orthopaedic consultants, radiographers and radiology consultants. With up to 5% of these fractures being missed on initial x rays a large number of these patients will be inappropriately treated.
A uniform system needs to be introduced like in most other body parts where a standard set of radiographs are taken in all hospitals to increase the familiarity of both terminology and visualization.

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029

Mini orthofix: External fixation for metacarpal fractures

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Purpose:
The retrospective evaluation of the results of the treatment of the diaphyseal and metaphyseal fractures of the metacarpals using the <<mini orthofix>> external fixation.
Methods:
From 1999-2004, 55 metacarpal fractures were treated with an open or closed procedure and the application of the <<mini orthofix>> external fixation. Internal fixation was applied in 9 fractures. Fractures were located at the fifth metacarpal (42), fourth metacarpal (2) and first metacarpal (11). Fifty fractures were closed and five were Gustillo type 1 open fractures. Closed procedure was performed in 47 fractures. Intravenous block anaesthesia was applied in all patients.
Results:
Solid union without a further procedure was achieved in 51 fractures. Four fractures required an additional bone grafting. All these fractures had been treated with an open procedure. Excellent functional result was recorded in 42 patients good in 12 and poor in one patient. Early loss of the reduction, re-manipulation and additional internal fixation was done in four fractures. Superficial inflammation at the pin sites was noticed in almost every fracture, all subsided with oral antibiotics. No deep infection was recorded in this series.
Conclusions:
External fixation for metacarpal fractures is a safe, flexible practical effective and well tolerated treatment method for metacarpal fractures. It offers adequate stability of the fracture and is well tolerated for the patient.

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030

Is there a benefit from minimally invasive total hip arthroplasty via direct anterior approach?

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Objectives:
Minimally invasive total hip arthroplasty has evoked substantial controversy with regard to whether it provides superior outcomes compared with conventional total hip arthroplasty. To elucidate benefits, the results of a minimal invasive direct anterior approach were compared with those of a standard lateral transgluteal approach.
Methods:
120 patients (120 hips) admitted for unilateral total hip arthroplasty were randomized to undergo surgery via minimal invasive direct anterior (group A) or lateral standard approach (group B). Patients with a body mass index of more than 35, previous hip surgery, preoperative neurological deficits and with an age of more than 80 years were excluded. Blood loss was calculated using the formulae by Rosencher et al., muscle damage was assessed by measuring serum creatinine kinase and myoglobulin.Two surgeons performed all procedures. Postoperative pain, stiffness and the ability to perform the activities of daily living were measured using WOMAC questionnaire
Results:
The groups were similar demographically. Patients in group A had less total blood loss, postoperative blood level of creatinine kinase, as indicator of muscle damage was significantly lower. Operative time was similar in both groups, we found no difference in component placement. Postoperative pain was rated less in group A. As regain of functional independence was accelerated in group A, stay in hospital was diminished and recommencement of the activities of daily living was earlier.
Conclusions:
Compared with standard lateral transgluteal approach, patients with minimally invasive total hip arthroplasty via direct anterior approach demonstrated decreased blood loss, diminished muscle damage and earlier regain of functional autonomy.

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031

Mimimal invasive total hip arthroplasty- single and two incision technique

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Purpose:
The purpose of this material is to compare the minimal invasive hip replacement techniques (one and two incisions) with the traditional hip replacement in the aspects of pain, blood loss, operative time, complications, early mobilization, and joint function.
Materials and methods:
The authors used the minimal technique between 2003-2005 in 259 patients. 53 of them were implanted through a double and 206 using the single incision technique. The double incision is based on the Berger's technique; the single incision is using the modified Rottinger' technique. The indication was osteoarthritis, dysplasia, posttraumatic arthritis and femoral neck fracture. Cementless, cemented and hybrid prostheses were implanted.The follow-up was between 3 months to 3 years. The body weight of these patients was between 48-128 kg.
Results:
Based on this investigation the pain is significantly reduced. In comparison of the traditional techniques there were no difference in blood loss (p=0,05). The operative time was no longer than using the traditional technique. In the aspects of complications there was in this material 1 femoral fracture and 2 dislocations and 4 reversible n. cutaneus femoris lateralis palsy. There was not any infection. All of the patients undergone an early mobilization. Between two days after the operation all of them stood up and walked with total weight bearing. The short time joint function was much better than using traditional techniques.
The authors prefers the single incision mimimal invasive method. It is similar to the traditional technique, it is suitable for cemented and cementless techniques as well. It can be enlarge if it is needed.
Conclusion:
The minimally invasive hip replacement has several advantages in comparison of the traditional techniques. Less pain, early mobilization, early weight bearing, good short time function in follow-up. It seems to be there was no difference in blood loss.

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032

Experience after 500 THR with the minimally invasive anterolateral approach in supine position- How to start with it

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Purpose:
Since November 2004 approx. 500 primary THR were operated with a modified minimally invasive Watson-Jones approach. The different steps in perfecting this procedure are discussed. Risks and complications during the learning curve as well as tips and tricks for preparing the patient and positioning of cups and stems are analysed to facilitate the start for beginners.
Material and methods:
The reduction of the skin incision and soft tissue trauma approaching between the gluteal muscle, under preservation of the muscle insertions and the tensor fasciae latea, requires accurate preparation of the anatomical structures and an extensive capsule release to ensure a tension-free adjustment of the cup and stem.
The orientation hasn't changed by keeping the supine position on a standard table. The prosthesis system we have used to date (Bicon screw cup and Zweymüller stem) is further implanted.
In comparison with the conventional procedure we haven't established any differences after radiological analysis. In the case of insufficient mobilization of the proximal femur for the stem preparation however the risk of a varus position of the implant and thus under-sizing the prosthesis exists.
We discuss the steps in perfecting our approach and the modification of instruments and the selection of retractors.
Results:
The advantages of MIS are evident: Earlier mobilization, walking without crutches after a few days, easier climbing of stairs.
In addition we present results of interviews among patients which have experienced both procedures.
No essential differences arose concerning post-operative pain and loss of blood. The total complication rate was 2%.
Conclusion:
The anterolateral approach in supine position in THR has become a standardised surgical technique. Exact preparation and detachment of the capsule and a tension-free adjustment of the proximal femur are necessary for the optimal positioning of the implants and to avoid complications. Patient satisfaction justifies the learning curve.

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033

Radiological evaluation in the cases of the one incision minimal invasive THR

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Purpose:
The authors made a radiological comparative evaluation in the respect of cup and stem positioning following one incision MIS and conventional THR.
Material and methods:
58 one incision MIS THR and 58 conventional THR have been compared from 01.06.2003 to 31.12.2005. They compared and evaluated the radiological position of different type of implants.The average BMI was given for different groups and they evaluated the effect of BMI on the radiological position of different implants as well.
Results:
The radiological position of the cup did not show significant difference between the MIS and the conventional groups, neither between the different prosthetic design. 28% of the MIS Exeter stems had varus < 5 º, 8% of the cases had varus >5 º but in the cases with conventional approach only 6,8% of the Exeter stems had varus < 5 º.In the cases of Metrimed prosthesis 18% of the stems had varus < 5 º compared to 6,8% with conventional approach. 16% of the cementless De-Puy stems had varus < 5 º. The average BMI did not show any difference in any group.
Discussion:
Concerning the cup positioning there was no difference between the two groups in this series. In the cases of stems, mainly in the cases of Exeter stems- with thick cement mantel- the number of the slight stem varus positions were significantly higher in the MIS group. In spite of the rather low average BMI (25,2) the relatively high number of varus stem malpositions are warning, mainly in the cases of Exeter design (thick cement mantel) from the respect of improving the technique and to keep in mind the importance of templating before surgery, however not to rely on the BMI only, the shape of the hip region could be important factor as well.

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034

Minimal invasive total hip arthroplasty

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Purpose:
In view of the rising life expectancy and increasing quality of life of the patients with hip disorders it is a demand for THA to return the patients quickly to the working life after operation. MIS -technique makes a big contribution to this purpose, because of its gentle softtissue treatment. We discuss about the advantages and disadvantages of MIS -technique with the special supine positioning of the patient on the operating table, developed in our hospital.
Material and Methods:
This MIS -technique in THA from Stolzalpe is a modified Watson-Jones approach in supine position, with a complete preservation of tendon of the gluteus medius, without any muscle cut. The bloodlost, op. -duration, postoperative care, complications and functional results in 320 patients have been reviewed and compared to 117 conventional operated patients.
Results:
From 9/2005 - 1/2006 we performed THA in 320 patients according to MIS -technique. The patients had an average age of 63 and a BMI of 30. Compared to the conventional method we could observe a shorter op.-duration (50 min. in average), less intra - and total bloodlost (400ml, 700ml) and a shorter p.o. ICU (6 hours).
We registered
9 intraop. femurshaft -fissurs (2-8%)
1 postop. dislocation (0,3%)
1 nerve injury (0,3%)
These complications have been observed during the first 2 months as we started with the new technique (learning curve). Consequently some modifications were necessary. Beside the less bloodlost, shorter op.-duration and postop. ICU, the patients were able to walk very early postoperatively without limping. The special supine positioning of the patient is the best one according patient comforts, anaesthesist and surgeon.
Conclusion:
At present the MIS -technique in THA according to Stolzalpe is a standard procedure in our hospital, easy to learn and to apply in the most of the primary coxarthrosis cases.

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035

Our experience with minimally invasive THR

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Purpose:
The comparison of MIS approaches in THR using in our clinic.
Material and methods:
85 THR using one of the MIS approaches were performed from Jan 05 to Feb 2006. We use ,,one incision" lateral approach, anterolateral approach and finally anterior approach. Both cemented and cementless implants were used. No X-ray intensifier for stem navigation was used. The postoperative pain, the bloodloss, learning curve and hospitalisation time were evaluated.
Results:
Short-term results are presented (0 - 13 mths.).
Discussion: Lateral approach is more ,,less invasive" approach than minimally invasive one. On the other hand the anterolateral and anterior approach fulfils criteria and standards of MIS.
Advantages and disadvantages of separate MIS approaches are discussed one by one (patient´s positioning - lateral decubitus vs.supine position, surgeon´s position, leg length measurement etc.).
Conclusion:
The postoperative pain and bloodloss were less in most cases, the hospitalisation time depended more on social and family situation than on the type of procedure. In generally, main differences between standard and MIS THR occur in the first six weeks after procedure.

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036

Direct lateral mini approach in hip arthroplasty

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Mini-invasive techniques for hip arthroplasty have been claimed to reduce blood loss, transfusion requirements, postoperative pain, and the length of the hospital stay compared with standard techniques through a longer incision. However, the literature is deficient of studies that support these claims. Moreover, a high rate of complications of minimally invasive total hip arthroplasty during surgeons' early experience with these methods was reported.

Purpose:

The aim of this prospective study was to compare the results of direct lateral mini approach with those of a standard direct lateral approach in hip arthroplasty in the early postoperative period.

Material and methods:

From April 2005 to November 2005, we prospectively studied twenty-three patients (14 total hip arthroplasties, 9 hemiarthroplasties) who underwent surgery through a short incision of ≤10 cm. As a control group we used 30 consecutive patients (26 total hip arthroplasties, 4 hemiarthroplasties) operated on during the same period through a standard incision of 16 cm.

Results:

No significant differences were detected between the two groups with respect to average surgical time, postoperative hematocrit, blood transfusion rate, analgesic use, early walking ability, or length of hospital stay. We found no difference in component placement, cement-mantle quality, or trauma to the soft tissues. The mini-incision group was found to have less intraoperative blood loss ($p<0.05$).

Conclusion:

Total hip arthroplasty performed through a direct lateral mini incision is safe and reproducible. The learning curve is short and rate of complications is low. However, it offers no significant benefit in the early postoperative period compared with a standard incision of 16 cm.

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037

Minimal invasive surgery – Arthroplasty register datasets and scientific evidence

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The short term and long term outcome of minimal invasive surgery is a very interesting topic according to publications and congress topics.
The scientific discussion is prohibited by a lack of standarisation in the definition of the surgical procedures and the outcome measurement parameter.
Arthroplasty Registers have started to include MIS in their forms recently.
This study is presenting an overview about studies according to Evidence Based Medicine standards and Arthroplasty Register Datsets including MIS hip arthroplasty as well as a review about influence on the outcome of unicondylar knee arthroplasty from the Swedish National Knee arthroplasty register from Lund.

Materials and Methods:

A peer reviewed literature review and arthroplasty register reports were used for this review.

Results:

There is a lack of definition for MIS-procedures in Register datasets as well as in clinical studies.
The outcome of MIS-operation seems to be dependent on the implant desing, the instrumentation of the implant and the training of the surgeons.
Initially the revision rate increased by using MIS techniques. Training programs for orthopaedic surgeons have been able to increase the performance to the initial level.
MIS is not a proper procedure for every implant, but training and adapted instrumentation seem to be able to demonstrate comparable long term performance comparing to standard incision procedures.

Conclusion:

The lack of standardisation in MIS is decreasing the comparability of literature. There are different procedures claiming to be MIS, which might influence the outcome.
Further clinical studies based on clear definitions and performance control by arthroplasty registers are recommended for the future.

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040

Endoprosthetic replacement in II.orthopaedic department of Comenius University in Bratislava

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Purpose:
The endoprosthetic replacement is continue achieving progress in Slovakia too. After enter Slovak Republic into European Union we have the some conditions for endoprothetic replacement than in all Europe. In this lecture we would like to show real possibility to implant endoprosthese in our department in years 1998–2004.
Material and methods:
We have taken out some statistic data with focusing on endoprothestic replacement with following issues : frequency of endoprosthetic replacement (hip and knee), payment of endoprosthetic replacement (public – privat), selection of patients, average costs, frequency of cemented and cementless implants, suggestions for improvements and demands.
Results:
The II. Orthopaedic department had from 1998 do 2003 90 beds, in 2004 was reduced to 60 beds. In this years we performed 13 386 operations. Endoprosthetic replacement were **2945**
22% of all operations (hip 2613 –89%, knee 332 –11%). Indication for endoprosthetic replacement were osteoarthritis degree III and IV. THR were performed 467 -18% in trauma indication. – Primay endoprotheses were 2480 –84%, and 465 –16% revisions. Cemented 2117 –72%, uncemented 828 –28%. In this years we had for one month for the endoprosthese 1 200 000–1 400 000 Sk, (30 000 – 35 000 Eur). The cheapest cemented hip endoprosthesis costs 20 000Sk (500 Eur), knee 40 000 Sk (1 000 Eur). Cementless endoprothesis cost 80 000 – 140 000 Sk (2 000 – 3 500 Eur). The 20% patient wanted the more expensive endoprostheses. – This could we realize by patients extra pay. From 2005 extra payment for endoprostheses was strictly prohibited. Waiting list was in 1998 1 year, in 2004 2 years.
Conclusion
In our department in years 1998 – 2004 was disproportion in requirement of endoprostheses and the financial resources of the department. We had disproportion between the requirement in the number of endoprostheses, and in the financial resources. We have preferred from this reason the cheap cemented endoprostheses. Plan for the future: to find the way for better financing endoprosthetic replacement program. The offer of the endoprostheses is in our country satisfactory, they are the some then in the western Europe.

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045

Infection after arthroscopically assisted mini open repair of the rotator cuff

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Arthroscopically assisted mini open repair of the rotator cuff may have an increased risk of infection as this procedure combines extensive fluid extravasate with open surgery. Between 1998 and 2005 arthroscopically assisted mini open repair of the rotator cuff was performed in 275 consecutive patients. Three postoperative subcutaneus infections (1,1%) were observed. All three patients were men and the average age was 59 years.
Two patients had a revision rotator cuff repair 5 years and 10 years respectively after the primary repair.
In one patient the subcutaneus infection developed after a primary repair. One patient did not require surgical intervention but two patients required a debridement of the subcutaneus tissue.
All infections occured between day 8 to day 14 after the tendon repair. Symptoms were characterized by an almost painless erythema surrounding the wound and purulent drainage. Propionebacterium acnes was identified in one case whereas microbiological examinations were noninformative in two cases.
All patients were given intravenous Augmentin for one weeks followed by an oral administration of Augmentin for two weeks. However in two cases complete resolution of clinical signs and symptoms of infection were achieved only after we changed the oral medication to Minocyclin.
In three cases with similar clinical signs of almost painfree erythema surrounding the wound and purulent drainage Propionebacterium acnes was isolated in one case whereas microbiological examinations were noninformative in two cases.
We prefer Minocyclin in verified or suspected subcutaneous infections with Propionebacterium acnes.

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046

Local anaesthetic infusion with elastomeric pump after arthroscopic subacromial decompression

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Introduction:
The success of day surgery depends on effective control of post-operative pain with minimisation of side effects such as sedation, nausea and vomiting.
Aims:
We evaluate the use of a portable elastomeric infusion device in patients undergoing arthroscopic acromioplasty and make a case for its potential to allow same-day discharge. Advantages and disadvantages of such a device over other forms of analgesia, cost-effectiveness and patient satisfaction levels are presented.
Methods:
Forty patients undergoing arthroscopic acromioplasty were prospectively followed-up. An epidural catheter connected to a portable elastomeric infusion system was inserted into the subacromial space under arthroscopic visualisation. Patients were assessed using a visual analogue pain scale (VAS). The amount and type of additional analgesia required by each patient along with sedation and nausea scores were recorded.
Results:
In the recovery ward 80% of patients reported only moderate pain and 20% mild pain. At 6 hours, 33% of patients had only mild pain and 66% minimal discomfort. Twelve hours postoperatively, 90% of the patients reported minimal discomfort and the remainder no pain. At the 24 hour mark, 67.5% had no pain and 32.5% only minimal shoulder discomfort. No patient reported severe pain at any stage. None of the patients required any parenteral analgesia with the pump in situ. No pump failures or wound infections were encountered. Patients were of the opinion that they found the device effective, discreet, lightweight, easy to care for and suitable for home use.
Conclusion:
The use of extended local anaesthesia for post operative pain has several advantages, including ease of use, safety, reliability, lower cost and effective analgesia with minimal side effects. Our findings suggest that the use of such an elastomeric infusion device following shoulder surgery allows safe and early discharge of patients with decreased need for parenteral or opiate analgesia.

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047

Reversed shoulder protheses in patients shorter than 165 cm a problem?

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Background:
Past experience in surgery has indicated that the commonly used reversed
shoulder arthroplasties (Delta / De Puy, Aequalis inversed/ Tornier,
Anatomica / Zimmer) might be oversized especially for people of a lesser body-height.
At present only epiphseal-parts of 36 or 42mm diameter are available.
Statistic research in the past years has stated that the average height of
people over 60 years of age- being the target patients for this kind of arthroplasty - in Austria is 171cm in the male and 161cm in the female population.
Method:
At first 15 mazerated humeri of humans less than 165cm in body height were
identified in cooporation with the Institute of Anthropology, Museum of Natural History, Vienna. Their length varied from 27,4cm to 32,7cm. In a pilot study three humeri were analysed using computertomography .
Consequently they were cut in 3mm thin slices with the aid of a diamant-saw in order to verify the data found earlier. The goal was to identify the thickness of the corticalis and the diameter of the proximal humerus in specifically defined locations.
The 12 remaining humeri were analysed only by computer-tomography.
Results:
Comparation of the dimensions of the epiphyseal-part of commonly used reversed shoulder protheses and the data revealed by the the analysis of real humeri have shown a significant difference between the measurements. The mazerated humeri had a mean -10,8%
transversal diameter than the protheses.
Conclusions:
Consequently problems may arise when implanting reversed shoulder protheses
in people of a lesser body height. The oversizing in the proximal humerus may provoke protruding of metal parts, fractured stalks or - later on - Notching.

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048

Shoulder arthroplasty-the method of the treatment proximal humeral fractures

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Purpose:
The purpose of this study is to analyse the results of shoulder arthroplasty, as the method of treatment fractures and complications of the proximal part of humerus.

Material/Method:
During the period 1995 - 2005 shoulder arthroplasty surgery was used for the treatment in 25 cases. Patients were 4 males and 21 females.
The age range of the patients was from 34 to 84 years.
Shoulder arthroplasty was performed for the following
reasons:
-four part fractures of the proximal humerus
(C3 according to AO)
- 14 cases
-posttraumatic deformation and aseptic
necrosis of the humeral head
- 3 cases;
-posttraumatic defect of the proximal
humerus (prior resection of the humeral head)
- 3 cases;
-pseudoarthrosis or non union fracture of
the neck of the proximal humerus
- 2 cases;
-posttraumatic osteoarthrosis
- 2 cases;
-chondrosarcoma of the proximal humerus - 1 case.
The follow up results were assed according to the UCLA END - RESULT SCORE.
The functional results were evaluated as follows:
-in 18 cases the patients were examined in person;
-in 5 cases patients filled out questioneries;
-in one case no response was received.

Results:
Overall:
2 excellent; 22 good; 1 poor.

Conclusions:
In 94% shoulder arthroplasty has showed excellent and good results. This proves that in each case the most appropriate method was used.
It is important to keep in mind that good results can be achieved by using arthroplasty in the treatment of four part fractures of the proximal humerus; aseptic necrosis of the humeral head; defect of the proximal humerus; pseudoarthrosis or non union fracture of the neck of the proximal humerus; as well as posttraumatic osteoarthrosis.

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049

Accuracy of kinematic navigation in ACL reconstruction surgery

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Introduction:
Rupture of the ACL is one of the most common knee injuries. The main problem in ACL surgery is correct tunnel placement. Approximately 70% of ACL operations are conducted by surgeons who perform fewer than 20 cases a year, and who can thus gather relatively little experience with tunnel placement. The aim of this study is to prove the accuracy of the CT-free OrthoPilot navigation system (Aesculap-B.Braun, Tuttlingen, Germany) usage in ACL reconstruction surgery.

Material and method:
We performed 40 ACL reconstructions without and 40 with the use of navigation (OrthoPilot device). The patients selection was randomised as they came to authors´ institution. Both tunnel positions were then evaluated and compared.

Results:
The femoral tunnel was in the navigated group localised in the ideal position with a mean deviation up to 8% from the ideal tunnel center in 35 cases (87,5%) and in the acceptable position with a mean deviation up to 14% in 5 cases (12,5%). In the controll group was the femoral tunnel localised in the ideal position in 14 cases (35,0%), in the acceptable position in 14 cases (35%) and in the wrong position in 12 cases (30%). The tibial tunnel was in the navigated and also in the controll group localised in the ideal position in zone B in 37 cases (92,5%). The mean additinal operation time caused by OrthoPilot navigation was 11 minutes. No complications were observed in both groups.
Conclusions:
The kinematic navigation system permited more correct placement of femoral drilling canal then the standard technique. Although there are many important considerations in ACL replacement surgery, accurate graft placement is a paramount in achieving a successful result. The more accurate tunnel placement after navigated surgery gives the optimal situation for better anterior knee stability.

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050
Thermodynamic analysis of the cruciate ligaments in the osteoarthritic knee
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Purpose:
Cruciate ligaments of the knee are often affected by the degenerative process in osteoarthritis. Deteroriation of the anterior cruciate ligament is well known, but the involvement of the posterior cruciate ligament is a matter of discussion in literature. One of the most controversial issues in knee arthroplasty practice nowadays is the necessity of preservation of the posterior ligament. The aim of current study was to establish the thermal features of the healthy cruciate ligaments and to detect the alterations in osteoarthritis. A further aim was to establish differences between thermograms of the anterior and posterior ligaments
Material and method:
Differential scanning calorimetry (DSC) is a well-established research method for the demonstration of thermal consequences of structural changes in biological systems. Advantages of this method for the investigation of biological systems has been described in numerous publications before. The healthy cruciate ligament samples were of cadaver origin. We took samples only from knees where degeneration of the joint could not be verified macroscopically in any terms. The pathologic ligaments were derived during knee prosthesis implantations. We measured samples of 8 arthritic knees of patients being in average 65 years (49–72) of age. Three posterior and six anterior cruciate ligaments have been examined with macroscopically evident degeneration. All samples have been checked by histological examinations as well.
Results:
By establishing the DSC scans of the normal ligaments we could demonstrate clear differences between the posterior and anterior ligament. We have observed less damage in posterior cruciate ligaments than in anterior ones in osteoarthritis. Even though the thermal features of the arthritic PCL are significantly better than those of the ACL, the posterior cruciate is compromised in osteoarthritis.
Conclusion:
Thermal analysis has been proved to be a useful tool in following the changes in ligaments affected by different pathologic conditions.

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051
Condition of achillis tendon in high level sport players after surgical procedure with open and percutaneos methods evaluated with isokinetic dynamometar
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Purpose:
High level and profesional sport is very demanded for the young people.Realization of top level sport results demand in methods of sport training to go over the possibility and border of human body.We are witnesis of very hard injuries in top level sports, and in that group are included and ruptures of tendo Achillis.

Material and methods:
Our work include 48 professional players with rupture of tendo Achillis. Age of players are betwen 25 and 38 years. 24 players were operated with open procedure and 24 with percutaneos method. Period in which those procedure were made was beetwen 1998 and 2005. All operated patients were tested after one year of the surgical procedure.
Results:
Presentation and comparison beetwen open and percutaneos method were made on isokinetic dinamometar.We get results that those patients who were operated with percutaneos method have 20% better results then thouse who are operated with open procedure.
Conclusion:
Percutaneos method is technicaly more easier than open method.Time spent in hospital is almoust twenty time shorter with percutaneus procedure. Return to sport activities are twice faster then those who were operated with open procedure. Until now we did not have reruptured Achillis tendon in sport players who were treated with percutaneos procedure.

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052
Boundary conditions in tendon-bone healing
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Purpose:
To investigate the effect of an anatomical tendon-graft fixation with biodegradable interference screws compared to endobutton technique and sutures on tendon-to-bone healing in an animal model of anterior cruciate ligament (ACL) reconstruction.
Methods:
36 mature female merino sheep underwent open ACL replacement surgery using an ipsilateral flexor tendon autograft. The sheep were divided into two groups each of which received an ACL reconstruction either with endobutton technique on the femoral and sutures fixed to the cortical bone on the tibial side or directly fixed with poly-(D,L-lactide) interference screws. Animals were euthanized after 6, 12 and 24 weeks and histologic evaluations were performed. Undecalcified specimens were evaluated under normal and polarized light. Additionally, animals received a polychrome sequential labelling to determine bone growth per time under fluorescent light.
Results:
Intratunnel histologic findings at 6 weeks showed a tendon-bone junction with only a partial fibrous interzone between the graft tissue and the surrounding bone. A mature intratunnel tendon-bone junction with a zone of fibrocartilage was found to 12 weeks. At the tunnel entrance site a wide regular ligamentous insertion site was seen in all specimens after 24 weeks. This insertion showed regular patterns such as a direct type of ligament insertion of a normal ligament with a dense basophilic transition zone consisting of mineralized cartilage.
Conclusion:
Based on our findings, it is reasonable to assume that the tendon-to-bone healing may progress partially by direct-contact healing without development of a fibrous interzone. This is in contrast to previous studies reporting the development of an indirect type of insertion when using nonanatomic interference fit fixation far away from the joint line. Thus, histologic data strongly indicate that anatomic interference fit fixation is beneficial for tendon-to-bone incorporation by leading to the development of a direct type of ligament insertion.

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053
The effect of cyclooxygenase-2-inhibitors on tendon-to-bone healing using soft tissue autografts in a rabbit model of ACL reconstruction
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Purpose:
Selective Cyclooxygenase-2 (COX-2) inhibitors are commonly prescribed following anterior cruciate ligament (ACL) reconstruction. The purpose of this study was to investigate the effect of COX-2 inhibitors on tenon-to-bone healing.
Methods:
28 New Zealand White rabbits underwent unilateral ACL reconstruction using an autologous semitendinosus tendon graft to investigate the effect of selective COX-2 inhibitors (celecoxib) using pQCT (peripheral quantitative computed tomography) and biomechanic measures. To assess indirectly the effect on local COX-2 activity Prostaglandin E2 (PGE_2) synovial fluid content was measured by ELISA. Each animal was assigned to one of two groups. One group received selective COX-2 inhibitors for 3 weeks, the other group received no drug (control). The animals were sacrifized 3 and 6 weeks after surgery.

