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Shoulder/Elbow

Arthroscopic treatment of calcifying tendinitis

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Introduction: The aim of the study was to evaluate the results of arthroscopic treatment in patients with calcifying tendinitis unresponsive to conservative therapy.

Patients: From October 1992 through June 1994, 21 patients (22 shoulders) were operated. There were seven men and 14 women, average age 43 (31–57) years. The average duration of symptoms was 54 (14–120) months. Arthroscopic subacromial bursectomy was performed in 5 patients (6 shoulders), in three with complete calcium removal. Arthroscopic acromioplasty was performed in 16 patients, in nine cases with evacuation of the calcium deposits.

Methods: Evaluation preoperatively and at follow-up included; Constant score, clinical examination and radiological evaluation.

Results: Twenty patients were available for follow-up. Average follow-up was 13 (9–18) months. In eight of the nine shoulders where the deposits were not removed, calcium resorption was complete at 3 months follow-up. There were five workmens compensation cases (WCC); three had some pain relief postoperatively but by objective criteria (Constant Score) none of the WCC patients had satisfactory results. Only one of the noncompensation cases had an unsatisfactory result.

Conclusion: Arthroscopic treatment of calcifying tendinitis is an effective procedure for the majority of patients. WCC claims were associated with inferior results.

Intraarticular lesions after acute primary anterior shoulder dislocations in young patients

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Aim: The aim of the study was an arthroscopic evaluation of the intraarticular pathology, especially a description and classification of the capsulolabral tears after a traumatic primary anterior shoulder dislocation (TPASD) in young patients.

Patients and methods: Between December 1991 and December 1993 ninety-two patients were examined with arthroscopy after TPASD . Criteria for inclusion was no prior history of shoulder dislocation, age between 15 and 39 years, radiographically confirmation of the dislocated shoulder and arthroscopic examination within 14 days. Average age was 23 (15–39) years, 74 men and 18 women. The arthroscopic examination was performed under general anesthesia in a lateral position using standard posterior approach, The capsulolabral lesions were described as intralabral (contusion and rupture) if the labral structure was damaged, but die base of the labrum was still firmly attached to the glenoid, as extralabral if the lesion was a glenolabral-, capsuloligamentous- or complete tear with loss of the bony and/or capsuloligamentous anchoring.

Results: The arthroscopic examination revealed 83 extralabral lesions (49 completer 26 glenolabral and 8 capsuloligamentous tears) and 15 intralabral lesions (contusion (8) and ruptures (7)). Sixty-nine Hill Sachs lesions, 10 osteochondral lesions of the central and posterior part of the humeral head and 9 osseous Bankart lesions were diagnosed. Synovitis (2) and partial rupture (1) of the biceps tendon and one partial rotator cuff lesion were found. Eighty-seven (95%) patients had ninety-eight labral and capsulolabral tears whereas five patients had a normal capsulolabral status. Twelve patients had both a intra- and extralabral lesion. The anatomical location of die capsulolabral tears was anterior in all patients. No lesions were detected in the posterior aspect of the joint.

Conclusion: Arthroscopic examination revealed that anterior intra- and extralabral tears appeared in 95% of the pa-

tients after TPASD. Anterior extralabral tears, especially complete tears were the most common capsulolabral lesion. Osseous lesions were found both in the humeral head and the glenoid cavity, but with a higher incidence of Hill Sachs lesions than previous reported after TPASD.

Effusion in the elbow joint

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Introduction: An earlier study showed that the ¿ ¿Radial Head-Capitellum View¿¿ (RHC) could be recommended only when an isolated effusion was identified on standard radiographs. In the present study the ability of four observers to diagnose the effusion on the standard lateral projection of the elbow joint was evaluated.

Material and methods: Seventy consecutive patients who suffered an acute trauma of the elbow joint, were included. All had radiographs in 3 projections (RHC, AP and LAT). The radiographs were evaluated twice by 4 observers (1 consultant. 1 sen. registrar, 1 registrar and 1 house officer) with an interval of 6 months for each observer. Before the evaluation the observers were instructed in the radiological criteria of effusion (fat pad sign).

Results: There were 15–22 effusions and fractures were seen in 29–30 cases. The observed agreement was ranging from 90% to 91% and 87% to 96% for respectively effusions and fractures. The kappa-values were ranging form 0.79–0.82 when effusion was evaluated and correspondingly for the fractures: 0.67–0.88. According to Altman 2 the strength of agreement (based on kappa) seen in this study was good to very good which is the highest possible score. The intraobserver agreement was even better.

Conclusion: This study shows that the fat pad sign can be used by both the experienced and the non-experienced orthopaedic surgeon evaluating primary radiographs.

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Hand surgery

Management of ulnar collateral ligament injuries of the thumb using the Mitek Anchor system

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The purpose of this study was to evaluate the use of Mitek Anchor system in the management of ulnar collateral ligament injuries of the thumb.

Patients: Between October lst 1991 and November 31st 1993, 43 patients were admitted to our department with the diagnosis of a ruptured ulnar collateral ligament of the thumb. Peroperatively the ligament was found to be avulsed off the basis of the proximal phalanx in 17 patients. These patients were operated on using the Mitek Anchor system. We have reviewed 16 of the patients where the Mitek Anchor system was used. The last patient did not attend to the second interview. 15 patients had acute injury to the ligament, one patient had an unsatisfactory result of a previous operation.

Method: A retrospective study based on existing information and any postoperative radiographs. At follow-up new radiographs was taken and a new examination was performed. Abnormal scar formation, active range of movement and laxity were parameters measured. The uninjured thumb was used as comparison.

Results: The 15 patients with acute injury to the ligament describe the results as good (5/15) or excellent (10/15). At examination we found normal range of active movement in 11 patients, no laxity in 13 patients but some tenderness around the scar in one patient. Abnormal scar formation was not found. The patient who underwent reconstruction claimed some improvement but 25 degrees of ulnar laxity and reduced force was found at the examination. The radiographs exposed one possible technical failure.

Conclusion: The Mitek Anchor system is a suitable alternative to pull-out wire in management of acute injuries to the ulnar collateral ligament of the thumb.

Distal radius fractures classified after Older—an observer variation-assessment

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Materials and Methods: The radiographs of 262 fractures of the distal radius were classified according to Older by five observers, one consultant radiologist and four orthopaedic

trainees to assess agreement (interobserver reliability and intraobserver reproducibility). The radiographs were classified blind with an interval of one month. Agreement rates were calculated by use of weighted kappa coefficients.

Results: The five observers agreed for 174 radiographs (66%) after first and 185 (71%) after second reading as classifiable according to Older, and for the Older type of 33 fractures first (13%) and 51 fractures (20%) after second reading. Overall agreement rates were fair. Median kappa value for interobserver reliability with the two weights were 0.53 (range 0.35–0.62) and 0.60 (0.45–0.71) after first and 0.57 (0.50–0.70) and 0.63 (0.56–0.76) after second reading. Intraobserver reproducibility were median 0.67 (0.63–0.86) and 0.71 (0.68–0.88). Simplification of the classification into two main groups (type I + II and type III + IV) did not improve agreement: 32%/35% were classified as type I or II and 22%/27% were classified as type III or IV, whereas 34%/32% were classified as type II or III.

Conclusion: The fair agreement in our study reflects the different interpretation of the classification between observers and that the test situation is very different from the clinical. Our results suggests some problems with Olders' classification if the treatment approach (conservative or operative) is based strictly on differentiation between type II and III. We find it important that the individual case is discussed before selection of treatment. However we consider classification of fractures as necessary in clinical work, postgraduate education and science, and we find Olders' classification useful.

Interobserver variation in classification of fractures of the distal third of the fourth and fifth metacarpal bones.

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During randomization of patients for a trial comparing different methods of treatment for subcapital fractures of the fourth and fifth metacarpal bones, we experienced a high disagreement rate between different orthopaedic registrars and trainees in the accident and emergency department in their inclusion of subcapital fractures and exclusion of intracapital fractures and distal shaft fractures. Therefore the aim of this study was to investigate interobserver variation in classification of fractures of the distal third of the fourth and fifth metacarpal bones, and to investigate if a special classification system was able to improve interobserver variation.

Thirteen physicians (2 hand surgeons, 2 orthopaedic surgeons, 3 orthopaedic registrars, 5 orthopaedic trainees and 1 radiologist) classified 45 fractures of the fourth and fifth metacarpals on the basis of radiographs (AP-, frontal- and oblique view). The fractures were classified into distal shaft fractures, subcapital fractures and intracapital fractures. After approximately two weeks the same 45 fractures were classified again by the same 13 persons according to a special new classification system.

The overall agreement rates were poor (kappa 0.381–0.571). The agreement rates between hand surgeons and orthopaedic surgeons were acceptable (kappa 0.600–0.797), as were the agreement rates between hand surgeons, orthopaedic surgeons and the radiologist (kappa 0.565–0.811). The agreement rates between orthopedics registrars and orthopaedic trainees were poor (kappa 0.389–0.552).

Classification using the new classification system did not improve interobserver rates. We thus conclude, that in investigations of subcapital fractures, where distal shaft fractures and intracapital fractures is to be excluded, it is advisable to let an orthopaedic surgeon or a hand surgeon take care of the inclusions.

Paediatric orthopaedics

Intramedullary femur-osteotomy

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Introduction: Patients operated by closed intramedullary femur-osteotomy, mainly indicated by anisomelia or rotation defects were followed up after 44 (24–72) months.

Materials and methods: Twenty patients (12 female) aged 13 to 63 years were treated by intramedullary femoral osteotomy followed by fixation using the Grosse-Kempf interlocking nail. Case records and radiographs were reviewed with a special view to complications.

Results: The mean time of hospitalization was 10 (4–15) days. The patients were mobilized after an average of 4 (2–9) days. Morphine drugs were typically used only in the first 24-hour period after surgery. No cases of nonunion were observed. At the first postoperative control, normal mobility of the knee joint was observed in all patients. Prolonged reduced function of the quadriceps was seen in three patients. No infections were determined. No patients expressed dissatisfaction with the method of treatment Conclusion: With regard to our follow-up, it seems that compared to conventional open surgical methods, the advantages of the intramedullary technique are shorter hospitalization time, faster mobilization after surgery, few complications and a high degree of patient satisfaction.

Talipes equinovarus—treatment and results

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In 1989 a new regime for the treatment of talipes equinovarus were introduced in our department. During the following 4 years 16 patients with 21 clubfeet have been treated according to this regime. One patient dropped out for social reasons, 15 patients (20 feet), have followed the regime. Age at follow-up 35 (14–69) months.

Method: Treatment is conducted by the same team of three: orthopaedist, physiotherapist and orthopaedic surgeon. As soon as possible after the diagnosis have been made, contact is made to the "varus-team". Treatment is established with manipulations taken over by the parents and a moldable redressing brace (Plexidur). The "varus-team" controls and adjusts treatment in the outpatient clinic. About 3 months an operative correction is performed with tendon elongations and capsulotomies through a Cincinnati approach. After postoperative plaster-cast for two weeks, a dynamic redressing splint is applied. The splint is controlled and adjusted regularly. When the child is beginning to stand with support, shoes with good heel-support is recommended, and the dynamic splint is used only as a "sleep-splint". When the child walks alone, the treatment is discontinued. Further controls in the outpatient clinic until 4–5 years.

