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Surgery for recurrent dislocation of the shoulder

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The mechanism of dislocation and the subsequent injuries to the articular capsule and the caput humeri are described and the stabilizing effect of the subscapularis muscle is discussed. During the operation, attention was focused on the subscapularis and the capsule, the latter being incised either parallel to the subscapularis (Magnusson) or transversely (Bankart). During both types of procedure the capsular injuries were attended to, and a shortening of the subscapularis was accomplished. Thirty-five shoulders have been reviewed. The average observation time was 11 years and the average age at the time of operation was 28 (15 to 65) years. There were 28 traumatic and seven spontaneous dislocations. Twenty-six were operated with a parallel capsular incision and nine with a transverse. Seven cases (20 per cent) have redislocated. Three have redislocated more than twice. There were no recurrences in the younger age groups. The outward rotation was diminished in the stable shoulders. Injuries related to the anterior part of the glenoid cavity showed no correlation to the postoperative stability.

A comparison between the figure-of-eight bandage and a simple sling in the treatment of fractures of the clavicle

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Fractures of the clavicle are very common and several hundred methods of treatment have been described. In Denmark, midclavicular fractures are usually treated with a figure-of-eight bandage. This method has been criticised as being neither comfortable nor efficient. During a 2-year period, we performed a prospective randomized study comparing the figure-of-eight dressing with a simple sling as treatment for midclavicular fractures. All fractures healed without problems. The functional, cosmetic and radiologic end-results showed no differences after 3 months. The simple sling was found to be superior to the figure-of-eight bandage because it was less uncomfortable, gave fewer complications, and required fewer check-ups.

These differences were statistically significant. We therefore now use the simple sling in the treatment of midclavicular fractures.

Severely displaced supracondylar fractures of the humerus in children

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From 1972 to 1981, 60 children with severely displaced supracondylar fractures of the humerus were treated with closed reduction and vertical traction with an AO- or Ormandy screw in the olecranon. The traction was removed after 2-3 weeks and a plaster slab applied for another week. None of the patients had complications such as infection or neuro-vascular damage due to the treatment, but eight had secondary dislocations and required a further reduction.

The average hospitalisation time was 2.6 weeks. A follow-up study including 56 patients (93 per cent) was performed with an average observation time of

78 months. The patients were examined clinically and radiographically with special attention to the carrying angle.

All patients showed an excellent or good end-result according to the criteria of Dodge.

It is concluded that vertical traction is easy to apply, carries little risk of complications and gives a good end-result compared to other methods. The method is recommended provided the risk of secondary dislocations and the longer hospitalisation time are acceptable.

Primary flexor tendon repair in "no man's land"

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Fifty-eight patients with 67 fingers with flexor tendon injuries in Bunnell's "no man's land", treated with primary repair, were re-examined 14–84 months after surgery. Thirty-five fingers had repair of both tendons, and in 32 fingers the superficialis tendon was excised and only the profundus tendon was repaired. Postoperatively, 31 fingers were treated by Kelinert's rubber-band traction, and in 36 fingers a dorsal plaster of Paris was applied. The functional end-result was evaluated according to the method of Buck-Gramcko. Seventy-four per cent of fingers with suture of both tendons and 47 per cent of fingers with suture of only the profundus tendon attained an excellent or good result. The fingers treated by Kleinert's rubber band traction achieved the most favourable functional result, but many variable factors influenced this evaluation. The number of re-operations was significantly higher after repair of only the profundus tendon.

The epidemiology of distal fractures of the radius

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In 1981, Frederiksborg County, Denmark, had 224 705 inhabitants over 20 years of age. All fractures of the distal radius occurring in patients over 20 years of age throughout that year were registered, comprising 394 women and 99 men. The right wrist was fractured more often than the left and a re-

duction of the fracture was required in 46 per cent of the men and 59 per cent of the women ($P = 0.02$). All radiographs were reviewed and the fractures classified according to the system described by Older et al. (1965).