Results:
PQCT: In the COX-2 group pQCT-Scans showed lowered bone mineral density (BMD) and cross-sectional area (CSA) of new bone around the grafted tendon after 3 weeks compared to the controls. CSA and BMD levels correlated with PGE_2 changes. *ELISA:* The COX-2 group had half the synovial fluid concentrations of PGE_2 after 3 weeks compared to the controls. By 6 weeks after surgery and 3 weeks after last drug administration, respectively, PGE_2 increased more than twofold in the COX-2 group, while in the controls there was a decrease in PGE_2 by time. *Biomechanical Testing*: Controls exhibited a nearly twofold higher mean maximum load to failure graft stability compared to the COX-2 group 6 weeks after surgery. An increase in PGE_2 was associated with lower maximum load to failure values (r= –.546, p= 066).
Discussion:
Our study demonstrated that after treatment with selective COX-2 inhibitors specimens exhibited increased, maybe reactive, PGE_2 concentrations and decreased graft stability and bone formation. Untreated controls appeared to have a more physiological healing course with a continuous decrease in PGE_2 and an increase in graft stability with time.

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054
The comparison study of the one incision minimal invasive posterior approach and the anterolateral approach in total hip replacement
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Purpose:
The comparison of peri and postoperative results including the positive and negative facts of the traditional anterolateral and the one incision minimal invasive posterior approach of total hip replacement.
Material and methods:
We have had 171 minimal invasive posterior approach THR operations since October 2003. We applied this technique in cases of primary coxarthrosis, rheumatoid arthritis, aseptic femur head necrosis, secondary arthrosis because of congenital hip luxation, femoral neck fracture, THR revision following spacer implantation. We compared the operating time, the blood claim, the pain quantity, the attendance time, the aesthetical results and the progress of mobility of the new method to the ones of the traditional way. We analyzed the complications and tried to find correlation with the new type of approach.
Results:
The operating time of the minimal invasive posterior approach THR was 8,3% longer on the average due to the new technique. The blood claim was 38,2% less. The pain quantity was significantly smaller. The attendance time was 34,6% less. The position of the incision site was favourable. The BMI has an effect of the length of incision, but it was 52,7% shorter. Mobilization starts on the first postoperative day, while in the anterolateral approach it started only on the third day. Analyzing the complications we have not met significant difference of periprothetical fracture, luxation, septical complications, early migration of the implants.We did not use mobile fluoroscopic imaging during intervention.
Conclusion:
Half of the patients can be operated by using this new method. The only condition needed is the good palpability of the patient's trochanteric region. The technique is more difficult than the traditional one and requires exact anatomical knowledge. Recognizing the advantages the justification of this technique is indisputable. The economical benefits of smaller blood claim, faster rehabilitation, shorter attendance time are not negligible.

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055
Mini-incision anterolateral approach for total hip arthroplasty
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In the last years the minimally invasive technique for total hip arthroplasty (THA) is getting more popular. Two different approaches are used. We started with mini-incision through an anterolateral approach in December 2003. The patient is in supine position. A oblique skin incision spanning 4-5 cm anterior - caudaly and 2-4 cm posterior - cranialy of the greater trochanter is made. Last year anterior Hueter approach is used as other posibility. The fascia is incised in line with skin incision. The gluteus medius muscle fibres are partialy desinserted and pushed cranially or left insitu. The capsule is incised and partialy removed anterocranially. The femoral head is dislocated anterior and resected. The following steps were performed in the usual maner.

We compared 25 non cemented or cemented THA's performed through a mini-incision with 25 performed through a conventional antero-lateral approach.
There were no significant differences in age, gender, and body weight between groups of our patients.
The mean operating time was shorther (50 ± 30 versus 60 ± 30 min), and the perioperative mean blood loss was smaller with the mini-incision (300 ± 200 versus, 600 ± 300 ml). There was no significant difference between the two groups in post-operative mean blood loss, mean inclination angle of acetabular and position of femoral components. There was no infection, dislocation and symptomatic pulmonary embolism in both groups. There was one postoperative hematoma in the conventional group which was treated by removal, but none in the mini-incision group.
In conclusion, a favourable short-term outcome with less surgical damage can be expected with a mini-incision anterolateral approach.

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056

What MIS hip technique should we use. Two year follow up of 350 two-incision minimally invasive total hip replacement

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Purpose:
Authors introduce results, hazards and solutions of 350 two incision MIS hip replacement . Aspects of one incision techniques are detailed with differences in indication .
Methods:
Between April 2003 and September 2005 350 two-incision minimally invasive total hip replacements were performed in authors institute. The cup and the stem is implanted through two incisions using physiological muscle routes. No muscles, tendons and ligaments are detached. Complications with solutions are introduced. Indication is determined by pathoanatomy and weight of the patient. 185 osteoarthritis, 82 aseptic necrosis, 77 dysplastic and 6 posttraumatic patients were operated.
The proximal approach was facilitated by a dissector developed by authors in order to preserve ilio and ischio-femoral ligaments that may act in leg length discrepancy and primary stability.
Results:
On properly selected patients results include increased primary stability, because of preserving the iliotibial tract, muscles and the ilio-ischiofemoral ligament. There was no dislocation. Radiological analysis revealed more than 3 degrees malalignment in 2,7% for stem and in 5,1% for cup. Fluoroscopy and OP time was reduced to av. 6 secs. Average flexion was 76 degrees in the first two post op days. Post operative pain was significantly reduced. Hospital stay was 3,2 days. There was no infection, nor heterotopic ossification. In 5 cases the femur fractured and wiring was necessary through the anterior incision.
Conclusions:
Two incision minimally invasive total hip replacement is technically more demanding, requiring adequate training and knowledge of anatomy. Appropriate indication is inevitable. Results are to be originated to the anatomical reconstruction and preservation of muscles tendons and ligaments around the hip.

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057

Anterior muscle sparing ,,Minimally Invasive" THR

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In resent years there has been much interest in minimally invasive THA. The anterior approach through the internervosus interval of Smith Peterson has been advocated in United States by Keggi and associates since 1977 (AAOS Congress).
The purpose of the study were to compare operative and clinical results of using the Keggi anterior muscle spraining approach done in Latvia (Studers at al) and senior author results published in J.B.J.S. December 2003 and 2004.
Material and Methods:
We compare Keggi results of 2132 THR published J.B.J.S. December 2003 and 2004 with 780 THR (1999-2003) done in Latvia by Studers et al. The data from medical history were used for documentation. The patient's data, operative times, intraoperative blood loss, complications and patient's satisfaction were analyzed.

Results:
Keggi (USA): Studers (Latvia)
Primary THR: 2132- 780;
Average OP time: 57.8 min.- 103 min.;
Average intraop. Blood loss: 500 c.c.- 638 c.c.;
Luxations: 1.3 - 1.3;
DVT: 0.8- 1.0
Conclusions:
1. The anterior muscle sparing THR were successfully introduced in Latvia,
2. We found the same low dislocation and DVT rate,
3. The rehabilitation of these patients has also been very rapid do to the minimal damage to the major muscle and their inervation and the short anterior skin incision.

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058
The anterior minimal invasive approach on a modified trauma table in hip arthroplasty
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Purpose:
The minimally invasive anterior approach on a modified trauma table has been adopted in hip arthroplasty from 5/2003. We evaluated the postoperative functional outcome and postoperative pain , respectively the complications.
Materials and methods:
A modified and limited Smith Petersen exposure, with the preservation of the miotendinous insertions has been adopted in hip arthroplasty.
The lesser damage of the hip muscles with this approach may reduce the postoperative pain and should improve the functional recovery after the surgery.
We report the results in 94 patients operated with this approach.
17 of them were suffering from a dislocated femoral neck fracture and were submitted to hemiarthroplasty. 70 patients suffering from OA and 7 suffering from aseptic femoral head necrosis were treated with cementless THR.
Results:
The mean age was 72 years. Skin incision ranged from 6 cm to 14 cm. Patient' s subjective grading has been evaluated according to a numeric pain scale (0 -10); early functional outcome has been rated according to a modified functional scale considering active flexion and abduction.
Average active flexion on p.o. day two was 71°, active abduction 18°. At day 7 active flexion
measured 83°, active abduction measured 25°. At day 30 flexion measured on average 92° , abduction 32°. All patients were mobilized on two crutches from p.o. day 2 and permitted to weight bearing depending on the postoperative pain.
There have been 6 complications:1 fracture of the greater trocanter, 1 transient femoral nerve palsy, 1 deep infection, 1 aseptic stem loosening; 2 cases of transient numbness of the lateral thigh due to compression of the femoral cutaneous nerve.
Conclusion:
The anterior approach for hip replacement on a trauma table provides good visualization both of the acetabulum and the proximal femur with early good functional results in the first postoperative days.

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059
AMIS in THR - from learning to practicing
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Purpose:
In this practice we present our experience in learning and practicing with anterior minimal invasive surgery in THR in Bosnia and Herzegovina.
Anterior minimal invasive surgery in THR we started in 2005 in Medacta-Switzerland teaching center in Lugano and in Paris.First of all we make practicing in cadaver center in Paris and after that we started with assistance to experienced surgeons in AMIS techniques in Civico hospital in Lugano.
After this we started with AMIS in our Clinical center.

Material and methods:
We performed 10 anterior minimal invasive surgeries in THR.7 patients were male and 3 female.Average age was 51 (40-72). 8 patients had osteoarthritis of the hip and 2 had avascular necrosis after femoral neck fractures and osteosynthesis with screws.We performed cementless THR in all patients.
Results:
In all 10 cases we performed anterior minimal invasive surgery in THR with special equipped instruments and extension table from Medacta - Switzerland.
Average operating time was 95 minutes (70-150).Blood supplies we used in 2 cases in patients with avascular necrosis after femoral neck fractures.
Conclusion:
First results give a hope to our patients and us that AMIS in THR has a lot of advantages compared by other techniques in THR. Main advantages are:minimal invasive surgery with no muscle cuts in anterior approach,walking without crutches first day after surgery,short stay in hospital after surgery (72 hours) and fast rehabilitation of patients.
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060
Hip hemiarthroplasty with minimal invasive surgery
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Purpose:
Plenty of publications exist concerning minimal invasive surgery in hip arthroplasty but only a few in hemiarthroplasty. The aim of our study is to refer our experience from minimal invasive surgery in cases of hip hemiarthroplasties**.**
Material and methods:
We report on a randomly selected group of 50 patients (14 males and 36 females) which were operated by a small incision 5-10 cm. The approach was through the gluteus medius muscle in all of the cases. The mean age was 80 years old, while the average BMI was 27, 3 kg /m^2. In all patients the same type of implant was used without any special instrumentation. All operations were supervised by the same surgeon. PMMA was used in 20 of the cases.
Results:
Follow up ranged from 6 to 26 months. The mean operative time was 45 min. Twenty three of the patients were not transfused at all intraoperatively (50 cc mean blood loss). A second assistant was necessary in educational operations. Five of the patients had postoperatively bruises or skin scratches. The mean value of early postoperative pain was classified as 4. Fifteen patients slept on the operated leg on the 2nd and 3rd postoperative day. Discharge from the hospital was available five days postoperatively. Two hip dislocations are referred as main complications (one in a psychiatric patient) and two DVT which received treatment.
Conclusion:
Minimal invasive surgery in hip hemiarthroplasty is worth one's while and is possible to be performed with the use of common instruments.

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061
Minimal invasive surgery (MIS) of trochanteric fractures using intramedullary hip screw (IMHS). Results and complications
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Introduction:
Discussion about the proper implant for the trochanteric fractures still exists. We report our experience using IMHS with MIS.
Material-Method:
We refer 93 patients, 75 females and 18 males, with a mean age of 81 years old. According to the AO classification we treated 39 patients with A1 fracture type, 46 with A2 and 8 with A3. The time of surgery was two days after the accident and the mean time of operation was 35 minutes. Our incision was only 2 cm.
Results:
Our follow up ranged from 6 months to 2 years during which 15 patients died, one of them in the immediate post-surgical period. Mean time of hospitalisation was 5 days. Two of the patients received treatment for DVT and two for superficial infection. Mean post-surgical pain was classified to 4 (maximum of 10). Mean time of bone healing was 12 weeks and the time of full weight bearing ranged from 1 to 6 weeks. Extension of the surgical incision was needed in 5 patients. Three of the patients underwent a second operation due to cut-through. Only 10 of the patients needed blood transfusion during the operation. The mean Harris Hip score was 80. Anatomical reduction was perfect in 65 cases and good in 28.

Conclusions:
In our opinion the advantages of MIS with the use of IMHS is the short time of operation, the avoidance of blood transfusion in most cases, the less post-op pain resulting in the good psychology of the patients and the short hospitalisation. Disadvantages of the method can be considered the inability to achieve closed reduction in some comminuted fractures and in some cases the loss of the anatomic reduction during insertion of the nail.

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062
Computer assisted total knee arthroplasty following posttraumatic arthritis with regards to history of osteitis
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Purpose:
Total knee arthroplasty in posttraumatic osteoarthritis requires special surgical strategy especially in cases of a previous osteitis. On one hand the alignement of the leg axis should be reconstructed in combination with a good soft tissue balancing. On the other hand the contact of pathological compartments with the articular joint itself should be avoided as far as possible. Computer assisted surgery creates this possibility due to the fact that there is no need for intramedullary rods to orientate the cutting plane.
Material & methods:
In a retrospective follow-up we examined 29 patients who were treated in our department after the introduction of computer assisted surgery for the total knee arthroplasty from April 2002 until April 2004. Five of these patients suffered from osteits after primary osteosynthetic treatment of the fracture. All patients were examined by their clinical, radiological and serological condition.
Results:
As a result the leg axis of 89% of the patients(26) showed a corridor of plus/minus 3 degrees around the Mikulicz line postoperatively. Three patients showed aberrations up to 6 degrees from the aimed corridor.
After a mean follow-up time of 9.7 months the HSS score showed a rise from preoperatively 55.6 points (32–71) to 79.
4 points (67-90).
There was no sign of reinfection in the examined group.
Conclusion:
The results are representing the high precision of computer assisted total knee arthroplasty.
We consider especially the protection of anatomical borders between posttraumatic compartments and the articular joint itself as the main advantage that is even more relevant in cases of infect associated posttraumatic osteoarthritis.

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063
Clinical and radiological results of computer-assisted navigation in TKA
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Introduction:
Computer-assisted navigation is used in total knee arthroplasty for more than five years at our hospital. In this retrospective study, clinical and radiological results of TKAs implanted with computer-navigation were compared to those implanted in conventional technique.
Patients and Methods:
In a period of 30 months between 2001 and 2003, 151 TKAs were implanted with computer-navigation.
In our study, 70 patients of each group were evaluated for follow up. All of them have been operated on by two experienced senior surgeons, selection criteria have been a random sample. For navigated implantation the Pi-Galileo-system was used, in the conventional group LCS-prostheses have been implanted. Mean follow up was 2,7 and 2,6 years, respectively.
For clinical evaluation, the American Knee Society Score was assessed. For radiological evaluation, weightbearing anterior-posterior-radiographs of the leg including hip and ankle joint were used. Mechanical axis was measured in the postoperative X-Ray.
Results:
The computer-navigated group achieved a Knee Score of 90,4 and a Functionscore of 87,9, the conventional group came up to 87,9 and 86,1 points.
Mean Range of Motion was 110,5° in the navigation group and 108,8° in the conventional group. Examiniation of anterior-posterior stability showed an a/p-shift less than 5mm in 87,1% of navigated knees and 75,7%, respectively.
The radiological evaluation revealed an average mechanical axis deviation of 1,09° of valgus in the navigation group (4° varus to 6° valgus) and 1, 03° degrees of varus in the group of conventionally implanted TKAs (10° varus to 6° valgus).

Conclusion:
While subjective patient satisfaction and clinical outcome were quite similar between both groups, implantation with computer-navigation performed slightly better compared to the conventional method of implantation in single categories like joint-mobility and a.p.-stability. The measurement of the long axis deviation showed a wider range of deviation in the conventional group.

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064
The concept of navigated ligament balancing during total knee arthroplasty
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Introduction:
Balancing of the knee joint is one of the corner stones in TKA. Conventional techniques determine the ligament tension by the surgeon's individual assessment. The presented navigation system allows the measurement of the ligament tension through a force controlled ligament tensioner and the integration of the results into the intraoperative implant management.
Technique:
PiGalileo is an optical landmark-based navigation system. The ligament tension is measured through a tensioning device with a force scale. Initially the mechanical axis is calculated, the subsequent steps involve:
1. Visualization of the pre-operative deformity and stability:
The deformity within the whole range of motion is graphically visualized. In addition, the extent of the instability is demonstrated through simultaneous valgus/varus stress. This procedure allows the determination of whether or not a ligament release will be necessary in extension, flexion, or in both positions.
2. Ligament balancing in extension:
After the tibial osteotomy the extremity is adjusted along the mechanical axis and the ligament tensioner is inserted and stretched with a predefined force. If an imbalance is determined, a sequential release is performed.
3. Ligament balancing in flexion:
The procedure is repeated in flexion whereas the rotation of the dorsal femoral cut may be slightly adjusted.
4. Planning of the prosthetic components:
This step provides the data to select the size of the femoral component and the height of the polyethylene in order to replace the flexion gap in its entirety while optimizing the joint line.
5. Applying the flexion gap information to the extension gap and performing the distal resection.
After placing the trial implant the outcome is visualized with respect to the reconstructed joint line, the ligament tension and the leg axis.
Summary:
The presented technique allows for the first time a quantifiable assessment of the ligament tension, regardless of the surgeon's individual judgment.

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065
Exact tibio-femoral axis correction after computer-guided open-wedge high tibial osteotomy
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Aim:
Aim of this prospectiv study is to present the first results of the grafted open-wedge high tibial osteotomy performed with aid of the computer-guided kinematic navigation and with use of the stable internal LCP-fixation. An arthroscopy preceded every operation.
Method:
20 cases were operated on in the year 2002 and 2003 by means of this method. The outcomes were evaluated minimally 2 years after the surgery clinically and radiologically.
Results:
Before the osteotomy, the mean anatomic lateral tibiofemoral angle (aLTFA) was 181,1°. The desired 2° "overcorrection" of valgus (aLTFA 172°) was found on X-rays postoperatively in all cases. The mean correction was 9,1°. The achieved correction wasn´t lost during 2 years of the follow-up. The osteotomy healed in all cases up to 4 months. The full range of motion remained after the surgery in all cases. All patients were satisfied with their results.
Conclusion:
The computer-assisted open-wedge high tibial osteotomy with tricortical grafts stabilized by means of LCP-fixation gives exact and reproductable results without correction lost.

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066

Ligament balancing in severe valgus knee replacement – soft-tissue or bone surgery?

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Purpose:
In case of severe valgus knee replacement there are two main problems: firstly the correction of mechanical axis - simple use a targeting device and bone saw and secondly ligamentous dysbalance correction - make soft-tissue release at the contract side. Controlled release means a strong sleeve but not cutting the ligament through, that would lead to a iatrogenic instability. Because of anatomy (small origin) is controlled release of lateral collateral ligament compared with medial side very limited. In case of severe deformity it is also not possible to reach symmetrical ligamentous tension only by means of soft-tissue releases.
Material and methods:
Indication und technique of lateral approach with sliding condylar osteotomy will be presented. This technique has several steps:
1.Z-lenghtening of the lateral joint capsule
2.”lazy S” incision of the quadriceps tendon
3.soft-tissue release tibial incl.posterolateral capsule and PCL
4. event.sagittal slide osteotomy of condylus
5.tension-free capsule suture (incl.lateral patellarelease)
It is also possible to use this osteotomy medial by correction of very contract varus deformity.
Results:
48 patients 2002-6 (from about 1200 knee replacements totally)
44 lateral and 4 medial osteotomies
follow-up 4-43 months
no complication related to osteotomy or approach
Conclusion:
With presented technique it is possible to correct ligamentous dysbalance in flexion and extension even at severe deformity and use unconstrained resurfacing implant without stems. Reduction of use expensive and bulky so called revision implants decreases implant costs, increases prosthesis longevity and makes revision surgery easier.

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067

Patella resection arthroplasty in primary total knee replacement

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Purpose:
Resection arthroplasty (spongialization) of the patella is a possible treatment option of patellofemoral disorders as described by Ficat in 1979. As an alternative to patellar resurfacing this method might be a solution in primary total knee replacement as well at our institute we introduced it in 1993. The aim of the work is to evaluate our long-term clinical results of patella spongialization.
Material and Methods:
We retrospectively evaluated the spongialized patella in 42 knees (49 patients) at an average of 9 years after total knee arthroplasty. The preoperative diagnosis was idiopathic osteoarthritis in 68%, posttraumatic osteoarthritis in 22% and rheumatoid arthritis in 10%. Patients were evaluated using Knee Society clinical score, Hospital for Special Surgery score (HSSs), a patella score (Bartlett-score) and radiographs.
Results:
The mean Knee Society knee score was 89 (33-99) points and functional score was 80 (25-90) points. The mean HSS score was 79 (35-89) points and Bartlett-score was 24 (11-30) points. 89% of patients were satisfied with the results of the surgery. Abnormal lateral patellar tilt and/or displacement occurred in 80% of patients however the overall prevalence of anterior knee pain was only 12% (6 of 49 knees). As a possible background of patellar pain we noted lateral subluxation in 3 cases, thick (underresected) patellar bone in 2 cases. In one patient no etiology of patellar pain could be determined. Only one patient needed revision due to patellar fracture in this case the patella has been overresected during primary surgery.
Conclusions:
Based on these results seen at follow up patella resection arthroplasty had a good long-term clinical results with a low complication rate. We recommend this intervention as a possible management option of the patella during total knee arthroplasty.

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068

Arthroplsty registers in knee replacements

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Purpose:
Arthroplasty Registers are a major source of information concerning the performance in arthroplasty. This instrument developed in Scandinavia has started to be introduced in the majority of european countries in the last years, supported by the European Arthroplasty Register (EAR) a project by EFORT.
The scientific-centre is the EAR-Office located at the University of Innsbruck. All publications form Arthroplasty Registers are collected there and reviewed.
Methods:
The scandinavian Arthroplasty Register Reports have been reviewed to extract relevant facts for knee-arthroplasty procedures in central Europe.
Results:
The Swedish Knee Arthroplasty Register in Lund could show a higher revision rate at patients without patella resurfacing. The frequency of primary resurfacing is decreasing. In a study performed by this center the quality of live with primary resurfacing was dependent of the patella treatment. The frequency of patella resurfacing is dependent on the used implant system.
Minimal Invasive approaches are effecting the long term outcome in unicondylar knee implants. This effect seem to be dependent on the instrumentation and training.
Cementing fixation is common in scandinavia after the general tendency to cementless implants in the 1980-ies and 1990-ies.
Beside a higher frequency of septic complications compared to hip-arthroplasty the cinematic aspect of the implant seem to be important for the survivorship. This is not only defined by the implant, but has also an impact by the instrumentation and surgical techniques.
The reasons for revision in total and unicondylar knee-replacement are different, it seem to be conclusive, that the factors for lossening are different.
The number of implants covered by the scandinavian national registers are too low to achieve valid figures concerning survivorship in a large number of implants.
Conclusion:
Arthroplasty Register Reports are able to present high valid basic guidelines for orthopaedic surgeons. A supranational cooperation might add some new possibilities in evaluations.

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069

Factors determining blood transfusion in patients undergoing total knee arthroplasty: cross-match or group and save?

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Purpose:
The current practice of routine cross-matching of packed red cells for elective arthroplasty varies throughout the United Kingdom. This area however, has received renewed interest recently due to limited haematological resources and the growing risk of infection transmission with transfusion. We therefore audited patients undergoing elective total knee arthroplasty in our centre, who are all routinely cross matched 2 units of blood.
Method:
Baseline demographics, past medical history and drug history were reviewed via casenotes, in 50 patients who underwent total knee arthroplasty, in a city teaching hospital. Partcular attention was paid to the use of aspirin, other non steroidal anti-inflammatory drugs (NSAIDs) or warfarin.
Results:
Out of the 50 patients 6 (12%) required transfusion. Pre-operative haemoglobin (Hb) differed significantly between the two group with a mean Hb in those requiring transfusion of 124.8 (18.5) mg/L versus 137.9 (12.4), $p = 0.026$. 50% of those transfused were on NSAIDs versus 27% in the non-transfused cohort. A weak but non-significant correlation (reflecting lack of subjects) existed between transfusion and NSAID use, $r = 0.161$, $p = 0.264$. No association was found with aspirin use ($r = 0.027$, $p = 0.853$). No statistical difference was found in age of subjects between those transfused and those not ($p = 0.344$)
Discussion:
Only 12% of the patients reviewed required blood transfusion demonstrating that the routine cross-matching of elective patients undergoing total knee arthroplasty in unneccesary. This study suggests that those with low pre-operative haemoglobin levels and concurrent use of NSAIDs constitute a high risk group for post-operative transfusion.

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070

Validation of the multiplier method for the leg length discrepancy prediction in knee epiphysiodesis

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Purpose:
The Moseley method has been acknowledged as a reliable method for the timing of the knee region epiphysiodesis. Due to its complexity there have been attempts of simplification. The multiplier method has been presented recently and it has been indicated that chronological age can be used instead of skeletal age, but no independent verification of the method has been published yet. The aim of our work is an independent clinical verification of the multiplier method for the timing of epiphysiodesis in cases with mild leg length discrepancy.

Material and methods:
Clinical and radiographic records of 31 boys and 12 girls with knee region epiphysiodesis have been reviewed. The mean preoperative leg length discrepancy was 2.5 cm (range 1.1 - 4.7 cm). The average chronological age at operation was 14.0 years for boys and 12.8 years for girls. The predicted results of the Moseley method, the multiplier method with skeletal age and the multiplier method with chronological age were compared to the final leg length discrepancy at skeletal maturity (measured radiographically in 24 cases and clinically with blocks in 19 cases).

Results:
The mean error with regard to the eventual clinical outcome was 0.4 cm for the Moseley method, 0.3 cm for the multiplier method with skeletal age (paired Student t-test with the Moseley method: $p = 0.72$) and 0.7 for the multiplier method with chronological age (paired Student t-test with the Moseley method: $p = 0.01$).

Conclusion:
The multiplier method has comparable results to the Moseley method and is much simpler to use in clinical practice, but the accuracy of leg length prediction with chronological age is inferior to prediction with skeletal age. This indicates the importance of considering small but significant discrepancies between the skeletal and the chronological age in patients close to skeletal maturity.

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071

The use of botulinum type A in 52 children with cerebral palsy

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Aim:
Botulinum toxin type A is a relatively new method of spasticity treatment in children with cerebral palsy. It has been the focus of extensive research since its application to cerebral palsy 12 years ago. Managment with cerebral palsy is the focus of considerable resources, so that evaluation of the eficacy of new and established treatment was our aim. The purpose of this study was to evaluate the results of use of botulinum toxin (B.T.) in 52 children.

Material and Methods:
The essence of the method was to inject botulinum toxin (Botox, Allergan) in 52 patients with cerebral palsy aged 2 to 17 years. The dose of 3-5 units/kg was used. Electromyographic guidance was used in selected cases to confirm appropriate localization of the injection needle in specific muscles imediately before injection. All the children were undergoing physioterapy program with monitoring of their baseline states for 3 months before botulinum toxin injection.

Results:
The peak effect was noticed by 1-2 weeks, lasted 3-10 months. The measuring of outcome over 4-23 months included clinical assessment based on opinions of physicians, parents, physical therapists, functional evaluating of gait (PRS), muscle tone grading (modified Aschworth scale) and measuring the range of motion.

Discussion / Conclusion:
The results were statistically significant, included decreased spasticity, improvements of gait and facilitating physical therapy. The application was repeated when the effects cased. Undesirable side effects or complications were not observed.

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072

Minimal invasive calcaneo stop method in cases of pes planovalgus in childhood with canulated titan implant

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Aim:
To improve the percentage of good results of pes planovlagus correction in childhood with calcaneo-stop method by using a new canulated titan implant.
Material and Methods:
With the series of 160 surgeries with the ordinary spongious screw placed in talus, we realized the advantages of that method in which we permanently corrected valgus position of the heel and lifted voult in 145 feet.
On the experience of 15 cases where we had weaker results (7 cases of wrong positioning and 8 cases of screw fracture) we constructed the new implant which will achieve much better results. We reinforced the screw dimension and we changed the material (titan alloy) to make it more flexible and fracture resistant.
Furthermore we canulated it to make the placement more precise by using the Kirschner wire.We placed the apex thread. For the placement we need implant, hand-drill, the canulated imbus key, the Kirschner wire, a scalpell, the prepare scissors and two stitches.
Results:
The surgery became more precise percutanely, we avoided the possibility of wrong positioning (prevosly in 7 cases), and the screw fracture (previously in 8 cases), we shortened the surgery and we deminished the invasivity. Patients have later posibility be examined with NMR.
Conclusions:
Based on previous surgery cases, we believe that the whole screw must function in correct position for at least 24 months, while the foot continues to grow, to become permanently correct and therefore we did not produce it from the bioabsorbable material. The drawback is possible in local anesthesia.