Results: Time of operation 14 (11–26) weeks. Hospital stay 2.6 (2–4) days. No infections or other complications. Dynamic splint discontinued at 51 (45–64) weeks. At follow-up no feet were revised and all patients used ordinary shoes. According to Lehman's Functional Rating System, 95% of the feet were scored as excellent.

Conclusions: The utility of the chosen functional rating system can be discussed, but the results confirms, what is our general impression. This way of treating talipes equinovarus is giving pleasant results.

Motor function in children with congenital idiopathic clubfoot—a descriptive, controlled case-base-study

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The purpose of this investigation was to describe the motor function and morphological conditions in children with clubfoot compared to children without this deformity. Seven boys with clubfoot treated in Herlev Hospital 6–7 years ago and fourteen matched children without deformity were included. Clinical examinations, functional tests and structured interviews were used. Muscular dysplasia was seen in all clubfoot legs. Passive movements in affected ankle joints were reduced in plantar flexion, dorsal flexion and eversion. All the differences were statistically significant. Balance, coordination and plasticity in the ankle joints were reduced as compared with expected age-related level of motor function and to the control group. After physical activity pain and fatigue in the legs were more frequently reported by the clubfoot children. The conclusion is that motor function in clubfoot children is developed to a lower level than in children without clubfoot, and this corresponds to the rest-deformity.

Callus distraction with mini-fixator in the treatment of deformities in smaller bones

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Introduction: In cases of congenital malformations and acquired lesions in the extremities there may be a need for bone reconstruction. The purpose was to evaluate the treatment of deformities i smaller bones by means of callus distraction and the use of a mini-fixator.

Materials and methods: 15 reconstructions in 12 patients are presented. Median age was 14 (3–25) years. 7 patients had congenital deformities treated by lengthening of 5 metatarsals, 2 metacarpals and 1 ulna in total. In the 5 other patients there were cases with fracture sequelae, two fractures of the radius (3 procedures) and one metacarpal fracture, 1 iatrogenic shortened metatarsal bone and 1 case of a severely traumatized hand with digital amputations (two metacarpal lengthenings). In all cases a subperiosteal osteotomy according to De Bastiani was performed and distraction was performed by means of an Orthofix® mini fixator. A derotation and/or a correction of an angular deformity was performed as part of the operation in 6 cases. In 3 cases a provisional K-wire was used for joint stabilization and one had an extensor tendon lengthening.

Results: In 12 reconstructions the goal was achieved primarily, yet in two cases with a rather short lengthening due to lively bone formation. Premature healing of the osteotomy was a problem in 2 procedures and in one of these cases a new lengthening procedure was performed with a good result. All 4 procedures with heavy bone formation took place in the early period of using this method and were probably due to a late and/or too slow a distraction. Pin site infection was observed in 9 procedures and loosening of one or more pins, either clinically or radiologically judged, was seen in 4 of these cases. Furthermore loosening was observed in one case without infection. Loosening had no influence on the final results. Refracture was seen in one case with a spontaneous healing without problems.

Conclusion: With thorough planning and follow-up the method can be used with good results. A learning curve exists and the most common complications are due to pin tract problems.

Treatment of Legg-Calvé-Perthes disease—a meta analysis

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Introduction: The purpose of this paper is to show a scientific base for the choice of treatment in Legg-Calvé-Perthes Disease.

Materials and methods: The information of previous published investigations concerning the treatment of Legg-Calvé-Perthes Disease has low statistical power on account of small materials, when seen separately. When gathered the statistical power increases. Searching Medline® for the period 1976-94 revealed 28 publications on the treatment of Legg-Calvé-Perthes Disease in English language, where the results are evaluated using the concentric circles of Mose or similar radiographic based method, and in which the patients was split up in Catterall groups. We extracted 2140 patients from these papers, and grouped them after the kind of treatment they had received: Conservative treatment with or without containment, femoral osteotomies and pelvic osteotomies. Four authors reports of 281 untreated cases are used as a base for a meta-chi-squared-analysis.

Results: In Catterall groups 3 and 4 all kinds of treatment shows better effect than no treatment, in Catterall group 2 only the femoral osteotomies shows a better result. Conservative treatment with containment and femoral osteotomy shows the best results.

Conclusion: Femoral osteotomy or conservative treatment with containment can be recommended in Legg-Calvé-Perthes Disease, for children in Catterall groups 3 and 4. The choice between these two treatments has to be made, remembering the long duration of the latter treatment.

Hip fractures

Inter- and intra observer variation in the assessment of femoral neck fractures according to the Garden classification.

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Background: Several authors have throughout this century suggested different classifications to grade the severity of femoral neck fractures. Garden's classification has during the last decades been the one most commonly used. Classification systems should be an important tool in providing therapeutic guidelines, and according to this its reliability is indeed of great importance.

Purpose/material: The purpose of this study was to evaluate the reliability of The Garden Classification based on the degree of agreement in assessing preoperative radiograms from patients with femoral neck fracture. Our material consist of 130 consecutive patients with the above mentioned fracture, where all their radiographs are included, but only in the AP-projection according to the work of Garden in 1961. Prior to examination no special criteria were set as to the quality of the radiographs, but in one additional study 78 (out of the 130) radiographs were in accordance with objective criteria classified as having a technically satisfying quality and they were evaluated separately. All radiographs were examined independently by 4 observers - all orthopaedic surgeons. To ensure that all observers had a uniform interpretation of Gardens classification, his original paper was distributed and read by all observers prior to the study. Three months later, the same observers were receiving the radiographs one additional time under identical conditions.

Statistics: For statistical analysis we used the Kappa-coefficient, which is an expression for observed agreement corrected for by-chance agreement. The value of Kappa varies between +1 and -1. The value +1 expels the total perfection of agreement. Kappa values above 0.75 expresses excellent agreement, while values between 0.5 and 0.75 is equivalent to good agreement and finally are values below 0,5 regarded as poor agreement.

Results: We found the following Kappa-values in our study: The overall interobserver variation at the first/second examination: 0.033/0.054. The overall interobserver variation in the situation, where there exclusively is differentiated between undislocated fractures (Garden 1 + 2) and dislocated fractures (Garden 3 + 4), first and /second examination 0.771/0.786. Intra observer agreement according to the Garden classification for the 4 observers: 0.634 - 0.335 - 0.191 - 0.235. Intra observer agreement according to the modified classification Garden 1 + 2 versus Garden 3 + 4: 0.914 - 0.739 - 0.861 - 0.674. Regarding only the 78 radiographs classified as having a good technical quality we observed very similar Kappa-values both concerning the inter- and the intraobserver variation both for the Garden classification and the dislocated/non-dislocated modified system.

Conclusion: According to the above mentioned values, we found poor agreement between the observers in grading the femoral neck fractures according to the Garden classification. Furthermore also poor agreement between the first and second evaluation for the 4 observers. When reducing/modifying the classification to only dislocation (Garden 3 + 4) versus non-dislocation (Garden 1 + 2) we found good to excellent agreement concerning both the inter- and the intra observer variation. We did not see any differences when we evaluated only the technical good radiographs compared to all radiographs.

Dynamic hip screw versus Hook-pins versus Uppsala screws in treatment of fracture of the cervical neck

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To compare three methods of internal fixation of fracture of the cervical neck: Dynamic hip screw (DHS), Hook-pins (LIH) and Uppsala subchondral screw (Olmed).

Materials and methods: The prospective and randomized study consisted of 150 patients, 37 men and 113 women, median age 80 (47–94) . Fifty were allocated to DHS, 49 to LIH and 51 to Olmed. Forty-nine of the fractures were undisplaced (Garden type 1 and 2) and 101 were displaced (Garden type 3 and 4) . Clinical and radiographic follow-up was performed after 4 and 12 months. Radiographic complications were: penetration, early loosening, nonunion and segmental collapse.

Results: Fourteen patients were lost to follow-up, most often because of other severe diseases, 18 patients died. Fifty-two complications were registered, 16 (32%) in the DHS group, 17 (35%) in the LIH group and 19 (38%) in the Olmed group. In patients with displaced fractures, the rate of complication was 13 (40%) in the group of DHS, 17 (57%) in LIH and 15 (40%) in the group of Olmed. No difference were found according to complication, need for walking aids, pain and need for painkiller.

Conclusion: There were no difference between DHS, LIH and Olmed in the first 12 months. The rate of complication was unacceptably high in patients with displaced fractures in spite of the type of internal fixation.

Osteosynthesis of femoral neck fractures with 3 Ullevaal Screws.

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Aim: To investigate the results after osteosynthesis of femoral neck fractures with 3 Ullevaal screws.

Materials: In a period of 14 months from January 1993 32 femoral neck fractures, was osteosynthesized with 3 Ullevaal screws.

Methods: The mechanism of injury and the time from fracture to operation was registered. A scoring of social and functional conditions was done preoperatively. The preoperative radiograph was classified according to degree of osteoporosis and Garden. The postoperative fracture-dislocation was determined by Gardens alignment index on the postoperative radiographs. Following parameters were considered as failures of screw position: Lack of calcar support, screw penetration of caput, more than 10 mm distance from articular cortex to the tip of the screws, non parallel screws. At the latest visit to the outclinic, social and functional conditions was registered. The latest radiographs was evaluated according to healing-complications and loosening of the screws.

Results: Mean of age was 73 (SD 15.3) years. Male: female ratio was 1:2.2. The mean follow-up period was 14.1 months (S.D. 3.7 months). 56.3% of the fractures were undisplaced. 43.7% were displaced. In 37.5% of the cases, the screws were removed after mean 7.8 (SD 3.5) months. 18.5% because of local symptoms from the end of the screws, 6.2% because of lack of healing and 12.5% because of loosening of the screws. There were 3 cases of avascular necrosis. Only 2 patients were reoperated with a hemiarthroplasty and with a total hip replacement respectively. 17% of the undisplaced and 47%. of the displaced fractures had healing-complications, (NS, p=0.1). There was no significant correlation between healing-complications and failure of screw-positioning. Among the displaced fractures there were no significant correlation between healing-complications and the result of fracture-reduction. The degree of osteoporosis had no significant influence on loosening of screws or failures in healing.

Conclusion: 10% of the patients developed avascular necrosis and a total of 38% of the screws were removed, but only in half of these cases because of healing-complications or loosening of the screws. The degree of osteoporosis and placement of the screws had no influence on the frequency of complications. 47% of the displaced fractures had healing-complications.

The use of closed suction drains in femoral neck and intertrochanteric fractures

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Introduction: In order to avert hematoma formation and wound infection after osteosynthesis of hip fractures closed suction drains are routinely used in Denmark.

