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Niels J. Holm

Department of Orthopaedic
Surgery, Frederiksborg
Amts Sygehus, DK-3000
Helsingør, Denmark

The use of antibiotic prophylaxis in amputations of the lower extremity

Børge Krebs

Department of Orthopaedic Surgery, Aarhus
Municipal Hospital, Aarhus, Denmark

In a prospective randomized study, the efficacy of prophylactic antibiotic therapy in the prevention of postoperative wound infection after lower limb amputation for ischaemia was investigated.

Thirty patients received Meticillin 1 g $\times$ 4 intravenously on the day of operation. The control group of 34 patients did not receive any antibiotic. The frequency of postoperative wound infection was 36 per cent in the control group compared to nil in the Meticillin group ($p < 0.01$). The frequency of re-amputation because of infection was significantly higher in the control group (33 per cent versus 0, $p < 0.05$). Twenty-two patients, 10 in the Meticillin group and 12 in the control group, had infective gangrene preoperatively. Among these, seven wound infections occurred in the control group and none in the group treated with antibiotics ($p < 0.05$).

Staph. aureus was isolated in 70 per cent of the patients in the Meticillin group and in 75 per cent in the control group preoperatively. In the postoperative infected wounds, *staph. aureus* occurred in 75 per cent. One patient in the control group developed gas gangrene. Prophylactic Meticillin significantly reduced the number of post-operative wound infections and re-amputations in amputations of the lower extremity for ischaemia.

Phantom limb phenomena in amputees

Børge Krebs, Troels Staehelin Jensen, Karsten Krøner, Jørn Nielsen & Hans Stødkile Jørgensen

Department of Orthopaedic Surgery, Aarhus
Municipal Hospital, Aarhus, Denmark

During the period 1970–1977, 624 amputations were performed. At the time of the investigation 95 patients (15 per cent) were alive; 86 patients were able to answer a standard questionnaire regarding phantom limb phenomena, phantom pain and stump pain. The incidence, the temporal course and the clinical condition were examined retrospectively with a median follow-up period of 7 years. The median age of the 86 patients at the time of amputation was 60 years. The main reason for amputation was peripheral occlusive arterial disease in 69 per cent and trauma in 23 per cent. The incidence of phantom limb sensation, phantom pain and stump pain was 77, 52 and 23 per cent, respectively. Phantom limb sensation included kinaesthetic sensation in 55 per cent, and in 30 per cent of these the limb felt shortened (telescoping). Phantom limb sensation and phantom pain were present mainly in the distal parts of the limb. Phantom pain was not found more frequently in patients with stump pain than in patients without stump pain. It is concluded that the present incidence of phantom limb phenomena in amputees 7 years after amputation is close to the reported incidence 6 months after the operation. Persistent phantom pain may occur more commonly than the usually reported frequency of 5–10 per cent.

The treatment of fractures of the femur around or below a hip prosthesis

Tim Toftgård Jensen & Niels Boel Mossing

Department of Orthopaedic Surgery, Sønderborg Hospital, Sønderborg, Denmark

Six cases with fractures of the shaft of the femur around or below a hip prosthesis are reported. Treatment with nylon-plates and straps, as described by Partridge and Evans, was used. In four cases where the fractures were situated around or just below the tip of the stem of the prosthesis, healing occurred uneventfully and early mobilization was possible. In two patients with supracondylar fractures, one had to be re-operated due to insufficient fixation of the plate, and in the other patient osseous stabilisation had not been achieved after 12 months.

We found that the method described provided a satisfactory alternative to conventional treatment in elderly patients with osteoporotic bone and fractures around or below the tip of the hip prosthesis.

Ipsilateral fractures of the femur after arthroplasty of the hip

Gunner Barfod

Department of Orthopaedic Surgery U, University of Copenhagen Hospital, Denmark

One hundred and thirty-six fractures in 128 patients treated in five different departments of orthopaedic surgery were evaluated. The fractures were classified according to topography and severity of comminution. Two thirds were spiral fractures and two thirds included the area around the tip of the prosthesis. Signs of stem loosening were found to be a significant risk factor. The fractures were treated conservatively, by internal fixation without removal of the prosthesis, or by re-arthroplasty with simultaneous internal fixation. The latter method was found to be much superior, 84 per cent of the patients being pain-free, with a satisfactory functional result. Internal fixation without removal of the prosthesis was associated with a higher frequency of functional impairment, delayed union and repeated secondary arthroplasties owing to non-union, and thus it cannot be recommended.

Total hip replacement in patients over 75 years of age

Vivian Petersen

Department of Orthopaedic Surgery, Frederiksborg County Hospital, Hillerød, Denmark

The early complications in 659 Müller total hip replacements performed over a 4-year period were recorded, and a follow-up study was done after an average of 39 months on the 77 patients who were over 75 years of age at the time of operation (range 75–88 years). The overall rate of medical complications was 14 per cent, and this increased significantly with increasing age. Medical complications occurred in half of the patients over 80 years of age.