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073

Three cases of macrodystrophia lipomatosis in foot. Case presentation and review of literature

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Purpose:
Macrodystrophia lipomatosis is a rare condition often associated with macrodactyly and localised gigantism. We describe three cases affecting the forefoot and present the clinical pictures, radiology, and management plan and literature review.
Materials & Methods:
Three patients presented to our foot and ankle clinic at three different times. First patient was a 30-year-old lady who was born with macrodactyly of second and third toes. She had these toes amputated when she was a child. She presented to us with massive swelling on the plantar aspect of the forefoot. Second patient was 37-year-old gentleman with a similar history as above. Third patient was a 7-year-old boy who presented to us with macrodactyly but was not operated before.
Results:
In the first two cases, hasty amputation of the gigantic digits resulted in severe deformities of the forefoot culminating in the formation of a sizeable abnormal mass of bone, cartilage and fat replacing the whole of the forefoot. The other case, a boy who was 7 years old was observed until 11 years when an appropriate shortening debulking procedure was undertaken combining Orthopaedic and Plastic Surgery input. A good result cosmetic and functional result was achieved.
Conclusion:
We therefore do not recommend early amputation of oversized toes. We present all these three cases, suggest management plan and update the available literature.

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074

Lateral patellar compression syndrome (LPCS). The experience of our clinic in conservative and operative treatment

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Introduction:
The primary treatment of the lateral patellar compression syndrome (LPCS) and of the 3-dimensional malfunction of the patella is mainly conservative and less usually operative.

Aim:
The aim of this study is to examine the results of the conservative treatment in the lateral patellar compression syndrome and to verify its contribution to the improvement of malfunction.
Material and method:
20 patients (17 female and 3 male), aged 18-25 years, with patellofemoral pain were treated in our clinic, during January 1996 to February 1998. 14 of them had lateral patellar compression syndrome and 6 malfunction of the patella. All patients attended a specific physiotherapeutic program (mobilization, patellar taping, closed kinetic chain exercises, and stretching) and treated with non steroid anti-inflammatory drugs for a 3-6 months period. Eventually, 5 patients had to undergo an operative treatment (arthroscopic release of the lateral patellar retinaculum)
Results:
The evaluation of these results was made according to the Kujala scale. The indicated physiotherapy combined with anti-inflammatory drugs helped to bring out very good results, so that only 5 patients had to be managed operatively.
Conclusion:
A frequent follow-up and consistent attendance of physiotherapeutic programs, combined with anti-inflammatory drugs, could contribute to very good results in the majority of the cases of lateral patellar compression syndrome and in cases of patellar malfunction.

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075
Arthroscopic lateral release in the treatment of patellofemoral disorders
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Purpose:
To determine the outcome of treatment of patients with patellofemoral pain by arthroscopic lateral retinacular release.
Methods:
Fortyfour patients who underwent 47 lateral retinacular release procedures between 1999 and 2001 for patellofemoral arthritis and malalignment were evaluated using a patellofemoral rating scale and questions relating to patient satisfaction**.**
Results:
The average patient age was 56.6 years (range 38-85 years) in the patellofemoral arthritis group and 32.2 years (range 12-70 years)in the malalignment group. There were 13 men (29.5%) and 31 women (70.5%). Mean follow up was 28 months (range 12 - 45 months). 21 knees had varying degrees of patellofemoral arthritis and 26 knees had evidence of patellar malalignment. The mean patellofemoral score was 67.25 for the first group and 59.69 for the second group. 72% were satisfied in the arthritis group and 61% in the malalignment group. One patient developed reflex sympathetic dystrophy and 2 patients had hemarthrosis post operatively.
Conclusion:
Arthroscopic lateral release is a safe and effective procedure in reducing pain and disability in patients with anterior knee pain. The response was better in cases of patellofemoral arthritis than in patients with evidence of patellofemoral malalignment in our study.

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076
Is occupation an aetiological factor in the development of symptomatic osteoarthritis of the wrist?
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Aims:
To investigate the occupation histories and correlation if any, between the nature of employment and development of symptomatic ostearthritis of the wrist.
Methods:
The wrist radiographs of 500 patients who presented with wrist pain to the general practitioner were surveyed. Questionnnires were sent to patients with positive radiological evidence of osteoarthritis of the wrist, enquiring about the nature of employment during their working life. The occupation was classified into office work, light manual and heavy manual work. Occupational history was elicited in an age and sex matched control group with no history of wrist pain in the same geographic region. Using statistical analysis both groups were compared.

Results:
Out of 70 patients with positive x-ray evidence of ostearthritis of the wrist, 50 patients responded to the questionnaire. Therfore 50 patients were recruited as controls.In the study group 17% were employed in office work, 53% in light manual and 30% in heavy manual work. The control group showed 10%,74% and 26% respectively. There was no statistically significant differencein the incidence of OA in the three groups (Chi square=3.33, p>0.1)
Conclusions:
This preliminary study indicates that there is no significant relationship between occupation and the development of symptomatic OA of the wrist.

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077
Should disease modifying antirheumatic drugs (DMARDS) be stopped before surgery?
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Aim:
Concerns have been expressed that DMARDS may interfere with bone healing. Previous studies give conflicting advise and no consensus exist in current practise especially with the newer DMARDS such as Leflunomide, Etanercept, and Infliximab. The aim of this study was to assess the in-vitro effect of DMARDS and cox-2 inhibitors on Osteoblast activity
Method:
Osteoblasts were cultured from femoral heads obtained from five young otherwise healthy patients undergoing total hip replacement. The cells were cultured using techniques that have been previously described. A computer aided design of experiment was used as a model for setting up the experiment on samples obtained from the five patients. Normal therapeutic concentration of the various DMARDS was added alone and in combination to the media. The cell growth was estimated after two weeks using spectrophotometric technique using Roche Cell proliferation Kit. Multiple regression analysis was used to estimate the best predictor of the final result.
Results:
The most significant factor ($p<0.001$) in predicting the ultimate response was the patient themselves. Cox-2 inhibitor (Etoricoxib) was found to have the most consistent effect although always in combination with some other drug which varied amogst different patients. Etoricoxib in fact had a stimulatory effect ($R=0.219$) on the osteoblast growth.
Conclusion:
Different patients respond differently to the drugs. None of the DMARDS tested inhibit osteoblast proliferation and differentiation in-vitro. If osteoblastic activity is considered to be the primary factor responsible for bone healing, then an inhibition should not result in patients who are on these drugs.

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083
Primary stability of osteochondral grafts used in mosaicplasty
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Purpose:
The aim of our study was to measure the primary stability of single and multiple osteochondral grafts.
Materials and Methods:
Grafts were transplanted from the trochlea of porcine femurs to the weight-bearing area of the lateral femoral condyle. Grafts were first pushed in level with the surrounding cartilage surface, then were pushed 3 mm deeper. Push-in forces were measured.
Results:
For single 4.5-mm grafts, the mean level push-in force was 43.5 N, pushing 3 mm deeper needed a mean of 92.5 N. For single 6.5-mm grafts, level push-in needed a mean of 76.2 N, while for pushing 3 mm deeper a mean of 122.2 N force was used. The length of the drill-hole and the dilation were both 20 mm in each setting. When using 20 mm long drill-holes and 15 mm dilation length, the values above were found to be 36.6 N and 122.5 N in the case of 4.5-mm grafts.
In the two patterns of multiple grafting series, level push-in needed a mean force of 31.8 N and 30.44 N, while pushing 3 mm deeper needed a mean of 52.17 N and 54.33 N.

Conclusions:
These results suggest that grafts of greater diameter are more stable and stability may be increased by shorter dilation length, while level push-in forces do not increase significantly. Multiple grafts are not as stable as single grafts and the pattern of transplantation does not influence stability.

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084

MegaOATS - a salvage technique for large osteochondral defects in young patients

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Introduction:
Large osteochondral defects of the knee are still a therapeutical problem in young patients. Mosaicplasty (OATS) may result in graft instability because of shear forces that occur when using multiple grafts. The transfer of the posterior femoral condyle combined with press fit fixation (Mega-OATS) can be a treatment option in those cases.
Material and Methods:
The posterior femoral condyle is osteotomized through an anteromedial/anterolateral (mini-)arthrotomy and implanted at the defect site using a press-fit technique. The biomechanical changes that occur when removing the posterior condyle were analysed by intraarticular pressure analysis in a series of 8 human cadaver knees. Clinical results were evaluated using IKDC and Lysholm Score.
Results:
Intraarticular contact pressure increases after removing the posterior femoral condyle at 30° und 60° of flexion - the so called ,,edge-effect". The analysis of postoperative MRI shows scarf-tissue that imitates the curvature of the resected condyle, so in vivo the edge-effect is a lot milder. In our opinion harvesting the posterior copndyle through a second posterior approach is no alternative because of possible neurovascular complications and difficulties in harvesting the graft in orthograde axial direction. All patients improved subjectively and objectively (Lysholm 38>93, IKDC), there were no complications.
Discussion:
Mega-OATS is a salvage procedure for large osteochondral defects in young patients. Clinical results are encouraging, although long term results are still missing. The biomechanical changes are tolerable when thinking of the possible protraction or even prevention of TKA.

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085

Improvement of the osteochondral autograft implantation technique to treat cartilage defects using hexagonal grafts

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Aim:
The implantation of osteochondral auto grafts to treat local cartilage defects is well established and in wide clinical use. One of the problems coming up with this technique is the area between the grafts that remains uncovered and the morbidity of the harvesting site. To optimize the filling of the defect was the goal of this study.
Method:
The percentage of defect filling is dependent on the number and size of auto grafts being implanted. The percentage of defect filling was calculated for three different diameters of punches, which are most commonly used in clinics. It was calculated in relation to the size of the lesion taking round cylindrical grafts in comparison to hexagonal once.
Results:
The results were transferred into a diagram. With its help it is very simple to determine the diameter and number of punches necessary to optimal fill a defect of a certain size. Therefore it can be used for preoperative or intraoperative planning. With hexagonal grafts defects can be filled almost up to 100%.
Conclusion:
In general the bigger the lesion the more favorable are hexagons to optimize the percentage of defect filling because there remain no gaps in between the hexagons.

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086

The importance of cartilage repair in osteochondritis dissecans - Long-term results

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Little is known about long-term results in osteochondrosis dissecans (OCD) of the femoral condyles. It was the aim of our study to reanalyse patients after a mean period of 20 years which had been operated on several years ago and had been followed up after 10 years.

Material & methods:

97/147 patients which were operated using different surgical techniques depending on the stage were followed-up clinically and radiologically. Results were analysed depending on the age, stage and surgical technique after 10 years. In a second follow-up nearly ten years after the first follow-up patients were reexamined again.

Results:

At the first follow-up we found a median Lysholm-Score of 83.7 pts.. Regarding OA-changes in 56.3% no changes, in 21.9% 1°-changes, in 3.1% 3°- changes, in 6.3% 3°- changes & in 12.5% 4° changes were detected. The mean OCD-stage was 0.97. Ten years later similar results were found: 56.3% no OA-changes, 21.9% 1°-changes, 3.1% 2°- changes, 6.3% 3°-changes and 12.5% 4°-changes. At the 2nd follow-up no individual changes could be detected in 73%, a slight impairment in 11.5% & a slight improvement in 15.4%. In most of the patients OA-changes were slight & did not show a severe impairment after a mean of 20.3 years. Adolescents exhibited no or slight OA-changes in 83.3% & moderate changes in 16.7%. Severe OA-changes were not detectable. Adults exhibited a distinct higher incidence of OA (no: 37.5% / 1°: 25% / 2°: 12.5% / 3°:/ 12.5% / 4°:12.5%). Retrograde surgical techniques leaving the cartilage layer intact resulted in distinct better results than those perforating the cartilage layer.

Conclusion:

Best clinical and long-term results with a low incidence of osteoarthritis are to obtain in cases with o.c.d. with intact cartilage layer not necessitating cartilage damage. Worst results are seen in adult patients with 4°-lesions.

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087

Late results of operative treatment in juvenile osteochondritis dissecans

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Purpose:

Juvenile osteochondritis dissecans (JOCD) is a rare disease with unknown etiology. However, there is some agreement that JOCD represents the result of cyclic cummulative stress to subchondral bone, resulting in subchondral stress fracture. Although various treatment methods resulted in good short-term results, long-term results are critical because of the joung age of the typical patient.

Material and methods:

This retrospective study was designed to evaluate our hypothesis that articular cartilage preserving methods result in a higher percentage of acceptable outcomes when compared with simple excision of the fragment. Fifteen patients (10 males and 5 females) with an average age of 13,7 years (range, 11-23 years) were treated surgicaly for knee JOCD at our unit from 1988 to 1997. Arthroscopy was performed to establish the stability of the lesion and the integrity of the articular cartilage. If the lesion was stable, arthroscopic drilling or bone grafting from a channel from above was undertaken. If the lession was unstable, it was treated by curretage of the femoral defect, drilling and internal fixation of the fragment. The average length of followup was 12,3 years (range, 8-16 years). Results were graded using the general Subjective Knee Evaluation Form and Knee Examination Form of the International Knee Documentation Committee (IKDC 2000) and the specificHughston rating scale for osteochondritis dissecans.

Results:

Overall, eight of the 15 patients (53,3%) had an excellent result, five of the 15 patients (33,3%) had good result, one each of the 15 patients (6,7%) had a fair or poor result, respectively, and no patient was graded as a failure; 86,7% (13/15) of treated patients received a satisfactory result.

Conclusion:

The results of this long-term study suport our hypothesis, and we recommend aggressive attempts to preserve articular cartilage in JOCD.

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088

Potential effect of chondroitinsulfat on arthritis changed cartilage

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Introduction:
The cartilage repair by the treatment of chondroitinsulfat supply was observed.
Material and methods:
Double blind, placebo controled study of efect of chondroitinsulfate have been made in patiens suffered with II. or III. grade of gonarthrosis. Treatment period was one year, histological examination before and after treatment has been made.
Results:
A significant changes in histologic images as well as a significant clinical examination improvement according to Tegner and IKDC scales were observed. The results according to Kellgren - Lawrence scale evaluation did not change significantly.
Conclusions:
Differences between placebo and active substance support theory of disease modified effect of chondroitinsulfate. Microscopic examination of cartilage showed some improvement of shape of cartilage after treatment.

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Minimally Invasive Surgery (MIS) techniques allow early rehabilitation in total knee arthroplasty (TKA)

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Purpose:
Different MIS techniques has been proposed. The Quad Sparing (QS) technique offers the most less invasive approach at the moment. This complete new technique is more demanding and time consuming compared to mini incision approaches. In this study the early rehabilitation of QS versus Mini-Midvastus (MMI) were evaluated. Furthermore the data were compared to the early functional results published for conventional open surgery.
Methods:
In a prospective, randomized and blinded study 24 patients were operated either in MMI or QS technique by one surgeon (EBL 1). Anaesthesia, pain management and mobilization was standardized. Clinical evaluation was performed by two scores (KSS and WOMAC) and five additional functional tests including straight leg raising, active motion, raising a chair, stair climbing and functional gait analysis. Testing was performed pre op and at 1, 6 and 12 weeks post op.
Results:
The average OR time was 92 min (70 to 130) for MMI and 110 (85 to 165) for QS respectively. There were no complications in the MMI and 1 (wound healing) in the QS group. The average preop scores were comparable between both groups. At one week the average scores (MMI vs QS) were KSS 85/61 vs 84/55 and WOMEC 15 vs 16 respectively. There was no difference between both groups at 6 weeks. At final follow up the average scores (MMI vs QS) were KSS 92/93 vs 92/88 and WOMEC 12 vs 12 respectively. There were no differences for the functional tests between the groups at any time and the these results were much compared to conventional surgery.
Conclusions:
There is still controversy on the benefit-risk analysis for the different minimal invasive techniques. In this study all patients showed excellent early functional results, but there was no difference in the postoperative course between MMI and QS technique.

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Alignment in minimally invasive Total Knee Arthroplasty (TKA)

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Purpose:
The limited approach in minimally invasive TKA may cause more malalignment compared to conventional open surgery. With standardized planning and intraoperative controls we could show in previous studies excellent alignment without navigation in conventional open surgical techniques. The aim of this study was to control, if these good results can be achieved with minimally invasive approaches too.

Material and Methods:
In a prospective study 100 consecutive patients received a TKA with minimally invasive surgical technique. Full-leg-length weight bearing films were used for preoperative planning and postoperative controls. The lateral distal femur angle (LDFA), the medial proximal tibia angle (MPTA) and the intramedullary correction angle (anatomical versus mechanical femur axis) were determined. In 55 patients a Mini-Midvastus-Incision (MMI) technique with front-cutting instruments and in 45 patients a Quad Sparing (QS) approach with new side-cutting instruments were used. Recutting was performed whenever necessary.
Results:
In the MMI group the preop alignment showed 38 knees with varus Ø 5° (1–19), 12 with valgus Ø 6° (1–17) and 5 with neutral axis. In the QS group 38 knees showed preop Ø 8° varus (1–16), 3 an Ø 5° valgus (1–17) and 4 had a neutral axis.
The postoperative alignment for both groups was excellent and good (+/–4°) in 93% of the cases. In the MMI group 4 patients (7%) showed malalignment (5–7°). The Ø angles were LDFA 90° (86-95), MPTA 90° (87–95) and slope 7° (3–12). In the QS group 3 patients (7%) showed malalignment (5–6°). The Ø angles were LDFA 90° (87–96), MPTA 91° (88–94) and slope 8° (5–12).
Conclusions:
The concept of planning and intraoperative double check has also shown excellent alignment with the minimally invasive technique in primary TKA. These results are comparable to published data of conventional TKA with computer navigation.

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Mini-Midvastus Incision (MMI) as a standard MIS approach for total knee arthroplasty (TKA)
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Purpose:
Up today risk-benefit analysis for MIS TKA are missing. Since Nov 2004 we routinely perform the MMI technique for primary TKA. In this study the short term clinical and functional results were evaluated and compared to the published data with conventional open surgery.
Material and Methods:
100 consecutive patients schedulded for TKA were included in this prospective study. Only patients with decompensated deformities were excluded. All patients received a posterior stabilized implant (NexGen®, Zimmer, Warsaw). Patients were operated with a standardized MMI technique (minimal arthrotomy, max 40 mm blunt mid vastus snip, no eversion patella and limited anterior dislocation tibia). Patients were evaluated clinical (KSS and WOMEC) and radiological (long standing x-rays) pre- and post op (1, 6-12 weeks and 12 months). Furthermore length of skin incision, perioperative complications, postoperative alignment and implant positioning were controlled.
Results:
Ø age of the 88 Varus- and 12 Valgusknees was 72 (48 - 82) years. Skin incision measured Ø 10,2 (8-13) cm. As perioperative complications 1 deep infection, 2 wound healing problems and 1 femoral condylar fracture occurred. 94% showed good alignment (±3°). Implant position was normal in all patients. Ø Scores (Knee/Function & WOMAC) were pre-op 58/64 & 38; 1 week post 85/61 & 15 and 6 to 12 weeks post 92/88 & 12. At final Scores were 93/90 & 11 points . Up to week 12 these MIS data were much better compared to the functional results in conventional surgery.
Conclusions:
First results with MIS TKA showed earlier rehabilitation, better functional results in the early period after surgery. In this study we could show that with a standardized surgical technique and experience the MMI technique is safe and reproducible. Patients benefit from the MIS technique especially during the first 6–12 weeks with earlier rehabilitation and independence from support.

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Navigated ligament balancing in MIS TKR – Method and first clinical application
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Introduction:
Minimally invasive surgery requires the redesign of surgical instruments to meet the demands of a smaller incision and a new surgical approach. In addition any new technique should ensure accurate ligament balancing, which is an essential factor for the outcome in TKR. We present a new method for MIS TKR that includes navigated force controlled ligament balancing.

Method:
The incision is performed as a medial arthrotomy using the subvastus approach. A rod is fixed intramedullary and functions as an anchorage for all surgical instruments. The instruments are guided by the PiGalileo Navigation System. To perform ligament balancing in this setup, a newly designed mini-spreader with a predefined force level is inserted into the gap and the patella is relocated. The ligaments of the knee are balanced in flexion first, then the dorsal cut is planned and performed. Next the extension gap is balanced, measured and cut with the intention to achieve equal gap distances in flexion and in extension under controlled tension. The first cases were done in arthritic knees with only mild deformities.
Results:
Despite completely redesigned instruments all surgeries were performed in a secure and reliable way. The fixed intramedullary rod was very stable to guide all femoral osteotomies. The balancing method has not changed fundamentally by the use of the mini-spreader, the main difference being the relocation of the patella prior to measurement. The insertion of the new tension device itself was relatively easy. Due to the new technology, the OR time was slightly longer and some instruments will need additional refinements.
Conclusion:
We conclude that this approach is safe and applicable for all operated patients.
However more studies need to be done in order to compare navigated with conventional MIS techniques. The outcome, the clinical relevance and contraindications will also have to be evaluated.

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Minimally invasive total knee arthroplasty with computer assisted navigation
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In our Institute we started to use computer assisted navigation for TKR and the minimally invasive technique with navigation. The aim of the study was to compare the precision of positioning of the implants.
During the period, mentioned before, we performed 69 TKRs with computer assisted navigation and 25 operation with the minimally invasise technique using navigation. The two groups were compared with 69 cases of conventional surgery. The operations of the three groups were performed with same design of prosthesis. Using pre- and postoperative long standing a-p and side X-rays, the axis of the lower limb were mesured pre- and postoperativly. The positioning of the femoral annd tibial components were checked also.
Comparing the navigated roup with the conventional, we found, that precision of components positioning and the alignment were better in 20 percent of the navigated TKRs. Using the minivally invasive technique, due to the minimalised explosure it is easier make malpositioning. The MIS with navigation allows to lose less from the precisity and the result are better than those in conventional implantation.

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Computer-assisted minimally invasive total knee arthroplasty
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Purpose:
Total knee arthroplasty (TKA) can fail because of concept failure, failure of the design, material, manufacture or fixation, implantation technique failure and failure of other causes. Implantation technique can be influenced by components alignment, surgical approach, biomechanical principles, primary stability and border continuity. Components alignment affects the joint stability, ROM and limb alignment. The TKA alignment is one of the most important factors of its survival. Minimally invasive (MIS) procedures are used more often today. On the TKA, the surgery through up to 10 cm incision should not violate the extensor mechanism (the subvastus approach). No eversion of the patella causes less disturbance of the proprioception. There may be an increased overall complication rate especially component malposition because of poor visualisation in MIS surgery. The disadvantage of restricted visualisation in the minimally invasive technique can be compensated by means of the navigation system. The purpose of this study is to evaluate both radiological and early clinical results of this combined procedure.

Method:
40 Search Evolution TKAs were implanted with use of the OrthoPilot kinematic navigation system in standard manner and 40 identical TKAs miniinvasively through the subvastus approach also with this navigation support. Primary osteoarthritis of the 3rd or 4th degree without severe valgus deformity was the indication for surgery. These patients were prospectively selected at random as they came to the authors´ institution. The results were evaluated radiologically on the long weight-bearing AP and lateral radiographs. The anatomic lateral femoro-tibial, anatomic lateral distal femoral, anatomic posterior distal femoral, anatomic medial proximal tibial and anatomic posterior proximal tibial angles were measured. The Knee Society Clinical Rating System according to Insall et al. was used for clinical evaluation. The Mann-Whitney U test was used for statistical evaluation.
Results:
Pain, range of motion, gait and function and the entire clinical score 10 days after the operation were significantly better evaluated in the MIS-group. 6 and 12 weeks postoperatively, the statistical significance of these results was found out no more. The ideal radiological results were obtained in all CASE in both groups. No difference in limb axis and component alignment was found after the operation between both groups. No complications were observed in both groups.
Conclusions:
Minimally invasive method is the technically very demanding option. I should be used only in carefully selected cases. Also computer assisted surgery has a long learning curve. That´s why combination of these two methods is used very seldom up to now. Advantages of MIS in TKAs occur only in the first weeks after the surgery. The long-term results still have to be approved. Usage of the kinematic navigation system compensates the disadvantage of restricted visualisation in the minimally invasive technique and makes the correct positioning of both TKA components possible.

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No mid-term difference between mini invasive and open medial parapatellar quadriceps splitting approach for unicompartmental knee arthroplasty
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The viewpoint for the treatment of medial compartment arthritis in stable knees is turning in favour of unicompartmental knee arthroplasty (UKA). Mini invasive approach was anticipated to improve its results.
To determine the differences between standard and mini invasive approach for UKA we performed a retrospective chart review study. 29 consecutive patients with mini invasive UKA were compared to a cohort of 44 consecutive patients treated with standard approach UKA. All patients had an anteromedial primary osteoarthritis, with no previous procedure on the index knee. Groups were matched by weight, age, and gender. We analysed range of motion, pain, duration of the operation, early and late complications. Follow-up periods in the "mini" group averaged 41 months (26 to 61 months), in the "standard" group averaged 96 months (63-132 months). We reviewed most recent x-rays for osteolysis, loosening, alignment and malposition. We performed also the Kaplan-Mayer survivorship analysis.
Two patients from the "standard" group died and one was lost to follow-up. Three were revised. There was no statistical difference in pain, revision rate, alignment, duration of the operation, range of motion and complication rate between groups. There were no osteolysis in any group, but there were two malpositions of the components and two subsidencies of the tibial components in the "standard" group. In the same group two patients suffered from non-lethal trombembolic disease and one patient had a device infection. In the "mini" group one patient needed arthroscopy because of impingement. No implant from "mini" group failed until now.
Within the numbers available, we found no mid-term benefit with mini approach. We feel that early postoperative rehabilitation is easier with mini approach but we could not prove it due to lack of data. Both groups achieved an excellent mid-term result. Long-term results are required to differentiate between various devices concerned.

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Navigated unicompartmental knee-replacement-genesis-accuris-system
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Introduction:
Various authors have shown that clinical results for unicompartmental knee replacements can be improved by using minimally invasive techniques. The reporting of good postoperative results for total knee replacements implanted with computer-assisted navigation systems had encouraging effected on their use for minimally invasive implanted unicompartmental systems.

Patients and Methods:
A population of 38 patients was divided into two groups. The 23 patients allocated to group 1 underwent a minimally invasive procedure. The remaining 15 patients of group 2 also had minimally invasive treatment plus computer assisted navigation during the procedure.
Methods:
We operated with the specific set of instruments for minimal invasive implantation for Accuris unicompartmental knee replacement in onlay technique. This was combined with the Brain LAB Vector-vision uni-knee system by Brain LAB].
Results:
In both groups the mechanical axis of the leg had improved significantly after operation. The improvement in the group having the standard procedure varied from 5.23°–0.77° with a mean value of 4.46° and a standard deviation of 1.62°. In the computer-assisted group these value were 4.18°–0.54°, 3.64° and 2.03° respectively. In group 1 the preoperative angle of the implant in relation to the longitudinal axis of the tibia was 88.84° on average. Postoperatively it was 86.91°.In group 2 the average preoperative angle was 87.13°. Postoperatively this angle was measured 87.13° on average. Sagittal plane alignment (slope): In group 1 the average slope was measured as 6.17° – 10° preoperatively and 5.09° postoperatively. In group 2 the preoperative angle was 6.90° on average and the postoperative one was 6.38°.
Discussion:
According to our findings and other studies, the use of computer navigation and minimally invasive techniques for implantation of unicompartmental knee replacements allows more precise positioning and axis calibration.