Materials and methods: Eighty patients who suffered a fracture of the femoral neck or an intertrochanteric fracture were randomized in our prospective study. The patients were treated by osteosynthesis (DHS, Ullevål screws) and were divided into two groups. In group A closed suction drains were used, while no drains were used in group B. The operative technique and the closure of the wound were the same for all patients. The two groups were compared in differences of temperature, sedimentation reaction, haemoglobin and leucocyte levels, signs of wound infection, hematoma formation and the need for transfusion.

Results: We found no significant difference between the two groups looking at the above mentioned parameters. There were no significant differences between the hematoma formation and wound infection rates.

Conclusion: We concluded that the use of closed suction drains is not necessary with uncomplicated osteosynthesis of the femoral neck and intertrochanteric fractures.

Treatment of fracture of the femoral neck by hemiarthroplasty a. m. Furlong (H.A.C.)

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Introduction: The purpose of the study was to evaluate the treatment of dislocated fractures of the femoral neck, looking at complications and long-term result.

Materials and methods: In the period 1987 to 1993, 185 fractures in 179 patients (mean: 82.3 years) were treated operatively with the Furlong (H.A.C.) prostheses. At time of investigation 106 patients were deceased. This was a retrospective study supplemented with a questionnaire (58 patients).

Results: The inclusion criteria was primary fracture (143 pts.), failure after osteosynthesis (34 pts.), displacement after conservative treatment (7 pts.) and pathological fracture (1 pt.). Eleven cases of surgical complications were recorded preoperatively and fourteen cases postoperatively (7 cases of luxation, 4 infections, 3 fractures). Four patients were reoperated with a total hip replacement. Average time to follow-up or death were 24,4 month, with a mortality of 10% after one month, 30% after one year and 46% after three year. The questionnaire showed that 77% were satisfied, 16% in doubt and 7% not satisfied

Conclusion: With few re-operations, a low frequency of complications and a high level of patient satisfaction, the prostheses fulfils the criteria for the treatment of dislocated fracture of the femoral neck in the elderly with a low level of activity.

Prevention of hip fracture with external hip protector

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Introduction: Approximately 90% of all hip fractures are related to a fall with impact near the trochanteric region. External hip protectors made with a hard outer shell has proven to be effective in preventing hip fractures in a nursing home population. The purpose of this study is to reduce the risk of later suffering a hip fracture by the use of external hip protectors in a population of inpatients in an orthopaedic department. The attitude and behavior in relation to external hip protectors are evaluated. Finally risk factors related to hip fractures are analyzed.

Method: External hip protectors are offered to 1000 inpatients aged 75 or more. By a structured interview items regarding risk of falling or sustaining a hip fracture are registered. A control group of 1000 patients are interviewed without being offered hip protectors. To clarify the attitude and behavior in relation to hip protectors a new interview take place 3, 6 and 12 month later. All fractures are registered during 12 month after inclusion.

Results: In the pilot study 38 patients were offered hip protectors (average 82 years). Twenty-five was interested, but for 3 persons the hip protectors could not fit. Eight of the 13 persons did not want hip protectors, as they had a feeling of not being at high risk for a later fracture. Among patients who did not want hip protectors there was a tendency to report fewer falls at home, a better balance and mobility prior to hospitalization. In contrast, the same group had a lower mental score.

Conclusions: One can expect that more than 60% of old people in an orthopaedic department will be interested in receiving hip protectors, when they are given free of charge. Regarding compliance it seems to be important, that the patients realize the risk of later hip fracture.

Osteoscopy in femoral neck fractures

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Introduction: Assessment of the perfusion in the femoral head was attempted by intraoperative osteoscopy in patients operated on for femoral neck fractures.

Material and method: 12 patients undergoing closed reduction and internal fixation with two 6 mm Olmed hip screws following a femoral neck fracture. 7 patients had a non-displaced fracture and 5 patients had a displaced fracture. A standard 5.5 mm arthroscope was introduced into the osseous tunnels prior to the insertion of the Olmed hip screws. After lavage with saline, bleeding was observed and video-recorded during the withdrawal of the arthroscope. In all patients osteoscopy was undertaken without major technical difficulties. Three different patterns of bleeding were encountered: No bleeding, b) possible bleeding i.e. non recurrent bleeding after lavage with saline and c) recurrent bleeding i.e. recurrent bleeding after lavage with saline.

Results: Bleeding patterns according to the displacement of the fractures are shown in the table:

Bleeding:	No	Possible	Recurrent
Nondisplaced	1 patient	1 patient	5 patients
Displaced	2 patients	2 patients	1 patient

Correlation of the bleeding pattern to the outcome of the fracture healing with special respect to the development of avascular necrosis of the femoral head has to await the follow-up.

Conclusion: Osteoscopy may be an option in the intraoperative evaluation of the perfusion in the femoral head in patients with femoral neck fractures.

Hip and knee arthroplasties

Comparative clinical follow-up of cemented versus non-cemented fixation of Taperloc femur stem in total hip arthroplasty

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Introduction: A retrospective comparison of the results of a cemented and non-cemented version of the same femoral component design.

Materials and methods: Series of 300 hips with cemented fixation and 203 hips with noncemented fixation of the stem were studied. The study was carried out by use of survival analysis and statistical analysis of questionnaires concerning the clinical outcome. All cups where noncemented Harris-Galante I type. Operations were performed from 1987 through 1991. Questionnaires were mailed in 1993.

Results: In the group with cemented stems, eleven had been revised due to aseptic loosening and three due to other reasons. Patients representing 35 hips had died. In the group with noncemented stems, two had been revised due to aseptic loosening or fracture. Patients representing seven hips had died. Survival analysis by use of Kaplan-Meier statistics did not reveal any significant difference between the two designs. Logistic regression analysis of clinical outcome according to questionnaires by use of a special designed score system (not biased by age, sex, follow-up period or indications) found better clinical outcome among the patients with noncemented stem.

Conclusion: No significant difference in survival between cemented and uncemented was found. A better clinical outcome according to questionnaires and the described score system was found in the group of patients with noncemented stem.

Impacted femoral cancellous grafting in cemented revision hip arthroplasty

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Revision hip arthroplasty of the femoral component with a cemented Exeter prosthesis and impaction cancellous bone grafting (X-change technique) (Gie et al. 1993) allows revision also in cases with severe bone stock deficiency. Early results have been encouraging. Since December 1991 we have used this technique in 70 revisions. This paper includes the first 45 which have a follow-up of 1 year or more.

Forty-five hips were operated in 43 patients. One patient has been operated bilaterally, and 1 hip has been operated twice. Male/female ratio was 24/21, right/left 22/23. The median age was 59 (26–89) years. There were 29 first femoral revisions, 15 second and 1 third.

Bone stock deficiency according to the Endo-clinic classification was grade I in 4, grade II in 20, grade III in 16 and grade IV in 5 cases. Four cases was operated as two-stage procedures with a three-week interval because of suspected infection, which was confirmed in 3.

Two hips have needed re-revision: One patient with a subtrochanteric fracture and bone loss grade III was revised after five months because of failure. One patient has been revised because of recurrent infection after a year. Another patient is infected with a fistula, but has not been revised. There has been one early postoperative prosthetic dislocation. One patient had a femoral shaft fracture below the prosthesis 3 months postoperatively.

The X-change revisions have generally resulted in an improved level of function and diminished pain in the patients, as expressed in the Harris-score.

Many cases show an improvement in bone quality with cortical bone remodelling and/or signs of trabeculation within the bone transplant. The femoral component often subsides slightly within the cement mantle within the first few months, and then remains stable.

Conclusion: Our early results with the X-change technique for revision of the femoral component in hip arthroplasties have been encouraging, also in patients with a poor bone stock and/or femoral fractures.

Reference: Gie GA, Ling RSM, Timperley AJ, Linder L, Simon J-P, Slooff TJJH. Impacted cancellous allografts and cement for revision total hip arthroplasty. J Bone Joint Surg (Br) 1993, 7S-B: 14-2 l.

Hip revision with graft impaction, Lubinus SP-II and Charnley

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We have used new special instruments for graft impaction in acetabulum and the femur adapted for Lubinus SP-II prosthesis and Charnley standard prosthesis in 48 cases.

We now report the first 22 hips in 22 patients 53 - 78 years old, all with mechanical loosening, first to third revision. Loss of bone stock grade II and III according to the Endoclinic classification. We used a posterior surgical approach with thromboembolic prophylaxis and antibiotic prophylaxis. Mobilization first to third day after surgery with crutches and protected weight bearing for 3 months. The complications was one refracture, one stem dislocation, one pulmonary oedema and one subluxation.

The results in 21 patients followed for 18–35 months (one dead after 6 months). 19 pain free, 2 slight hip pain. Radiographic results: early subsidence of stem and cement in 4 patients, between 3 and 8 mm. No graft resorption. No zones. Trabecular remodelling in 8 cases.

One retrieved femur 6 months after surgery with a Charnley flanged 40 prosthesis. Histology showed a high activity of new bone formation and osteid in the grafted areas. We also see dead graft pieces and pieces of new living bone in close contact with the cement. These early results are good and show signs of bone ingrowth with this impaction device, morsellized allograft and cemented standard prosthesis.

Bone mineral measurements by DEXA around the femoral component—the influence of regional size on the precision error

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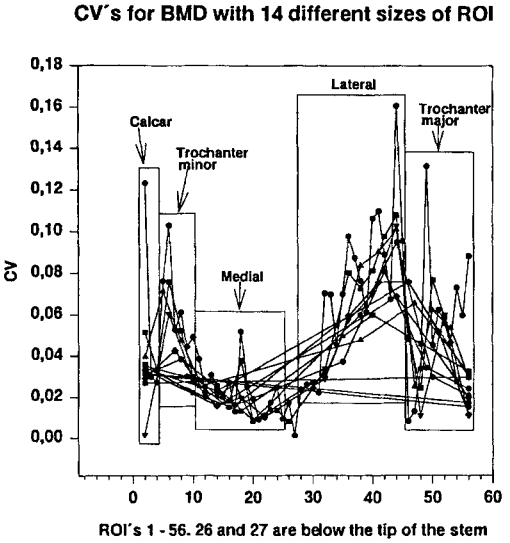
Introduction: The precision of bone mineral density (BMD) measurements and the influence of rotation of the femur were examined in a previous experimental study . The present study evaluates the possible influence of the regional size on the coefficient of variation (CV).

Material and methods: A cadaver femur with an implanted uncemented femoral stem were scanned by Dual Energy X-ray Absorptiometry (DEXA) at 15, 20 and 25 degrees of rotation (Norland XR26 Mark II). When measuring BMD, regions with sizes varying form 5 to 120 mm were used along the stem. The CV (CV = SD/mean) were calculated for all the regions at the three rotational degrees.

Results: The mean CV ranged from 2.32% (when using 75 mm regions) to 5.18% (when using 5 mm regions). No significant difference in CV for the 14 different sizes of regions (Kruskal-Wallis test) was found. The figure shows the variation of the CV (y-axis) as a function of localization (x-axis) for the 14 different sizes of regions around the femoral stem.