The most severely displaced fractures were seen in elderly women. Most accidents were due to a fall on level ground. The age-specific incidences were calculated for men and women and compared to similar investigations from Malmö, Sweden and Oslo, Norway. The incidence was found to be higher than in Malmö but lower than in Oslo. In women, the peak incidence in Frederiksborg County occurred in the age group 80–89 years, which was 10–15 years later than in Oslo. This could not be explained by differences in temperature or snow-cover, but could possibly be related to differences in the number of oestrogen users in the two countries.

Femoral fractures in children under 15 years of age

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A consecutive series of fractures of the femur occurring in children under 15 years of age during the period from 1970 to 1982 has been reviewed with reference to frequency, site and location of the fracture. It was found that the frequency of femoral fractures was declining during the period. Fractures of the distal metaphysis, spiral fractures, and greenstick fractures were more frequent among the very young children, while open fractures, comminuted fractures and distal physiolysis were more frequent among the older children.

It was found that the higher frequency of spiral fractures among small children could be explained by the different pattern of accidents sustained in the different age groups.

Chondromalacia of the patella treated by anterior displacement of the tibial tuberosity a.m. Bandi

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In a retrospective study, 38 patients with a clinical picture of chondromalacia of the patella were eval-

uated with regard to the results of anterior displacement of the tibial tuberosity. The indication for surgery was retro-patellar pain of at least 6 month's duration. There were no patients with patella alta, subluxation or recurrent dislocations of the patella, and all patients had a normal Q-angle. The operation was performed a.m. Bandi without routine arthrotomy. Two patients were operated bilaterally. The follow-up period was from 6 to 68 months postoperatively. The follow-up showed that six knees were pain-free, 11 knees were significantly improved, 10 knees showed only fair results with only marginal improvement and 13 knees remained unchanged or worse. It is concluded that the Bandi operation only helps a few patients operated with this indication and that the results are unpredictable.

The course of healing after treatment of open, comminuted tibial fractures

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A factor-determined analysis was carried out on the healing of 67 open, comminuted tibial fractures. Twenty-one had one intermediate fragment, loss of skin was observed in 27 cases, and 10 cases had loss of both skin and muscles. Eight fractures were treated with AO-plates, 38 with external fixation, and 21 were treated conservatively. One-third of the fractures with several intermediate fragments showed non-union, and more than one-third of the fractures with loss of soft tissue showed deep infection and non-union. Deep infections occurred in 63 per cent after internal fixation, in 18 per cent after external fixation and in 14 per cent of the conservatively treated. The incidence of non-union was 38 per cent after internal fixation, 18 per cent after Hoffmann's fixation and 29 per cent in the conservative group. Malignment of the healed fractures occurred in 34 per cent after external fixation and in 38 per cent of the conservatively treated. Functional results were found to be good in 57 per cent and poor in 18 per cent. Patients with loss of soft tissue and with fractures with several intermediate fragments obtained the poorest results. However, the method of treatment showed only a slight influence on the result at the final evaluation.

The relationship between hip joint tamponade and necrosis of the juvenile femoral head investigated by Tc-scintimetry in dogs

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The occurrence of ischaemic necrosis of the epiphysis of the femoral head following hip tamponade was investigated by means of ^{99m}Tc -DPD-biphosphonate scintimetry. In five puppies under general anaesthesia a unilateral continuous hip joint pressure of 50 mm Hg was established and maintained for 6 h, this pressure being between the venous and the arterial blood pressure. The opposite hip served as control. During the investigation the hip joint pressure, blood pressure, core temperature and blood gasses were kept at a steady state. Two and four weeks later, the hip joints were scintimetrically investigated. After the fourth week the animals were sacrificed, and the epiphyses and metaphyses were removed and re-examined. By means of a computer, digital image registration and a video colour screen, the regions of interest were analysed.

Scintimetry 2 and 4 weeks after the tamponade showed a mean ratio (investigated hip/control hip) of 1.00 and 1.01. In the bones dissected free from soft tissue, the mean ratio in the epiphyses was found to be 0.94 and in the metaphyses 1.02. Thus, under the experimental conditions used, the present study showed no signs of persistent bone ischaemia.