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Cementless unicompartimental knee arthroplasty, Mid / longterm results
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Purpose:
Unicompartmental Kneearthroplasty became applicated in the past 15 years also in younger more active patients.Therefore the durability of the bone anchorage and polyethylene wear are at increased risk for failure. Provides the cementless implantation of the AMC-Uniglide prosthesis a reliable fixation? Are the clinical and functional results comparable to the cemented version of this prosthesis?
Material and Methods:
The AMC Uniglide prosthesis ensures congruent area contact with low contact stress on the polyaethylen in combination with physiological kinematics resulting from imitation of the healthy morphology of the femoral condyle and unrestricted movement of the polyethylen bearing. This also secures a low intrinsic stability which relieves the implant bone fixation. There is a cemented and cementless version of this prosthesis. From 1991 to 12/2003 477 implantations were performed with cement and 137 cementless. The follow up is (2–14) mean 8 years and seized 96% of the cases. They were prospectivly assessed according to the "Knee Society Rating System" and the "Roentgenographic Evaluation and Scoring System"
by F. C. Ewald.
Results:
Knee score cementless prae/post 36/94 (cemented 35/94)
Function score cementless prae/post 54/92 (cemented 52/90)
Range of movement increased from flexion/extension 109–5–0 to 124–2–0
Patient assessment: excellent 72%, good 20%, fair 5% and poor 3%.
Component loosening needing revision happened 2 times (1,5%) with the cementless version and 10 times (2%) in the cemented group.
The radiological assessment showed less radiolucent lines at the implant bone interface in the cementless cases.
Conclusion:
The cementless implantation of the AMC Uniglide gives excellent results comparable to the cemented version. The loosening rate is even lower.
A stable interface at 1 year never deteriorated. The cementless fixation is attractive for younger patients (less 70 years) and especially for the mini-invasive implantation technique.

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Matrix associated chrondocyte implantation

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New therapies have become available for the last 15 years to treat focal cartilage lesion after trauma or disease. The most influencing has been the autologous chondrocyte implantation (ACI) pioneered by Peterson and co-workers. Despite good clinical, radiological, and histological results in over 10.000 worldwide treated patients, the technique requires a large surgical exposure and a sutured periosteal cover. These are blamed for some rare but major complications: periosteal hypertrophy, arthrofibrosis, and implant delamination or failure.
The matrix (scaffold) associated chondrocyte implantations (MACI) have expanded at the turn of the millennium. The matrix provides a temporary environment for chondrocytes which stimulates their proliferation and differentiation. The chondrocytes, adhered on- or mixed into the matrix, do not require an external coverage for the fixation into the lesion. MACI are faster, less invasive, and they are supposed to have fewer complications.
Two major problems of the MACI are to find an appropriate biomaterial and to provide secure fixation of the implant into the joint. Many natural, modified, and synthetic materials have been tested in preclinical trials, but only a few have become available for clinical applications (e.g. fibrin, collagen, hialuronan, PLA/PGA). The mechanical properties of a biomaterial define the operative approach (mini-arthrotomy, arthroscopy) and also the fixation strategy (self-adhesion, fibrin sealant, bone or cartilage sutures, or cover.
The first clinical results of MACI show very promising results, but the patients follow-up (about two years) lies far behind the experiences with the "classical" ACI. Although many biomaterials have been tested, there is no ideal chondrocyte matrix (to meet all biological and surgical requirements) available at the moment. The matrix techniques will improve with years and they have a great potential not only for cartilage repair but also for the repair of other musculoskeletal tissues.

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Treatment of cartilage defects with autologous chondrocyte implantation (Hyalograft C®) versus microfracture technique- a clinical retrospective comparative study

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Purpose:
Microfracture and A.C.I. are one of the most frequent techniques in the surgical treatment of cartilage defects. The discussion about the superiority is still controversial.
Material and methods:
31 patients (mean follow up 2 years) with cartilage defects in the knee were treated with matrix assisted A.C.I. (Hyalograft C©, Fidia, Italy) and 35 patients (mean follow up $2^1/_2$ years) with microfracture technique. Lysholm-, ICRS-, IKDC-, and modified Cincinnati-scores were evaluated pre- and postoperatively.
Results:
Age of patients was similar in both groups. The mean size of the lesions was 1.8 cm2 in the microfracture group, and 4.7 cm2 in the A.C.I. group. In the microfracture group the Lysholm Score improved from 58 to 87 points and the Cincinnati score from 3.1 to 7.0 points. In the A.C.I. group the Lysholm Score improved from 51 to 75 points and the Cincinnati score from 4.1 to 7.3 points. 6 patients in the microfracture group failed; 4 of them were treated with Hyalograft C© and in other 2 the joint was replaced with a TKA. In the A.C.I. group 4 patients needed a TKA.
Conclusions:
Microfracture is still a first line option for the treatment of cartilage defects in the knee joint. A.C.I. with Hyalograft C© shows improved clinical results in larger defects and in patients after failed microfracture technique. However, in some cases the necessity of implantation of a TKA is inevitable.

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Treatment of deep chondral defects in the knee with autologous chondrocytes fixed in a scaffold carrier form hyaluronic acid esters (Hyalograft C)

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Purpose:
Different biomaterials were advised as temporary carriers for fixation and an even distribution of autologous chondrocytes. We prospectively evaluated our material from a 3year clinical trial considering deep knee chondral defect treatment with autologous chondrocytes fixed in hyaluronic acid esters (Hyalograft C) as a scaffold carrier.
Materials and methods:
8 transplanted patients (7 men, 1 women). Average age 31 years. 3,9 cm average defects size on femoral condyles. Evaluated at 9months minimal follow up.
Functional outcomes (IKDC, KOOS, Lysholm score) and MRI were evaluated before, 3, 6 and 12 month after surgery. Newly formed cartilage was controlled visually (ICRS visual score) during arthroscopy 9 to 12 month after transplantation. Cartilage stiffness was compared at the original defect and intact sites with a special palpating device. Chondrocyte specimens were evaluated histologicly, histochemicly and imunohistochemicly.
Results:
Knee joint improvement was confirmed in all patients at 10 month following surgery. Average IKDC subjective score improved from 46 to 76 points. KOOS scoring system showed decreased pain and improved function. Life quality score improved from 35 to 70 points. Lysholm score improved from 61 to 83 points. Good correlation of MRI and arthroscopic findings was observed. Arthroscopy showed normal cartilage in 6 and abnormal in 2 cases. Average ICRS visual score was 9,4 point. No graft failed. Histological picture showed mixed cartilage in 7 and hyaline in 1 patient.
Conclusion:
Functional improvement occurred in all patients. Hyalograft C forms a new cartilage surface. A well-fixed cartilage of a predominantly mixed (fibro-cartilaginous) type formed in less then a year. Scaffold carrier resorbed without problems. We conclude that Hyalograft C cartilage transplantation is a safe and efficient method for treatment of deep chondral defects in the knee. It is especially useful for patients with initial failures in cartilage defect treatment or for complex surgeries.

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Chondrocyte transplantation (CARES-Technology) with autologous bone transplantation for treatment of osteochodritis dissecans at the medial femoral condyle

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Osteochondritis dissecans (OCD) of the femoral condyles is a common disease. For the repair different procedures such as microfracturing, osteochondral transplantation and auto-logous chondrocyte transplantation are recommended. We report on the treatment of OCD-lesions at the medial femoral condyle with a combination autologous bone-plug transplantation for the repair of the subchondral damage combined with autologous chondrocyte transplantation (CARES®-technique: autologous chondrocytes dispensed in a rat-collagen matrix).
Material & methods:
22 patients with OCD-lesions (grade III & IV (ICRS-classification) were treated in a two-step procedure: At the first arthroscopic operation the diagnosis was confirmed and the chondrocytes harvested. In the second operation 10 days later the subchondral sclerosis was removed and the bony defect restored with autologous cancellous bone plugs harvested from the proximal tibia. The cartilage layer was reconstructed with matrix-associated autologous chondrocytes. Postoperatively, partial weight-bearing was limited to 15 kg for the first 6 weeks and until the 12th week to 30 kg, afterwards full weight-bearing was allowed. Sports activities were restricted for one year. All patients received CPM for 3 months.
Postoperative follow-up was performed using the IKDC-score and the patients and physi-cians contentment scale (excellent-poor). The IKDC-score was analysed statistically comparing the preoperative score with the one-year follow-up results.
Results:
Follow-up was possible in all 22 patients. The mean preoperative IKDC-score was 35.1 pts., after 1 yr. 67.7 pts. the mean change to baseline was 29.3 ($p < 0.0001$). Results were clearly depending on the size of the defect and the duration of symptoms. The content-ment of the patients/physician resulted in 9/8 excellent, 9/9 good, 4/3 fair and 0/2 poor results.
Conclusion:
These results are promising. Further follow-up is necessary to show stability of these results. In addition, comparative studies are desireable.

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The treatment of the deep chondral defects of the joint cartilage by cultivated autologous chondrocytes

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Introduction:
The method of cultivated autologous chondrocytes transplantation in the form of a solid chondrograft was used in the treatment of deep defects of joint cartilage. Other surgical techniques were additionally performed.
Material and Methods:
The surgical indications for the transplantation were acute injuries of cartilage or its sequelae, chondropathy, focal defects, osteoarthritis. The clinical pre- and postoperative examination in the knee included the Meyers, Tegner and Lysholm-Gillquist scores, intraoperative arthroscopical Outerbridge score. In the ankle the Anderson scale and the Berndt and Harty scale were the indications for the surgery, clinical results were evaluated according to both Mazur and Weber scores. MRI examination was evaluated pre- and postoperatively in 2w, 2m, 6m and 1 and 2 yrs intervals. The full cartilage sample from the non-weight bearing zone of the trochlea femoris or talus was harvested. The cultivation of chondrocytes lasted from 28 to 42 days. The fixation of a solid chondrograft graft was managed by tissue glue Tissucol.
Results:
The authors treated by this method 38 patients (21 male, 17 female) among them 11 children (8 boys, 3 girls). The age range was 10 to 54 years, the mean age 30.2 years, in children 10 to 18 years, mean 15.2 resp. The follow-up period in 34 patients ranges from 7 to 30 months with the average of 17.7 months. 4 patients, being less than 6 months after the surgery, are not included in the evaluation.
Conclusions:
The significant clinical function improvement was achieved in the comparison of the initial and final follow-up terms. MRI evaluation shows a good integration results. The decision for the treatment by this method is worth in cases, which could be hardly treated by any another surgical techniques.
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The full-endoscopic operation of lumbar disc herniations using interlaminar and lateral transforaminal access

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Purpose:
Lateral access is often necessary in full-endoscopic transforaminal operation of lumbar disc herniations in order to guarantee sufficient decompression. Especially at level L5/S1 there are anatomical problems due to the pelvis. Development of an interlaminar access made it possible to operate here full-endoscopically. The endoscopes available had problems with mobility, resection of hard tissue and sufficient cleaning of the intervertebral space. Objective of this prospective study was to investigate the broadened possibilities offered by newly-developed endoscopes and instruments in the full-endoscopic operation of lumbar disc herniations.
Material and Methods:
283 patients with lumbar disc herniations were operated in 2002 in full-endoscopic technique with lateral transforaminal and interlaminar access. 7-mm endoscopes with intraendoscopic 4.2-mm working canal and corresponding new instruments were used. Follow-up lasted 36 months. 229 patients (81%) could be followed. Additionally to general parameters validated scores were used.
Results:
There were no intraoperative complications. 5 patients developed transient dysesthesia. The mean operation time was 28 minutes. 188 patients (82%) reported having no more leg pain, 30 (13%) had occasional pain. 8 patients (3.5%) developed recurrence. These were re-operated using the same technique. The new endoscopes and instruments enable resection of hard tissue, bone and intradiscal material. The measuring instruments showed a significant, constant improvement.
Conclusion:
The full-endoscopic operation of lumbar disc herniations with interlaminar and lateral transforaminal access is a sufficient and safe alternative compared to conventional procedures, taking into consideration the effectiveness and constancy of the results over several years. At the same time, it offers all the advantages of a truly minimally-invasive procedure. The new endoscopes and instruments improve the mobility, the resection of hard tissue and reduce the recurrence rate. Given the possibility of selecting an interlaminar or transforaminal access, all lumbar disc herniations can be full-endoscopically operated.

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Operation of lumbar degenerative recess stenosis in interlaminar and lateral transforaminal full-endoscopic technique

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Purpose:
According to current knowledge, decompression in lumbar spinal stenosis improves symptoms of neurogenic claudication and neurological deficits. Extent of decompression and additional fusion are still under discussion. The target is sufficient decompression with reduced traumatization and destabilization. Objective of this prospective study was to evaluate the full-endoscopic technique for operation of lumbar degenerative recess stenosis.
Material and Methods:
127 patients were operated lateral transforaminal or interlaminar from 2002 to 2004. Inclusion criteria were: singlelevel recess stenosis, no foramen stenosis of the underlying level, no disk herniation, spondylolisthesis without lysis max. Meyerding Grade I, unilateral leg pain. Conservative therapy time was at least 9 months. The operation was performed full-endoscopically under fluid flow using 7-mm endoscopes with a 4.2-mm intraendoscopic working canal. Follow-up lasted 12 to 30 months. 115 patients (91%) could be followed. Additionally to general parameters validated scores were used.
Results:
There were no intraoperative complications. 3 patients developed transient dysesthesia. Mean operation time was 42 minutes. There was no measurable blood loss. 94 patients (82%) reported no further radicular leg pain, 15 patients (13%) had occasional pain. 6 patients (5%) underwent conventional revision. These reported unsatisfactory results even after revision. The measuring instruments showed a significant, constant improvement. The same was observed in the lengthening of walking distance. No increasing instability was diagnosed radiologically.
Conclusion:
Within the indication criteria, the full-endoscopic operation of degenerative recess stenosis is technically feasible. It enables selective procedure with direct visualization. Based on the results, the decompression is found to be sufficient and with few complications, while at the same time enabling reduction of traumatization of the access pathway and spinal canal structures. It offers the advantages of a truly minimally-invasive procedure. The questions of recurrence and stability could not yet be definitively answered.

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Benefit of the total disc arthroplasty in the treatment of degenerative disc disease - indication and results after a follow-up period of 2 year

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Purpose:
Motion preservation represents a new trend in the surgical management of degenerative disease. However, fusion success may be in the 90-95% range, clinical success for fusion is only in the 50-70% range. While fusion has succeeded in providing pain relief and restoring spinal stability, restoration of natural disc function is impossible. ,,Fusion disease" generates facet hypertrophy, spinal stenosis, osteophyte formation , posterior muscular debilitation and accelerates disc degeneration at adjancent levels.A young patient receiving a fusion is a candidate for additional spine surgery.
Material and methods:
This study includes data of first 53 patients and of 57 total disc replacement at the age of 42,7 women prevailed. Patients were evaluated clinically, radiologically and by VAS and ODI. Evaluation was done in minimum of 12 months follow-up and 24 months follow-up.
Results:
Preoperative VAS data showed 7.9 on average, l2 months post-op decreased to 4,3 and from l2 patients 24 months post-op decreased to 3,8. ODI showed pre-op 54 on average, l2 months post-op 26 and 24 months post-op 28. These data represent very good results. Based on the authors´ experience the following indications for total disc replacement arise:
1. Post-nucleotomy syndrome
2. Mono and bisegmental degenerative disc disease
3. Segmental instability with degenerated disc
4. Recurrent hernia only at the level of the disc
5. Long-term chronic back pain
6. Unsuccessful conservative therapy

Conclusion:
This study involves results of patients operated for degenerative disc disease by total disc replacement. Authors prove very good results provided proper indication criteria were followed. These results support VAS and ODI data with minimum follow up 12 and 24 months. The fact that the achieved data 12 and 24 months post-op do not differ is encouraging.

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Endoscopic anterior fracture stabilization of the thoracolumbar spine
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Introduction:
Reconstruction of the anterior column in the thoracolumbar spine has become a standard procedure to prevent post-traumatic spinal deformity. The treatment strategy depends on the fracture pattern and the general condition of the patients. New developments on the instrument and implant sector have allowed anterior stabilization of the fractures in the thoracolumbar spine to be performed with the endoscopic technique.
Material and Method:
Between 2001 and 2003, 50 patients (36 men,14 women) were treated for fractures of the thoracolumbar spine. The age of the patients was ranged from14 to 62 years. 29 patients were polytraumatised or had additional chest and pulmonary injury. The fracture classification was according the AO. 18 Patients had a neurological deficit at admission. The neurological status was classified according to Frankel Scale (A-D).
Due to fracture instability and compression of the spinal cord 43 patients underwent primary fracture stabilization through a posterior approach and secondary reconstruction of the anterior column by the endoscopic technique.
Results:
Mobilisation of the patient performed after the second post-operative day depended on the general condition of the patients. Improvement of the neurological deficit was observed in 13 cases. CT control at least of 2 years follow up shows good bone integration of the iliac crest bone in the majority of the cases. Two patients experienced temporary neurological symptoms, which showed complete remission. In one patient we observed a bleeding, which required a revision and in one patient a failure of the screw position without any complication.
Conclusion:
The endoscopic procedure for reconstruction of the anterior load-bearing spinal column developed to a standard concept in trauma management.
The minimal morbidity of the operative approach, good visualisation of the operative field and angle stable implant make it possible to restore the anterior column on a safe technique.

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Is there an indication for semirigid implants in lumbar spine surgery?
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We report on 30 patients being treated with a semirigid stabilisation using ,,Scientix"-implants with a follow-up of at least 1 year; Scientix implants were used because of the possibility of using either rods or plates with the same screws and the combination of rigid and semirigid segments. Previous experiences with ,,Dynesis-system"reduced the number of dynamic stabilisations in hypermobile discopathy.
Our indications to dynamic stabilisation were:
10 "topping offs" above a fused segment
8 dynamic stabilisations and decompressions
7 dynamic stabilisations and decompression above a fused segment
2 dynamic stabilisations below a fused segment
2 dynamic stabilisations to enlarge a narrow foramen
1 dynamic stabilisation in hypermobile discopathy
According to these different indications we do not report on clinical results, but concentrate on the technique of implantation and the radiological parameters. Early results demonstrate few problems in implanting of the semirigid elements both using plates and rods. We saw no breakage or tear-out of screws and no case of clear fail of the dynamic implants. But, in conclusion, it will not be possible to give a limited answer to the question, if this system will fulfill the expectations before a 5-years follow up.

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Do we need national guidelines for the management of low back pain?

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Purpose:
Worldwide, many countries apply national guidelines for the management of low back pain. This study compares and contrasts these national guidelines to demonstrate essential differences and to discuss the possible causes and consequences of these differences.
Material and Methods:
A constructive comparison of the national guidelines was performed.
Results:
It is evident that there are many similar properties in the various national guidelines. Nevertheless, there are also differences. Establishing guidelines to study such a large topic as back pain, is a laborious process. By regularly updating the guidelines, this process will be continued according to the fundamental rules of Evidence Based Medicine.
Conclusion:
Establishing international guidelines offers a twofold opportunity:
1) to deal with the most recent material in the Evidence Based Medicine Literature, and
2) to adapt the guidelines to national circumstances, i.e. with regard to social laws, or to define possible problems in implementing the guidelines.

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The relaps of C6 exostosis in hereditary deforming dyschondroplasia

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Aims:
Authors describe rare relaps of exostosis involving spinous process C6 occuring 3 years after previous operative ablation. The case of l0 - years old girl with hereditary multiple exostosis and review of literature is discussed.
Material:
Twins / girls / with hereditary multiple exostosis are patients of orthopaedic department since 1999. There were many corrective ablations of hyperplastic bones mainly on lower extremities. One sister was operated on 2001 because of exostosis involving C6. After 3 years of free period she registered limitation of cervical extension. The relapse of exostosis was detected / X ray, CT, MRI /, no symptoms of cervical cord compression had occured.
Results:
Reoperation including laminectomy of C6, C7 solved problem of spine configuration, no malignity was found. On the other hand questions of external fixation of cervical spine still persist, need of - second step - internal fixation, ROM in this region, and of future common day / sport activities.
Conclusion:
The relapse case of exostosis in cervical region,and spinal as well, is relatively rare / 50 literature citations during 35 years/. In spite of temporarily good result we had to cope with large recidivous process that need extirpation and laminectomy of C6, C7 to be done.

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Revision arthroplasty following the aseptic and septic loosening of the knee endoprosthesis

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Aim:
The aim of this study is to analyze results after implantation of revision total knee endoprosthesis model Kinemax Plus Superstabilizer at our Department.
Material and Methods:
Between 2000 and 2005 we implanted 45 modular revision knee endoprosthesis model Kinemax Plus Superstabilizer in 44 patients, 41 female and 3 male. The mean age was 69,22 (57–85) years. The indications for revision knee arthroplasty included pain and aseptic instability in 39 knees. Septic instability of the primary knee endoprosthesis was diagnoses in 6 patients, and they were treated with two-stage revision arthroplasty. The mean time from primary to revision arthroplasty was 8.07 years (range, 1 to 17). The mean patient follow-up was 19,27 (6–54) months.

Results:
The mean surgical time was 132 (85–165) min. and blood loss 1566 (620–4000) ml. In 3 knees we performed wound revision because of the haematoma. In 5 patients deep infection developed and they were treated by debridement, liquid drainage and antibiotics. In two of those cases we removed revision endoprosthesis because of infection recurred and knee arthrodesis by external fixator was successfully performed. One patellar dislocation and one periprothetic fracture were observed and operated. One patient needed tibial insert replacement. 10 (22,2%) patients were lost from follow-up. 34 patients (35 revision prosthesis) were available for follow-up and 33 revision knee prosthesis survived. 2 (5.71%) prosthesis had to be extracted due to deep infection, and knee arthrodesis was performed. In the group of 33 successfully revised knees there were no clinical signs of instability during the follow-up period, but in 4 (12,12%) knees we found radiolucency_more than 1 mm on standard plain radiographs.
Conclusion:
We may conclude that main problems arising from complexity of the revision procedures of the knee joint may be successfully solved with modular type of the revision endoprosthesis.

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Preliminary results in knee arthroplasties performed for sterile loosening
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Purpose:
We would like to present a preliminary report on a group of patients with sterile loosening in whom we performed knee revision arthroplasties.
Methods:
Between 01-01-2001 – 09-30-2005 we performed a total 148 knee revision arthroplasties in our department. We categorised the patients according to the HSS system before and after the operation. We also took in to account the amount of bone and ligamental defect that had to be corrected in the postoperative results. We also investigated what bone and ligamental defects we could expect with the various prosthesis as well as how to correct them. The postoperative level of patients satisfaction with the result was measured using the VAS .
Results:
We performed a total of 148 knee revision arthroplasties in 138 patients. The patients population consisted of (26%) men and (74%) women The indication of the primary surgery was: varus arthrosis in 72,3%, RA in 14,5% of the patients, and in the rest was: primary arthrosis, valgus deformities, posttrauma cases, etc. The original surgery was a UKA in 85,81% of the total knee revison cases. In 16,54% of the UKA revisions we replaced the components with another UKA. In 83,46% of the UKA reoparations we converted them to a total knee arthroplasty. All together 1 arthrodesis were performed from TKA.
Conclusion:
The goal of every arthroplasty is the restore good joint functionality. In the majority of our arthroplasties we were able to accomplish this and only in 1 cases were we forced to abandon this goal. With HSS classification we found the results better when we only had to repair the ligaments than when we also had to replace bony defects.

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Why do prosthesis fail: Analysis of 100 consecutive revision surgeries in total knee arthroplasties (TKA)
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Purpose:
There is a growing demand on revision surgery in the last decade. We are a referral center for painful and failed TKAs and have performed more then 400 revision surgeries between 2000 and 2005. In this paper we have analysed the cause(s) of failure(s) in patients with painful or failed TKAs.
Material and Methods:
100 consecutive revision surgeries were analysed using a standardized diagnostic algorithm. This included extended history, clinical evaluation with special tests and laboratory examinations. Radiographic analysis included standard x-rays, full leg standing weight bearing x-rays and special fluoroscopic views. Patients with suspicion of implant malrotation received a special computer tomography and stress x-rays. In patients with suspicion of infection aspiration of the joint and if negative a technetium and leucocyte bone scan was performed. The suspected cause(s) of failure(s) was analysed during revision surgery in all cases.

Results:
In 48% malalignment (> 4°) caused overloading, pain and/or PE-wear. In 26% malrotation (> 3°) of the tibia and/or femoral component caused either patella malttracking, stiffness or flexion gap instability. In 23% pain was caused by instability either in extension, midflexion and/or full flexion. In 19% the cause of pain was infection. In 24% several other rare causes could be identified. Only in 9% there was aseptic loosing over the time without any implantation failure. 78% of all revisions were performed within 3 years after the primary surgery.
Conclusions:
Aseptic loosing, PE-wear and instability had been described as the main failure mechanisms in TKA. In this study it could be shown, that these are only secondary phenomena's for the three main implantation failures of malalignment, malrotation and mismatch of the flexion/extension gaps. In most of the early failures within 3 years after primary implantation these revision surgeries might be prevented by a more precise primary implantation.

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Isolated internal malrotation of the femoral component may cause early failurein total knee arthroplasty (TKA)
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Purpose:
The purpose of the current study was to evaluate the clinical results and functional outcome after revision surgery with correction of an isolated internal malrotation of the femoral component in patients with painful total knee arthroplasties (TKA).
Material and Methods:
In a prospective study in 68 consecutive patients with painful TKA rotational alignment of the femoral and tibial component was evaluated using a special computed tomography. 14 patients showed isolated internal malrotation of the femoral component without other implantation failures. In all patients infection was excluded and they suffered either from limited flexion or instability in flexion.
Results:
Average internal malrotation of the femoral component was 7° (3°-10°). Two clinical types of malrotation could be distinguished. Type A showed good flexion (> 90°) but painful lateral instability in the flexion gap. Type B had always a limited painful range of motion (< 90°) and medial joint pain. Revision surgery with exchange of the components was performed in 12 patients with internal malrotation ≥ 4°. We could increase the average KSS Knee Score/Function Score from an Ø 51 (26-69) / 65 (30-90) points to Ø 87 (66-94) / 87 (65-100) points after revision with a mean follow-up of 25 (10-59) months.
Conclusions:
Isolated internal malrotation can not be detected by standard radiographs. Patients show a typical clinical presentation with two types. Correction of isolated internal malrotation of the femoral component in patients with painful TKA or early failure of the prosthesis can be successful in carefully selected cases.
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In vitro study of sheep meniscus cells seeded on two slightly different biomaterials made from hyaluronic acid and polycaprolactone
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Introduction:
The behaviour of sheep meniscus cells seeded on 2 slightly different biomaterials was evaluated in vitro to investigate the biomaterials´ feasability as a possible tissue-egineered meniscus substitute.
Methods:
Both materials, the BF-1 and the BF-1 CO-PET are made from 30% hyaluronic acid and 70% polycaprolactone. The BF-1 CO-PET is additionally augmented by polyethylene fibers. 47 matrix cylinders (6 mm diameter, 5 mm height) were punched out of each biomaterial and seeded with $2x10^6$ sheep meniscus cells each. The specimens were harvested in triplets after 12 hours, 7, 14, 21 and 28 days. Histological and immunohistochemical analysis (collagen I and II) were performed. The glycosaminoglycan GAG content was measured biochemically and RT (reverse transcriptase)-PCR was performed for collagen I and II. 2 cylinders were evaluated by electronic microscopy at 28days.

Results:
On the BF-1 the cell morphology continuously changed from a spherical to a more elongated phenotype whereas the cells on the BF-1 CO-PET showed the same behaviour till the 14days time point, but then changed their morphology to the spherical phenotype again. Collagen I mRNA expression was present on both materials at all time points. Collagen II mRNA expression on BF-1 decreased over time, whereas on the BF-1 CO-PET an increase of collagen II m RNA was seen between 14 and 28 days. Immunohistochemical staining was positive for collagen II and negative for collagen I. The GAG-content increased in both materials significantly, but was eight times higher in the BF-1 CO-PET.
Conclusion:
Sheep meniscus cells could be cultivated on both materials. In vitro, the cells seeded on the BF-1 CO-PET showed a more cartilaginous phenotype, as spherical morphology, increased Collagen II mRNA expression and a higher GAG content were detected.

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A tissue engineering approach to meniscus regeneration in a sheep model

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Purpose:
Meniscus injuries are the most common knee injury. Loss of the meniscal tissue leads to cartilage degeneration and osteoarthritis. A new resorbable biomaterial developed to serve either as a partial or a total meniscus substitute, was tested in an in vivo study in sheep.
Material and Methods:
All procedures were approved by the local ethics committee for animal studies. 8 skeletally mature stone sheep were divided into 2 groups. Group TM (total meniscus replacement, n=3) received a total medial meniscectomy and a total meniscus implant. Group PM (partial meniscus replacement, n=3) received a resection of the anterior part of the medial meniscus and a partial implant sutured to the original meniscus. The left non-operated stifle joints served as controls. For each group an empty control (without implant) was performed.The biomaterial is a porous composite of polycaprolactone and HYAFF®.
The sheep were euthanized 6 weeks after surgery. The joints were evaluated macroscopically and histologically.
Results:
In all cases there was excellent tissue ingrowth from the capsule to the implant. In group PM tissue had formed in the contact area between the biomaterial and the original meniscus. The surface of the biomaterial was covered with a synovial-like tissue.The main histological findings were an excellent bonding between implant and the capsule in all specimen. In Group PM, tissue formation between the biomaterial and the residual part of the original meniscus could be demonstrated. The tissue, covering the implant, had a synovial-like appearance, bloodvessels were seen throughout the implant. All specimen showed accumulation of giant-cells in contact with the biomaterial, however, fibroblast-like cells were detected in-between.
Conclusion:
Our study revealed that meniscus replacement with a HA/PCL biopolymer is feasible and leads to adequate tissue formation; long-term studies on the adaptive remodelling of the tissue to a meniscus-like structure and cartilage protection will follow.