Technical complications occurred in 5 per cent of the operations, and significantly more frequently in patients whose hip had previously been operated. The overall rate of dislocations was 0.6 per cent, but it was higher in patients over 75 years of age.

Dislocations also occurred more frequently in patients who had previously had a hip operation. The follow-up demonstrated a clear pain-relieving effect of the operation, whilst there was only a slight improvement in walking ability, and hip mobility remained virtually unchanged. The social grading of the patient also remained almost unchanged.

Sliding hip screw or four AO cancellous bone screws in femoral neck fractures

Frank Linde, Erik Andersen, Inge Hvass, Frank Madsen & Rune Pallesen

Department of Orthopaedic Surgery, Esbjerg Centralsygehus, Esbjerg, Denmark

In a randomized trial, 103 consecutive patients with intracapsular femoral neck fractures, Garden stage 3 and 4, were treated with either the sliding hip screw or four AO cancellous bone screws. The two groups were comparable as regards primary dislocation and quality of reduction as assessed by the Garden staging system and the Garden alignment index. The results with respect to avascular necrosis were assessed in 87 (85 per cent) patients by ^{99m}Tc-MDP scintigraphy 3 months postoperatively. In the sliding hip screw group, there was 25 per cent total avascular necrosis and 10 per cent segmental necrosis against 6 per cent total and 4 per cent segmental avascular necrosis in the four AO cancellous bone screw group. This difference was statistically significant ($p < 0.025$). It was concluded that osteosynthesis with a sliding hip screw increases the risk

of avascular necrosis compared to osteosynthesis with four AO cancellous bone screws in femoral neck fractures.

Suction drainage in total hip replacement

Jens Kristian Gøtrik, Henrik Menck & Tommy Korsgaard Larsen

Department of Orthopaedic Surgery, T-2, Gentofte Hospital, Hellerup, Denmark

Ninety-one total hip replacements were randomly allocated to two groups. The suction drainage used in one group had a vacuum of 130 mm Hg, and in the other group 600 mm Hg. In all patients a subcutaneous and a subfascial drain were used, and all drains were left in place for 4 days. The total amount of wound drainage was registered. The amount of drainage from the superficial drains showed an average of 126 ml in the low pressure group against 164 ml in the high pressure group ($p > 0.05$). The drainage from the deep drains showed an average in the low pressure groups of 666 ml, compared to 849 ml in the high pressure group ($p = 0.03$). No statistically significant difference with respect to the number of transfusions, pre- and postoperative levels of haemoglobin or formation of serious haematomas was registered in the two groups.

Comparing the total costs in economic terms of the two drainage systems, it was concluded that the different demands on the nursing staff would be the important factor to consider.

Regional blood flow in arthritic puppies

Kjell Sølund, Frederic Joyce, Henrik Schrøder & Cody Büniger

Orthopaedic Hospital and Institute of Experimental Clinical Research, Aarhus, Denmark

The purpose of the study was to investigate the effect of chronic synovial inflammation and joint effusion on the blood supply of the juvenile hip joint and to evaluate the haemodynamic effect of limb use on the arthritic hip.

In five mongrel puppies unilateral arthritis was induced by weekly intra-articular injections of Caragheenin into the hip joint for 12 consecutive weeks. The contralateral hip served as a control. The regional blood flow was measured by a tracer microsphere technique. The joint pressure was measured in both hips. In the arthritic hip significant elevation of the intra-articular pressure and synovial hyper-

aemia were found as well as the formation of a caput magnum. The blood perfusion of the femoral head epiphysis was significantly elevated. In the arthritic hip exercise caused a significant reduction of the blood flow in the femoral head epiphysis with a continued severe reduction of the blood flow after exercise. In the normal hip joint minimal changes in the perfusion were seen during exercise.

The results suggest that in coxitis with an elevated joint pressure or disturbance of the bone circulation, a risk of ischaemia of the metabolically highly demanding femoral head epiphysis is present during and after exercise.

Early mobilization for lateral ankle sprain

Frank Linde, Inge Hvass, Uwe Jürgensen & Frank Madsen

Department of Orthopaedic Surgery, Esbjerg County Hospital, Esbjerg, Denmark

In a prospective study, 150 consecutive patients with lateral ankle sprains were treated with early mobilization. Absence of pain on walking was achieved in 44, 67, 89 and 99 per cent after 4 days, 8 days, 1 month and 3 months, respectively. More than half of the patients were fit for work after 4 days. Eighty-one per cent were fit after 8 days, 97 per cent after 1 month and all were fit for work within 3 months. Among athletes 70 per cent were back in sport after 1 month, and 90 per cent were back after 3 months.