Conclusion: The coefficient of variation for measurements of bone mineral along the femoral stem was unaffected when region size was varied from 5 to 120 mm and the measurements were performed at three different degrees and rotation.

Reference: Gehrchen PM, Petersen MM, Nielsen PK & Lund B. Bone mineral density measurements around the femoral component. Acta Orthop Scand 1994; 65 (suppl 262): p.18.

Postoperative immunomodulatlon following cementless TKA

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Introduction: Postoperative immunosuppression is well documented in the field of surgical gastroenterology and is believed to increase the risk of infections (1). Postoperative immunomodulation following orthopaedic surgery is poorly documented.

Patients and methods: 12 patients with arthritis of the knee were treated with cementless total TKA (AGC2000, Biomet). [Spinal analgesia, tourniquet, postoperative autotransfusion (CBC, Stryker), no homologous transfusions]. Peripheral venous blood samples were drawn preoperatively and at postoperative days 3, 6, 9 and 14. Monoklonal antibodies (DAKO) were used to identify the lymphocyte subpopulations and analysis was performed using flow cytometry (Epics Profile). The following subsets were identified in pairs and the quantity expressed in percent of total lymphocyte count: CD3 (T-cells) and CD19 (B-cells), CD4 (T-Heiper) and CD8 (T-Suppressor).

Results: (Wilcoxon)

Subset	preop	day 3	day 6	day 9	day 13	P
CD3	60.4	58.1*	62.4*	61.3	61.8	< 0.05
CD19	11.9	13.3*	13.0	12.9	12.2	< 0.05
CD14	37.3	34.2*	41.9*	40.3	40.1	< 0.01
CD8	24.8	24.3	22.4*	22.8	23.2	< 0.05

Conclusion: We found postoperative immunosuppression, shown by a significant decrease in CD4 (T-Helper), followed by a significant compensatory increase. These postoperative immunological changes seems to be of lesser magnitude than those seen after some forms of abdominal surgery (2). This can perhaps be explained by the nature of the surgical trauma and by not transfusing homologous blood (3).

Reference: (1) Lennard: The influence of surgical operations on components of the human immune system. Br J Surg. 1985; 72:771-6. (2) Hansbrough: Altered helper and suppressor lymphocyte populations in surgical patients. Am J Surg. 1984; 148: 303-7. (3) Maeta: Perioperative allogeneic blood transfusion exacerbates surgical stress-induced postoperative immunosuppression. J Surg Oncol. 1994; 55: 149-53.

Arthroplasty of the patello-femoral joint a.m. GUEPAR

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Introduction: Isolated patello-femoral osteoarthritis (OA) is a challenging problem in orthopaedic surgery. Rarely there is an indication for patellofemoral arthroplasty (PFA), and this study is an analysis of the value of surgical treatment with a PFA in these cases.

Materials and methods: From Dec. 1987 to April 1993, 13 patients (15 knees) underwent a PFA, 9 women and 4 men. The prosthesis in use was designed by the GUEPAR-group (France). 1 patient was reoperated 6 months later with a total knee replacement due to aggressive OA and concomitant necrosis of the patellar bone including loosening of the polyethylene component. 1 patient did not want to participate in the study. 11 patients (13 knees) were examined, average age 65 (47–77). At follow-up, average 51 (18–86) months, all patients were interviewed and examined including radiographs. Assessments were made using the rating scale of Hospital for Special Surgery (HSS).

Results: 10 knees were rated as excellent or good, and 3 as fair according to the HSS-score. 6 patients had no or reduced pain, 4 patients (5 knees) had initially reduced pain but developed later increasing pain. 1 patient bilaterally operated had no change in preoperative pain.

Conclusion: PFA is a satisfying solution in the treatment of painful OA in the patello-femoral joint, when nonsurgical treatment has proved its insufficiency, but the indication for PFA is rather limited. A PFA can be changed for a total knee arthroplasty.

Five-year survival after total knee arthroplasty

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Introduction: In Denmark around 1,500 Total Knee Arthroplasties (TKA) are performed every year, but the survival of these patients is unknown. Therefore, we have investigated a large group of TKA patients, and compared them with a group of patients operated on with Total Hip Arthroplasty (THA) and with the age- and sex-matched general population.

Patients and methods: In the period February 1989 through December 1990, a total of 1024 TKAs (AGC 2000) were performed in 926 patients in 14 Danish departments of orthopaedics. In the same period, 344 THAs with similar age- and sex composition were performed in Hillerød. For TKA the following factors were analyzed using Cox analysis: age, sex, diagnosis, preoperative job and activity level, +/- cement, complications within the first year, and the first vs. the second TKA. For THA age, sex and diagnosis were analyzed. December 1994 the time of death, if any, was checked. Cumulative survival was estimated using the Kaplan-Meier method. The expected mortality (standardized mortality rates) were calculated from life tables from the Danish Central Bureau of Statistics.

Results: The cumulative 5-year survival was 89% for both TKA and THA patients, this being significantly better than expected. Mortality increased with age, but not as much as could be expected. Among the 926 TKA patients, 139 deaths were observed, but 176.6 were expected. For the 246 males, the numbers were 50 vs. 56, and for the 680 females the numbers were 89 observed vs. 120.7 expected deaths. I.e. an improved survival for both sexes, but significantly higher for females. Among the 761 osteoarthritis patients, 115 deaths were observed, but 155.5 were expected, whereas 112 rheumatoid patients had 20 deaths vs. 13.9 expected deaths. Among the 25 patients with complications a total of 8 deaths were seen vs. 4.5 expected. When stratifying for age and sex, old females with osteoarthritis turned out to be those with the relatively best prognosis. Splitting up into the different complications revealed no significance, nor did the remaining factors.

Conclusion: Male sex, old age, rheumatoid patient and complication within the first year all included increased mortality; in case of rheumatoid patient also compared to the expected survival. However, the general survival after TKA was significantly better than expected, and identical with the survival after THA. The cumulative 5-year survival was 89%.

Noncemented total knee arthroplasty for the treatment of rheumatoid arthritis

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We examined the results of uncemented total knee replacement with PCA and LCS prosthesis.

Material and methods: 35 prosthesis were inserted from December 1985 to February 1994 in 24 patients (4 men and 20 women). Peroperative Mean age 62 year (25-77). At the

time of follow up 3 patients with 5 TKA were dead and 1 patient with 2 TKA was unavailable, but had no pain. 20 patients with 30 TKA underwent a clinical examination with knee score according to the HSS. Standardized radiographs were obtained using fluoroscopy.

Results: At follow up 26 of 30 TKA had no pain, 3 had minimal pain and 1 moderate pain. Using HSS knee assessment 18 TKA were found excellent, 8 good, 2 fair og 2 poor. Median HSS score 85 (53–98). 18 patients were satisfied, 1 patient critical and 1 patient discontented. 3 patients were re-operated. There were no deep infections. There were only minimal radiolucency.

Conclusion: We found acceptable results after insertion of a uncemented prosthesis for the treatment of RA.

The ANSPACH system for removal of fractured stem in total hip replacement.

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Fracture of the femoral component in total hip prosthesis is a well-known complication. A fractured stem will nearly always necessitate revision, and during operation it can be difficult to retrieve the part distal to the fracture as this part is not loose. Conventional techniques involve the cutting of a window in the lateral femoral cortex - but this carries the risk of weakening the bone and often requires insertion of a long-stemmed prosthesis.

The "ANSPACH 65K EXTRACTOR III" (BIOMET) offers a new method of retrieval of the distal part of the prosthesis from above. A high-speed drilling machine into which special carbide-cutters are inserted is used to drill a 7-mm conical hole in the broken stem, and by means of a small malleable sleeve an extractor rod is impacted into the hole. A slide hammer is attached to the extractor rod, and the prosthesis is easily removed with light taps. Since march 1993 we have used this system 7 times, without any problems in 5 cases. In 2 cases it was not possible to drill a sufficiently large hole in the stem, and this was subsequently removed via a window in the femoral cortex. Against the background of our experience we find that we can recommend this method.

Impacted morsellized allografts and cement for revision total knee arthroplasty—a case report

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Revision of failed knee arthroplasty with intramedullary impaction of morsellized allograft similar to the technique described for the hips has been performed with a new impaction device for Link rotation knee in three cases. Follow up after 17, 18 and 24 months showed satisfying clinical and radiological results. Histology in two cases showed replacement of the allograft with viable bone after 14 and 23 months. This preliminary report suggests that impacted morsellized allograft may be used also in knee revision surgery and it is our opinion that this method may be the best alternative when prosthesis with intramedullary stems are revised.

Knee, leg and ankle

Reconstruction of the anterior cruciate ligament using the ABC-ligament—a 2 year follow-up study.

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Purpose: To evaluate the results 2 years following reconstruction of the anterior cruciate ligament using the ABC-ligament.

Material and methods: 29 consecutive patients, age 18 to 46, with rupture of the ACL-ligament and persistent instability after rehabilitation were treated by the ABC-ligament. 5 patients underwent reoperation before the time of follow-up, using the Bone-Tendon-Bone technique. 4 patients were not available for reexamination. The remaining 20 patients (9 women and 11 men) were reviewed after 25 (23–28) months.

Results: 14 patients were satisfied with the result. 3 reported continued giving way and three still used a stabilizing bandage during sports activity. Mean Lysholm score was 86 (55–100). 13 had improved activity-score (Tegner). 2 reached their pre-injury level. In 11 patients the Lachmann test was found positive, 4 had a positive pivot shift. In 6 patients the mobility was decreased. The knee laxity test was increased on average 3,9 mm compared with the uninjured knee. Quadriceps atrophy greater than 2 cm was found in 4 patients. 8 complained of pain due to the tibial plug.

Conclusion: 14 of 25 (56%) patients had obtained a satisfactory function after 2 years. This is comparable to other short-term studies of this ligament. Better results have been reported using biological grafts.

Ketoprofen versus morphine in the treatment of severe pain after reconstruction of the anterior cruciate ligament.

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Aim: To compare the safety and efficacy of ketoprofen and morphine in the treatment of severe pain after reconstruction of the anterior cruciate ligament (ACL).

Materials: The study included 63 patients. 43 patients were evaluated. Mean age for the Ketoprofen group was 24.5 years and for the Morphine group 26.7 years.

Method: All patients were operated arthroscopically using bone-tendon-bone ligament. We used the mid third of the ligamentum patellae. The trial was a randomized double-blind investigation. Consecutively, patients were included and randomized to either treatment with ketoprofen or morphine for the first three postoperative days.

Results: For mean pain intensity day 1, mean pain difference, use of escape medicine, overall, and mean pain intensity all days calculated on the basis of verbal rating scale, analyses showed no significant treatment effect (p=0.3619). The safety evaluation shows significant difference between the treatments (adverse events ketoprofen 9 versus morphine 18 pts; P=0.009)

Conclusion: Both ketoprofen and morphine are efficient in the treatment of severe pain after reconstruction of ACL. There is no significant difference in use of escape medicine. There is no significant difference in analgesic effect. Ketoprofen gives less adverse drug reactions.