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In situ gene therapy in cartilage repair

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Introduction:
The transfer of cDNAs encoding certain bioactive proteins like growth factors or cytokines into mesenchymal stem cells represents an alternative treatment strategy to promote cartilage repair. In a previous study, we showed that it is possible to implant a collagen- glucosaminoglycan-matrix into osteochondral defects of rabbits carrying adenoviral vectors. We found that mesenchymal stem cells from the subchondral bone will then migrate into the matrix and get infected by the vectors. These modified stem cells are able to express high levels of transgenes. This so called in situ delivery would obviate the need for a technically demanding, labour intensive *ex vivo* procedure.
The aim of this study was to investigate the use of autologous bone marrow plugs as a biological "matrix" to support local transgene expression following genetic modification *in vitro*, and to deliver gene vectors to osteochondral defects *in vivo*.

Method:
Generation of vectors: First generation, E1, E3 deleted, serotype 5 adenoviral vectors carrying the complete cDNA for firefly luciferase green fluorescent protein (GFP) and tissue growth factor-ß1 (TGF-ß1) were constructed using the method of *cre-lox* recombination. The resulting vectors were designated Ad.Luc, Ad.GFP and Ad. TGF-ß1 respectively.
Generation of osteochondral defects: 3 x 6 mm osteochondral defects were generated in femoral condyles of New Zealand White Rabbits. Bone marrow was aspirated from the iliac crest mixed with approximately 1 x 10^9 particles/ml of either Ad.Luc, Ad.GFP or Ad. TGF-ß1 and coagulated to form so called gene plugs. Gene plugs were then loosely press fit implanted into the defects.
To determine levels of luciferase transgene expression, 3 rabbits were sacrificed at days 1, 3, 7, 14, and 21 following implantation and the recovered tissues were assayed for luciferase activity.
To observe the location cells genetically modified to express GFP were viewed by fluorescence microscopy.
Histology and immunochemistry was performed 6 weeks after operation
Results and Discussion:
Luciferase activity in the implanted matrix containing Ad.Luc was high throughout the first week following gene delivery and gradually decreased up to day 21. GFP positive cells were found throughout the plug but not in the surrounding tissue indicating a local delivery. Histology showed hyaline like cartilage filling the defects 6 weeks postoperative by using Ad. TGF-ß1 gene plugs.
Conclusion:
These data confirm that it is possible to transfer genes to osteochondral defects locally by direct *in vivo* gene delivery using bone marrow aspirate. The plugs serve as a natural matrix providing a complete in growth and have the capacity to undergo chondrogenesis if treated with TGF-ß1. Further experiments using growth factors in a sheep model are on the way.

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The relationship between the in vivo measured cartilage stiffness and the histological stage of degeneration
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Aim of the study:
To investigate whether there is a relationship between the stiffness and the histological stage of degeneration of human knee articular cartilage.
Material and Method:
Compressive stiffnes of knee articular cartilage was measured in 87 patients during arthroscopies.Mean age was 29 years (17-73).49 female and 38 male patients and 40 right knees and 47 left knees were operated on. Artscan 1000 was used for in vivo measurements.Macroscopically normal or grade I-II. (according to Outerbridge classification) chondropathic surfaces were measured. Our results were recorded on the ICRS standard evaluation form. Additionally histological appearance (according to Mankin score) of the biopsies taken from the measurement sites were assessed. Linear regression analysis was performed.
Results:
A high negative correlation between Mankin score and cartilage stiffnes was observed for the medial (r2=0.79) and the lateral femoral condyle (r2=0.82), while the correlation for the medial tibial condyle was r2=0.72, while for the lateral tibial condyle r2=0.75.
Conclusion:
The high correlation between stiffness and Mankin score suggests that the stage of cartilage degeneration can be indirectly assessed during arthroscopy with hand-held indentation probe.

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Gene expression profiling and phenotypic properties of human mesenchymal stem cells (hMSCs) during ex-vivo expansion
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Human mesenchymal stem cells (hMSCs) can be easily isolated from bone marrow cells. Because of their capacity of rapid expansion and differentiation into several cell lines (e.g. osteoblasts, chondroblasts, adipocytes, myocytes, astrocytes and neurons) interests in sciences and clinical applications increases over time. However, the molecular mechanisms of self-renewal and multilineage differentiation are still not well understood and there is some necessity for more basic investigations regarding safety in regenerative cell therapy.

At the Department of Orthopaedics and Orthopaedic Surgery Graz a substantial stock of hMSCs were built-on under the approval by the local hospital ethic committee. In this study we addressed the question of molecular stability of long-term cultivation of undifferentiated hMSCs in the face of cultivation conditions in-vitro and stem cell properties. Large-scale expression profiling of hMSCs of ten normal donors was performed by human oligonucleotide microarray slides with 30.000 elements during the process of ex-vivo expansion and osteogenic differentiation. Additionally, proliferation kinetics, surface marker profile and differentiation potential were monitored during ex-vivo expansion of the cells.
In the session we will come up for discussion our findings, which show great promise for genetic and phenotypic stability during long-term expansion of isolated hMSCs.

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Wich way to go in knee revision: Semi- versus full-constrained knee prostheses

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Purpose:
Purpose of this study was to compare a semiconstrained versus two constrained knee revision systems in terms of survival time, clinical outcome and quality of life.
Material and Methods:
Between 1999 and 2005: 46 semiconstrained Duracon TS®(DTS), 17 Finn® Rotating Hinge (FRH) and 42 Modular Rotatig Hinge®(MRH) prostheses were implanted at our department. Mean follow-up for DTS was 44 months, for FRH 55 months and for MRH 17 months. We investigated etiological and epidemiological data (gender,age), clinical outcome (KSS), quality of life (WOMAC) and radiological findings.
Results:
The constrained prostheses showed as high survival rates as the semiconstrained sytem :100% survival for FRH, 85% for MRH and 82% survival for the DTS. Preoperative KSS pain score was lowest for MRH group ($p<0.001$) if compared to DTS. Postoperatively KSS pain score was improved in all groups ($p<0.001$) with no difference between the groups. KSS function was also improved in all groups postoperatively ($p<0.001$) with no difference between groups, although preoperative function score was lowest in the FRH group. The ROM was highest in the MRH group ($p<0.1$). There was no difference in WOMAC score. The necessity for crutches was highest in the FRH group ($p<0.001$, $p<0.01$) with lowest preop. function. There was no difference in radiologic outcome.
Conclusion:
Modern constrained knee revision systems show high mid term survival, good clinical outcome and postoperative range of motion. In our study semiconstrained prostheses showed no superior results if compared to rotating hinge prostheses.

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Indications for the LCCK total knee endoprosthesis

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The legacy constrained condylar knee prosthesis (LCCK, Zimmer®) is designed for revision of total joint arthroplasties that need additional stability due to ligamentous deficiency and to compensate for bone defects. We are going to analyse indications and results using this type of implant.
Between November 1999 and January 2006 64 patients were provided with 69 LCCK knee endoprotheses. 40 prostheses were implanted in cases of revision surgery and 29 as primary implants. The mean age of patients was 75 years (range 22-93).
Indications for revisions were 21 aseptic loosenings, 12 late infections, 7 instabilities and 5 cases due to polyethylene wear.
Indications for primary arthroplasties were 17 severe valgus and 7 severe varus deformities, 4 cases post infections and 2 post traumatic deformities.
For the femur we used 15 straight and 20 offset stems, at the tibial site 34 straight and 22 offset stems . In 36 cases we used augmentation at the femoral site and in 34 cases at the tibia. In 11 cases the patella was replaced.
The most influencing early complications were a peroneal lesion and an intraoperative fracture in one case each, minor complications were limitation of movement in 7 patients, 10 wound healing problems and 1 thrombosis.
Late complications needed 5 revisions, 4 because of late infections and 1 because of instability.
The LCCK prosthesis is an excellent implant to treat severe deformities and perform revisions with extensive bone losses. The initial situation is in most of the cases difficult due to poor skin situations and often severe adipositas. As nearly all these procedures are salvage procedures, the clinical results are anyhow satisfying.

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Revision arthroplasty of 52 malaligned total knee using LCCK NexGen system

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Purpose:
Authors introduce indication and results, hazards and solutions of 52 revision total knee replacement performed in their institute. Aspects of mal-aligned components resulting in loosening techniques of reconstruction of bone loss and stability is examined.
Methods:
Between January 2000 and December 2005 52 revision arthroplasties were performed in authors institute. The technique includes midvastus approach compared with standard medial parapatellar approach.
34 patients had significant primary mal-alignment of the components, 14 patients had instability resulting in mal-alignment of the joint 4 patients had aseptic loosening. Revision included stemmed, augmented components of CCK system with bone grafting in 3 cases.
Follow up was made using the Knee Society Knee Score with independent examiners.
Results:
The operation performed on patients with constrained revision resulted in appropriate ligament balance and stability. Average flexion was 54 degrees in the first two post op days using midvastus approach.
In 1 case re-revision was performed because of trauma. Post operative pain was significantly reduced. There was no infection.
Conclusions:
Revision total knee replacement is technically more demanding, requiring adequate training and knowledge. Appropriate indication is inevitable in order to achieve good alignment, stability set of rotation of the components. Midvastus approach seems a good choice regarding post op function. CCK system proved to have adequate stability of revised knees.

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Revision arthroplasty with rotation hinge prosthesis (LINK)

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The ,,Link" rotation hinge prosthesis was developed by the Endoclinic in Hamburg in the late 70ies. In cases of medial and lateral ligament instability, bone loss of the condyles or tibial head, severe destruction following rheumatoid arthritis it is the endoprosthesis of choice for primary implantation. Revision arthroplasty after loosening of total knee prostheses or ligamentous dysbalance following asymmetric surface abrasion of polyethylene was performed in 142 cases between 1993 and 2000: Hemis 14, total knee (PCA/LCS/Natural/PFC & others) 97, (semi-)constrained endoprosteses (GSB/Guepar/Tillman/Blauth & others) 31.
The patients were between the age of 62 up to 88 with an average survival time of the removed implant of 7.4 y (1.5–12), 86 women and 56 men.
Perioperative technical complications were seen in 5 cases , three times burst fractures of the condyle, perioperative fractures at the top of the femoral stem twice, solved by additional osteosynthesis.
3 infections within 1 y after implantation urged a removal of arthroplasty and arthrodesis by fix.ext.. 121 of 139 prostheses were followed up after at least 5 years. The average motility was ext./flex. 0/5/105, 2/3 of the old people could walk painfree without cane, 1/3 had further disabilities with additional hip or contralateral knee prostheses or signs of spinal stenosis thus limiting their mobility even if the revisioned knee was without disorder.
The model can be recommended as salvage procedure for revision arthroplasty and is the implant of choice for the described indications. In cases of infected loosening an intermediate implant ("drainage prosthesis" of Thabe) with a similar design is used in order to apply antibiotics into the septic bone stock following by a second exchange after minimizing all laboratory and local signs of infections.

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TUmor-REvision-MOdular-System (TUREMOS), a constraint tumor and revision knee-prosthesis system with new anchoring system

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Introduction:
With the TUREMOS-Prosthesis system we will present a new constraint titanium hydroxi-apatit covered prosthesis with a new reliable anchoring system due to its full-surface contact metal to bone
that is implanted cementless since May 1996 by one surgeon

Material and Method:
In a prospectiv study we followed 54 patient, 34 women and 20 men, who were operated at the age of 22 to 88, average 59 years, in 18 cases due to primary bone tumors, in 8 cases due to secondary bone tumors and in 28 cases due to failed knee-prosthesis. Follow up was at least 12 month, 12 to 80 months, mean 46 months. All patient were personally controlled by the authors.
Results:
In 41 cases we found a very good result with patients in a fully rehabiltiated situation walking without cane and following their daily work and living. 6 patients need one cane and in 7 cases patients had to walk with 2 crutches or needed a wheel-chair, in all these seven cases due to other medical reasons. In three cases we found a loosening of the femoral component, two needed resurgery, one could be controlled conservatively. One patient needed amputation due to uncontrollable infection. We found in all cases, also after resurgery or conservative treatment of loosened femoral componend, a radologically completely femoral and tibial bony integrated prosthesis.
We will show the homogeneous, all-surface, osteointegration of the anchoring system with histological review of two prosthesis components.

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Treatment of bone metastases from conventional clear cell renal carcinoma
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Between 1966 and 1998 the Prague Bulovka bone tumor center treated 218 patients with bone metastases (BM) of conventional clear cell renal carcinoma (CCCRC). 145 men and 73 women of average age 57 years.161 patients were in class 1 with solitary BM and 57 in classes 2-4 with multiple metastases. 53 patients had pathologic fractures (PF). The risk of PF was the highest in the femur 43%, followed by the humerus 38%.
New classification, clinical presentation in different location and radiographic findings are discussed. Different treatments as plating with cement, nailing or endoprostheses are presented depending on the affected bone and intraosseous location. As the CCCRC represents a highly vascular tumor we always indicate angiography with embolization in suspicious BM, after which surgery is performed within 4 days to prevent sever bleeding. In cases of accidental surgery without a correct diagnosis and embolization, like e.g. in acute treatment of pathologic fractures, a quick curettage is a life saving procedure that stops the bleeding. Systemic adjuvant treatment together with primary tumor removal leads to survivals over one year in most cases. In intramedullar nailing without systemic treatment we recommend radiotherapy for local control, even if the tumor is considered radio-resistant. 14 patients are surviving over 5 years after removal of solitary metastasis and primary tumor resection. Complications as local progress, failure of osteosynthesis, deep infections or lethal intraoperative bleeding can occur. Curettage with a cement spacer can give good local tumor control especially when combined with adjuvant treatment. Local progression in such cases indicates failure of systemic treatment and predicts bad prognosis. Endoprostheses are indicated for solitary BM around joints. In such locations with multiple BM plating and cement are options. For diaphysis we prefer plating with cement. Cement enables good early detection of local recurrence on plain radiographs or CT.

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Treatment of pathologic fractures due to primary and secondary bone tumors
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Purpose:
An individual approach to every patient is essential in order to choose the most suitable surgical treatment for pathologic fractures (PF). Depending on the fracture etiology, fracture location and other patient related risk-factors, one of the various forms of surgical therapy should be chosen. Objective of this study is to evaluate different types of surgical treatments for PF due to various bone tumors.
Note:
Our Department has no Emergency unit, and we rarely treat emergency cases.
Materials and methods: Retrospective study: January 1994 to December 2004. At our Department 32,064 operative procedures were performed, 2,420 of which were operations with diagnose of suspected tumor (including all primary and secondary tumors and tumor-like lesions). We analyzed X-rays of all the patients with osteolytic type of bone tumor.

Results:
The study was based on 157 patients with PF. The most common diagnose was metastatic tumor (26% of all PF), enchondroma (19%), solitary (juvenile) bone cyst (18%), osteosarcoma (7%), and chondrosarcoma (6%). The majority of the patients with malignant primary or secondary tumors had initial nonoperative therapy followed by "en-block" tumor resection and one- or two-stage reconstruction. Enchondromas, localized mostly on the hand, were treated by excochleation and spongioplasty, and PF were mostly purely accidental findings. Juvenile bone cyst required steroid installation to avoid persistence of the cyst and refracture. Fracture healing in benign tumors was predictable without any surgical treatment.
Conclusion:
Surgical treatment depends primarily on the tumor type. The aim of surgical treatment is primary to treat/remove tumorous tissue, and than to heal fracture, maintain or restore function, and minimize pain thus improving the patient's quality of life. Surgical and reconstruction procedures should be chosen to minimize the risk of long-term failure in patients with a good prognosis and be as simple as possible in patients with poor prognoses.

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Resection and reconstruction versus transfocal internal stabilization in the treatment of metastatic bone diseases
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Purpose:
The impact of two different methods ie. resection and reconstruction versus transfocal internal stabilization of bone metastases was studied in 209 patients concerning the survival, life quality and local complications.
Material and methods:
338 patient with bone metastases were treated in two Institutions during the periode of 01.1990 to 01.2000. The minimum follow-up was 12 months. 129 patients were excluded for different reasons. 109 patients (Group I.) were treated with complete resection of the metastasis followed by reconstruction (endoprotheses in 58 patients, bone grafts in 2 patients, blading and bone cement in 37 patients, resection only in 12 patients) and 100 patients (Group II.) with internal transfocal stabilization (curettage, bone cement and blading; intramedullary - interlocking-, Gamma- or Ender-nailing - fixation and/or bone cementing. The patients of the two differently treated groups were matched according the general condition (Karnofsky), site of the primary tumor (lung, breast, kidney, prostate and others). For the statistical analysis the Fisher's exact-test, the t-test, the Kaplan-Meier survival curve and the Cox-Mantel test were used.
Results:
The survival differed significantly in the two groups: in Group I. 46.6% 1-year, 20.5% 2-years, 10.7% 3-years and 2.6% 5-years survival rates were detected; versus 15.1% 1-year, 4.04% 2-years and 0% 3-years survival rates in the Group II. Concerning the site of the primary tumors the mean survival in kidney metastases (17 months) were superior to the breast (11.3 months) and lung (6.7 months) metastases.
Conclusions:
The type of surgery does not influence the final outcome of the disease.
Resection and reconstruction is recommended in the early stage (soliter form) and translocal internal stabilisation in the more advenced stage (multiple form) of bony metastases. At right indication, the rate of complications is low (group I, 8% and group II, 11%) and comparable in both groups.

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Preventive osteosynthesis in case of multiple bone metastasis
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Purpose:
In Hungary and in that counties where trauma and ortopaedics are done at separate departments the surgical treatment of bone metastases is an unsolved problem. Orthopaedic centers are excellent in tumor surgery and histological diagnosis but no chance for acute osteosynthesis. Trauma centers are ready for acute surgery but no tumor treatment and oncology. The patients with pathological fractures need booth inmediate surgery and definitive tumor treatment. Extensive X-ray often shows bone metastases in prefracture status. The purpose is to perform inmediate definitive surgery of pathological fractures, to prevent imminent ones surgically, to have an early histological diagnosis and to give oncological treatment at the same time. The procedure needs an extremity surgery department with oncological surroundings.

Material and methods:
As a surgical management of metastatic imminent fractures we applied preventive osteosynthesis in 26 cases to prevent pathrological fractures. Mostly intramedullary nailing was performed. At multiple metastatic tumors only osteosynthesis but in case of solitaer metastasis a resection plus osteosynthesis was done.
Results:
No metastatic fracture was seen after preventive surgery. Patients were mobilized after surgery soon with no complication. In all of cases an osteosynthesis has prevented trauma and pathological fractures.
Conclusion:
Extremity surgery either orthopaedic or trauma must be an important phase of the tumor treatment of the patients with bone metastases to prevent trauma, pain, immobilization by preventive osteosynthesis.

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The benefits of surgery in the treatment of pelvic metatstases
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Purpose:
Purpose of this study was to analyse the benefit of surgery in pelvic metastases with respect to survival time and clinical outcome. We also wanted to compare the outcome of intralesional and extralesional resection of the metastases.
Material and Methods:
We followed 43 patients with pelvis metastases, who underwent intralesional resection in 37 cases and extralesional resection in 6 cases between 1980 and 1992. Survival time was calculated by the Caplan-Meier method. Clinical evaluation used the Karnovsky performance status.
Results:
The Karnovsky performance status was improved from 55% preoperatively to 75% (p=0.0001) 3 months and 77% (p=0.0001) 6 months postoperatively. Those having intralesional resection had a median survival of 13 months, a complication rate of 24% and a local recurrence rate of 19%. The respective data for extralesional resections were: 16 months survival, complications in 3 out of 6patients, but no local recurrence.
Conclusion:
Quality of life was improved by operation of pelvic metastases. Intralesional resection is preferable in most patients however extralesional resection should be considered in solitary metastases with good prognosis.
Words: 174

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Opinions and practices relating to primary hip arthroplasty dislocation in the West of Scotland
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Introduction:
Dislocation following primary hip arthroplasty is a difficult problem encountered in day-to-day orthopaedic practice. The rate of dislocation in Scotland is 3.9%. Our aims were to review the current practices of consultants in the West of Scotland relating to immediate management of hip dislocation, and to see how this compared to the existing literature on the subject.
Materials and methods:
All orthopaedic consultants in the West of Scotland were contacted via postal questionnaire. Two sets of questions were employed; one for first time dislocations and one for recurrent episodes. The questions related to the preferred venue for attempted reduction (A&E department, theatre) and the immediate post-operative management (bed rest with or without traction, brace, free mobilisation).
Results:
Fifty-four (76%) correctly completed replies were received. The majority (62%) preferred reduction in theatre for first time dislocations, compared to only 41% for recurrent episodes. 51% preferred free mobilisation for first time dislocations, with 25% placing their patients in a brace. For recurrent dislocations, 45% allowed mobilisation and 42% opted for external bracing. The suggested time periods for use of a brace ranged from 6 weeks to 3 months (first episode), and 2 weeks to 6 months (recurrent).
Discussion:
Evidence in the published literature suggests that enforced bed rest, either with or without traction produces no reduction in subsequent dislocation rates. The use of external bracing is also not supported by clinical evidence. Our survey highlights marked inter and intra-departmental variation between consultants in the West of Scotland. Significant resources and time appears to be spent on practises which are not evidence-based. We suggest that a consensus protocol be formulated for the management of these patients.

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DDH – adolescents and adults: Algorithm of triple pelvic osteotomy planning

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Purpose:
Adolescents and adults with DDH frequently suffer from moderate to severe pain frequently or exclusively during daily physical activity or sports activity. Especially power walking, running, walking downhill provoke pain in the thigh area.
Materials and Methods:
Since 1993 we perform a triple pelvic osteotomy according to Tönnis in patients with typical DDH - related clinical findings. The operation is not performed in hips with moderate or severe degenerative changes. Depending on the hip joint geometry in some cases an osteotomy of the proximal femur is performed additionally. Concise patient questionnaires, special clinical tests and different types of radiographic examinations lead to the correct indication.
Results:
The retrospective examination shows that in patients with a typical case history, distinct clinical findings and DDH signs in conventional x-rays the mentioned procedure can be correctly indicated by plain x-ray studies. In doubtable cases (e. g.: reduced acetabular anteversion or reduced femoral antetorsion, tears of the labrum acetabulare) additional studies such as CT-Scans, MRI Scans or MR Arthrographies need to be performed. In suspected deformities of the proximal femur standard conventional x-rays to evaluate the femoral antetorsion ("Rippstein") or axial projections ("Lauenstein") to identify "bump" osteophytes have to be performed.
Conclusion:
The classification of DDH-related symptoms is correctly done by an exact clinical examination in combination with the above mentioned conventional x - rays. In patients with marginal signs of DDH additional studies such as CT-Scans (eventually combined with a 3D reconstruction), MRI-Scans and MRI-arthrographies are necessary.

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The long-term results of THR in young patients

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Purpose:
The purpose of the study was to evaluate late-term results of THR in patients treated because of hip arthrosis at the age below 30 years.
Material and methods:
In our Institution between 1985 and 2005, 1008 uncemented THR were performed. In this group, 56 surgeries were performed in 50 patients (78% female) who, at the time of surgery, were 30 years old or younger. The youngest patient was 17 and the oldest 30 years old (mean age 26,6 years). The etiology of the hip arthrosis was in most of the cases (71,4%) DDH, and trauma (7,2%), AVN (7,2%) and other. Patients were treated with different types of uncemented prosthesis, including Mittelmeier tytpe in 48% and PM 30,3% of all cases. The mean follow-up was 13 years, but almost 46% patients had follow-up over 15 lat. At the last follow-up patients were evaluated clinically and radiologically.
Results:
In 20 cases the final result was very good, in 22 satisfactory and in14 as poor. The revision surgery was performed in 14 patients. In 6 cases only the cup was revised, in 1 steam and in 7 the total prosthesis. In 8 patients the nerve injury was noted (4 femoral and 4 peronal). In 2 cases the recurrent hip dislocation was observed and in 2 cases the deep wound infection was noted. In 10 cases intraoperative complication occurred (femur of acetabulum fracture). All of above mentioned complication was observed in patients with difficult cases after DDH treatment in the childhood.
Conclusions:
The THR in young patients is an acceptable option of treatment which give good long-term results. Difficult cases after hip surgery in the childhood should be planned carefully and performed in experiences centers.

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Hip-resurfacing as a concept of operative treatment of osteoarthrosis in young adults - results of short and middle range follow-up

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In our orthopaedic department 55 patient have been operated on from February 2003 to January 2006 with osteoarthrosis of the hip. 3 BHR, 3 Cormet-Hip and 49 Durom-Hip types were used.
The follow-up was performed with the Harris-Hip-Score.

Results:
The patients had on average of 49 years (range 23 to 66 years) there were 24 female and 31 male patients. Surgery was performed in over 80% in side position by the posterior approach.
The Harris-Hip-Score was 48 points preoperatively (range 28 to 89 points) one year postoperatively 91 points (range 56 to 100 points), two years after surgery 95 points (60 to 100 points).
All patients were satisfied and would have performed the same surgery again, or have already been operated on the other side. There where 2 transient neurological deficits (palsy of the nervus ischiadicus) and two fractures of collum femoris (one female patient with multiple sclerosis, one male patient 60 years old). The complications will be presented in the talk.
Conclusion:
The Hip-resurfacing has excellent functional results in young adults. Complications can be reduced by stringent indications. We no longer operate with this technique on patients more than 55 years or in any case of risk of osteoporosis.

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Hip arthroplasty for osteochondritic coxa vara
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Purpose:
The hip deformity of osteochondritic coxa vara confronts orthopedic surgeons with the challenge of implanting cemented or cementless cups and correcting the associated leg length discrepancy.
Materials and methods:
Between 1993 and 1998, 52 patients presenting with osteochondritic coxa vara were treated. One patient died meanwhile. All patients were implanted with a threaded double-cone cup of pure titanium. As no classification is available, three grades of skeletal abnormalities were distinguished: 20 patients were grade I (femoral head above tip of trochanter), 13 were grade II (femoral head level with tip of trochanter) and 18 were grade III (tip of trochanter above femoral head). In terms of Randelli's and Crowe´s classification of the severity of dysplasia, 29 hips were grade I, 21 were grade II and 1 was grade III. The mean follow-up time was 4.9 to 11.4 (mean 8.9) years. 46 patients were female and 5 were male. The patients age was 20 to 76 (mean 49) years.
Results:
As a result of medialization, 43 cups were fully buried in bone cranially on the postoperative monitor-guided a.-p. radiographs, 6 were anchored in bone by three quarters and 1 by two thirds. No more than 1 cup was only half buried in the bone stock cranially. All but one showed complete osseointegration on long-term radiographs. Leg length was equalized in 37 patients. The maximal lengthening effect was 4.5 cm. Radiologically, the position of 49 cups was unchanged at the time of follow-up. Two metal - on - metal cups had worked loose.
Conclusion:
The results showed that even in patients with severe acetabular deformities primary and long-term implant stability can be achieved with a threaded cementless cup. Even incomplete bony implant coverage and leg lengthening by up to 4.5 cm did not have any negative effects on the medium-term outcome.

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Are two screws enough for the fixation of subcapital fractures of the neck of femur?
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Purpose:
The techniques used for the application of cannulated screws for treatment of subcapital fractures of the neck of femur have been under discussion for a long time. Number of screws and the way they should be positioned through the neck are the main points of interest. Various studies, mainly in vitro biomechanic ones,suggest that three screws should be applied.But are they really necessary?

Material and methods/ Results:
We present a series of fifteen selected patients (regarding age,general condition,fracture type) where, provided that certain technical rules were followed, percutaneous fixation of such fractures with only two cannulated screws led to an uneventful healing with no complications in a minimum follow-up of one year.We review the relevant literature and open the subject for discussion.
Conclusions:
We believe that in many cases and under certain restrictions two screws should be enough for the treatment of subcapital FNF but this really requires further investigation.

