

cement granulomas in nonloosened cases. The first signs of the synovial membrane appeared as soon as 2.5 months postoperatively, while 7 months after primary operation the first cement debris was observed, while the synovial membrane was already fully developed and did not differ histologically from that in cases with loosening.

Rheumatoid arthritis

83. Our up-to-date experience with use of cementless Parhofer's hip prosthesis in rheumatoid disease

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The cementless total hip prosthesis devised by Parhofer was implanted for the first time in our department in 1987 in an 18-year-old woman suffering from juvenile rheumatoid arthritis. April 1987–June 1991 this procedure was carried out on 66 patients (42 women and 24 men), age 34 (18–54). 83 hips have been operated on because of rheumatoid arthritis and 23 hips due to ankylosing spondylitis—bilaterally in 41 patients. Follow-up ranged from 7 months to 4 years and 10 months, mean 2 years.

In 107 THR in patients with rheumatoid disease, the results were favorable, especially with regard to pain and range of motion. Only in one case with persistent femoral pain, aseptic loosening of the stem is suspected. A transient femoral nerve paresis, probably due to stretching, was observed in one patient. In one case, a perforation fracture of the femoral cortex, and in another, a fissure of femoral shaft occurred during surgery; twice there were fractures of the trochanter—all fractures healed uneventfully.

We concluded that the Parhofer cementless THR is a valuable method in surgical treatment of rheumatoid hips, provided the procedure is carried out accurately and by experienced surgeons.

84. Long-term results after knee replacement with different types of prostheses in rheumatoid arthritis patients

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The aim of the study was to define: a) the long-term results depending on the type of prosthesis, b) the most useful type

of prosthesis in the survival aspect, c) the method of management of the failure cases.

During the years 1967–1991, we operated on 609 knees with 16 types of prostheses in 505 patients affected by rheumatoid arthritis. Only 433 knees in 358 patients with 5–24 years follow-up were taken into consideration—101 (23.3%) knees in 77 patients were reviewed. 28 patients had died, 35 had changed their address and 218 did not respond. The examined patients were divided into 3 groups, depending on period of operation: group I: 1967–1975, 18 knees in 18 patients; group II: 1976–1980, 38 knees in 29 patients; group III: 1981–1986, 45 knees. There were 62 women and 15 men, the mean age at the time of operation was 46.

The Knee Society Rating System and radiographic assessment were employed. The cumulative survival calculated for the constrained and nonconstrained types of prostheses was similar—38% and 41%. Failure of the prosthesis was also similar—24% and 26%.

The most useful prosthesis in the survival analysis seems to be the condylar type (in our study Kinematic) and the semiconstrained (in our study GSB).

After aseptic loosening of a sledge prosthesis it seems possible to change to a condylar or semiconstrained knee prosthesis if the bone quality is good.

85. Uncemented Freeman-Samuelson total knee arthroplasty in rheumatoid arthritis

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Introduction: Long-term results of total knee arthroplasty have in several studies been reported to be good. Due to concern about the long-term adverse effects of PMMA several attempts of uncemented fixation have been developed. We have in Göteborg followed prospectively patients with rheumatoid arthritis who have been operated on with uncemented Freeman-Samuelson total knee arthroplasty. The aims of the study were to evaluate these arthroplasties: 1) clinically, 2) radiographically and 3) with roentgenstereophotogrammetric analysis (RSA).

Material and methods: 102 consecutive knee arthroplasties in 86 patients were followed. The mean age at operation was 60 (22–78) years. There were 69 women and 17 men and the mean follow up was 5 years. The clinical data were prospectively computerized pre- and post-operation and thereafter annually. The Hospital for Special Surgery score was used for evaluation. Preoperative and postoperative alignment and prosthetic positions were measured radiographically.

Radiographic early signs of tibial loosening are difficult to detect because the interpretation is dependent on the projections. Therefore roentgen stereophotogrammetric

analysis (RSA) was used in 19 patients and in two studies. In one study (I), the migration of tibial components with metal backing and stem was compared with the all polyethylene implant. This group included 11 patients measured by RSA postoperatively and at 3, 6, 12, and 24 months. In addition, at two years postoperatively stress examinations were performed to study micromotion. In another study (II), 8 patients were randomized to a comparison between cemented and noncemented metal backed tibial plateaus.