Postoperative "Cryo - cuff" treatment

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The purpose was to estimate the effect of cold—and hydrostatic pressure—treatment following anterior cruciate ligament (ACL) reconstruction.

Material and methods: Forty patients were consecutively included in a prospective study. All over the age of 18, with isolated ACL - insufficient diagnosed by arthroscopy. They were treated with open ACL reconstruction (BIB - graft and LAD - augmentation) in spinal anaesthesia. Patients with previous knee-surgery except partial trans-arthroscopic meniscal-resection, other knee-ligament injuries or previous intraarticular features were excluded. The patients were randomized into one of the following postoperative regimes: (I) conventional after-treatment with a standard dressing (control group, n=20), (II) Cryo-cuff treatment during the first 6 h after surgery (n=20). Skin temperature was electronic recorded every half hour at the operated and the non-operated knees. Pain was assessed using Visual Analogue Scale at 1, 2, 3, 4, 7 and 14 days after surgery. Total analgetic requirements during the first 14 days after surgery was recorded. Swelling of the operated knee was recorded preoperatively, 3, 7, 14, 21 and 30 days after the surgery. Total drainage after the surgery was recorded. The patients were evaluated 6 month after surgery with the Lysholm - knee function score.

Results:

	+ Cryo-cuff (II)	– Cryo-cuff (I)
Age	26.4 (18–47)	28.0 (18–47)
Temp diff (°C)	–0.8 (–2.1–0.0)	0.4 (–1.1–2.1)
Swelling diff (cm)	0.9 (–1.0–3.1)	1.5 (–2.0–4.6)
Pain	2.5 (1.5–5.0)	2.5 (1.0–5.0)
Analgetics		
paracetamol (g)	12.0 (1–23)	8.2 (0–18)
NSAID (mg)	1976 (60–6390)	1696 (0–8260)
morphine (mg)	49 (0–120)	38 (0–390)
Drainage (mL)	139 (12–570)	111 (0–390)
Lysholm score	91 (83–100)	90 (58–100)

Conclusion: Cryo-cuff treatment following open ACL-reconstruction shows only a minimum of cooling effect and reduction in swelling of the operated knee. It was not possible to show any reduction in postoperative pain, likewise there were no improving effect on any of the other data recorded.

Avulsion fracture of the tibial attachment of the posterior cruciate ligament.

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Introduction: The aim of the present study is to present the trauma, treatment and outcome of osteosynthesis of isolated avulsion fractures of the tibial attachment of the posterior cruciate ligament.

Materials and methods: In the period 1978 to 1993 six patients were treated at the County Hospital of Vejle and the University Hospital of Odense due to isolated avulsion fracture of the posterior ligament at the tibial attachment. 5 men and 1 woman were operated with osteosynthesis. The age range from 18 to 57 years (average 26). The cause of injury was: Motorcycle accident 2, dashboard injury 2, fall 1 and motorbike 1. All patients were follow up clinically and radiologically. Time of follow up was from 17 to 146 month (average 68 month). The results follows the criteria of Hughston graded as good, fair and poor based on a objective, subjective and functional judgement of the knee.

Results: Objective: 3 patients had a good and 3 a fair result. Subjective: 3 patients had a good and 3 a poor result. Functional: 2 patients had a good, 2 a fair and 2 a poor result.

Conclusion: Acceptable results in comparison with the very few other results in the literature. Operation is recommended.

Complicated muscular reflex elicited from the ACL

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Introduction: The proprioceptive function of the knee is changed after ACL injuries, and even though the knee is stabilized with a graft the proprioception is not normalized. This study was performed to clarify if a muscular reflex can be initiated from sensory nerves in the ACL.

Patients and methods: In twelve patients with a normal ACL, two stimulation wires were inserted into the proximal and distal end of the ACL. The ligament was stimulated with a monophasic current stimulus in trains with 1 to 10 stimuli, each lasting 1 ms. Surface electromyogram (EMG) was recorded from biceps femoris, semitendinosus, the medial head of quadriceps, rectus femoris and the medial head of the gastrocnemius muscle. 25–50 consecutive sweeps were full wave rectified and averaged both at rest and while the subjects flexed or extended against an external load.

Results: Singular stimuli did not elicit any changes in the EMGs. Stimulus trains elicited a complicated response: At rest the hamstrings were stimulated. During active flexion the hamstrings were inhibited, during active extension the quadriceps was inhibited and in both situations the gastrocnemius was inhibited. The reflex was most prominent during dynamic work and diminished during static work.

Conclusion: From normal ACLs a uniform but complicated reflex to the muscles around the knee can be elicited. This reflex is probably of importance for the normal function of the knee.

Talu-crural arthrodesis a.m. Baciu

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Retrospective examination of patients, who has had talu-crural arthrodesis done after the Baciu method between March 1993 and November 1994.

Patients and methods: 12 patients at the age of 36 to 72, average 54 years. Sex M/F 6/8. 11 right and 1 left ankle due to arthritis (2), rheumatoid arthritis (2) and posttraumatic arthritis (8). A Kirschner wire is drilled in the medial malleolus, through the talu-crural joint and through the lateral malleolus. An 18 mm milling-cutter is manually drilled to lateral corticalis on the lateral malleolus. The dowel of bone is then rotated 90 degrees and reinserted. A below-knee cast is applied and full-weight bearing is allowed.

Results: Average operation-time 32 (25–65) min, average post-operation hospitalization 4.5 (3–9) days, average time in cast 11.5 (7–16) weeks. 9 patients had solid fusion, 3 has had a reoperation. 2 patients has returned to their previous jobs, the remaining were already pensioners.

Patients opinions: Excellent 1, good 4, satisfactory 3, poor 4 (incl. 3 reoperations). Normal shoes 6, special footwear 3 out of which 5 has "rocker-soles". Pain when walking 5, pain when manipulated 4. All arthrodesis in neutral position. Average Mazur score 78 (64–92).

Conclusion: Regarding the frequency of fusions this operation method is equivalent with other methods. The advantages of this method is, short operation- and hospitalization time, simple method, easier on the patients, no external apparatus thus no skin care, no shortening of the leg, very small risk of wrong position of the arthrodesis and less risk of infections.

Limitations: Considerably preoperative wrong position of the talu-crural joint.

DonJoy R.O.M-Walker versus Aircast in treatment of stable lateral malleolar fractures

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Introduction: The aim of this study was to evaluate the usability of Aircast in treatment of stable lateral malleolar fractures type SE-II and compare it with DonJoy's R.O.M.-Walker.

Methods: In a prospective study 68 consecutive patients with type SE-II fracture were included and randomized to either Aircast or R.O.M.-Walker. Both braces were applied from day one, and allowed free motion in dorso- and plantarflexion. From patients pain-diary Pain intensity (scale 0-10) was calculated.

Results: Totally 59 could be evaluated (29 Aircast & 30 R.O.M.-Walker). The Patients comfort was significantly better in the group treated with Aircast. Inflammatory score (max. 48 points) was measured after 1 week, 4 weeks, 6 weeks and 12 week but significantly differences was only found at the 4th week examination (Aircast 17 points & R.O.M 12 points). Pain intensity Aircast/R.O.M. during the 1th week: 5.1/4.9 (NS); 2nd week 3.5/2.7 (NS); 3d week 2.1/1.2 (NS); 4th week 1.2/0.6 (p=0.05).

Conclusion: Significantly most comfort was found in the group treated with Aircast. The group treated with R.O.M.-Walker had the lowest inflammatory scores and tendency to better pain relief. Both braces has been found qualified in the treatment of stable malleolar fractures type SE-II.

Treatment of malleolar fractures in Denmark

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Introduction: Malleolar fractures are common fractures and well described. The treatment is either conservative or operative. A great many of operating methods are described in literature. The aim of the study was to find out how these fractures usually are treated in Denmark.

Materials and methods: A questionnaire was sent to all Departments of Orthopaedic Surgery and to all Departments of General Surgery in Denmark, 66 departments in all. 51 of these departments replied to the questionnaires (77%)

Results: The results showed that 64% of the Departments of Orthopaedic Surgery were treating stable fractures with osteosynthesis. In 13% of the Departments of General Surgery. In 75% of the Departments of Orthopaedic Surgery operated malleolar fractures were treated with plaster of Paris immobilization of the fracture for 6 weeks. The most common method of osteosynthesis of malleolar fractures in Denmark is A.O.

Conclusion: In most Departments of Orthopaedic Surgery in Denmark all types of malleolar fractures are operated on. In the Departments of General Surgery mostly unstable fractures are operated on, and only few stable fractures. Most of the Departments of Orthopaedic Surgery use plaster of Paris immobilization of the fracture for 6 weeks even if osteosynthesis has been performed.

Below-knee versus above-knee cast after Achilles tendon repair—a prospective controlled study

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In the last decades most departments have stopped using above-knee casts after Achilles tendon repair. Some still use the above-knee cast in the first weeks postoperatively to ensure the immobilizations. A controlled study between the below-knee and the above-knee cast has newer been done, so the purpose of this investigation was to study any differences in the outcome.

Material and method: During a period of two years, 40 patients were randomized for postoperative bandaging in either, a below-knee plaster with the ankle in equinus position for four weeks followed by a plaster cast for walking for four weeks, or an above-knee plaster for four weeks followed by a plaster cast for walking for four weeks. During the operation metallic markers were placed in both tendon ends and the distance between these were followed by standardized radiographs. Two patient were excluded because of protocol compliance; All other were examined after 4, 8, 12 weeks postoperatively and at a Follow-up after 1–2 years. At the early controls special effort was done to monitor pain, ROM, muscle athrophy and sick-leave. At Follow-up examination Isometric plantar strength was measured.

Results: We found no significant differences between the two groups concerning pain and use of analgesic. The above-knee cast group was on sick-leave median 10 weeks, the below-knee cast group 7 weeks. The above-knee plaster group had significantly more quadriceps athrophy and a significant ROM reduction in the knee joint after 4 weeks; but not later on. At follow-up median 15 month (13-23) after the operation, we found no difference in the patients subjective evaluation of the result. No difference was found in complains of tenderness or stiffness. Using the Tegner score both groups were declined from median 6 to 5, but significantly more patients in the below-knee group had resumed sport. We found no significant differences in ROM, plantar flexion strength (isometric strain-gauge), work capacity of calf muscles or athrophy of quadriceps or calf circumference. With a median separation on 11 mm after 12 weeks in both groups, no significant differences between marker separation were found. In the above-knee plaster group, a single re-rupture occurred.

Conclusion: Using an above-knee cast after Achilles Tendon repair seems not to minimize postoperative pain. We found no advantages; but only some early knee problems and a delay in resuming sports activities and have now stopped using the above-knee cast in the department.

Pseudarthrosis treated a.m. Ilizarov

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Introduction: Evaluation on the treatment of tibial pseudarthroses with external fixation a.m. Ilizarov.