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Intracapsular femoral neck fractures. Is internal fixation acceptable?
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Purpose:
To stydy the mid term results of internal fixation as method of treatment of intraarticular femoral neck fractures.
Patients and methods:
We retrospectively reviewed 84 patients who underwent internal fixation of an intracapsular femoral neck fracture. The mean age was 58 years and the time from injury to operative treatment was 5.3 days. The mean follow-up was 4.7 years (range, 2-8 years).
Results:
At the latest follow-up, in the 46 patients with undisplaced (Garden I, II) fractures, nonunion occurred in two patients and avascular necrosis of the femoral head in nine. Six of these nine patients had a good or excellent result, one had a fair result, and two had a poor result. Of 35 patients with no sign of avascular necrosis, 32 patients had a good or excellent result, two a fair and one had a poor result. In the group of 38 patients with displaced (Garden III, IV) fractures, nonunion occurred in six patients and avascular necrosis of the femoral head in 15. Of these 15 patients, 10 had a good or excellent result, two had a fair result, and three had a poor result. Of 17 patients with no sign of avascular necrosis, 14 had an excellent result and three patients a poor result. Overall only five of the 24 patients who developed avascular necrosis of the femoral head had undergone total hip arthroplasty.
Conclusion:
Internal fixation remains a simple and safe, method of treatment for both undisplaced and displaced femoral neck fractures in middle-age patients. Despite the relatively high rate of avascular necrosis after internal fixation of femoral neck fractures, only a few of these patients (20%) required further surgical treatment in the follow-up period of this study.

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Extended outpatient physiotherapy and outpatient rehabilitation of orthorthopedic and traumatic illnesses
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Outpatient Rehabilitation (OR) has developed and gained importance for patients in orthopedic traumatology and sports medicine. Up to now, more than half a million patients have undergone rehabilitation at the almost 200 affiliated outpatient institutions of the non-profit making German Central Association of Rehabilitation Centers, called ZAT.
Outpatient Rehabilitation needs an interdisciplinary team, managed by a specialist in orthopedics, surgery or accident surgery. Our patients receive 3 to 5 treatments per week even on one day of the weekend. The net treatment time is around 2 - 5 hours for each patient.
Typical indications are the follow-up care of hip, knee and shoulder replacements, slipped or herniated discs accompanied by pain and neurological symptoms including disorders and injuries of the spine and vertebrae. Follow-up care of vertebral fractures secondary to surgery or conservative treatment as well as of serious postural disorders. In sports medicine, the main indication for therapy are serious injuries of the large and medium-sized joints.
The high quality standards of the rehabilitation offered by ZAT-centers have been confirmed by a study conducted by the Infratest-dimap-Institute of Munich.
Results:
§ rehabilitation centers fulfill the quality requirements for staff and equipment as laid down in the contracts made with the third-party payers
§ OR showed high efficiency in patient care
§ OR can be superior to inpatient rehabilitation with regard to the targeted outcomes
The use of OR can shorten hospital stays and often makes it possible to forgo inpatient rehabilitation altogether. Another benefit involves the cost reductions achieved by preventing secondary injuries and recurrent disability.
The Outpatient Rehabilitation causes lower follow up costs as well as half of the patients receiving OR can continue to work which further reduces costs. It is highly effective and economical and upholds the principle of "outpatient care is preferable to inpatient care".

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Our results in total knee arthroplasty reimplantation following antibiotic spacer for infected knee prostheses

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Purpose:
Nowdays every orthopaedic surgeon has more and more complicated knee arthroplasties mainly because of the increasing number of primary implantation. The septic knee arthropasty is treated most of the time in two steps, with the help of antibiotic spacer, then knee prosthesis reimplantation. We'd like to present the radiological and functional results of our patients in this subject.

Materials and methods:
On our department we have had 24 cases with antibiotic spacer followed by knee arthroplasty reimplantation between 2000. and 2005. We have evaluated the result of these patients according to the pre-, and postopoperative X-ray and HSS score.

Results:
In 6 cases home made and in 18 cases Cemex, gentamycine spacer were used. The best functional result was achieved following unicondylar knee prosthesis removal, antibiotic spacer and knee prosthesis reimplantation. The functional outcome was less suceeded in those cases where great bony loss and destruction was seen before the reimplantation.

Conclusion:
There is close correlation between the bony destruction at the time of the reimplantation and the worse functional outcome. However we have had recurrence of the infection. Because of the danger of the infection recurrence on the one hand it is very important to excise with enough radicality the necrotic tissues, but on the other hand aiming for every single healthy bony bit is helping in the stability of the reimplanted prosthesis and also to achieve a better functional result.

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2 - 5 years results in the treatment of infected total knee arthroplasty following two-stage revision with an antibiotic spacer prosthesis

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Purpose:
2-5 years results in the treatment of deep infection of total knee arthroplasty (TKA) after two-stage reimplantation are presented. An articulating temporary antibiotic spacer prosthesis (TASP) and a standardized antibiotic therapy were used.

Material and Methods:
In a prospective study 33 consecutive patients were treated with an TASP. This articulating spacer was made on the table by cleaning and autoclaving removed parts of the infected TKA. Parenteral double antibiotic therapy in combination with rifampicin were given for 10 days, followed by oral therapy for 4 weeks. Re-implantation was performed between 6-12 weeks with a revision system in hybrid cementing technique.

Results:
At a mean follow-up period of 47 months (31 to 67) three patients had reinfection (success rate 91%). We could increase the average Hospital for Special Surgery knee score from 67 points (44 to 84) to 87 points (53 to 97) after reimplantation.
At final FU 25 knees (76%) were rated excellent, 5 knees (15%) good, 2 knees (6%) fair and one patient (3%) had amputation. Complications were one temporary peroneal palsy, one dislocation of the spacer due to insufficient extensor mechanism and one fracture of the tibia due to substantial primary metaphyseal bone loss.

Conclusion:
Using TASP the disadvantages of joint fixation with a fix spacer between the two stages can be prevented. There is no difference in the reinfection rate compared to procedures using fixed spacer blocks. Patients with a TASP show much better function and satisfaction during the spacer period. Furthermore this techniques facilitates the reimplantation and gives good functional long term results.

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Clinical outcome and quality of life after aseptic and septic revision knee arthroplasty

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Purpose:
To compare the clinical outcome and quality of life in patients that underwent aseptic and septic revision knee arthroplasty.
Material and Methods:
We retrospectively reviewed revision TKAs performed at our department. In clinical follow up examinations WOMAC score, Knee Society Sore and Sf-36 Version 1 score were obtained to rate quality of life of each patient.
Results:
Out of 93 patients that underwent revision TKA, 4 were lost due to missing follow up, 27 due to death not related with TKA. Clinical outcome was assessed from 62 patients (45 aseptic revisions, 17 septic revisions). Mean scores for KSS pain, KSS function, WOMAC and Sf-36 physical health score were 65.7, 51.5, 34.8 and 32.8 for the aseptic group and 53.2, 45.2, 42.0 and 33.4 for the septic group. None of these differing results reached significant levels ($p>0.05$).
Discussion:
Though there were differences in the results regarding clinical, functional and pain scores, those were not significant. Higher numbers of patient population are required to demonstrate a significant difference.

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In vitro antibacterial activity of platelet gel rich in growth factors. A pilot study

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Introduction:
Growth factors are important in initiating healing processes. Platelet α-granules contain over 30 growth factors. The most important are PDGF, TGF-β, VEGF, IGF and EGF. By concentrating platelets a higher level of growth factors might be reached which could stimulate the healing process in bone. Platelet-rich plasma (PRP) is a novel osteoinductive therapy that could achieve this goal in the treatment of disturbances of bone healing processes. After connecting PRP and thrombin Platelet-rich Gel (PG) is formed.
Aims:
In present study, we investigated in vitro antimicrobial activity of PG.
Material and methods:
54 ml of whole blood was collected from each of 15 donors. PRPs were prepared with using GPS system from Biomet. In vitro laboratory susceptibility to PG was determined by the Kirby-Bauer disc diffusion method on Mueller-Hinton agar. Baseline antimicrobial activity was assessed by measuring the zones of inhibition. Agar plates were coated with one of the following strain: Staphylococcus aureus ATCC 25923, Klebsiella pneumoniae ATCC 700603, Escherichia coli ATCC 35218, Escherichia coli ATCC 25922, Enterococcus faecalis ATCC 29212 and Pseudomonas aeruginosa ATCC 27853.
Results:
We tested 12 samples of PG. Zones of inhibition produced by PG ranged between 6 - 23 mm in diameter. PG inhibited the growth of Staphylococcus aureus. PG also was active against Escherichia coli. No activity against Klebsiella pneumonice, Enterococcus faecalis, Pseudomonas aeruginosa was detected.
Conclusions:
Despite advances in pharmacology, the treatment of open fractures continues to be associated with high rates of infection and consequence nonunion. Connecting osteoinductive properties and antimicrobial activity can be turning point in treatment infectious nonhealing wounds and nonunions. This is a pilot study and next trials are needed to determine whether PG will be able to reduce the rates of infection and nonunion.
Acknowledgements: This work was supported by Committee for Scientific Research (MNiI) No. 2P05C00126.

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Revision of tumour endoprostheses around the knee joint - quality of life and number of revision surgeries

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Purpose:
To evaluate the midterm results of patients that underwent revision surgery of a tumour Endoprostheses around the knee joint.

Material and Methods:
We retrospectively reviewed revision surgeries of tumour endoprostheses around the knee joint performed at our department between 1998 and 2004. In clinical follow up examinations MSTS scores and Sf-36 scores were obtained to rate quality of life of each patient.
Results:
Out of 23 patients 15 were eligible for evaluation (2 consecutive hip enucleations, 3 patients dead due to disease, 2 patients dead due to a natural cause and 1 patient lost due to missing follow up). The average age at primary arthroplasty was 23 years (median 17, range 7-61) and in average 7 revision surgeries had to be performed (median 8, range 3-12). The average follow up time was 35 month (median 29, range 3-85). The average MSTS Score was 81 (median 84, range 40-97).
Discussion:
Though high number of revision surgeries performed patients showed high ratings regarding MSTS-score and Sf-36 scores. Revision total knee arthroplasty in tumour endoprostheses seems to be an efficient treatment option regardless the number of pre-surgeries performed.

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Spinal metastases: evaluation of seven preoperative scoring systems
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Purpose:
Several preoperative assessment systems predicting prognosis of patients with spinal metastases have been designed in order to help surgeons in the decision if and if yes how extensive to operate. Such systems have been proposed by Tokuhashi, Sioutos, Van der Linden, Tomita and Bauer. The purpose of the present study was to evaluate which system most accurately predicted survival.
Material and methods:
51 patients (25 male, 26 female) were treated surgically for spinal metastases between 1996 and March 2004. The mean age at operation was 60 years. The most frequent site was the thoracal spine (30 cases), followed by the lumbar (16) and cervical (5) spine. Kidney (13 cases), breast (10), and prostate (7) were the most frequent primary lesions. Seven parameters were assessed for each patient: general condition, number of extraspinal bone metastases, number of spinal metastases, visceral metastases, primary cancer, severity of spinal cord palsy, and pathologic fracture. Scores according to Tokuhasi (original and revised), Sioutos, Tomita, Van der Linden, and Bauer were assessed as well as a modified Bauer score without scoring for pathologic fracture.
Results:
Nine patients were still alive as of March 2005 with a minimum follow up of 12 months. All other died after a mean period of 17 months after operation. The average period of survival was 3 months for lung cancer, followed by prostate (6 months), kidney (20 months), and breast (24 months). Of all seven scoring systems a Bauer score modified for pathologic fracture had the best correlation with the survival period (p=0.0045).
Conclusion:
The modified Bauer score assessing the positive prognostic factors as no visceral metastases, one solitary skeletal metastasis, no lung cancer, and a primary tumor like breast, kidney, lymphoma, or myeloma seems to be a practicable and highly predictive preoperative scoring system for patients with spinal metastases.

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Total spondylectomy in 20 Patients with solitary metastases of the spine
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Study Design:
A retrospective analysis of 20 patients with solitary metastases or primary bone tumors of the spine treated with total spondylectomy.
Method and Material:
In 20 patients (11 female, 9 male, average age 58,5) a vertebral body replacement was performed. Indication of surgery was given according to the Toukuhashi-Score (precondition: >9). The location was cervical in 1, thoracic in 10 and lumbar in 9 patients. In 13 cases the tumor was localized intracompartmental and in 7 cases extracompartmental.
One level vertebral replacement was done in 18 cases, two level in two cases and three level replacement in another two cases. We used a dorsoventral approach in the thoracic and lumbar spine (16 Harms®-Cages, 5 Synex®-Cages combined with dorsal instrumentation). In 6 cases operative treatment consisted in a double-stage procedure from which 4 were planned one stage operations stopped due to severe intraoperative bleeding.
17 cages were filled with cement and 3 cages were filled with autologeous bone graft (iliac crest).

Results:
The complication rate was 53%, there was no operation related death. 4 of the patients died after an average of 19,7 months postoperatively. The over all survival rate was 2,2-41,7 months (avarage: 29,6 months). An improvement of pain was observed in 86% (4-Point VRS). There was a temporarily postoperative deterioration of neurological status in 3 and a permanent deterioration in 1 case (ASIA).
Discussion:
Total spondylectomy in selected cases of metastatic disease of the spine leads to a sufficient reduction of pain and preservation of neurologic status.
The possibility of radical excision of the tumor could lead to a higher chance of cure and increase survival rates. Because of the high complication rate there is a requirement for careful selection of patients who could benefit from this radical and highly demanding surgical procedure.

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Anterior surgery in spinal metastasis treatment
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Purpose:
Anterior surgery is generally accepted as procedure with significant morbidity and mortality. The purpose of the study is to evaluate the agressivness of anterior surgery in comparison with published posterior surgery results.
Method:
Anterior vessels were dissected first at adjacent levels. Opposite segmental vessel at tumor site was ligated if necessary. Adjacent discs were removed until posterior ligament was reached. Anterior distraction was performed to correct kyphosis and/or to decompress the spine by means of ligamentotaxis. After body removal, bleeding on posterior cortex was stopped by bone wax. Four bicortical screws were used, bone cement was used to fill the interbody space and to envelope the rods (to prevent cement migration).
Patients:
64 patients in the period 2000-2004 were analysed. Posterior or lateral tumor location, sacral tumors were excluded from the study. Paraplegia was considered as contraindication. Hypervascular tumors were embolized prior to surgery.
Results:
Intraoperative time was 110 min. $\pm$ 40. Intraopreative blood loss was 600ccs $\pm$ 200. Embolized tumors did not bleed significantly greater than other tumors. There were no intraoperative deaths or neurologic worsening, no wound healing problems. Chest tube was removed on 7th day, and patients proceeded to oncologic department. Patints were followed for one year, there were two reinstrumentations due to the tumor reccurence. There were no implant migrations nor instability problems. There was no need for aditional anterior surgery.
Discussion:
Our posteriorly operated group was too small for comparison, therefore results were compared to the published data. Reported was 13% morrtality, 10-52% of complications, bleeding was 1500-1900 ccs. Deep wound dehiscence and infection was a significant problem.
Conclusion:
Comparing the results of anterior surgery to published results of posterior surgery, we concluded that correctly performed anterior surgery is less aggresive and probably better tolerated by the patients than a long-lasting and blood consuming posterior procedures.

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The 825C>T polymorphism of the G-protein beta-3 subunit gene (GNB3) as a parameter in the risk profiling for bone metastasis of breast cancer
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Introduction:
The 825C>T polymorphism of the G-Protein beta-3 subunit gene is associated with the occurrence of a splice variant of GNB3. Because of the influence of G-Proteins on the intracellular signalling pathways including mitosis and cell growth this polymorphism was linked to the appearance of malignant diseases.

Methods:
248 patients with histological verification of metastasised breast cancer were genotyped regarding the polymorphism of GNB3 825C>T and the incidence of the genotypes CC, CT and TT investigated.
Results:
131 patients presented with bone metastasis, 117 patients with extra osseous metastasis. The prevalence of the diverse Genotypes of GNB3 in the 248 patients was 50, 4% for CC, 41, 9% for CT and 7, 7% for TT. The incidence of the single Genotypes in patients with bone metastasis was 57, 3% for CC, 39, 4% for CT and only 3,1% for the Genotype TT. Statistically we could find a highly significant Pearson´s Coefficient p=0,005 for the incidence of osseous metastasis of the TT Genotype of GNB3.
Discussion:
Further research and analysis of polymorphisms could be an appropriate way to establish a risk profiling for the early detection of osseous metastasis for different tumors.

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Mechanical cup navigation in total hip endoprosthesis
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Purpose:
Wrong positioning of the acetabular cup leads to impingement, luxations and limited ROM. To improve the cup position computer assistant navigation systems had been developed. They are expensive, sometimes not easy to handle, time consuming. Because of this reason we developed a simple mechanical navigation system for cup orientation.
Material and methods:
A new concept for the implantation of THP will be introduced: The cup position is not orientated as usual according to the body axis, but according to the stem position. Stem and cup are a closed biomechanical system, cup anteversion and inclination will be positioned according CCD angle and torsion of the stem.
With a new mechanical navigation system for the cup with special cup probes in different sizes and a rod guiding system the best position is found intraoperatively according to ROM, impingement, luxation and tension of the muscles.
Results:
150 patients had been operated. Op-time is extended only maximum to 6 minutes. Dysplasia inlays, impingements and luxations could not be observed.
Praeop/AC 20°-64° Ø 41,0°
CCD 97° - 144° Ø 128,9°
Postop. Inclination 28° - 62° Ø 42,7°
Postop. Anteversion (-) 5° - (+) 44° Ø 19,37°
Conclusion:
Stem and cup should be positioned to each other in the best individual biomechanical position. Average inclination (42,7°) and anteversion (19,37°) do not take into account the high individual variations. Mechanical cup navigation system is simple to handle and leads to individual best biomechanical position of the implants.
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Cementless total hip replacement in patients with high total hip dislocation: The results of femoral shortening z-osteotomy
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Objectives:
We evaluated the results of a femoral shortening z-osteotomy in patients who underwent THA due to high dislocation of the hip.
Methods:
From 8/1997 until 11/2003 we performed THA in combination with a z-shaped subtrochanteric shortening osteotomy in 6 patients (4 females, 2 males) with high dislocation of the hip. In all cases for the reconstruction of the acetabulum a cementless press fit component was implanted, in 5 cases in combination with an acetabular roof reconstruction by autograft. For the femoral component we used standard titanium cementless stems in 5 cases, in one case a revision model. The z-shaped shortening osteotomy was fixed by titanium cerclages in all cases.

Results:
Postoperative complications (nerve lesions, THA dislocations, non union) could not be observed in the clinical and radiological follow up examinations 6 to 72 months postoperatively. In all cases femoral union at the area of the shortening osteotomy could be observed 3 months postoperatively.
Conclusion:
Femoral shortening z-osteotomy in THR is a safe technique in patients with high total dislocation of the hip, leading to satisfactory postoperative results.

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Managament of severe acetabular defects using a stemmed acetabular component: A preliminary report on 12 cases
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Purpose:
Despite extensive acetabular defects as found in revision of failed total hip arthroplasty, the dorsal ilium usually still provides for secure fixation of a stemmed acetabular component. We present a preliminary report on a series of 12 patients, who were treated with a pedestal cup.
Material and Methods:
From March 2003 to September 2005, 12 patients (6 women and 6 men) underwent revision surgery for aseptic acetabular loosening. The mean age of our patients was 79.6 years (range 55-98 years) and patients had undergone at mean 1.8 operations prior to acetabular revision. The stemmed acetabular component was implanted without use of cement in 10 cases, whereas cemented implantation was performed in 2 patients due to poor bone stock. Acetabular defects were classified on plain radiographs according to Paprosky. There were two hips with type II B, and five hips each with type III A and III B defects, respectively. After 3 days of bed rest, subsequent mobilisation was partially weightbearing for six weeks and fully weightbearing thereafter.
Results:
In each case the pedestal cup showed primary stability and allowed restoration of the original center of rotation. Three patients died after surgery due to unrelated causes. In one patients the implant had to be revised at 11 months after surgery due to malpositioning.
Conclusion:
Using a stemmed actabular component, primary stability was achieved by anchorage in the preserved dorsal ilium. The pedestal cup is difficult to implant, the main reason being the difficulty in gaining sufficient exposure to place the initial guide wire. Intra- and postoperative control of implant position is therefore of utmost importance. However, nearly all revision cases and rim defects can be managed with this implant. Our results should be considered encouraging albeit preliminary.

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Late results after Smith-Peterson Cup
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Between 1969 and 1975 62 patients were treated with the Smith-Peterson Cup in the orthopaedic department of the university clinic at the Oskar-Helene-Heim in Berlin. The method was chosen in cases of dysplasia osteoarthritis, idiopathic and posttraumatic coxarthrosis and avascular head necrosis of young adults in the age between 25 and 57 years. Seven of them were previously operated by acetabulum osteosynthesis/osteotomy or intertrochanteric correction. Until 1986 28 implants must be revised, 17 of them were removed at the clinic between 1 to 19 years after the procedure with implantation of a total endoprsthesis because of ankylosis (8x), secondary necrosis (5x) and cervical fracture (2x). 11 patient were not yet living at the time of follow up 1986-8, 34 hips could be controlled between 14 and 19 years after implantation. There was an examination of the physical status and x-ray control at an average follow up time of 17.5 years.
The result was very good according to Merle d´Aubigne in ten cases, 12 good and 8 sufficient. Only 4 patient suffered of a bad function with shortening and secondary stiffness of the hip because of periarticular ossification.
Two third of the surviving patients showed a functioning hip more nearly two decades after implantation, thus promising good perspective for the revival of the method by the McMinn procedure since the beginning of the 90ies.

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The usefulness of radiologic techniques for measuring post-THA leg length

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Purpose:
Maintaining or restoring equal leg lengths is one of the determinants of successful THA. For assessing leg length full-length radiographs have been recommended side by side with radiographs using a ruler, sonography and CT-assisted imaging. For the purposes of this study full-length imaging of the leg was modified and compared with a.-p. radiographs of the pelvis in order to evaluate the role of the two techniques and define the diagnostic usefulness of pelvic obliquity for evaluating leg length.
Material and method:
With the patients standing pelvifemoral radiographs (from the iliac crest to the fossa intercondylica) and a.-p. pelvic radiographs were recorded from 31 patients pre- and postoperatively. On the pelvifemoral films the distance between the highest point of the iliac crest and the condylar notch was measured. On the a.-p. pelvic films the distance between a prominent point of the iliac crest and on the trochanter minor was determined. In addition, changes in pelvic obliquity were correlated with changes in leg length.
Results:
On the pelvifemoral films mean leg lengthening was 16 mm (4-28 mm; SD 0.64) versus 17 mm (6-33 mm; SD 0.72) on the a.-p. pelvic films. In 14 patients leg lengthening desired to correct for pre-operative leg length discrepancy was achieved. Post-THA pelvic obliquity did not correlate with post-THA leg length.
Conclusion:
As there is no statistically significant difference between leg lengths measured on a.-p. pelvic radiographs post THR versus those measured on pelvifemoral radiographs, determining leg length from standing a.-p. views of the pelvis with the film/focus distance kept constant appears to be sufficient. There is, consequently, no need for additional pelvifemoral X-ray to determine leg length. The poor correlation between postoperative pelvic obliquity and leg length rules out an evaluation of leg length discrepancies on the basis of a.-p. views of the pelvis.
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Modular titanium wagner stem (ZMR) in revision surgery of THA

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Aim:
Use of tapered, titanium, modular cementless stem in cases of femoral bone loss after THA may offer the advantage of better biomechanical reconstruction with a design that ensure primary stability and promotes bone reintegration.
Method:
48 revision hip arthroplasties were performed in 47 patients in whom the tapered modular Wagner stem (ZMR) was used. The indication for revision was aseptic loosening with massive osteolysis in 33 hips, periprosthetic fracture in 13 and 2 cases were done second stage after chronic deep infection. The femoral component was revised in all hips and the acetabular cup was revised in 18 hips (38%).
Results:
The mean follow-up of patients was 22 month (6-69 months). none of the revised stem required rerevision. in one case the repeated dislocation was observed. The average Merle d´Aubigné score improved from 6,7 point to 14,8 point at latest follow-up. The X-ray study showed excellent or good restoration of the proximal femur bone in more than 90 percent of patients.
Conclusion:
Our results confirmed the benefits of Wagner modular stem in femoral revision in term of stability of fixation, regresion of osteolytic lesion and improved clinical function.

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The extend of volumetric wear of polyethylene cups of total hip prosthesis is determined by the amount of the contact hip joint stress

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Purpose of study:
The purpose of the work was to study the effect of radiographic parameters (size and shape of the pelvis and proksimal part of the femur) and biomechanical parameters (the resultant hip joint force and the contact hip joint stress) on extend of the wear of polyethylene cups.

Methods:
The study was performed on 80 patients who had been inserted a total hip prosthesis and had to be operated again between 1997 and 2001 due to the loosening of the artificial hip joint. On A/P X-ray of hips with the pelvis after the insertion of the total hip prosthesis, we used a simple three-dimensional mathematical model for the calculation of the extend of the resultant hip joint force, and the extend of the contact hip joint stress. With the same patients we used the radiographic method of determining the wear of polyethylene cups in order to determine the volume. Then we compared the results of the mathematical model and the results of the radiographic method. This way we got the answer to the question about the effects of the resultant hip joint force and the contact hip joint stress on the extend of the wear of polyethylene cups.
Results:
The extend of the wear of polyethylene cups is greater when the value of the resultant hip joint force and the contact hip joint stress is high.

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The extend of volumetric wear of polyethylene cups of total hip prosthesis is determined by the amount of the contact hip joint stress
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Purpose of study:
The purpose of the work was to study the effect of radiographic parameters (size and shape of the pelvis and proksimal part of the femur) and biomechanical parameters (the resultant hip joint force and the contact hip joint stress) on extend of the wear of polyethylene cups.
Methods:
The study was performed on 80 patients who had been inserted a total hip prosthesis and had to be operated again between 1997 and 2001 due to the loosening of the artificial hip joint. On A/P X-ray of hips with the pelvis after the insertion of the total hip prosthesis, we used a simple three-dimensional mathematical model for the calculation of the extend of the resultant hip joint force, and the extend of the contact hip joint stress. With the same patients we used the radiographic method of determining the wear of polyethylene cups in order to determine the volume. Then we compared the results of the mathematical model and the results of the radiographic method. This way we got the answer to the question about the effects of the resultant hip joint force and the contact hip joint stress on the extend of the wear of polyethylene cups.
Results:
The extend of the wear of polyethylene cups is greater when the value of the resultant hip joint force and the contact hip joint stress is high.

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What's on the Latvia hip and knee registry?
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The basis of Latvian hip and knee registry are the analysis of database collected at Riga Hospital of Traumatology and Orthopedics since 2001.
The hospital database occur more than 10 000 patients with hip and/or knee pathology who have done or needs THA.
The database has 3 hands:
1. waiting list (>8000 patients),
2. THA data (> 4500 THA),
3. follow-up groups

For clinical evaluation Merle D' Aubigné criteria (modified Pellici scale) -TOS scale are used (pain, mobility, walking distance).
The same parameters are analyzed in all 3 hands of database.
The data are collected by anketing performed by orthopedic surgeons.
From THA data used implants, early complications, surgery data are analyzed.
For documentation and evaluation MS Access are used.
The goals of Latvia hip and knee registry are;
1. the analysis of waiting list helps to prognoses THA for next years,
2. patient's clinical analysis in pre and post THA groups shows THA efficacy,
3. shows early and late complications of THA,
4. The database is excellent material for clinical follow-ups.

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P01

Surgical management of bone tumours and metastases in a non-tumour-center hospital- the Bozen experience

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The "primary care" management of bone tumours and metastases in a "peripherical" hospital is limited and difficult, but necessary and often inevitable. It is demanding for the whole team and the hospital`s resources to manage the whole process of evaluation and staging in order to decide whether an individual case is surgically manageable in a state-of-the-art way in house or necessary to refer to an interdisciplinary tumour center in a university clinic hospital.
Many of our patients are referred by other departments of our hospital but also by family doctors; some are diagnosed "by chance" when a traumatized patient is evaluated radiologically.
After an interdisciplinary diagnostic management (radiology, oncology,…) and finishing of staging, the following decisions are drawn:
• Peripherical metastases are surgically treated in our unit according to the state of the art.
• Biopsies are performed if the eventually resulting definitive tumour surgery could be done in our unit.
• Suspicious complex findings, unclear biopsies and all vertebral tumours are referred to the nearest tumour centers, which for Bozen are Innsbruck, Verona and Bologna.
Conclusions:
The diagnostic and surgical management of the bone tumours and metastases in a non- specialized unit is limited but important for the immediate "primary care" of the population.