A 1-year follow-up was carried out in 136 cases. In 24 cases (18 per cent) there were sequelae, but only 11 (8 per cent) found the condition unsatisfactory. A blind statistical assessment of risk factors for sequelae was done. Haemarthrosis, instability and inability to stand on the foot on the fourth day were found more often in the group with sequelae than in the group without, but the difference was not significant. Athletes had a significantly ($p < 0.025$) higher rate of sequelae than other patients, and among top athletes 32 per cent had sequelae after 1 year.

The influence of the fibrin adhesive system on blood flow and bone formation in autologous bone transplants

Ulf Lucht, Cody Bünger, Jens Tandrup Møller, Frederic Joyce & Hans Plenk

Institute of Experimental Clinical Research, University of Aarhus, Denmark and Institute of Histology and Embryology, University of Vienna, Austria

The aim of the present study was to examine the reported improvement of the fibrin adhesive system (FAS) on the incorporation of transplanted bone.

In 18 dogs a standardized defect was made in each tibia and filled with cancellous bone from the iliac crest. On one side, the transplant was mixed with the two-component fibrin-sealant Tisseel®, while the other side served as control. After the transplantation the bone was secured with an AO-plate and the dog was allowed full weight-bearing.

Six dogs were examined on the 7th postoperative day, six on the 14th day and six on the 21st day. The blood flow in the transplants was measured using the microsphere technique, after which the transplants were studied by histology and bone morphometry.

The highest flow rates and the most intensive new bone formation were found on the 14th day. However, there was no significant difference between the FAS-treated transplants and the controls at any of the times investigated.

The present results indicate that FAS has no advantage in ordinary transplantation of autologous cancellous bone, but it can be useful in situations where it is difficult to keep the transplant in place.

Closed treatment of ankle fractures

Kristian D. Kristensen & Tonny Hansen

Department of Orthopaedic Surgery, Odense Hospital, Odense, Denmark

Ninety-four conservatively treated patients with Lauge Hansen Stage II supination-eversion fractures of the ankle were interviewed after 16–25 years. Patients with pain were examined clinically and radiographically. Eighty-nine patients had good and five medium results according to Cedell. Our observations compare well with published reports of open treatment. We conclude that this particular fracture type is so benign that it may be treated closed without reduction. (Published in *Acta Orthop. Scand.* 56, 107–109, 1985).

Experimental distal subluxation in the glenohumeral joint

Jørgen Ovesen

Laboratory of Biomechanics, Orthopaedic Hospital, Aarhus, Denmark

In an experimental set-up of ten shoulder specimens, increments in the acromio-humeral distance, the subacromial space, were measured on an x-ray radioscope after cutting the vertical stabilizing structures of the glenohumeral joint. It was found that by cutting the supraspinatus tendon only, the acromio-humeral space increased only a few millimetres. After further cutting the coracohumeral ligament and the proximal one third of the anterior capsule, the acromio-humeral distance was doubled in both cases. Distal subluxation did not occur when only the anterior capsule was cut. When the coracohumeral ligament was also cut, the acromio-humeral distance was more than doubled. It is concluded that the most important structure in the pathogenesis of distal subluxation is the coracohumeral ligament, followed by the proximal part of the glenohumeral capsule.

Dislocation of the shoulder treated a.m. Eden-Hybinette-Alvik

Henrik A. Schrøder & Peter B. Fristed

Department of Orthopaedic Surgery O, Odense Hospital, Odense, Denmark

In the Alvik modification of the Eden-Hybinette procedure, an iliac crest bone graft is jammed into a preformed wedge-shaped groove on the anterior aspect of the scapular neck. A follow-up of 33 patients revealed only one spontaneous redislocation and one case of disabling subluxation. In both cases the bone block had been inserted too low at the scapular neck. The patient who had dislocations was reoperated. Two further patients had experienced redislocations, but both of these were after violent traumas. Muscular strength and joint motion were only insignificantly affected. Only one patient did not rate the end result as good.

The rate of recurrences is comparable to other methods, but the frequency of reoperations is low, as no complications occurred from fixation of the bone block. With other methods, problems with osteosynthesis have been reported in up to 10 per cent of cases.

We have found the Alvik modification to be an excellent method for treatment of recurrent anterior dislocation of the shoulder.

Sterno-cleido-mastoid tenotomy for torticollis

Gudmundur Harri Gudmundsson, Rainer Weeth & Ove Rasmussen

Orthopaedic Hospital, Aarhus, Denmark

A follow-up study was carried out on 47 patients from a consecutive material of 49 patients operated for muscular torticollis at the Orthopaedic Hospital in Aarhus during 1970 to 1980. Six patients had been reoperated once and three patients three times. The median age at the first operation was 7 years (7 months–29 years), and the average observation period after the last operation was 9 (1–14) years.

The method of operation was a combined open upper and lower tenotomy including the mastoid, the clavicular, and the sternal heads of the muscle. Post-operatively, the patients were treated with a soft collar for 1 week and a corrective plaster of Paris collar for 5 weeks.