Material and methods: 16 patients with an average age of 35 years (10-56) with pseudarthrosis, localized to tibia. 4 were hypertrophic, and 12 atrophic. 2 hypertrophic and 6 atrophic were infected. 11 patients had been through one or more conventional operations for pseudarthrosis. The purpose for the Ilizarov treatment was union and elimination of infection. The additional goal was correction of deformities, and elimination of shortening. The hypertrophic pseudarthrosis was treated with compression/distraction, and in case of shortening distraction by means of proximal corticotomy. The infected atrophic had a segmental resection, proximal corticotomy and internal bone transport followed by compression/distraction. In 4 cases a supplementary spongious autograft was performed.

Results: 15 pseudarthroses united. 9 had significant deformities eliminated. 7 had an average of 5 (3–10.4) cm internal bone transport. Duration of treatment from operation till removal of fixator was 5.2 (2.5–11) months. Lengthening index was 1.7 (O.4–6.3) mdr/cm. 7 patients who had no additional deformity were treated in 3.9 (2.5–7.3) months.

Complications: There were 9 cases of pinsite problems, all treated with oral antibiotics, and one patient was reoperated with additional bone grafting. One patient had broken wires exchanged twice. 1 patient who suffered from his pseudarthrosis for 15 years, and was operated on several times chose to be amputated, although callus was initiated 3 months after beginning of treatment.

Conclusion: Pseudarthrosis can be treated a.m. Ilizarov, and it seems possible to achieve union in most cases. We observed only few minor complications. The treatment is demanding to the patient as well as to the surgeon.

Is diagnostic knee arthroscopy in the outpatient clinic justified?

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Introduction: Diagnostic knee arthroscopies are performed in local anaesthesia in the outpatient clinic. The aim of the study was to evaluate if this is an appropriate procedure.

Patients and methods: The hospital files for all patients who had arthroscopy performed in the outpatient clinic under local anaesthesia during the period 1985–1990 were studied and the necessary information extracted.

Results: The arthroscopy could be completed in 360 of the 371 patients. In 172 patients (46%) there was no indication for further surgical treatment and 14 (4%) had arthroscopic surgery performed during the outpatient procedure. Totally 188 (51%) patients were discharged in connection with the arthroscopy, but 10 of these had to be rearthroscoped due to unchanged symptoms. 158 (43%) were put on a waiting list for surgical treatment during admission—only 135 of these were actually arthroscoped again. In these, the same diagnosis was found during the first and second arthroscopy in 54% of the cases. The patients waited 91 days (mean, range 0–1554 days) for the outpatient arthroscopy and 185 (6–1546) days for the second arthroscopy.

Conclusion: For the patients who could be discharged after the outpatient arthroscopy the diagnostic procedure was a good alternative. For the rest of the patients it was a time consuming step to the final surgical treatment. Outpatient arthroscopies should not just be performed for diagnostic reasons and the technical possibilities to perform surgery, especially partial meniscectomies, should be available.

Miscellaneous

Distraction histeogensis for revascularization of a leg threatened by amputation

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Introduction: In conjunction with callus distraction by means of Ilizarov technique a histeogenesis is seen in the surrounding soft tissue with creation of blood capillaries among other things. The purpose was to use this effect for revascularization of a leg and foot in a patient threatened by amputation and where vascular surgery was not possible.

Material and methods: A 71-year-old man with pain in the foot during night time and with chronic toe ulcers without healing tendency is presented. Repeated measures of distal blood pressure over a period of one year showed toe pressures < 15 mmHg. Angiography at two occasions showed severe peripheral arteriosclerosis with occlusion of all three rural arteries without possibility for vascular reconstruction. The patient was offered a treatment with distraction histeogenesis in stead of amputation. A longitudinal corticotomy was done percutaneously on the tibia and the fibula, and distraction was performed by means of K-wires connected to an Ilizarov frame.

Results: As the result of distraction a vascular genesis in the surroundings, verified by arteriography, took place. The ulcers disappeared together with the rest pain. The toe nails started to grow again and the walking distance was increased to infinity. Since the operation toe pressure has been ever increasing to > 40 mmHg. Pletysmographic evaluation has demonstrated a blood flow as high as or higher than in the other leg free of symptoms and at a level of a normal leg. There were no wound complications but during the treatment infection was seen in conjunction with one K-wire. The infection disappeared by means of simple wound treatment in combination with oral antibiotics after frame removal. The patient is still symptom free 2 years and 8 month after the operation.

Conclusion: In some cases of arteriosclerosis threatened by amputation and without any possibility for vascular reconstruction one may use distraction histeogenesis for the local genesis of new blood vessels in the soft tissue thereby increasing local blood flow. The hypothesis is that multiple small capillaries has been created by angio genesis establishing yet a low pressure area but with a high total blood flow.

The first 31 patients from former Yugoslavia admitted to the Department of Orthopedics, Rigshospitalet, Denmark

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Introduction: Since July 1993 patients from the civil war in the former Yugoslavia have been admitted to the Department of Orthopaedics, Rigshospitalet for further treatment. We report our experience from the first 18 months.

Patients and methods: Retrospective registration of data from the journals of the first 31 patients.

Results: The patients were 24 men and 7 women ages 14 to 64 years old. Twenty-nine patients had suffered from injuries caused by bullets, explosives etc., and 2 patients suffered from bone tumors. Time from initial trauma to arrival in Copenhagen was median 169 (25-581) days. At arrival 27 patients suffered from sequelae to fractures. Twenty-two patients suffered from infections demanding surgical revision or antibiotic treatment, of these 12 patients suffered from osteomyelitis. Three patient suffered from sequelae to amputations. One patient had sustained a lesion of the sacral plexus caused by a bullet.

Treatment in the Department of Orthopedics, Rigshospitalet: Further surgical revision: 18 patients; Internal fixation of fractures: 2 patients; Bone lengthening: 4 patients; Amputation: 1 patient; Operation for nonunion: 2 patients; Arthrodesis: 1 patient; THA: 2 patients; Other operations: 13 patients.

Conclusion: A major part of the patients suffered from infections demanding further antibiotic treatment or surgical revision. Reconstructive surgery was carried out hereafter when necessary.

Disaster medicine preparedness for hospital personnel in Viborg, Ringkøbing and Arhus county—region II of the Civil defence

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Through questionnaires to all anesthesiological, orthopaedic and surgical departments in region II of the civil defence and to all doctors and nurses in the region who have participated in disaster medicine preparedness course since 1990, we have tried to illustrate the coverage of preparedness for the hospital personnel and factors related to this in the region. From the 335 doctors and nurses, who received a personal questionnaire, 5% could not be localized and 65% replied. The percentage of reply for the individual departments concerning doctors and nurses respectively was: 97% and 99%. On average 7% of the junior consultants, 29% of the senior consultants and 56% of the chief consultants at the departments in question had attended a disaster medicine preparedness course. The distribution of doctors on average according to speciality is seen from Table 1.

Percentages	Anest. dept.	Surgical dept.	Orthop. dept.
Junior consult.	14	0	10
Senior consult.	28	24	41
Chief consult.	88	37	46

On average 31% of the nurses at the departments in question had attended a disaster medicine preparedness course. The distribution of nurses on average according to speciality is seen from Table 2

Percentages	Anest.	Op.	Casualty	Surg.	Orthop.
Nurses	59	28	41	1	0

From the persons in question 15% had attended further courses concerning disaster medicine and 43% had used the acquired knowledge either in theory or in practice. From these 43%, 62% had used their knowledge in dealing with larger trauma cases, and 51% in relation to training. 10% had used the quarried knowledge in relation to preparedness management and 12% in relation to purchase of preparedness equipment. 97% replied in a positive way to the question whether the course in general had been fertile, and there were a generally request for a follow-up course once a year. Several stated problems concerning planning inside the specific departments, partly because of a large staff turnover and partly because of lack of possibility of priority concerning the staff members wanting to attend the course, as the selection of participants is done by the course managers according to the course it self.

Radiographic examinations at an open casualty department of a county hospital—changes from 1983–1993

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Introduction: To illustrate the use of, the results and the staff - and - time work load involved in examinations in the casualty department of a County hospital and a comparison made to a similar examination ten years ago.

Materials: Out of 3,729 patients 1,372 radiographic examinations were undertaken during a four months period of observation in 1993.

Results: We found an increase in patients visiting the casualty department on 50% compared to the investigation ten

years ago, with the major part of increase among minor injuries, which increased from 19.7% in 1983 to 27.9% in 1993. The increase in incidence of radiography was from 14.5 to 16.1 (11%). On average 44% were positive solely diagnosing fracture and 73% were positive if distorsion and ligament rupture were included. Still 50% of the radiographic examinations were performed at daytime (08.00–15.59 hours) and less than 10% during the nighttime (00.00–07.59 hours). The staff - and - time work load in the radiology department was 8% of the total amount i 1983 and 1.2% in 1993.

Conclusion: Though there were seen an increase in the total number of radiographs on 24% and in the incidence on 11%, we conclude, that thus the amount of patients visiting the casualty department has increased drastically, this has not influenced the quality of the junior doctors treatment, and it is not considered suitable to transfer this treatment to general practice.

Registration of complications in an Orthopaedic department

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Purpose: To evaluate the system for registration of postoperative complications (DAN-KIR) in an orthopaedic department.

Design: Over a 3 months' period the continuous routine registration of postoperative complications was compared to the actual data found by a thorough review of the patients' records. The following postoperative complications were registered: superficial wound infection, deep wound infection, pulmonary embolism, AMI, apoplexy, femoral head necrosis, redislocation, displacement, refracture, thromboembolic disease, pneumonia, septicaemia, urinary tract infection and death. 587 patients were included.

Results: By routine registration 37 (6.3%) complications were registered corresponding to 53% of the complications registered by review of patients' records, i.e. 70 (11.9%). The most common complications found by routine registration/review of the patients' records were 17/19 deep infections (90%), 319 superficial infections (33%) and 3/14 urinary tract infections (23%).

Conclusion: When introducing a program for registration of postoperative complications the data registration should be reduced to comprehend only the data necessary to detect failure in treatment at an early stage.

Experimental orthopaedics

Periosteal insulin-like growth factor I during leg lengthening in rabbits

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During bone lengthening there is a high stimulation of bone formation. Insulin-like growth factor I (IGF-I) is a potent stimulator of bone formation and has been suggested to play a role in cellular regulation in fracture healing (1). We measured IGF-I in the periost of rabbits tibiae during leg lengthening and measured the amount of bone formation by CT-scanning.

Materials and methods: In 37 growing rabbits an osteotomy of the right middle tibia was performed and fixed by a unilateral external fixator (Orthofix 100). The rabbits were randomized into 6 groups. Group 1a was distracted 0.5 mm/day and killed after 2 weeks distraction (7 mm). Group 2a was distracted 0.5 mm/day and killed after 4 weeks distraction (14 mm). Group 3a was distracted 0.5 mm/day for 4 weeks (14 mm) and killed after 6 weeks. Groups 1b, 2b and 3b were controls; they were osteotomized, but not distracted (fracture group). After killing the rabbits, a blood sample and a standardized periosteal sample from the lengthened/osteotomized zone and from the intact left legs were taken, and IGF-I was measured with radioimmunoassay . The tibiae were stripped of soft tissue and the lengthened zone was CT-scanned to measure the cross-sectional area of bone.