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P02

Surgical management of metastatic fractures in extremities; A monocenter analysis

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Introduction:
Bone metastases have traditionally been the most commonly encountered form of malignant bone tumor. The aim of treatment of pathological fractures due to metastases is stable and secure fixation ideally allowing full weightbearing with early return to daily activities.
We report a single center experience with the most commonly used methods of reconstruction of pathological fractures of the femur and the humerus.
Material/Methods:
Our study was based on 94 pathological fractures of the femur (n=77) and the humerus (n=17) surgically treated from 1998 to 2005. The average patient´s age at time of index procedure was 67 years. Fifty-five female and 39 male patients were operatively treated with endoprostheses (n=59), osteosynthetic devices (n=22) with adjuvant cementation, or intramedullary nailing (n=14). The primary cancer site was the breast (n=32), the lung (n=14), the kidney (n=14), the prostate (n=10), the liver (n=4), melanoma (n=4) and others.
Results:
Forty-four patients were still alive at a median of five months after operation (range from 0-102 months). The Bauer score averaged out 2,5.
The overall complication rate was 6.6%. We did not see local complications in the upper-extremity group, therefore we had seven complications (9%) in the lower extremity group.
Of 53 operations involving endoprostheses, we had four deep infections (local failure rate: 7.5%). Of 17 operations involving osteosynthetic devices (single or double plating) we saw one periprosthetic fracture and one superficial wound infection (local failure rate: 11.8%). Of seven patients treated with intramedullary reconstruction nails, complications consisted of one refracture, and one superficial wound infection (local failure rate: 28.6%).
Discussion:
General guidelines are necessary to assist the orthopaedic surgeon in the choice of stabilization of pathological fractures. Every effort must be made to provide the patient with durable fixation lasting for his or her remaining lifetime. Our retrospective analysis presents basic principles regarding the indications and choices of modalities of surgical treatment of pathological fractures in extremities.

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P03

Bizarre parosteal osteochondromatous proliferation (Nora lesion). Report of three cases

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Introduction:
The bizarre parosteal osteochondromatous proliferation is an exophytic outgrowth from the cortical surface consisting of bone, cartilage, and fibrous tissue commonly occuring in hands and feet. Described by Nora et al. in 1983 this benign lesion of the bone is occasionally mistaken for malignant processes such as parosteal osteosarcoma or chondrosarcoma. We report three cases of this rare entity.

Material and methods:
The first case is a 16-year-old male suffering from local swelling and pain at his left distal ulna.
The second case is a 37-year-old male with the same affliction at the third finger of his left hand.
The third female patient (51a) presented with a bothering rigidification at her left thumb.
Preoperatively standard x-rays, local MRI, and CT were performed in all patients. In one case an additional 3-phase-szintigraphie was initiated.

Results:
Histo-pathologically all cases turned out to be Nora lesions.
Two patients suffered from local recurrence 4 respectively 10 months after excision. In case one an asymptomatic, stable local recurrence did not require further surgical intervention. Due to local affliction and evident progress a second excision was done in case two. Eight months postoperatively the third patient is free from local disorders and recurrence.

Conclusion:
The recommended therapy of symptomatic bizarre parosteal osteochondromatous proliferation is simple excision. Due to high local recurrence rate and for want of adjuvant therapy options the Nora lesion will pose a challenge for orthopedic surgeons and clinical research in the future. Therefore treatment and aftercare of this rare bone tumor should take place in tumor centers.

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P04

Assessment of chosen prognostic factors in patients after radiation therapy of bone metastases

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Background and purpose:
One of the significant factors affecting the decision of what local therapy to choose for patients with neoplastic bone metastases is the prognostic survival rate. This study focuses on assessment of value of chosen prognostic factors in patients after radiation therapy of bone metastases.

Materials and methods:
The work has undertaken the evaluation of some chosen prognostic parameters such as age, sex, the presence of extra-skeletal metastases, the existence of pathological fracture, administration of biphosphonates and systemic treatment with 305 irradiated patients due to bone metastases.

Results:
The median survival rate was 6,2 months. The sex, age and number of bone metastases foci were of no particular significance for the median survival rate of patients. The significant influence of presence of extra-skeletal metastases, the existence of pathological fracture, administration of biphosphonates and systemic treatment on survival time of patients depended on primary cancer.

Conclusion:
The median survival rate was up to the primary location of the disease.The influence of the remaining prognostic factors, however depended on the initial location of the neoplasm.

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P05

The impact of bisphosphonate therapy on the survival time of patients undergoing radiotherapy for bone metastases

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Background:
Bisphosphonates are form of medical therapy for bone metastases. Morbidity from bone metastases including hypercalcemia episodes, pain, patological fractuers and appearance of new metastases in skeletal system is decreased by bisphosphonate therapy. The aim of this article is to determine the influence of bisphosphonate therapy on survival time of patients irradiated due to bone metastases.
Material and methods:
305 patients irradiated due to bone metastases were assessed in this retrospective study. 94 of them were additional treated by bisphosphonates. Median survival time counted from the end of radiotherapy to the death of patients was assessed. Using U Mann Whitney test the influence of bisphosphonates therapy on survival time was determined. The significance level of $p = 0,05$ was accepted.
Results:
The median survival time of patients irradiated due to bone metastases and treated by bisphosphonates was 8,1 month and 5,24 month in the group treated only by radiotherapy. Median survival time of pts with breast cancer and with unknown primary site of cancer who were treated by radiotherapy and bisphosphonates was significantly longer (respectively $p = 0,001$ and $p = 0,016$) as compared with the group with irradiated bone metastases only.
Conclusions:
1. Bisphosphonates therapy improved the median survival time in the whole group of patients irradiated due to bone metastases. 2. Statisticaly significant prolonged survival time was observed in groups of patients with breast cancer and with unknown primary site of cancer. Median survival time was prolonged in these groups about 5 months and 3,5 months respectively.

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P06

Limb salvage surgery in malignant bone tumors in children

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Purpose:
The historical overview of resection procedures in primary malignant bone tumors in children, performed in clinic in the yrs.1984 - 2002.
Material and methods:
158 patients with malignant bone tumor were treated. Development of reconstructive surgery correlates with increasing quality of chemotherapy
Results and discussion:
The response on the preoperative chemotherapy is very important and has the direct influence on the type of procedure. If the knee joint was affected, resection arthrodesis using proper allograft fixed by internal osteosynthesis was usually performed. Tumorous TKR is not a method of choice for us because of low durability in correlation with increasing percentage of surviving patients, infection risics, bone deteriorations and restricted motion activities. If epiphysis remains intact (proof the growth plate as a barrier for the tumor with the aim of preoperative MRI is necessary), resection of metadiaphysis with the salvage of the knee joint is a proper method. In fact, the developement of endoprosthetics continues.
In proximal femoral resection a special ,,custom made" bipolar titanium THR was used (2 cases are presented).
The autograft - ipsilateral proximal fibula was used as a replacement after proximal humerus resection. In the case of a graft fracture, contralateral fibula was dissected and fixed by screws.
Conclusion:
Methods mentioned above belong to experimental surgery and individual access to the patient is the main important issue.

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P07

MPNST in long bone? Report of a case

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Introduction:

Malignant peripheral nerve sheath tumors (MPNST) in soft tissue are uncommon sarcomas and can occur in the presence of von Recklighausen`s disease. Occurrence of this lesion in bone is even rarer. MPNST are high grade sarcomas with high rate of recurrence and metastases. The typical microscopic feature is fibrosarcoma-like fasciculated growth of tightly packed, spindle cells with nuclear pleomorphism and faintly eosinophilic cytoplasm. The tumor cells are S-100 protein and vimentin positive. About 15% of cases exibit epitheloid morphology and divergent differentiation.

Case report:

69-year old man suffered gradually increasing pain for the last 2 months in his right hip. X-ray showed lytic lesion in the femoral neck eroding the cortex. Computed tomography (CT), magnetic resonant imaging (MRI) and bone scan confirmed the lesion. The incision biopsy of the tumor confirmed the malignant nature of the tumor, most probably the metastatic malignant melanoma. Total hip arthroplasty was performed. The histology and immunophenotype of resected specimen were consistent with MPNST. The diagnosis of MPNST was confirmed in two Slovenian and one Netherlands pathology center. 6 months later the patient returned with pain in his right shoulder and left knee. X-ray, bone scan and CT showed lytic lesions in left tibia, right clavicle, at distal part of endoprosthesis and brain metastasis. Incision biopsy specimen taken from left tibia showed identical morphology like tumor from right femoral neck. The tissue blocks from the resected femoral neck were sent in consultation to Department of Pathology, Mayo Clinic, Rochester, USA. The tumor was diagnosed as primary central dedifferentiated chondrosarcoma.

Conclusion:

Although the MPNST are very rare primary bone tumors (just 19 cases reported in literature to our knowledge), they should be included in the differential diagnosis. Because of difficult recognition and rarity of the tumor, consultations with referral centers in bone pathology are mandatory.

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P08

Myoepithelial carcinoma in the adductor muscle - an extremely rare case of a soft tissue tumor radiologic-pathologic correlation

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Introduction:

Myoepithelial carcinoma belongs to the so called soft tissue mixed tumors displaying epithelial and / or myoepithelial elements in varying proportions, within a hyalinized to chondromyxoid stroma. This extremely rare kind of tumor has been characterized recently. In the following case report we are presenting a 38 year old woman treated in our hospital due to a myoepithelial carcinoma in the adductor muscle of the right thigh.

Case Report:

In July 2004 a 38 year old woman was admitted to our hospital with a swelling of the right thigh clinically combined with intermittent cramps. The MR imaging showed an 8x8x6 cm tumor on the front side of right femur consisting of solid and cystic parts. A biopsy was performed displaying no malignant tissue. As this result was regarded as a sampling error, a second biopsy was performed, leading to the diagnosis of a focal glandular benign schwannoma. Therefore a marginal resection was done. Histological examination of the whole surgical specimen revealed a myoepithelial carcinoma. Because of the potential malignancy of this tumor local radiotherapy with 54 gray was given. At 13 months follow up the patient shows no evidence of recurrence or metastatic disease. As a side effect of the local radiotherapy premature menopause and local soft tissue infection was observed.

Conclusion: Only few cases with myoepithelial carcinoma have been reported so far. Although the biological behavior of myoepithelioma is benign, myoepithelial carcinoma is known to recur and metastasise. Due to the various and partly benign looking histological parts of this mixed tumor it is sometimes difficult to avoid a sampling error. In conclusion this case report again emphasizes that a preoperative MRI might present important details to avoid a sampling error, especially in a mixed tumor like the myoepithelial carcinoma composed of benign and malign parts.

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P09

Is cytological examination of bone-tumours sufficient for a correct diagnosis?

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Introduction:
From the files of the Institute of Pathology of the Medical University Graz, Austria we selected cases of miscellaneous bone lesions of the last 2 years. These cases were sending by the surgeon for frozen sections. In addition to histological examination imprint cytology was performed. We tried to find out whether cytology was sufficient for a correct diagnosis. The final diagnosis was established by histology.

Material and methods:
We selected 4 osteosarcomas, 1 osteoblastoma, 2 chondromas, 4 non-ossifying fibromas, 3 eosinophilic granulomas, 1 chondrosarcoma, 1 bone metastasis of an adenocarcinoma of the GI, 1 plasma cell myeloma, 1 hemangioma and 1 angiosarcoma of the bone.

Results:
As a rule, malignant tumours showed high cellularity and the criteria of malignancy.
The non-malignant lesions were not as cellular as the malignant ones. Reactive lesions include the same cells than non-malignant tumours. Fibrosis, calcification, lack of cellularity inhibit the cytological diagnostic procedure extremely.

Conclusion:
We think it is problematic to distinguish reactive lesions and benign tumours in cytology. For example, reactive bone and an osteoblastoma show the same cells. Some tumours have cells more characteristically for the particular entity like an enchondroma. But it is important to keep in mind also in this case, that callous includes chondrocytes too. On the other hand malignant tumours can be detected by cytology, if the tumour has highly atypical cells. In the most cases cells do not reveal characteristic features for an entity, and the tumours have a large morphologic heterogeneity, which makes a definite diagnosis only by cytology nearly impossible. In our opinion in all of the cases histology is absolutely necessary. We would not make a diagnosis only on the basis of cytological examination. But cytology is in our opinion a very good additional method for diagnostic purposes.

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P10

A case of an interdisciplinary resection of a huge retroperitoneal liposarcoma G1 of 25 kg

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Introduction:
Liposarcoma is one of the most prevalent entities of soft tissue sarcomas in the adult age. It occurs mainly in the age of 40-60. The most frequent location besides the extremities is the retroperitoneal tissue. In this location for reason that it is a more hidden area, bigger masses are described than in the easily detected appearance in the upper or lower limb.

Case:
An Asian male 66 years of age was admitted to our department. He complained about a continuous increase of his abdominal girth for the last 13 years. In the last 12 months he realised a rapid increase. In a peripheral hospital the tumour was diagnosed as inoperable. A CT and NMR-scan revealed a fat equivalent lobated mass 47x25x42 cm of size, expending from the left retroperitoneal space and enclosing the left kidney. A biopsy was taken, the specimen showed a low grade liposarcoma. In an interdisciplinary surgery (orthopaedics, abdominal surgery, urology) a marginal resection was performed, the tumor, 25 kg of weight including the left kidney, was resected. In the postoperative period a chyloabdomen occurred, but remained stable without further surgery.

Result:
The patient was discharged 8 weeks after surgery in good general condition. A follow up after 11 months showed no incidence of a recurrence in the NMR-Scan.

Discussion:
To the best of the authors knowledge this is a case of the resection of the biggest retroperitoneal liposarcoma. Even huge liposarcomas that are regarded as inoperable due to size and localisation can be resected in an interdisciplinary approach in a specialised centre.

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P11

A case of coexistence of a high-grade osteosarcoma with a low-grade myxofibrosarcomatous component

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Introduction:
Osteosarcoma is a complex family of biologically diverse pathologic entities that produce bone or osteoid by malignant cells. Several histological patterns in osteosarcoma have been described so far.
Case Report:
A 19 years old patient complaining of pain in the proximal left tibia was admitted to our department. X rays and MRI revealed an osteolytic lesion of the proximal tibia with an intra- and extraosseous component of 12,5x6,5x1,4 cm. A biopsy showed the typical histological picture of a myxoid chondrosarcoma Grade II. According to this diagnosis a primary wide resection and reconstruction with a tumour prosthesis were performed. The operation specimen was investigated and showed the presence of a high-grade osteosarcoma with a low-grade myxofibrosarcomatous component. A chemotherapy following the COSS 96 protocol was admitted postoperatively. The patient has no evidence of disease at 11 months follow-up.
Discussion:
To the best of the authors' knowledge this is the first case of the coexistence of a high grade osteosarcoma and a low grade myxofibrosarcomatous component.

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P12

Symmetrical metastatic infiltration of a squamous cell carcinoma

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Aims:
The aim of this study was to report a case of a very unusual, symmetrical and bilateral metastatic infiltration of both iliac crests with secondary involvement of the iliocostal muscles, originating from a Squamous Cell Carcinoma of the lung.
Patients and methods:
In June 2003 a 75-year old man was referred to our hospital due to progressive swelling and pain localised paravertebral in the lower lumbar vertebrae. The MRI of the lower vertebrae and pelvis showed a contrast medium absorbing, bilateral mass in both iliocostal muscles and a cortical defect of the adjacent iliac crests. Further diagnostic steps were required, hence a fine needle aspiration biopsy of the iliocostal muscle, a thorax-CT and a fiberoptic bronchoscopy of the left lung were performed.
Results:
The patient was suffering from a highly differentiated Squamous Cell Carcinoma of the lung with metastatic spread to both iliac crests, expanding into the iliocostal muscles. Due to the advanced cancer stage the patient was treated palliatively, no indication for chemotherapy was set and the patient died one month later.
Conclusion:
Symmetrical metastatic spreads of Squamous Cell Carcinomas are extremely rare. Usually Squamous Cell Carcinomas spread in a lymphogenic way, but once vascular invasion occurs, 7.5% of the cases infiltrate the bones. The point that the bone infiltration happens in a bilateral way and furthermore the contiguous skeletal muscles were involved makes this case unusual in several aspects. To our knowledge this is the first case reporting these unusual findings, as found in the literature. The question arises why the tumor spreads in a bilateral and symmetrical way. The hypotheses can be made that the infiltration happens incidentally or that a special anatomy of the vessels favours the infiltration.

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P13

Pubic osteomyelitis in a young athlete. A case report

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Purpose:
We report about a rare case of septic arthritis of the symphysis pubis due to Staphylococcus aureus in a young athlete. Strenuous exercises, especially sport with a lot of sprinting and sudden changes of direction, like soccer, are associated in 19% of cases with osteomyelitis of the pelvic pubis.

Case:
A 21 year old, healthy male soccer player, presented to our emergency department with exercise depending groin pain. There was an overstretching trauma three months earlier. Walking and active range of motion was limited. C reactive protein was elevated (113mg/l); white blood cell count was 6100. The pelvic radiograph shows a 19 mm widening in the joint space of the symphysis with cortical irregularity. The MRI showed a fluid collection in the area of the symphysis and reactive inflammatory changes within the Mm. obturatorius externus and adductor brevis. The CT-guided aspiration of the fluid revealed a pan-sensitive Staphylococcus aureus. Due to conservative treatment with 3 weeks intravenous penicillin 5 Million IE/ 6 h and 9 weeks oral Clindamycin 600 mg/ 8 h, the 3 months follow-up MRI showed a marked regression of the pubic fluid collection as well as a completely normalized musculature. Normal C reactive protein, full regression of the clinical symptoms, he could return to sport after 3 months.
Conclusion:
Pubis osteomyelitis should be suspected in athletes with groin pain and signs of infection. The pathogenesis is difficult to explain. A possible reason is local trauma of the pubic bone and the attaching tendons. Needle aspiration and culture is necessary. Conservative treatment with intravenous antibiotic therapy and prolonged oral antibiotics has a high chance of resolving the infection. A surgical intervention should only be performed in the case of persistent infection or development of sequestrate.

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P14
Medial bone support in osteosynthesis of the trochanteric region fractures
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Significance of medial bone support in osteosynthesis of the trochanteric region fractures

Purpose:
Trochanteric fractures are fractures in the region between intertrochanteric line and horizontal line that crosses the lower border of lesser trochanter. If no medial stability of fracture is achieved with treatment, it will lead to change in direction and intensity of vertical and horizontal forces that act in the area of intertrochanteric region causing nonunion or delayed healing of the fracture.
The aim of the study is to point out complications that occur in osteosynthesis with AO plate of 130^0 , 90^0 in unstable trochanteric fractures when , during the surgical procedure itself, medial support of fracture or biomechanical restitution of the fracture were not solved.
Material and methods:
In the period of 3 years authors analyze 92 unstable intertrochanteric fractures that were stabilized with AO plate (130^0, 90^0) and where medial support of fractures was not satisfactory.
Results:
Out of 92 patients, 33 operated patients had a good result. Healing with varus of femoral neck and shortening of the operated leg occurred in 32 patients. 14 patients developed pseudoarthrosis, there was nonunion of the fracture. In 9 patients there were fractures of the osteosynthetic material and 4 patients had increased (over 10^0) extrenal rotation of the operated limb.
Conclusion:
Authors concluded that osteosynthesis with AO plate of 13^0, 90^0, for unstable intertrochanteric fractures through establishment of over 50% of medial support of cortex represent the basic biomechanical minimum for fracture reconstruction. Reconstruction of the intertrochanteric fracture with over 50% of medial support biomechanically leads to balanced effect between already existing vertical and horizontal forces and thus a good result can be expected.Every lesser medial support of the cortex gives less certain result.

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P15
Supracondylar osteothomies of humerus in correction of posttraumatic elbow deformities
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Purpose:
Posttraumatic deformities of the elbow most commonly develop following the sypracondyliar fractures in children. These fractures are common and poorly healed fracture may take place even under the best conditions of treatment.
Material and methods:
Authors analyze 21 patient with elbow deformity as a consequence of the supracondilar fracture of humerus. The average age of patients is 8,2 years and they were operated between 3 and 20 years following trauma. Left arm was affected in 14 patients and right arm in 7 patients. There were 12 men and 9 women. Two patients had valgus deformity of the elbow and 19 had varus deformity of the elbow.

Results:
In one case deformity was a consequence of a dislocated radial head following Monteggia fracture at age of 7. Second was a result of surgically removed radial head. They were treated through varisation osteothomy and stabilized with AO plate and screws.Prior to operation varus deformity was between -5^0 and $+40^0$, (an average $20,8^0$). Clinical result following union of the valgisation osteotomy and subsequent physical therapy was between $+15^0$ and -5^0. Recidivism was not observed, in sense of recurrent varisation and functional state of the elbow was always improved, compared to the previous state.
Conclusion:
Based on these elements, authors recommend valgisation osteothomy of humerus even earlier, upon the complete consolidation of bone callus, already 6 to 18 months after the poorly healed fracture (valgus or varus).

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P16
A case report of a 49 years old woman with dislocation of the radial head alone
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Introduction:
Isolated dislocations of radial head are very rare. If the radial head appears to be dislocated anteriorly, a Monteggia fracture should be suspected. If the dislocation appears to be posterior, posterolateral rotatory instability is a more likely prospect.
Aim:
The aim of this report is to present a case of a woman with a dislocation of the radial head alone.
Material and Method:
A 49 years old obese woman fell from a small height (<1m) and came to the emergencies of our hospital with an obvious fracture of her right humeral head, and limitation of movement of her left elbow. The mechanism of injury was forced pronation with impact. After the X-Ray examination a posterior dislocation of her left radial head revealed, apart from the humeral head fracture (3 pieces). The left forearm and the adjacent wrist were also X-rayed so that we could exclude a Monteggia fracture. The radius was reduced and stable in pronation with a cast.
Result:
The patient was examined and X-rayed again after 3 days and the reduction remained stable. She was examined weekly for a total period of 3 weeks. The cast was removed and the patient regained practically the full range of flexion, extension, supination and pronation 20 days after the cast removal with stability of the joint. Six months post injury a follow up revealed a slight restriction of all movements especially rotatory parameter (extension 5°, flexion 120°, supination 80° and pronation 30°). No eterotopic ossification was revealed in X-ray examination.
Conclusion:
Isolated dislocations of the radial head are very rare. The diagnosis of radial head dislocation should be established only after excluding a Monteggia fracture or congenital dislocation of the radial head.

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P17
War injury - Fracture of femur
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Introduction:
within the period 1992 - 1995, during the war in Bosnia we treated 214 patients with complicated femur fracture caused by war injury .
Etiology:
the humerus fracture occurs as a consequence after injury with: bullet 142 (67,6%),shell 58 (27,8%), bomb 7 (3,2%), explosive device 5 (2,3%), mine 2 (0,9%).
Method:
the wcund was treated by open method, in dependence of infection there were applied the primary deleyed suture or the secundary one. We fixed the bone by external fixation 186 (86%) patients, by 37 patients on percutaneous way), plate (16 patients, after infection is gone) ilizarov aparatus 5, Kirschner wire + plaster 4, Küntscher nail 3. The great defectus of soft tissue were covered by microvascular lobe.The bone defectus were filled in by autografts.
Result:
excellent (no contracture, no pain) 78 (36,5%), wery good (restriction of movement <1/3 moderate pain) 92 (43%), good (resection of movement <2/3 freouent pain) 28 (13%), pure (arthrosis of joint, abreviation, ankylosis) 16 (7,5%).
Conclusion:
we achieved the good results by primary deleyed , or secundary suturae of the wound and external fixation of bone.

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P18

War injury - Fracture of tibia and fibula

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Introduction

within the period 1992–1995, during the in Bosnia we treated 199 patients with complicated tibia and fibula fracture caused by war injury.

Etyology

the tibia and fibula fracture occurs as consequence after injury with shell 89 (44,7%), bullet 71 (35,7%), mine 18 (9,1%), bomb 13 (6,5%), explosive device 8 (4,0%).

Method

the wound was treated by open method,in dependence of infection there were applied the primary deleyed suture or the secundary one.We fixed the bone: by external fixation 155 (77,8%), 41 partients on percutaneus way, Ilizarov aparatus 20 (10%), Kirschner wire + plaster 9, plate 9. The great defectus of soft tissue were covered by microvascular lobe. The bone defects were filled in by autografts. By 9 patients external fixation was replaced secondary by plate.

Result

exellent (no contracture, no pain) 59 (29,6%)
Very good (restriction of movemint <1/3 moderate pain) 78 (39,2%)
Good (restriction of movemint <2/3 friquent pain) 39 (19,5%)
Pure (arthrosis, ankylosis, abreviation) 23 (11,7%)

Conclusion

we achieved the best result by external fixation of fracture , and by primary deleyed or secundary suture of the wound.

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P19

Conservative treatment of intraarticular fractures of distal radius at orthopedic department in cantonal hospital Bihac

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Purpose:

Conservative treatmant in orthopedic practice is used at this time as well as before, regardles the fact that there are enormus negative consequnces and results remaining after this kind of treatment in a way of articular incongruention and secundary dislocation of distal fragment of radius. Our goal is to show the diference between surgical and conservative treatement of those fractures.

Materials and methods:

During the period from january 2000 to february 2004. we have cured and observed 60 patients with cominutive articular fracture of distal radius. We observed 22 female and 38 male patientes. Radiographic controls were done after reposition on 7, 14, 30, 42 day and after 12 months.

Results:

Secondary fracture dislocation in a way of dorsal angulation has been evidented within every 60 patientes between first and fourth or sixth week of wearing plaster cast immobilisation. At 20 patientes we have done a surgical reposition and stabilisation before observation period. Articular incogruention after taking of the immobilisation has been evidented at 25 patientes treated with plaster cast immobilisation.

Conclusion:

Our experiance shows that intraarticular fractures demand surgical treatment for complete anatomical reposition and contencion of fragments.With this kind of treatment secondary dislocation of fragments is stoped, so the following consequences of fractures in a way of artrhosis of radio carpal joint, pain, funcionality,especialy at younger population are less shown.

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P20

Treatement of distal radius dislocated fractures with outer fixater

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Dislocated articular fracture of distal part of radius can bring up to serious problems in function of radio carpal joint and fist and there is always a dilema in a way of treatement those fractures.

Purpose:

Purpose of this work is to show results of treatement in this kind of fractures with outer fixators.

Materials and methods:

During the period of six years (from 1995 till 2001) we have treated 26 patientes with closed and opened (Gustilo tipe I and II) dislocated articular fracture of distal part of radius (10 female and 16 male) assembling the outer fixater Siemens for forearm and radio carpal joint. Observation period was 12 months.

Results:

Outer fixater was applicated to 16 patientes, and outer fixater combined with Kuntscher needles was applicated to 10 patientes. At the end of the observation period we received those results Jakim (1991) scoring sistem : excellent 53,8% , good 19,3% , satisfying 19,3% , bad 7,6% patientes. Within 11 patientes (42,3%) we have got remained articular incogruention from 1–2 mm. At the end of observation period we evedented grade I osteoporosis at 10 patients.

Conclusion:

Surgical treatement of dislocated articular fractures of distal radius with outer fixater Sintes is main method in treatement of those complicated articular fractures.

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P21

The impact of delayed admission of spinal injured patients to a specialist unit over a five year period

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Study Design:

Retrospective study of 432 patients admitted to our institution with a spinal injury over a five-year period.

Objectives:

To present epidemiological data relating to this spinal population, reporting
specifically on delayed admission and length of hospitalisation.

Methods:

432 traumatic spinal injuries admitted between March 1998 and March 2003 were analysed with respect to age, gender, mechanism of injury, level of bony injury, neurological level (complete, incomplete and intact), Injury Severity Score (ISS); date of injury, referral and admission independently and length of hospitalisation. The delays between injury and referral (>3 days) and between referral and admission (>7days) were correlated to the length of hospitalisation. A detailed analysis of the cause of delay at both junctures was undertaken.

Results:

There were 322 males (average age, 38.6 years) and 110 females (average age, 41.8 years) in our study. Classification of neurological severity disclosed 108 complete injuries, 115 incomplete and 209 intact. The average time between injury and referral was 5.5 days (range 0–94), and between referral and admission was 10.7 days (range 0–130). One hundred and sixty one patients (37%) experienced a delay between injury and referral, of whom 59 (37%) were subsequently also delayed to admission. The principal reason for delay between injury and referral was the treatment of concurrent injuries. Even patients with complete injuries (15/43) experienced delayed referral.