Evaluated according to the strict cosmetic and functional criteria suggested by Ling (*Clin. Orthop.* 116, 142–8), 13 patients were classified as having good results, 31 as fair, and three as poor. The most common single reason for the results being rated as fair was hypertropic, broad scars. Facial asymmetry was seen in 62 per cent of the cases, more commonly among those operated late. Three recurrences were found, making a total rate of recurrence of 26 per cent.

Detection of glass foreign bodies by radiography

Poul Grøn, Kjeld Andersen & Ewald Eggert Pedersen

University Departments of Orthopaedic Surgery and Radiology, Aarhus County Hospital, Aarhus, Denmark

Over a 1-year period, patients with suspected glass foreign bodies were radiographically examined before removal. Glass foreign bodies were removed from 27 patients, one of whom was not radiographically examined. Of the remaining 26 patients, the glass foreign bodies could be detected in all but one case, in which the examination was not technically perfect.

In nine patients, the glass foreign bodies were not detected at the first call to doctor or hospital. In none of these cases did the initial examination include radiographic examination.

It is concluded that, contrary to common belief, almost all glass foreign bodies can be detected by radiographic examination. With refined techniques (high-resolution or mammographic technique), even minute glass splinters may be visualized.

Fracture of the tibia treated by external fixation a.m. Hoffmann

Henrik Anton Schrøder, Steen Lindequist, Hardy Christoffersen & Torben Scherff Sørensen

Department of Orthopaedic Surgery O, Odense Hospital, Odense, Denmark

In a primary series of 266 fractures of the shaft of the tibia, 96 fractures were treated by external fixation a.m. Hoffmann. Both unilateral and transfixing devices were used without any difference in the indications. Uniformity between the groups was obtained for both severity of fracture and soft tissue damage. In 41 cases a unilateral single bar frame was used, 33 cases had a unilateral double bar frame, and in 15 cases a transfixing Vidal frame was used. Seven fractures were treated with extra pins for intermediate fragments; this group was not comparable to the other three groups.

The median time for healing was 10.3 (4.1–76.0) months with a tendency to prolonged healing in the group treated by the Vidal frame. The unilateral devices, on the other hand, led to a significantly increased number of redislocations.

Seven cases of chronic osteitis occurred, four of which developed from pin track infection, which was observed in 36 per cent of the patients.

Four pseudoarthroses and five refractures occurred, but residual deformities were negligible.

As significant advantages of the transfixing Vidal frames could not be demonstrated, continued use of the simpler unilateral double bar frames is recommended.

The value of arthroscopy in acute, severe knee injuries

Ole Simonsen, Jørn Jensen & Jørgen Lauritzen

Department of Orthopaedic Surgery, Aarhus County Hospital, Aarhus, Denmark

To evaluate the diagnostic accuracy of clinical examination and stability testing under anaesthesia and to assess the value of arthroscopy in acute, severe knee injuries, 148 consecutive patients with hae-

marthrosis or instability were examined clinically, under anaesthesia and by arthroscopy.

In the 67 per cent who had injuries requiring arthrotomy arthroscopy was found to be almost 100 per cent reliable; 45 per cent had MCL lesions, 51 per cent ACL lesions, 11 per cent PCL lesions and 2 per cent had lesions of the LCL. Two thirds of the cruciate ligament lesions were total ruptures. Clinical examination and even stability testing under anaesthesia gave many false positive and false negative diagnoses. Examination of the individual ligaments was most inaccurate as regards the ACL, where PV_{pos} and PV_{neg} for clinical examination were 0.69 and 0.62, respectively. For stability testing of the ACL under anaesthesia, these values were 0.87 and 0.70, respectively.

Planned treatment based on stability testing was compared with definitive treatment directed by arthroscopy. The planned treatment was changed in 31 per cent of the patients. It was shown that if severe knee injuries are treated without arthroscopy, 10–34 per cent (95 per cent confidence limits) of the total ACL ruptures will be overlooked, 4–17 per cent of the arthrotomies will be unnecessary and in 9–21 per cent of the patients the treatment will be seriously wrong.

Patellar bone scan in patellofemoral disorders

Niels Hejgaard & Henrik Diemer

Department of Orthopaedic Surgery,
Rigshospitalet, Copenhagen, Denmark

In a prospective study comprising 80 patients with patellofemoral pain syndromes, the predictive values of Tc-99m-MDP bone scans were evaluated. A positive bone scan ("hot patella") was defined as a patellar uptake greater than the distal femur and proximal tibia of the ipsilateral leg. "Hot patella" was found in 54 of 160 cases (34 per cent). A positive correlation was found between positive scintigrams, the number of previous operations, and the grade of chondromalacia according to Outerbridge. Intraosseous pressure measurements were performed in all knee caps during extension (P_{ext}) and during sustained flexion (P_{flex}). P_{ext} was 25 mm Hg in the hot patella group and 22 mm Hg in the group with negative bone scans. P_{flex} was significantly higher (90 mm Hg) in the positive group than in the negative (65 mm Hg). However, the predictive value of a positive bone scan in patients with intrapatellar hypertension was limited, because of a false positive rate of 84 per cent.