Results: In the fractured groups periosteal IGF-I was significant increased at the osteotomy after 2 weeks ($p < 0.04$), but there were no differences after 4 and 6 weeks compared to the non operated left legs. In the distracted groups IGF-I was increased after 2 weeks ($p < 0.07$) and significantly increased after 4 weeks ($p < 0.03$) but after a further 2 weeks without distraction (group 3a) no difference was found in IGF-I compared to the intact left legs. CT measurements of bone area in the lengthened zone showed during lengthening (group 1a and 2a) a decrease of bone toward the middle of the lengthened zone, and after a further 2 weeks without lengthening (group 3a) CT-scanning revealed a considerable formation of bone in the whole lengthened zone.

Conclusions: We found increased periosteal IGF-I in the early callus phase in the fracture groups, in agreement with previous findings (1), and in the phase of distraction in the lengthened groups. These findings support a stimulating role for IGF-I at an early stage in the process of bone formation.

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Complicated tibial shaft fractures and bone mineral of the hip and tibia

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Introduction: Osteoporosis is an important risk factor for hip fractures in the elderly, and it is generally believed that the age-related bone loss is the most important determinant of hip fractures. The aim of this study was, to determine to which level bone mineral of the hip could decrease as a consequence of long-term immobilization following a fracture.

Material and methods: Thirteen patients (mean age= 37 (18-58) years, M/F = 11/2) were included in the study. All were still suffering from complications (nonunion, chronic osteomyelitis, new fracture in the same leg, or decreased limb length, bone defects (treated with bone transport)) following a fracture of the tibial shaft 3.4 years (0.5–10 years) earlier. The patients were currently undergoing treatment for the fracture, and all had a healthy contralateral leg with no previous fractures. Bone mineral measurements were performed in both legs using dual energy X-ray absorptiometry (NORLAND XR-26 Mark II). BMC (g/cm) was measured in the AP-plane of the proximal or distal tibia and BMD (g/cm^2) was measured in the hip with calculation of BMD in the femoral neck and greater trochanter.

Statistics: Nonparametric test a.m. Wilcoxon.

Results: BMC in the proximal tibia was decreased by 45% (p= 0.002) in the injured legs compared to the healthy contralateral legs. BMD measured in the hip was decreased by 23% (P = 0.002) and 27% (P = 0.002) for respectively femoral neck and greater trochanter.

Discussion: The average decrease in BMC of the proximal tibia was the same as seen in previous studies. The decrease in BMD of the hip of 20–30% following a complicated tibial shaft fracture must be of clinical importance with respect to the age-related bone loss of 1% per year.

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Collagen type I gene expression in normal human osteoblast cultures.

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Introduction: Collagen type I is the most abundant extracellular matrix (ECM) protein and the major load-bearing element in bone tissue. Collagen type I is synthesized as a procollagen molecule which normally contain 2 identical α1(I) chains, and a structurally similarly but genetically different α2(I) chain. Most information of the gene expression in osteoblast cells is based on animal bone tissue. We investigated the temporal expression of collagen type I gene during development of human osteoblast (hOB) in cell cultures from normal bone.

Materials and methods: HOB-like cells were cultured according to Beresford et al. and were obtained from 7 patients aged 14 to 79 years. Cells derived from the explants were passaged once and grown 35 days in medium containing 10% fetal calf serum (FCS). Cellular RNA was isolated at 3, 5, 7, 10, 12, 16, 21, 28 and 35 days using the method of Chomczynsky and Sacchi. At each time point 15 µg of total RNA were electrophoresed in 1% formaldehyde-agarose gels and transferred to nylon filters. The filters were hybridized with (^{32}P) dCTP by Nick translation and the relative amounts of mRNAs were determined against GAPDH by densitometric analysis.

Results: The level of collagen type I mRNA reach a maximum after 15-16 days and then gradually decrease (Figure 1).

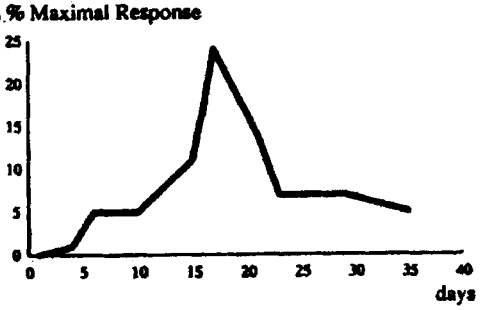

Figure 1. Temporal expression of collagen type I gene during development of the normal hOB, n=7 pts.

Discussion: Previous studies (Stein and Lian, 1993) on development of the osteoblast (OB) shows that the cells undergoes a period of active proliferation with expression of cell growth regulated genes (e.g. c-fos, c-jun, and c-myc) during the first 10–12 days of culture. During this proliferation period several genes associated with formation of the ECM among these type I collagen are actively expressed and then gradually down-regulated with collagen mRNA being maintained at a low basal level during subsequent stages of OB differentiation. Our results show that the mRNA level of collagen type I in normal hOB cultures reach a maximum at day 15–16 which is almost a week later then what is found in osteoblast cultures from fetal rat calvaria. This difference could be explained by the difference in species or most likely by the particularity of fetal tissue.

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A perfusion chamber for measurement of oxygen consumption of cultured human osteoblasts in vitro

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Background and purpose: We have previously described a closed chamber for measurement of the oxygen consumption in human osteoblasts in vitro based on mass spectrometry [1,21]. The limitations of this type of chamber is that osteoblasts are used in pellets. This could mean that the cells in the center of the pellet are under relative hypoxic conditions. Also, it is difficult to count the cells, and thereby compare measurements from different patients. The purpose of this work has been to solve these problems.

Material and methods: Osteoblasts were cultured according to Beresford et al [3]. Second generation cells were cultured in so called "slide flasks". A monolayer was obtained after 4 days. The bottom of the flasks can be removed, leaving the cells on a slide glass. The perfusion chamber is made of perspex, and a water bath ensures a temperature of 37 °C. The top of the chamber can be removed, and the glass placed in a slot. Perfusion is done with 2 precision pumps. Prior to perfusion the medium is led through a silicone tube, coiled up in a glass flask. This makes it possible to saturate the medium with a known gas composition (e.g. atmospheric air) by blowing the gas through the bottle. The tip of the catheter, connected to the mass spectrometer, measures the partial pressure of oxygen in the medium after it has passed the osteoblasts. The partial pressure of oxygen is measured with a slide glass without cells. When steady state is obtained, the glass is replaced with a slide glass with osteoblasts. The oxygen consumption is calculated by applying the general law of gases to the difference in steady state values. After each experiment the cells are fixated and counted.

Results and conclusion: With this technique we have measured oxygen consumption from 4.5 to 12.0 x 10–14 mol/min/cell. The technique makes it possible to measure other metabolic parameters, such as lactate. This possibility is under investigation.

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Hydroxyapatite and fluorapatite coatings for fixation of loaded implants

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Introduction: Plasma-sprayed hydroxyapatite (HA) and fluorapatite (FA) coatings have been demonstrated to enhance implant fixation by bony ingrowth (1,2). Short term studies have shown no adverse reaction of HA coating but resorption is a matter of concern for the long term fixation of ceramic coated implants (3). Loading and micromotion accelerates resorption of HA (4). FA has been shown to be more stable than HA in an unloaded transcortical model (2). The purpose of the present long-term study was to compare mechanical fixation and bone ingrowth of HA and FA coated implants, and to estimate the resorption of the two ceramic coatings, in a established loaded animal model (1).

Materials and methods: A stable implant device system, which allowed loading of the implant without micromovement, was inserted bilaterally into the medial femoral condyles of 8 skeletally mature mongrel dogs. Porous coated, titanium alloy (Ti-6Al-4V) implants (6x10 mm) were plasma-sprayed with FA or HA, and were randomly allocated to the right or left knee. The implants were initially surrounded by a 0.75 mm gap. Crystallinity of the coating was 68 and 74 percent for HA and FA coated implants, respectively. The purity was 97 percent for both ceramic coatings. The dogs were sacrificed after 25 weeks. Implant fixation was evaluated by push-out test. Histomorphometry was evaluated on three serial vertical sections ground to 50 µm (5). Resorption of ceramic coating, and bone and tissue ingrowth to the implant surface were estimated blinded, using stereological methods (5). A random rotation line grid system with points was used (Gride, software-program, Olympus, Denmark A/S).

Statistics: Paired Student's T-test was used. SEM =standard error of mean is given in brackets.

Results: Push-out test did not show any difference between HA and FA coated implants. Ultimate shear strength was 6 MPa for HA and FA, energy absorption was 1021 (159) and 1013 (93) for HA and FA, respectively. Bone ingrowth defined as percentage of trabecular bone in direct contact with the ceramic coating or the implant surface, was 62 (1.6) percent for HA coated implants, and 60 (2.9) for FA coated implants (NS). The surface of the implants were covered with ceramic coating on 79 (1.6) and 85 (2.7) percent of the total Ti implant surface for HA and FA coated implants, respectively (NS). The volume of the HA coating showed the same tendency towards greater resorption compared with the FA coating, but not significant. Thickness of the coatings were estimated to be 29 (1) and 31 (1) µm for HA and FA, respectively. Both ceramic coated implants were surrounded by trabecular bone, and no fibrous connective tissue or fibrocartilage were found. No signs of inflammatory or foreign body reaction or delamination of the coatings were found.

Conclusion: HA and FA coated implants were fixated by bony ingrowth after 25 weeks of observation. Non of the coatings showed signs of delamination, and no inflammatory reaction was found.

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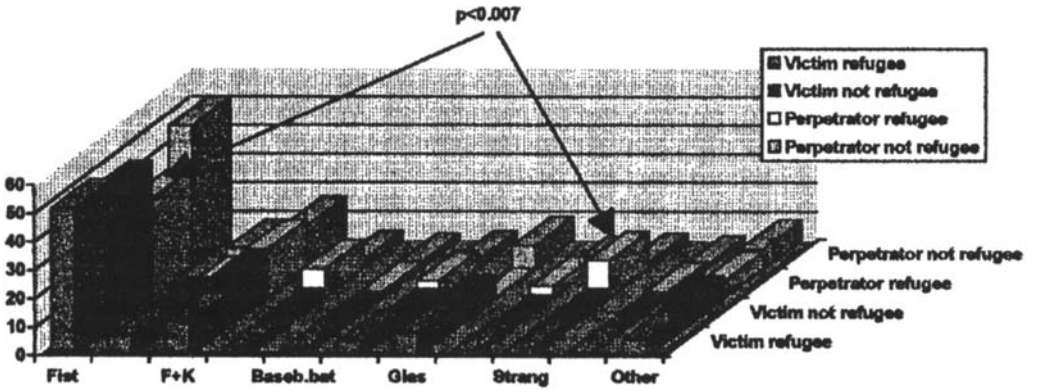

Weapons and violence

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Aim: To analyze methods of violence through a one year prospective study in Århus.