Experimental anterior instability of the glenohumeral joint

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The increment in external rotation in the glenohumeral joint was measured in an apparatus developed to register joint movements under well-defined circumstances. The movements were measured after cutting of the anterior stabilizing structures. The humerus was abducted and externally rotated with a constant force of 1.5 Nm. The anterior structures were cut in two series. In the first series the subscapularis muscle, the proximal third of the capsule and the middle third of the capsule were incised successively. In the second series the distal third, middle third and proximal third of the capsule were cut. It

was found that in the movement from 0 to 90 degrees of abduction in the plane of the scapula, the subscapularis muscle stabilizes the joint during the first 30 degrees of abduction. Beyond this point of abduction, the distal third of the anterior capsule was the most important stabilizing structure.

The contribution of the cortical shell to the compressive strength of the proximal tibia

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Non-destructive measurements of the compressive stiffness of the proximal tibia were made on 20 autopsy specimens. Primarily the maximal compressive strength was determined by three minimally destructive penetration tests in each condyle. The tibial epiphyses were loaded to 50 per cent of the predicted maximal compressive strength which corresponded to the linear portion of the load deformation curve. All stiffness measurements were made on the second of two successive experiments to avoid the influence of relaxation phenomena. Total surface loading after resection of the tibial joint surface was compared to loading through templates covering all but the peripheral 2 mm of the surface.

The modulus of elasticity was significantly reduced when the whole surface was loaded, indicating the peripheral rim of the bone as the more compliant. The load-bearing capacity thus increased much less than would be expected from the increase in area. These results suggest the absence of a true cortical shell around the proximal tibial epiphysis.

Experimental rotatory instability of the knee joint after transection of the cruciate ligaments

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The importance of the cruciate ligaments (ACL & PCL) and the medial and lateral compartmental ligaments of the knee in relation to valgus-varus axial rotatory instability was investigated in 30 osteo-ligamentous preparations. Instability was continuously registered during flexion-extension with a constant torque force applied to the tibia. Isolated cutting of the medial collateral ligament resulted in moderate

anteromedial instability. Cutting of the ACL or the posterior medial capsule doubled this instability, the latter causing the most marked instability in extension and also causing a marked posteromedial instability in semiflexion. Isolated cutting of the lateral collateral ligament produced only slight anterolateral rotatory instability. This was not aggravated by cutting of the ACL or the posterior lateral capsule, but combining one of these lesions with transection of the lateral collateral ligament produced posterolateral instability, most marked after cutting of the posterior lateral capsule and with a maximum in the semiflexed position.

Isolated transection of the PCL only produced minor instability in the flexed position, but combined with medial or lateral collateral ligamentous lesions, the PCL was shown to be a most important stabilizer in flexion with regard to both valgus-varus and axial rotatory instability.

Results of ankle arthroplasty with the TPR® prostheses

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A study was made of the initial series of TPR ankle arthroplasties performed at the Orthopaedic Hospital in Aarhus during a 3-year period. This consecutive series comprised five male and eight female patients with a median age of 62 (33–70) years with an average follow-up time of 2 years. All patients suffered from rheumatoid arthritis and had severe pain in one or both ankles on walking. A total of 17 prostheses was implanted. The results were good with regard to pain relief in 15 ankles, and the walking ability was improved in over half of the cases, the limiting factor being rheumatic affection of other weight-bearing joints. There was no improvement in joint mobility. There were three cases of superficial self-healing skin necrosis and one non-fatal pulmonary embolism. Secondly, signs of implant loosening in the form of a radiolucent zone between the cement and bone around the tibial component were seen in six cases, and in one case the talar component had migrated.

It is concluded that there is an unsolved loosening problem in connection with the tibial component, but arthroplasty of the ankle may be considered a usable alternative to arthrodesis in patients with advanced rheumatoid arthritis and limited walking requirements.