Partial or total meniscectomy

Adam Hede

Department of Orthopaedic Surgery T-3, Gentofte Hospital, Hellerup, Denmark

In order to evaluate the effect of partial meniscectomy compared to total meniscectomy, 200 patients entered a prospective clinical study with 100 patients allocated to each of the two operations. The two groups did not differ as to duration of symptoms or age and sex distribution. The meniscectomies were performed by conventional arthrotomies. Of the patients 192 were examined 3 weeks, 2 months, and 1 year after the operation. No difference in the duration of sick leave was found between the two groups. One year after the operation, six of the 98 patients who had partial meniscectomy had been re-operated. These patients all had posterior meniscal tears at the primary operation and at the re-operation. Four out of 94 patients who had a total meniscectomy had been re-operated. In all four cases part of the posterior horn had been left behind. At the 1-year follow-up it was found that a significant number of patients in the group treated with partial meniscectomy were without symptoms. No difference in the occurrence of radiologic changes was found between the two groups at the 1-year follow-up.

Late results of patellectomy

Thomas Lind

Department of Orthopaedic Surgery,
Rigshospitalet, Copenhagen, Denmark

Seventy-nine patients (82 per cent of the total) who had had a patellectomy were re-examined as to late results. Three had been operated bilaterally. Only 32 per cent could be classified as "excellent", while 33 and 35 per cent were classified in the categories "medium" and "poor", respectively. A high correlation was found between a pain-free knee and patient satisfaction, and the presence of residual pain was therefore given the greatest importance at evaluation of the knees. Considerable insufficiency and atrophy of the quadriceps were commonly found, but there was only a low correlation between strength of the quadriceps mechanism and patient satisfaction. The patellectomized knee frequently caused functional disorders, and considerable social problems were found among patients belonging to the categories "medium" and "poor". Fifty-three per cent of the patients in these categories had moved to a lower social group. No reliable criteria for the pre-oper-

ative selection of the patients based on the diagnosis, sex, age or previous operative procedures could be found.

Ruptures of the extensor mechanism of the knee joint

Eilif Larsen & Poul Martin Lund

Department of Orthopaedic Surgery, Gentofte Hospital, Hellerup, Denmark

The clinical results and changes in femoral patellar morphology were evaluated in 18 cases of ruptures of the quadriceps tendon and in 10 cases of ruptures of the patellar ligament. The clinical results were found to be excellent or good in 15 and seven cases, respectively, in the two groups. Only one patient treated for a rupture of the quadriceps tendon had pain, whereas four patients who had a rupture of the patellar ligament had pain after work. All patients with pain had some degree of femoral patellar dysmorphology with changes in the tracking and/or the height of the patella, but not all patients with radiologically visible femoral patellar changes had pain, and pain did not necessarily interfere with muscular strength or range of motion.

We recommend exact adaptation of the tissues and reinforcing of the suturing of the patellar ligament with a wire cerclage so as to decrease tension on the suture line, whereas in ruptures of the quadriceps tendon end-to-end suturing seems to be sufficient.

Biopsies from four patients revealed similar degenerative changes in the tendons and ligaments, suggesting a common genesis of the two kinds of ruptures in these elderly patients.

Translatory-rotatory instability of the knee joint in experimental lesions of the anterior cruciate ligament

Strange Nielsen, Peter Helmig & Kurt Andersen

Biomechanical Laboratory, Orthopaedic Hospital, Aarhus, Denmark

The importance of the anterior cruciate ligament (ACL) and the medial compartment ligament complex (MCL and PMC) in relation to translatory and axial rotatory instability was investigated on 15 osteoligamentous preparations. Registration of the instability was done continuously during the extension-flexion movement with a constant torque applied to the tibia.

Isolated cutting of the ACL released a moderate

anterior translatory movement which reached a maximum at 30° of flexion. If the MCL was included in the transection, this instability increased rapidly from 0° to 30° of flexion, but remained constant during further flexion. Further transection of the PMC produced an even more marked anterior translatory movement with a maximum 90° of flexion. Combined lesions of the MCL and the PCL as well as the posterolateral part of the ACL did not provoke this type of instability as long as the anteromedial part of the ACL was intact. Spontaneous axial rotatory instability was not affected by isolated transection of the ACL or of this in combination with the PMC. Combined lesions of the ACL and MCL released a moderate external rotation in the flexed position when an anteriorly directed torque was supplied. When the PMC was included in the lesion, this instability was markedly increased during the whole range of motion.