Results: Clinical data revealed a HSS-score of 38 preoperatively and 82 at latest follow up. Excellent and good results were found in 90%. 100 knees were painfree or had slight discomfort during activity. There were 7 revisions, 6 of which were due to aseptic loosening of the tibia plateau and one to deep infection. Radiological assessment showed good correction of the usually severe preoperative deformity. RSA measurements showed that the prosthesis with metal backing and stem had a significant reduction of varus-valgus and anteroposterior tilt and of the inducible displacement. The mean migration was smaller for the stemmed than for the nonstemmed prostheses. In the group where cemented vs uncemented were compared we found a significantly smaller migration at one year follow up for the cemented prostheses.

Conclusion: Uncemented knee arthroplasties in patients with rheumatoid arthritis showed good results in a 5-year follow up with satisfactory clinical scores but 6% of the tibial components became clinically loose. Furthermore, RSA data for uncemented tibial plateaus indicate a significant migration and micromotion which may be a hazardous sign in the long run. The addition of a stem to the tibial plateau reduced the migration between the component and the bone, but a still more stable situation was obtained by using cement as well. On the other hand, femur and patella components were successfully fixed for a 5-year period without cement.

86. Mid-term results of the Souter-Strathclyde total elbow prosthesis in patients who have rheumatoid arthritis

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Introduction: Aseptic loosening in constrained prostheses has been a major problem in the past. Resurfacing implants like the Souter-Strathclyde elbow prostheses, that have fewer constraints, are likely to have a much better chance for long-term good results (1).

Patients and methods: Between February 1985 and December 1991, 29 primary total elbow prostheses were cemented in place in 24 patients, whose elbows were severely affected by rheumatoid arthritis. We reviewed the results of the first 24 prostheses in 20 patients (4 patients had had a bilateral operation), with a minimum follow-up of

2 years. There were 5 men and 15 women. In all patients severe pain in the elbow was the primary indication for the operation.

Only 3 patients had had a previous operation on the elbow; synovectomy with excision of the radial head (1x). In all patients the function and ROM of the ipsi-lateral shoulder, wrist and affected elbow were recorded pre-operatively and at follow-up. Marked instability (20°) could not be found. The elbows were graded radiographically according to the classification of Larsen et al. Joint exposure was by a posterolateral approach as described by Campbell (2).

Results: There were two postoperative complications: one patient with a recurrent luxation, who was reoperated on after 8 weeks and is now doing well and one with a wound dehiscence which was closed secondarily by skin rotation flap and grafting, this patient developed a fistula but his function is good. One patient died 2.5 years after his operation of pericarditis. In the remaining 17 patients (20 joints), who had an average follow-up of 4.5 years (2-7), pain was markedly less or had resolved completely and the function of the elbow was greatly improved. Nevertheless two loosening of the humeral component were seen in two very active men (6 and 3 years follow-up) without complaints. All complaints were in the dominant arm.

We believe that the mid-term results of the Souter-Strathclyde prostheses are quite acceptable, but in very active men early loosening of the prostheses has to be expected.

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87. Long-term follow up on rheumatoid arthritis patients with total shoulder replacement

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Introduction: A prospective and consecutive study was done of 73 shoulder replacements in 62 patients with rheumatoid arthritis.

Material and methods: From 1983 to 1990, 74 patients, all graded radiographically Larsen type 4 or 5 received a Neer 2—one patient a Neer 1 prosthesis. The primary indication for the operation was severe chronic pain. Eleven patients were bilaterally operated, 5 had an ipsilateral elbow prosthesis. Seventy-two were total, one hemi-arthroplasty and 72 were cemented. There were 46 women, 16 men receiving 45 right and 28 left shoulder prosthesis. The

patients were evaluated annually according to the American Shoulder and Elbow Special Surgery scoring system. All patients received physical rehabilitation.

Results: The average age at operation was 59 (32–77), the follow-up period was 61 (3–104) months. Pain relief was observed in 86%, average function score increased from 10 to 24 points (maximum 40 points). Strength increased in the anterior and middle deltoid muscle and for external rotation. ROM in sitting and supine position regarding forward elevation increased 31° and 30° whereas the increment in external rotation was only 6°. One intraoperative complication was recorded (perforation of the glenoid fossa). Postoperatively, two patients developed pneumonia, there was one wound revision, one superficial infection and one revision operation. Two patients died early postoperatively due to uremia and heart failure. In 29% of the glenoid components, there were radiolucent lines around the component—40% of the humeral component had one or more radiolucent lines. None appeared to be loose.