One hundred and twelve patients (26%) experienced a delay between referral and admission. Principal reasons included the provision of beds (Intensive care, acute and rehabilitation) and physiological stabilisation of other injuries particularly thoracic trauma.

Conclusions:

Provision of beds remains the most common preventable reason for delay between referral and admission and is associated with increased hospitalisation. Early liaison with a designated spinal injuries unit, particularly those with cord injury remains vitally important.

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P22

Review of paediatric supracondylar humeral fractures over a 10 year period : A London teaching hospital experience

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Introduction:
We report our experience over a period of 10 years in a tertiary referral center.
Methods:
A retrospective review of notes and radiographs identified a total of 268 patients with a documented supracondylar fracture.
Results:
Most children presented between 1100 and 1900 hours with extension type Gartland II and III fractures. 71% were taken to theatres on the day of admission. Open reduction was necessary in 22% cases. 4% of children had long term deformity (3% malreduction and 1% growth arrest) but corrective surgery was required in 1%.
Conclusions:
An aggressive approach to achieve accurate surgical stabilisation of these fractures is justified by the low incidence of long term deformity and neurological complications.

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P23

The role of early stabilisation in thoracolumbal fractures

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Purpose:
In our practice we present case report of young man with thoracic spine fractures with paraplegia and early surgical treatment with excellent neurological recovery
Material and methods:
23 years old fireman injured by falling from stairs.Clinically examination showed paraplegia,CT-compressed fractures of thoracic segment from VIII – XI with compression of spinal cord
Patient injured at 11 p.m. and surgically treated at 1.30 a.m. with decompression and stabilization sec. Harrington
Results:
Neurological recovery with independent walking after 6 months and partly incontinent as a final results
Conclusion:
Early decompression and stabilization within 6 hours give a great possibility for neurological recovery. It is necessary to exist qualified surgical teams in small centers

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P24

Abdominal manifestations in patients with multiple fractures

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Purpose:
In this study we present cases that were mimicking acute abdomen in patients with multiple fractures.
Material and Methods:
During last year, 5 patients were admitted in the Surgical Department of our Hospital with manifestations of acute abdomen and multiple fractures, but were not finally operated. All of them were in a stressful condition and a number of imaging examinations and blood tests were needed to define the causes of abdominal pain. They were 4 men and one woman with a median age of 56 years old. The admission diagnosis was ileus in 3 patients and intra-abdominal hemorrhage in 2 patients. All the patients had multiple fractures (ribs,limps,pelvis). Two of the patients were admitted in Intensive Care Unit (ICU), and surgeons were called for an emergency intervention.
Results:
Diagnostic peritoneal lavage was executed in 2 cases (OPSI Syndrome and ARDS Syndrome) in ICU patients. Diagnostic laparoscopy was used in one case, without any special findings. A retroperitoneal haematoma was present in the rest of the patients. Computed tomography of the abdomen was necessary for the total of cases.

Conclusion:
Acute stress conditions are mimicking surgical emergencies due to acute motility disorders of the gastrointestinal tract. Especially when the patient is under mechanical ventilation, the surgeon has a difficulty to decide for the surgical or non-surgical strategy of the therapy. Minimal invasive surgery and peritoneal lavage are effective interventions in middle-ground cases. Fortunately, in awake patients acute abdomen- mimicking conditions can be diagnosed after 5–6 hours of the admission in Hospital.

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Fatals injuries after falls from heights
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Purpose:
Falls from heights are common causes of multi-systemic injuries.It is not always easy to pretell about the prognosis of these cases since many factors are involved. Although there are similarities in injuries after falls from heights, there is a great difference according to the height of the fall and other secondary factors.
Material and Methods:
Fatal falls from heights are studied in this retrospective study. Since 1996 in total 124 people were admitted in the Surgical Department of our Hospital after falls from heights. In our study only 97 patients were included, that had a fall from a height >2 meters. The median age was 37 (5 – 77) years old. A head injury was found in 85 patients and a face injury existed in 15 patients. In 27 patients a thoracic injury was diagnosed, with rib fractures, pneumothorax (6) or hemothorax (4). Pelvic fractures existed in 15 patients, with retroperitoneal hemorrhage in 13 patients and spine injury in 20 patients. Limbs fractures were found in 86 patients. Finally, an abdominal injury was present in 13 patients. According to our data, 12 patients fell from a significant height (more than 10 metres). In total,6 patients died, 2 deaths happened inside the first post-injury hours, 2 patients died during the first post-injury week, one patient died 30 days later and one more patient died 4 months later.
Results:
In the mortality group, the average height of fall was >10 meters. All the victims presented a head injury and multi-systemic injuries as well. In total, 4 cases of major hemorrhage out of 6 fatal injuries were present. Thorax and abdomen injuries co-existed in 4 cases.
Conclusion:
Mortality after falls from heights is mainly caused by head injuries and major hemorrhage determines the death risk of the first post-traumatic hours.

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Subacromial impingement due to massive supraspinatus hypertrophy in a bodybuilder. A case report
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Purpose:
Repetitive weight-training with heavy loads may lead to chronic injuries. Common injuries are tendinopathy of the rotator cuff(RC), stress fractures of the upper extremity, vertebrae and the clavicles. Muscular hypertrophy, poor technique or overuse can contribute to nerve injuries such as thoracic outlet syndrome or vascular stenosis. We report the case of a female bodybuilder with symptomatic subacromial impingement.
Case:
A 44 year old female competitive bodybuilder with a history of anabolic steroid intake presented with pain in the left shoulder during exercise, reduced strength at bench-press and neuralgic pain between the scapulae. Except for some asymmetry of both teres muscles and a positive Hawkins sign the clinical examination was normal. MRI showed a massive hypertrophy of the supraspinatus with some degeneration of the insertion and bulging of the supraspinatus tendon. One year earlier an arthroscopic subacromial decompression with acromioplasty and AC-joint resection had been performed followed by an arthroscopic re-acromioplasty for persisting subcoracoidal impingement seven months later. Initially the post-operative follow-up was uneventful. Under sparing isometric exercises, systemic pain medication and by avoiding exercises causing pain the symptoms vanished within two months, the patient fully recovered and returned to competition. Eight months later the patient is still doing well.

Discussion/conclusion:
Literature about injuries in weightlifters and bodybuilders due to weight-training is rare. Most common is a tendinopathy of the RC with the supraspinatus affected in 3.5–12% of cases due to relative hypoperfusion of the tendon and narrow subacromial space. A dysbalance between the scapular and pectoral/shoulder stabilizers, may lead to glenohumeral and/or scapulothoracic dysfunction and dyskinesia. Anabolic steroid use accentuates the mismatch between muscular hypertrophy and the relatively weak tendon. In most cases the treatment is conservative with NSAID's, strengthening of the stabilizers of the scapula and of the external rotators and posterior muscles to correct the dysbalance.

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P27
Tendon transfer around shoulder in obestetric brachial plexus paralysis: clinical and computed tomography study
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109 obstetrical palsy patients with defective shoulder abduction and external rotation had subscapularis release and transfer of teres major to infraspinatus with or without pedicle transfer of the clavicular head of pectoralis major to deltoid. The age at surgery averaged 67 (11–192) months and Follow-up averaged 36 (12–80) months. 39 cases had follow-up CT scan of both shoulders.
Improvement of abduction averaged 64o and that of external rotation 50o, 100% and 290% gain, respectively. Both negatively correlated with the age at surgery ($p<0.001$), and were significantly higher in patients operated <4 years old. On CT scans, the degree of glenoid retroversion positively correlated ($p<0.001$) with the age at surgery, and was significantly higher in patients operated >4 years old. The degree of posterior subluxation showed no significant difference between different ages. There was no significant difference between the operated and normal sides in patients operated <4 years old as regards glenoid retroversion and in those operated <2 years old as regards posterior subluxation.
The operation is useful for correction of defective shoulder abduction and external rotation in obstetric palsy. It is best performed before the age of two to get maximal improvement in motion and prevent secondary bone changes. Between the ages of 2–4, it also resulted in significant improvement in motion and prevented glenoid retroversion, but not posterior subluxation. After the age of 4, the improvement in motion was not significant and secondary bone changes were not prevented.
Key words: obstetric brachial plexus palsy – tendon transfer – glenoid retroversion – posterior subluxation

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P28
Early experiences of needle arthroscopy – An alternative diagnostic tool in shoulder pathology
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Purpose:
We present our early experiences of Needle Arthroscopy as an alternative to diagnostic imaging and conventional arthroscopy. We also demonstrate how Needle Arthroscopy has a place in current clinical practice and is both efficient in terms of cost and waiting times.
Materials and Methods:
The Innervue Diagnostic Scope System from Arthrotek was used in six patients using a variety of anaesthetic methods – general anaesthetic, local anaesthetic and suprascapular nerve block. This utilises a 1.2mm (18 gauge needle) and requires o ne
(posterior) portal. The same surgeon – who is experienced in conventional shoulder arthroscopy – performed all arthroscopies. The value of the images obtained was evaluated by the surgeon and patient acceptability was assessed by way of pain scores during, immediately after and one day after the procedure.
Results:
Under general anaesthetic, the procedure was straightforward to perform and the images obtained were comparable to conventional arthroscopy. The procedure was not tolerated by any of the three patient who had 20mls of 1% Lidocaine (with or without Adrenaline) infiltrated into the glenohumeral joint and insertion point. In the two patients who had a Suprascapular nerve block as well as glenohumeral infiltration, the procedure was better tolerated and adequate images obtained in one.
All patients were pain free following the procedure, however the highest pain score during the procedure was 7/10.
Conclusions:
The technique of anaesthesia for Needle Arthroscopy needs modification before this procedure can be widely used – perhaps in the form of Scalene Block. Once this issue is overcome, Needle Arthroscopy is straightforward and is a valuable tool which would reduce waiting times from referral to diagnosis from between five and ten months in our location with no increase in costs.

P29

Experience with the threaded Munich cup

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Cup failure due to aseptic loosening remains a major problem in total hip arthroplasty. Threaded cups were developed in an attempt to eliminate this complication.

Purpose:

To prospectively evaluate the mid-term results of a cementless corundium blasted titanium alloy threaded Munich type cup.

Material and methods:

Between October 2000 and June 2003, twenty-six patients (29 hips) had acetabular replacement with a threaded Munich type cup. One patient was lost to follow-up and the mean age of the remaining 8 males and 18 females was 58 years. The 28 hips in the series were examined clinically and radiologically at mean 2.6 years after surgery.

Results:

We observed excellent clinical outcome with mean Harris hip score 93 points (range, 74 to 100 points). At latest follow-up all cups were radiologically stable without radiological signs of aseptic loosening or significant migration. Small lytic lesions were observed in three cases. The average annual linear polyethylene wear was 0.056 mm/yr (SD ±0.05 mm).

Conclusion:

Munich threaded cup demonstrated excellent mid-term clinical outcome, good early stability, and a favorable wear rate. Our data suggest that screw-thread fixation of acetabular components can be satisfactorily achieved with this particular design. Further long-term follow-up is needed.

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P30

Minimally invasive THR – Approaches and technical conditions

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Purpose:

The comparison of minimally invasive approaches in total hip replacement using in our clinic with respect to technical requirements.

Material and methods:

85 total hip replacements using one of the MIS approaches were performed from Jan 05 to Feb 2006. We use "one incision" lateral approach, anterolateral approach and finally anterior approach. Technical conditions and requirements are specific due to the used approach.

Results:

Patient´s positioning, surgeon´s position etc are shown. Advantages and disadvantages of separate MIS approaches are presented.

Conclusion:

In generally, main differences between standard and MIS total hip replacement occur in the first six weeks after procedure.

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P31

Hip Protector

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Introduction:

In the last decades, dramatic increase of a hip fracture in older people all over the world accelerate a need for method searching of secondary prevention of hip fracture, especially in people with age-related osteoporosis, elderly with previous history of hip fracture and people with age-associated gait and balance disorders. Although this problem is widely investigated in USA, Scandinavian countries and Japan, in central Europe is the use of hip protector still neglected. So, the purpose of this poster is to inform about latest facts of this relatively new approach to secondary prevention of one of the most common fractures in human.

Material and methods:
Review of the recent literature was done, with paying special attention to different biomechanics and cost-benefit analyses, including various parameters of quality of life.
Results:
Some basic biomechanics types of hip protectors are presented, their effectiveness on force attenuation/dissipation in typical falling conditions of the elderly is explained, and advantages and disadvantages of their practical use are emphasized.
Conclusion:
Hip protector as a mean of secondary prevention of hip fracture could be strongly recommended for wider use in older population.

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P32
Biomechanical analysis of stresses in slipped capital femoral epiphysis
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Slipped capital femoral epiphysis (SCFE) is an important orthopaedic problem, which emerges in early adolescence. Many hypotheses regarding its etiology have been put forward, however, the question which of the factors is the most important one remains unanswered. In order to test the validity of the mechanical hypothesis, we compared the values of biomechanical and geometrical parameters of the population of hips with an increased risk for SCFE to the corresponding parameters of the population of healthy hips. We determined the shear, compressive and tensile stresses in the epiphyseal plate in both populations.
In the retrospective study we included 106 hips on the contralateral side of the hip that underwent a slip of the capital femoral epiphysis and 72 healthy hips. The geometrical parameters were measured from standard AP roentgenograms of the hip and pelvis and biomechanical parameters were calculated. The resultant hip force and the peak radial contact stress on the femoral head were determined by the computer program HIPSTRESS, while the stresses in the femoral neck were determined by using a mathematical model.
Our results showed that the shear stress in the femoral neck is significantly higher in hips with a higher risk for the slip of the capital femoral epiphysis than in healthy hips. However, from a biomechanical point of view, most pelvic geometrical parameters were more favourable in the group with a higher risk. We also found a statistically highly significant difference between the two groups in the slope of the physis. The used method is suitable for the analysis of the risk of developing SCFE in adolescents who already have SCFE on one side and in those with hip pain of unknown origin.

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P33
20 years follow-up of Gore-Tex posterior cruciate ligament reconstruction
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Introduction:
Twenty years ago the Gore-Tex expanded polytetrafluoroethylene (PTFE) prosthetic ligament was used as feasible salvage procedure in patients with failed, multiply operated knees, or knees with gross instability.
Material and methods:
At the Department of Orthopaedic Surgery we operated 13 patients and replaced the posterior cruciate ligament (PCL) with the Gore-Tex prosthetic ligament. Recently we had opportunity to evaluate clinical, arthroscopic, magnetic resonance imagining (MRI) and patohystologic (PH) findings in patient F. K. twenty years after the reconstruction.
Results:
Due to osteoarthritic changes arthroscopic toilette of the knee was performed. On that occasion arthroscopic evaluation and biopsies for microscopic examination were carried out. MRI performed prior to arthroscopy revealed tidy continuity and volume of PCL with advanced arthritic changes of knee. MRI findings were consistent to clinical findings of good knee stability. Arthroscopy revealed the Gore-Tex prosthetic ligament completely coated with thicken synovial membrane i.e. fibrosis. Partial removal of the synovial membrane showed continuity of characteristic PTFE strands. The continuity of PCL was established by the probe. After that, few pieces of synovial membrane from sheath of PCL and from other parts of synovial membrane of the knee were taken. One PTFP strand of artificial PCL was collected as well. Patohystological findings clearly excluded inflammatory reaction in synovial membrane of the knee. Furthermore, synovial membrane of Gore-Tex prosthetic ligament sheath was found to contain mature fibrotic tissue with multinuclear giant cells and fragments of foreign polarizing material.

Conclusion:
This case report demonstrated excellent biocompatibility and good knee stability twenty years after replacement of the PCL with the Gore-Tex prosthetic ligament in patient with gross instability. It is interesting to mention that there was no deterioration of PTFE strands.

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P34
Mosaic chondroplasty of the knee cartilage defects
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The mosaic chondroplasty of the femur condyles cartilage defect allows to reach restoration of an articulate surface with good clinical result.
The arthroscopic mosaic chondroplasty was performed in 28 cases. The patients had cartilage defects of the loaded surface, area of 0,8 up to 4 sm^2. Patients were divided in three groups depending on the size of defect: I group – of 0,8–2 sm^2 (n=6), II group – 2,1–3 sm^2 (n=13), III group – 3,1–4 sm^2 (n=9). The diameter of the cylindrical graft was 6 mm, its length – 2 sm. One year after the mosaic chondroplasty with the using of autografts, the function of the knee was restored by all the patients of the first, 10 patients of the second and 5 patients of the third group.
The mosaic chondroplasty provides a rather fast restoration of the damaged articulate surface with it acquiring properties similar to hyaline cartilage.

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P35
Treatment of cartilage defects with a biostable polymer implant – Final assessment
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Purpose:
The treatment of cartilage defects is a complex procedure, because of the missing ability of cartilage to regenerate itself. Especially for patients of higher age the only possibility is to replace the joint surface. Our aim was to replace or defer the implantation of an endo-prosthesis. Salucartilage®, a cylindrical, biostable Polymer was used at our clinic to reach this goal.
Patients & Methods:
12 Patients (Ø61.3 years; f:m=8:4) were operated due to painful chondral defects in the knee. The operation was performed by doing a small arthrotomy, cleaning the defect area of cartilage debris, drilling the subchondral bone, compacting the bone and press-fit positioning of the Salucartilage implants. The patients were mobilized under full weight bearing and full range of motion. The outcome was evaluated using forms and clinical examination before the operation and after 3,6 and 24 months.
Results:
In our experience Salucartilage is easy to implant and handle. The pain level was high during the first post operative week and became better after 3–4 weeks. At the first follow up after 3 months the average pain and activity level could not be changed significantly in comparison to the pre-op level. These results did not change throughout the rest of the follow up time of 36 months. In one case an infection of the knee occurred a few days after the operation and another patient suffered of implant dislocation after 5 months. After 3 years a knee endoprosthesis was implanted in 10 out of 12 patients.
Conclusion:
The final assessment of Salucartilage as a treatment of cartilage defects in very special cases reveals, that a treatment of cartilage defects with satisfactory results is not possible. Our experiences indicate that mechanical instability (no osseous integration, disintegration of the implant surface) are the most important factors of our poor results.

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P36

Surgery and drugs in treatment of large osteochondral lesion of the knee – case report

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Purpose:
In our work we present case of 40 years old postman with large osteochondral lesions of medial femoral condyle caused by hyperextension during football game.
Material and methods:
40 years old postman injured his left knee during football game by hyperextension of his knee.Clinical findings 2 days after injury showed swelling,effusion,pain and loosing of full flexion and extension.X-rays showed osteochondral lesion of anterior part of medial femoral condyle.We performed open surgery and find 50 x 20 mm large osteochondral part of medial femoral condyle.We fixed osteochondral part by 3,5 mm spongious screw 50 mm long.After surgery we treated patient by immobilization and walking with crutches.5th day after surgery we started with intraarticular application of Hyalgan injections repeated every weeks during 5 weeks.After 6 weeks we started with rehabilitation with Kynetec system during 14 days and partial wear bearing in next 4 weeks.
Result:
3 months after surgery patient had painless knee with full ROM without swelling Arthoscopy after 6 months showed fully restitution of osteochondral lesion.One year after surgery there is a full ROM with painless knee.
Conclusion:
Osteochondral lesion represent difficul case for treatment.In our case we showed that surgical treatment with intraarticular application of hyaluronic acid in osteochondral lesion give good result.

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P37

The effect of capacitively coupled electrical stimulation (CCEST) on healing processes in rabbit femur – a preliminary report

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Introduction:
Failure in the therapy of fractures in the form of delayed union of fractured bone or lack of this union, gave rise to research on the best conditions that are essential for successful regeneration of the bone.
Material and Method:
Within the confines of researches project "Electrostimulation in the bone repair activation", with Ethics Commitee consent, the raising of 20 rabbits was initiated in Central Animal Quarters of Medical University of Silesia. The animals were operated in operating room, under general anaesthesia. The femur of each rabbit was sawed, and then stabilized by external fixation (MIKRO-ZESPOL method). The rabbits were divided into 2 groups (10 animals in group) – control and experimental group. In the control group electrostimulation wasn't used. Capacity current was used in the second group (non-invasive method). The animals were clinically and radiologically assessed. The blood was drawn for laboratory tests and bones were sampled for histological examination.
Results:
The animals took food and water without limitations. Their behaviour was normal. During healing period, single complication in the form of subcutaneous abscesses and destabilisation of the osteosynthesis occurred. The bone repair process was more advanced in the experimental groups in comparison to the control group. This is a animal study and next trial is started to determine whether CCEST will be able to use in the treatment in clinical practice.
Conclusions:
On the basis of radiological and histological examination, the following conclusions were drawn:
1. In non-invasive capacity current group, the bone repair was more advanced than in control group
2. Any pathologic findings related to cytotoxicity and carcinogenesis were not observed in livers and kidneys of the animals.
We did not found any noxious effects of the applied methods on the animals.
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Value of thromboemolic prophylactic in prevention of the thromboembolism in orthopedic surgery

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Purpose:
From 01. 03. 2004. until 01.06.2004. there were 174 patients hospitalized on the Clinic for Orthopedic Surgery and Traumatology. Patients were admitted for injured or diseased limbs. The average age was 46,95 years. Men were represented in 115 cases and women in 59 cases.

Material and methods:
Preoperative and postoperative complete thromboembolic prophylactic was administered to 50 patients, among them: total or partial hip replacement took place in 41 patients, in cases of 3 patients spine surgery was performed, 2 patients had pelvic surgery . There were also 2 intertrochanteric fractures. Also, 1 case of femoral shaft fracture and 1 case of tibial plateau were surgically treated.
As the antithrombotic agent we used Clivarin in 34 cases and Clexan in 16 cases.

Results:
Venous thromboembolic prophylactic was not administered to 124 injured patients: 9 patients with polytrauma, 2 patients with cervical spine injuries and 8 patients with lumbar spine injuries (3 cases of lumbar spine injury were surgically stabilized), 24 patients with injuries to the humerus (15 patients were non-surgically treated), 7 patients with forearm fractures, 15 patients with hand injuries , 7 patients with pelvic fractures (5 of them were non-surgically treated), 7 patients with femoral intertrochanteric fractures, 11 patients with femoral shaft fractures that were operated, 17 patients with lower leg injuries (9 of them were surgically treated and 8 were treated with plaster immobilization), 7 ankle injury were surgically treated, there were 7 cases of above knee amputations and 3 cases of bellow knee amputations) .

Conclusion:
In the first ten days, tromboembolic complications occurred only among patients that were not administered thromboembolic prophylactic. Clinical manifestations were: lower leg tromboflebitis in 7 cases, pulmonary embolism in 2 cases, stroke in 3 patients, 4 patients died, with clinical signs of pulmonary embolism and stroke and these were confirmed by autopsy.

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Quality of life in ambulated geriatric patients

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Purpose of our study is to outline the quality of life after ambutation in geriatric patients.

Material and Methods:
A remarkable number of amputations has been performed in the Surgical Department of Komotini General Hospital since 1991.The main indication for amputation has been diabetic foot necrosis, circumstantially total peripheral arterial obstruction, and severe trauma in a few cases.In total 122 amputations of lower limbs and 3 amputations of upper limps have been performed in patients with a median age of 78,5 years. After the operation, the patients have the opportunity to visit their doctor almost every day, and receive complementary medical advice. The minor peripheral Health Institutions of the National Health System support amputated patients and solve simple everyday problems.We managed to communicate with the majority of our patients and investigate the difficulties of adaptation to their new situation.

Results:
In 65,5% of cases, the patients report that they have accepted the new reality. The national program "HOME CARE" has helped patients to a great degree and has provided them a sense of safety and stability (100% approval). In 12% of cases problems with the stump were the reason of difficulty and repeated amputations made things even worse(6–7%). Lack of adaptation because of bilateral or high amputation has been reported by 6 patients, while absence of supporting environment has driven 12 patients to depression and social isolation.

Conclusion:
Medical and social support mechanisms are very important in the period following amputation. The problem of isolated geriatric patients who live far from the big urban areas could be helped by home– based programs of health care.

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P40

Primary orthopaedic education for general doctors

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Purpose of our study is to determine the orthopedic education level provided according to the new educational programme of general doctors(GPs) in Greece.

Material and Methods:

A new promising educational programme has recently been composed for trainees in General Medicine by the Hellenic Society of General Doctors. It refers to the minimum level of medical skills needed from each specialty.

Results:

A 3-month programme is the mandatory pattern for primary education in orthopedics. The "General Medicine logbook" includes the official guidelines that determine the essentials in orthopedics, as emergency procedures. As far as skills and techniques taught are concerned, it is upon the goodwill of the Orthopedic Department's medical staff to teach certain rules and practices. Quality of education depends on Hospitals' available equipment, too. Also, subsidized seminars given by the Ministry of Health are mainly limited in theory. ALTS course is a certified 2-days course that helps General Doctors, but is also quite expensive, so is not taken by the total number of trainees.

Conclusion:

General Medicine is not a hospital specialty. Probably that is a reason explaining the inadequate education of the GP trainees in comparison to other specialties. Orthopedic societies should take the step and educate general doctors in primary orthopedics, providing practical cources with essential skills in orthopedics, since the quality of Health Services in any country depends mainly on General Medicine.

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P41

Hallux valgus correction with proximal L-shaped metatarsal osteotomy – preliminary results

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Introduction:

Metatarsal osteotomy (MT-OT) is a common method to correct hallux valgus (HV)-deformity. Proximal osteotomies have a higher correction potential, without compromising blood-supply of the metatarsal head compared to the distal procedure. But they are considered to have less primary stability. In a prospective study, we investigated our series of proximal L-shaped MT-OT regarding loss of correction and patient's satisfaction.

Methods & Material:

Within eight months we performed ten consecutive L-shaped proximal MT-OT. The average age of the patient was 47±12 years (2M/8F). Accompanying procedures in all cases were resection of the pseudoexostosis, lateral release (lateral-collateral ligament, adductor hallucis, intermetatarsal ligament) and reduplication the medial capsule. In four cases a Aiken procedure was performed to correct an additional valgus-interphalangeus deformity. The HV and intermetatarsal-(IMT)-angle was determined in weight-bearing radiographs in two planes before the operation, after six weeks and one year, respectively. For four patients, one-year-follow-up data were available, six-weeks results were available for all feet.

Results:

The average pre-operative HV-angle was 28.8°±5.1°. Six weeks post-operatively, the HV-angle was 16.5±4.5°, the loss of correction after one year was 1.8°±1.3°. The average first-IMT-angle was 13.7°±1.3° and 6.9°±2.8° after six weeks, respectively. The average loss of correction after one year was 1.3°±1.9°. All patients were satisfied with the result. In one case intermetatarsal wound-healing disturbance occurred. In two feet disturbing screws were removed after one year.

Conclusion:

The proximal L-shaped MT-OT is a reliably reproducible, relatively easily to perform procedure with minimal loss of correction without the potential risk of compromising vitality of the metatarsal head. Patient's satisfaction is high.

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P42

Quantitative assessment of the three-dimensional lumbar spinal kinematics in subject groups with different degrees of functional impairment

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Purpose:

To investigate the three dimensional movements of the lumbar spine in subject groups with different degrees of functional impairment.

Materials and methods:

Lumbar spinal kinematics of 60 participants with chronic non-specific low back pain (CLBP) and 40 healthy subjects were assessed by an ultrasonic movement analysis device (Zebris CMS-HS). Patients with chronic non-specific LBP were grouped in three cohorts according to their functional impairment previously assessed by the Oswestry Disability Index (ODI). Minimal disability (ODI: 0-20%) was found in 20 cases, moderate disability (ODI: 20-40%) in 24 cases and severe disability (ODI: 40-60%) in 16 cases among the patients with CLBP. The average age was 39.4 years in the groups of CLBP and 26.9 years in the group of healthy subjects. Each individual performed flexion-extension, right and left lateral bending and right and left axial rotation. The parameters considered included range of motion (ROM) and velocity of motion. For statistical analysis Student's *t* tests were applied. $P<0.05$ was regarded as significant.

Results:

No significant differences of the measured parameters could be observed between the low back pain groups, but flexion-extension and lateral flexion in all disability groups have shown significant decrease compared to the healthy patients.

Conclusion:

It would appear that there is no evidence for a relationship between low back ROM and functional impairment in patients with chronic non-specific low back pain. (This study was supported by OTKA-T046800).

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