Free periosteal grafts in human knee joints using Fibrinkleber-Human Immuno®

Bent Niedermann, Svend Boe, Jørgen Lauridsen & Jens Mørck Rubak

Department of Orthopaedic Surgery, Aarhus County Hospital, Denmark

Based on the results from previous animal experiments, articular cartilage lesions in human knee joints have been repaired experimentally using free periosteal grafts. In cases of osteochondritis dissecans lesions of the medial femoral condyle, not suitable for replacement, a free periosteal graft was transplanted from the tibia to the defect in the articular cartilage. The graft was fixed with the two-component tissue glue Fibrinkleber-Human Immuno®.

The patients were re-examined clinically, by x-ray, and by arthroscopy 3, 6, and 12 months after the operation. The results so far are promising, showing the articular cartilage and bone defects filled with bone tissue which is covered with cartilage and level with the normal cartilage.

Septic arthritis of the knee treated by synovectomy

Per Riegels-Nielsen & Jørgen Steen Jensen

Department of Orthopaedic Surgery U, Rigshospitalet, Copenhagen, Denmark

Five cases of septic non-gonococcal arthritis of the knee were treated by synovectomy 5-12 days after

the diagnosis was confirmed. Synovectomy was performed in cases with persistent fever and continuous effusion in spite of adequate antibiotic therapy and serial needle aspirations.

The infection subsided in all cases. At follow-up 2 years after the operation one patient had died of an unrelated disease but was known to be without knee complaints. There had been no recurrences among the remaining four. One patient had disabling pain on weight bearing and considerable restriction of joint movement with 2–3 mm narrowing of the joint space. Three knees were painless and with a normal range of movement, but in two cases changes in the lateral femoral condyle resembling osteochondritis were found on the radiographs. Synovectomy of the knee is a valuable adjunct in the therapy of septic arthritis. In order to prevent damage to the cartilage, the operation should be performed while the lesion is still synovial, i.e. within 5–7 days.

Compartmental arthroplasty with modular prosthesis. An experimental study on human knee preparations

Jens T. Møller

The Orthopaedic Hospital, Aarhus, Denmark

The articulation with the femur of flat tibial components, placed horizontally and with 10° posterior tilt, was studied radiographically in 20 medial and 20 lateral hemiarthroplasties. The placement of the tibial component and the preoperative inclination of the tibial plateau were both found to be decisive factors for the articulation. The articulation was found to take place more posteriorly on the horizontal than on the tilted components, the difference being significant between 0–20° of flexion in medial arthroplasties and for the full range of motion in lateral arthroplasties.

A significant correlation was found to exist between the change of inclination of the tibial plateau and the point of articulation in 0–20° of flexion in the medial and for all degrees of flexion in lateral arthroplasties.

Using regression lines, an optimal articulation could be expected if the tibial component was inserted with the same slope as that of the original tibial plateau. The articulation of the posterior margin found in horizontal components could be prevented through the use of tilted components.

Compartmental arthroplasty. A study of bone strength and of the anterior cruciate ligament

Jens T. Møller

The Orthopaedic Hospital, Aarhus, Denmark

A metal modular component was inserted in six medial and six lateral tibial plateaux. The relative strength of the underlying cancellous bone was calculated from load-deformation curves obtained by submaximal compression in an Instron machine. The tests were done at 20 regularly spaced points in each component.

In the medial plateau the compressive stiffness was maximal when the load was supplied to the center of the component, but declined sharply toward the medial and posterior margins. In the lateral plateau maximal stiffness values were obtained more posteriorly and the stiffness gradients towards the periphery were less marked.

The tibio-femoral articulation of components placed either horizontally or with a 10° posterior tilt was studied in 10 medial and 10 lateral unicompartmental arthroplasties before and after cutting the anterior cruciate ligament. In all degrees of flexion the cutting resulted in a posterior displacement of the articulation in both flat and tilted components. Absence of the ACL is apparently a contraindication of unicompartmental arthroplasties.

Trabecular bone strength in the severely degenerated knee joint

Ivan Hvid

Biomechanical Laboratory, The Orthopaedic Hospital, Aarhus, Denmark

The resistance to axial penetration of subchondral trabecular bone as a function of the depth of penetration was measured in 105 consecutive total condylar knee arthroplasties. Each condyle was measured posteriorly, centrally, and anteriorly. Reproducible coordinates for the measurements were achieved by means of a series of congruent templates. The tibial bone strength calculated as the average of six measurements was moderately reduced in rheumatoid knees. In the osteoarthritic group a significant negative correlation to the age

and a positive correlation to the weight of the patient were established. In rheumatoid arthritis there was a significant positive correlation to the level of physical activity and a negative correlation to the duration of the disease. Malalignment profoundly influenced the distribution of bone strength in the tibia. In varus knees the strength on the medial side was always higher than on the lateral side. In normally aligned knees the strength on the medial side was higher in most knees, while in valgus knees the medial/lateral distribution was unpredictable, higher medial strength being found in some knees with up to 25° of valgus. The variation of bone strength with depth also depended on the type of malalignment. Relatively large decreases of bone strength with depth (12–35 per cent) were noted in the stronger tibial condyle.