Materials: In one year (93/94) 1411 persons were victims of violence in Århus City. There were 312 women at the mean age of 31 (SD 13.12) and 1099 men at the mean age of 27 (SD 10.61).

Method: For victim and perpetrator numerous demographic data were recorded including nationality. Methods of violence and types of weapon were analyzed. A new weapon, the baseball bat was observed.

Results: The diagram shows the distribution of weapons in percentages. Several ethnic groups are shown. Several blocks are interesting. There is highly significant difference in some types of violence ($p<0.007$). ex. strangulation done by perpetrator who is a refugee.

Conclusion: Methods of violence have changed significantly. Ethnical groups affect the picture showing use of weapons in violence. New "popular" methods are being used.

Epidemiological study on artificial ski slope injuries

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It is our intention to report a new type of injuries in Denmark: injuries sustained on the artificial ski slope in Gjern, Denmark. Furthermore showing some of the risk factors involved and suggest preventive measures.

Patients and methods: All patients with injuries from the Gjern Skicenter who consulted the Emergency Departments at the Hospital of Silkeborg and the Hospital of Aarhus Amt from September 30th – December 31st, 1994. In total 101 patients, 30 female and 71 male with an average age of 23.8 years (8–51). All received a questionnaire concerning presumed risk factors.

Results: The 101 patients presented 136 injuries covered by 36 diagnoses. 88% (120) were upper extremity (UE) injuries, 7% (9) lower extremity and 5% (7) head injuries. Thumb injuries accounted for 54% of all UE-injuries with the most important being distorsion of the MCP-joint, rupture of the ulnar collateral ligament, fracture of phalanx and fracture of metacarpal. 12 patients were admitted to the hospital, 2 with concussion.

Conclusion: In our material thumb injuries dominate. The mechanism of injury is in the majority of cases due to the construction of the ski slope. The thumb is caught in the holes of the matting with a resulting abduction-/hyperextension trauma. Probably only changing the matting will prevent this.

Epidemiology of pelvic fractures in a Danish county

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Introduction: To study the epidemiology of pelvic fractures according to incidence, age and sex distribution, external cause, fracture classification, associated injuries and hospitalization.

Material and method: A retrospective study of pelvic fractures in Vejle County during the 10-year period 1983–1992. The external cause of the fractures is classified according to Alffram into moderate and severe trauma. The fractures are classified according to Peltier into stable and unstable fractures.

Results: 628 patients were treated in hospital, 385 women and 243 men. The age was on average 58.4 (4–101) years. The incidence was 19 per 100.000 per year. There were no difference in the incidence of pelvic fractures between the

two sexes up to 70 years of age. In the older persons, the incidence was increasing with a higher incidence among the women (P=0.000001). Severe trauma occurred in 366 patients (58%) and was more frequent in younger age groups (0–59 years). 63% of the severe trauma was traffic accidents. Moderate trauma occurred in 262 patients (42%) and was more common in the older persons (>70 years) and more frequent in the women. 458 patients (73%) had stable fractures and 170 (27%) unstable fractures. There were 348 patients (55%) with associated injuries, of whom the most frequent was fractures of the extremities. 357 patients (57%) were mobilized, while 271 (43%) were immobilized. Of these, 40 patients went to surgery (internal or external fixation). Complications occurred in 167 patients (27%). 28 persons (4%) died, 15 of these during the first day. The mean length of hospitalization was 31 days (1–363).

Conclusion: The tendency of this study mostly equals previous studies including the same population. Though there is an increase in incidence of severe trauma, specially traffic accidents involving the younger age groups, and in associated injuries. The high mean length of hospitalization confirm the tendency in this study.

Injuries in the railway accident at Mundelstrup, Denmark

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Introduction: The aim was to analyze the injuries, their causes at the railway accident at Mundelstrup the First of March, 1994 when an intercity train (IC-3) smashed into a standing local train (MR).

Materials and methods: All 128 persons in the trains (92 at the IC-3 train, 33 at the MR) have been asked by a questionnaire about their placing, injuries and their causes. 113 persons have answered (88%). Three persons have been omitted because of no information about their positions in the train.

Results: There were three main types of injuries:

1) Whiplash. Nine of the 30 persons (30%) in the MR train had whiplash symptoms while only 10 of 82 (12%) in the IC-3 train had these symptoms. One cause might be the higher seats in the IC-3 train compared with the MR train

2) Face. Thirteen of the sixteen passengers (81%) sitting in the "flyseats" had injuries of the face, while only 8 (12%) of the rest of the sitting persons in the IC-3 train had these injuries.

3) Thoracoabdominal. In the IC-3 train 38 persons were in contact with the tables between the seats, no one had serious injuries. Four of them were hospitalized.

Conclusion: Seats with headrest might prevent whiplash lesions. Flyseats" in the IC-3 train increase the risk of face injuries. The fragile construction of the tables in the IC-3 train is suitable.

Tumors

Lipoma and liposarcoma of the extremities, a 10-years statement in a local county

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The aim of our study was to show appearance and treatment of lipomas and to show the frequency of malignant tumors in the material. Size, localization, age, sex and duration of symptoms were examined.

Materials and methods: Retrospective evaluation of clinical records and microscopic request sheets of the patients who were send under the diagnosis tumor extremitas. Anamnesis, clinical observations, radiologic investigations and histologic diagnosis were evaluated. For statistic analysis the Mann-Whitney test was used.

Results: We found 105 patients, 46 men and 59 women. Age 8–86 years, median 51 years, men 18–86 years, median 50 years, women 8–86 years, median 52 years. No significance in the difference of the appearance of lipomas and liposarcomas was found when groups of age were related (p=0.3878). 2 patients were suspected for malignant tumors, all others for benign tumors. Of the 2 patients suspected for malignancy only one was malignant. 8 patients had a malignant tumour (liposarcoma), 97 were found having benign tumors, mainly lipomas. 58 patients searched because of a visible tumor, 10 because of pains and 37 because of both. Patients delay was 1–300 months, median 24 months. 39 tumors were located in the humeroscapular region, 30 were located in the femoral region and 7 in the region of the antebrachium. 10 tumors appeared in the crural area and only 1 was found in the foot. By relating the size of the tumors (lipomas vs. liposarcomas) we found large tumor areas (>100 cm^2) to be significantly more often malignant, (p=0.0196). The relation between the surgeons evaluation and the histologic diagnosis appears from the table shown below.

Surgeons description		Histologic examination			
		Lipoma	Liposarc.	Benign	Not eval.
Lipoma	52	49	2	1	1
Benign tumor	38	32	2	1	3
Malignant tumor	12	8	4	0	0
Not described	3	2	0	0	0

Conclusion: This work shows a high ratio of malignancy, 7.5%. It is obvious that there is no adequate connection between the surgeons estimation of the nature of the tumour and the histologic diagnosis. In the light of this we do recommend everyone, who are extirpating soft tissue tumors to carry out a histologic examination of the tumour, regardless of the lack of suspicion of malignancy and no matter how sure one is of the clinical diagnosis. We recommend centralization of the treatment of soft tissue tumors larger than 100 cm^2.

Skeletal metastases of unknown primary tumor

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Introduction: Skeletal metastases of unknown origin remains a difficult diagnostic challenge. The diagnostic procedures should be done in the most effective manner. After evaluating the procedures hitherto undertaken in twenty-nine patients of this category, we propose a diagnostic approach as the primary screening for an unknown primary tumor.

Materials and methods: Twenty-nine patients with skeletal metastases of unknown origin, evaluated at the Orthopaedic Departments of the County Hospitals of Copenhagen, were reviewed. They had been evaluated non-uniformly with an array of diagnostic procedures including physical examination, routine laboratory tests, chest radiographs, technetium-99 bone scintigram, ultrasonic scanning of the abdomen, various gatrointestinal tests and biopsy of the osseous lesions.

Results: A diagnosis were obtained in twenty-one patients (72%) antemortem and in another three patients postmortem: 11 of the primaries were lung carcinomas, 3 prostatic carcinomas, 2 breast carcinomas, 2 were malignant lymphomas. In three patients carcinomas of the kidney, pancreas and in the stomach were found. One patient had a carcinoid tumor in the small intestine and one had a retroperitoneal rhabdomyosarcoma. Mean survival time after metastasis was twelve months.

Conclusion: On the basis of our study and review of the literature, we propose a flow-sheet for evaluation of this category of patients including a medical history, physical examination, ordinary laboratory tests, chest roentgenogram, bone scintigram, ultrasonic- or computed tomography of the abdomen and finally a biopsy from the most accessible skeletal metastasis.

Prognosis and survival of patients with bone metastases treated with surgery—a retrospective study (preliminary results)

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Introduction: Bone metastases are frequently one of the first signs of disseminated disease in cancer patients, and their treatment requires a broad approach. A number of patients are treated with surgery.

Materials and methods: In this study survival data from 78 consecutive patients (median 64 years, range 34–91) operated in 1982–1993 were collected, and possible prognostic factors for survival were investigated. Most patients suffered from breast, kidney or tung cancer. Karnofsky's Performance Score (KPS) was recorded for all patients. In 53 patients osteosynthesis was performed, and in 25 arthroplasty or other intervention were performed.

Results: Preoperatively patients had a KPS of 70 points (median), meaning they were unable to work but managed at home. Median survival after surgery for all patients was 6 months. Nine patients were later operated for new bone metastases. A significant association between KPS and length of survival as well as a significant association between cancer type and survival was found.

Conclusion: Patients treated surgically for bone metastases generally live for several months (median: 6). It seems that surgical intervention is indicated at least for some patients. Two factors (KPS & cancer type) seemed to be useful indicators for survival.

Functional outcome after surgical treatment of sarcomas—amputation versus limb salvage surgery (preliminary results)

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Introduction: The aim of this study was to compare functional results after amputation and limb salvage surgery in the treatment of sarcomas.

Materials and methods: 107 patients (median age 53 years) treated in the period 1979–1993 for malignant, deeply localized extremity sarcomas were included in this study. 68 patients had limb salvage surgery (group 1), 39 had amputation (group 2). The groups were comparable according to age, follow-up and tumour-size. Functional score was obtained using a questionnaire and a simple clinical test (Enneking et al. 1989). Median follow-up was 3 years (range 4 months–12 years).

Results: The functional score was higher for group 1 (median 83 points, range 17–100) compared with group 2 (median 40 points, 13–87), $p < 0.001$ (Wilcoxon). In group 1 patients with soft-tissue sarcomas had a higher functional score (87 points, 20–100) than patients with primary bone tumors (40 points, 17–73), $p < 0.001$. Neither tumour-size nor radiation therapy was found to significantly influence functional outcome.

Conclusion: Functional score was significantly higher in the group that had limb salvage surgery compared with the group where amputation was performed.