The forequarter amputee

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Twelve patients underwent forequarter amputation due to malignant tumours of the upper extremity or shoulder girdle. All tumours were found in extra-compartmental spaces, stage II B according to Enneking's classification. The radical amputation was followed by a high rate of survival and the follow-up period was from 0.5 to 17 years.

Two patients had died from metastases and one patient with a synovial sarcoma died of a gastric cancer 2 years after surgery. The survivors were doing well in all respects of daily living, and only two patients were unemployed.

A cosmetic prosthesis seemed satisfactory in all patients. Only one patient, a plumber, experienced good function from an actively movable prosthesis. Transitory exogenic depression occurred in two men. Forequarter amputation is an acceptable procedure in patients with extracompartmental, malignant tumours of the shoulder region.

Coxarthrosis treated with the Monk "hard top" endoprosthesis

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The results of the Monk hemiarthroplasty in 125 hips in 118 patients were studied. The mean follow-up time was 2½ years and the results were graded according to the d'Aubigné system. Seventy-six hips were found to be pain-free, 24 had slight pain and 17 had moderate pain. Aseptic loosening had occurred in 17 hips and sepsis occurred in one case. The Monk endoprosthesis was found to be an alternative to the cemented hip prosthesis in the treatment of osteoarthritis.

However, the Monk prosthesis was not suited in all cases, especially not in patients with severe dysplasia, in marked osteoporosis or in cases with a wide femoral intramedullary space.

A critical preoperative evaluation may reduce the number of re-operations.

Discussion: In discussion, J. Steen Jensen reported that the Monk prosthesis is unacceptable for the treatment of osteoarthritis as the clinical results are inferior, the re-operation rate is too high and the per-

centage rates of migration and sinking are also too high on short-term follow-up.

The sliding screw-plate for internal fixation of fractures of the femoral neck

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The sliding screw-plate was used in 110 consecutive cases of fractures of the femoral neck, in patients who were considered to have a physiological age of less than 70 years. Immediate postoperative weight-bearing was permitted. Twelve patients were lost to follow-up and the remaining 98 fractures were followed until 5½ years postoperatively.

Two cases developed deep infection and four cases characterized by primary technical failure were re-operated. Union, implying radiographically visible trabeculation across the fracture site 6 months postoperatively, was encountered in 87 per cent of the fractures. Sixteen per cent (13/80) of these fractures developed necrosis of the femoral head. Based on the low rate of non-union and necrosis of the femoral head, as compared to other methods of internal fixation, the sliding screw-plate is recommended for fixation of fractures of the femoral neck.

The use of prophylactic antibiotics in total hip replacement

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A prospective study of 620 patients undergoing total hip replacement between 1978 and 1982 was performed in order to test the efficiency of prophylactic antibiotics in reducing postoperative infection.

All patients were operated in the same conventional operating theatre and the operations were performed by the same team of surgeons. The patients were randomized into a group receiving antibiotics and a control group. The observation time was between 3 and 24 months. In the group receiving antibiotics, three superficial infections were found (230 patients), whereas 17 infections (nine superficial and eight deep) were encountered in the control group (390) patients. Moreover, 26 other infections such as pneumonia and urinary tract infections were found in the control group, compared to seven infections of this type in the group receiving antibiotics.

Beta-lactam antibiotics used as prophylaxis against postoperative wound infections

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A study was made of the prophylactic effect of four beta-lactam antibiotics: methicillin, dicloxacillin, cephalothin, and cefuroxime. The study consisted of (1) studies of the pharmacokinetics in the surgical wound following intraoperative intravenous administration

of the antibiotics and (2) *in vitro* studies of the minimal inhibitory concentrations (MIC) of the antibiotics, using surgical wound fluid as the culture medium.

The MIC of the antibiotics was determined for 17 clinical isolates of *staph. aureus* and the wound kinetics investigated in 20 patients undergoing surgery for pertrochanteric fractures. After the intraoperative administration of 1 g of the antibiotic in question, the wound concentrations were found to be higher than the MIC for *staph. aureus* for 12 h with methicillin, 13 h for dicloxacillin, 8 h for cephalothin, and 16 h for cefuroxime.