Bone strength profiles in the proximal tibial epiphysis of cadaver knees

Ivan Hvid & Stig Lau Hansen

Biomechanics Laboratory, The Orthopaedic Hospital, Aarhus, Denmark

Multiple penetration tests were performed with a thin needle (Hvid et al. 1984) on the proximal tibial epiphyses of 12 normal and 12 malaligned knees. Measurements were obtained in a regular fashion, with measurements being done in a quadratic pattern with 5 mm between measurements. Computer-produced pseudo-3-D drawings were used to illustrate the characteristic patterns produced. In the normal knees bone strength was higher in the medial condyle. There was a large high strength area medially, while laterally a smaller area of relatively high strength was noted posteriorly. Bone strength decreased marginally beneath the menisci and beneath the intercondylar area. The decrease of bone strength with depth exceeded 50 per cent at the medial condyle and 30 per cent at the lateral condyle. Varus knees were invariably stronger medially, with high values being obtained at the margin of the condyle. Valgus knees were of several types: some did not differ significantly from normal knees, one showed high values at the margin of the lateral condyle, and some were stronger at the center of an enlarged lateral condyle.

Arthroscopic determination of patello-femoral alignment

Jens Ole Søjbjerg, Jørgen Lauritzen, Ivan Hvid & Svend Boe

Department of Orthopaedic Surgery, Aarhus County Hospital and Orthopaedic Hospital, Aarhus, Denmark

The alignment between the patella and the femur was evaluated during arthroscopy according to the degree of knee flexion at which the lateral facet, the patellar ridge, and the medial facet of the patella gained full contact with the femoral condyles. The intraarticular pressure was 100 cm H₂O.

Fifteen patients with a normal patello-femoral joint showed alignment of the lateral facet at a mean knee flexion of 20°, the patellar ridge at 35° and the medial facet at 50° of flexion.

Twelve patients with patellar subluxations showed no difference in the alignment of the lateral facet, but a significantly different alignment of both the ridge and the medial facet at a mean flexion of 53° and 90°, respectively.

Fourteen patients with idiopathic chondromalacia did not differ from the normal material. However seven showed alignment of the medial facet at a knee flexion greater than 60°, similar to the subluxation group. All except one had chondromalacia grade 2–3. Two patients had alignment of the medial facet at 25° of flexion, and were classified as lateral hyperpressure syndromes. In five patients, of whom two had grade 1 chondromalacia, arthroscopy could not explain the patellar pain.

It is concluded that in patients with patello-femoral disorders arthroscopy is a valuable supplement to clinical and x-ray examination. It seems that patients with idiopathic chondromalacia can be reclassified according to the arthroscopically determined patello-femoral alignment. This may be of importance in the management of these patients.

Late results after meniscectomy

Uffe Jørgensen, Stig Sonne-Holm, Flemming Lauridsen & Arne Rosenklint

Department of Orthopaedic Surgery, T-3, Gentofte Hospital, Hellerup, Denmark

One hundred and forty-seven athletes with an isolated meniscus lesion were re-examined after 6 and

14 years. All had had the meniscus removed through an arthrotomy. At the 6-year follow-up 54 per cent had at least one complaint related to the meniscectomy, whereas 83 per cent had such complaints 8 years later. The x-ray findings described by Fairbanks (ridge formation, flattening of the femoral condyle and narrowing of the joint space) were correlated to the complaint at the 6-year follow-up. Fourteen per cent with Fairbanks changes at that time had developed osteoarthritis at the 14-year follow-up (Ahlbäck's criteria). This was significant ($p < 0.05$) compared to patients without Fairbanks changes at the 6-year follow-up and to the development of osteoarthritis in the opposite knee.

A total of 42 had Fairbanks changes and 8 per cent Ahlbäck changes at the 14-year follow-up.

It is concluded that Fairbanks changes are significantly correlated to complaints after meniscectomy and the development of osteoarthritis according to Ahlbäck's criteria.

Total condylar knee arthroplasty. A 2-year follow-up of 247 cases

Strange Nielsen, Ivan Hvid & Otto Sneppen

The Orthopaedic Hospital, Aarhus, Denmark

Two hundred and forty-seven consecutive total knee replacements with the Insall-Burstein standard total condylar knee system were followed up after 2 years. Of the 238 available to follow-up, two had been reoperated during the period because of infection or traumatic loosening of the tibial component. In 79 patients the operation had been performed because of rheumatoid arthritis and in 94 patients for osteoarthritis. A rating system registering pain, walking ability, range of motion, muscle strength, flexion deformity, valgus-varus deformities, instability, and the use of walking aids was used in the assessment. Excellent or good results were found in 91.5 per cent, 6.5 per cent had a fair, and 2 per cent a poor result.

There were two cases of infection, one of which resulted in removal of the prosthesis and fusion of the knee.

There were four suspected aseptic loosening, three cases of transient peroneal nerve palsies, and three patients developed reflex dystrophy.

Prosthetic positioning and overall postoperative alignment were studied in 138 of the cases. A radiolucency index incorporating width and extent of radiolucency zones in the tibia was shown to progress more in the RA group when varus alignment was present. A tilt of the tibial component of more than 4 degrees in any direction increased the radiolucency index in both groups.

De Quervain's disease

Jon-O. Wethelund

Aarhus Kommunehospital, Department of Orthopaedic Surgery E, Aarhus, Denmark

The purpose of this retrospective analysis was to examine the success of operative treatment of de Quervain's disease, and its early and late complications. During 1973–1983, 30 consecutive patients were operated. Twenty-five patients (17 females, 8 males, median age 39 years) were re-examined. The median period of observation was 55 months. The average duration of symptoms prior to operation was 9.3 months and consisted of pain, swelling and reduced mobility. Fifteen patients had previously been treated conservatively with ultra-sound, immobilization and steroid injections. On average patients were on sick-leave for 18 days. At re-examination, 11 patients had pain, swelling or reduced mobility and eight of these had previously been treated conservatively. Two patients had hypaesthesia distal to the scar, three adhesions, 10 reduced mobility of the thumb, and three had reduced strength. Some had slight pain on palpation of the scar, but no neuromas or granulomas were found. Superficial infection was seen in two cases, but treatment was not necessary. It must be emphasized that in 10 of the 14 patients with sequelae, additional factors such as ganglion, osteoarthritis, or sequelae from other operations were found. The patients treated on an out-patient basis fared as well as those treated during a hospital stay.

It is concluded that operative treatment of de Quervain's disease is a radical procedure associated with few and unimportant sequelae. Treatment on an outpatient basis can be recommended.

Treatment of scaphoid fracture

Jørn M. Jepsen & Carsten Juhl Terkelsen

Department of Orthopaedic Surgery, Randers Centralsygehus, Randers, Denmark

In a retrospective study, the treatment of scaphoid fractures was evaluated, comparing the results with a circular plaster cast from the humerus to the thumb (48 patients) and a below-elbow removable plastic cast (44 patients).

No difference in the frequency of non-union was found between the two groups. Also, with respect to pain, mobility and strength of the hand, the results were identical.

It is concluded that the more comfortable below-elbow cast is preferable to the high circular plaster cast.

Classification of distal fractures of the radius in adults

Søren Solgaard

Department of Orthopaedic Surgery U, Rigshospitalet, Copenhagen, and Department of Orthopaedic Surgery O, Hillerød Hospital, Hillerød, Denmark

In order to evaluate the prognostic value of five commonly used classification systems of distal fractures of the radius, the radiographs of 269 patients were reviewed and classified according to the classification systems described by Nissen-Lie (1939), Gartland & Werley (1951), Lidström (1959), Older et al. (1965) and Frykman (1967). Furthermore, the primary displacement (dorsal angulation, radial displacement and radial shortening) was measured and the age and sex of the patient were registered.

All data were statistically analysed using multiple contingency tables. The analysis showed that the quality of the fracture reduction depended on the primary shortening of the fracture, whereas the dorsal angulation and radial displacement had no direct importance. The prognostic value of the classification system described by Older et al. was superior to the other systems, with respect to the possibility of achieving both a good reduction and an ideal position at fracture union. None of the type 3 and type 4 fractures were in ideal position at fracture union, despite the fact that 25 per cent had been reduced to an "anatomical" position.

The analysis furthermore showed that the initial displacement influenced the final result only indi-

rectly (through the influence on the quality of reduction), and that the age of the patient was also of prognostic importance.

It was concluded that the classification system of Older et al. (*J. Trauma* 5, 469-476, 1965) should be used to classify distal radius fractures.

Modified closed treatment of Achilles tendon rupture

Johnny Keller

Orthopedic Section, Department of Surgery, Horsens Hospital, Horsens, Denmark

In order to minimize rerupture after closed treatment of Achilles tendon rupture, the period of immobilization proposed by Lea & Smith was prolonged from 8 to 12 weeks and an above-knee plaster cast was used for the first 3 weeks. In 37 consecutive patients followed for an average of 3 years, re-rupture had occurred in two patients; it was significantly less frequent than in a previous series treated by the standard method of closed treatment. Ten patients had slight complaints and seven patients had slightly abnormal ankle motion. In comparison with reported series treated by open treatment, the modified closed treatment appeared to be just as good as open treatment. The most important complication to closed treatment was re-rupture, but the incidence did not appear to be greater than that of serious complications after open treatment.

It is concluded that modified closed treatment is a good alternative to open treatment.