Conclusions: Shoulder arthroplasty provides a good predictable reconstructive alternative for patients with severe affection of the shoulder joint. The results are overall satisfactory with pain relief and improvement in ROM and strength with few postoperative complications.

88. Structure and function of matrix components in normal and rheumatoid labrum glenoidale

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The labrum glenoidale is a fibrocartilaginous rim that contributes to the stability of the glenohumeral joint. Little is known about its involvement in rheumatoid arthritis. Therefore the aim of this investigation was to characterize the different components of the extracellular matrix in normal and rheumatoid shoulder joints.

Materials and methods: Specimens from the labrum glenoidale were obtained at arthroscopic operations in RA (n=12). They were compared with a control group of directly postmortally dissected tissues (n=18). The extracellular matrix was examined by use of light and electronmicroscopic methods. The distribution of carbohydrate structures and their receptors—endogenous lectins—was analysed by lectins, neoglycoproteins and histochemical techniques (e.g. critical electrolyte concentration of basic dyes). To characterize collagenous components, morphometric methods and mABs (type I, II, III, IV, and VI) were applied. Monocytes were detected by use of MABs (CD 14, MAC 387, OKM 1).

Results: In normal specimens the extracellular matrix was homogeneously stained by PAS. In contrast, Alcian blue at pH 1.0 marked only thin fibrils in the periphery of collagen strands. Its binding pattern correlated with the

affinity of WGA. The mean diameter of collagen fibrils was 87.2 nm (SD 28.6 nm). They were arranged in dense parallel bundles. The average distance between the major bands was 59.8 nm (SD 3.7 nm). The extracellular matrix contained small oxytalan fibres. Regardless of pathology, the fibrocartilage was intensely stained by takin DSL, LCA, PHA-E and RCA-I. The connective tissue showed only a weak affinity for heparin, mannose and Con A. Endogenous lectins binding heparin was uniformly distributed throughout the labrum glenoidale. Its surface was stained by a thin layer of PNA. Ultrastructural results showed a regular pattern of sialic acid receptors in collagenous fibres. STL, DBA, UEA-I and sucWGA were constantly negative.

In RA, sialic acid molecules were diminished at the upper layers of the labrum glenoidale. The affinity of the extracellular matrix for alcian blue and toluidin blue at pH 4.0 was increased. In these areas PAS showed only a weak staining reaction. However, sulphated proteoglycans were focally accumulated. The ultrastructural collagen architecture was markedly altered and the arrangement between the filaments was significantly disturbed. The mean diameter of the collagenous fibrils was decreased to 74.6 nm (SD 34.1 nm). Also the average distance between the major bands was reduced (54.1 nm). Type III, IV, and VI collagens were significantly increased. A shift to more immature precursing elastic fibers was detected. Alterations in matrix texture were not restricted to areas near the inflammatory pannus. The collagen strands showed an intensification of the binding affinity for mannose. Fucose reacted only in inflamed areas. Con A revealed a higher affinity to the extracellular ground substance compared with normal tissue. The staining intensity of DSL and PNA was significantly enhanced. The proof of Gal-beta-(1-3)GalNAc was confined to areas of severe ultrastructural destruction.

Conclusions: The normal function of the labrum glenoidale is critically dependent on its physiological collagen and proteoglycan pattern. RA induces complex alterations in matrix composition and cell matrix interactions. Our findings may explain the functional insufficiency of the rheumatoid glenohumeral joint.

89. Orthopedic surgery in hemophilia—a 20-year review

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In Sweden today, with about 600 hemophiliacs, almost every patient with severe or moderate form (40%) receives regular factor replacement therapy. One consequence of this regimen is a decreasing need for complementary orthopedic surgical procedures. In Malmö, serving large parts of Sweden, altogether 85 orthopedic operations were performed between 1970 and 1990, in 58 patients with hemophilia. 46 had hemophilia A and 12 hemophilia B, the

age ranged from 6 to 71 years. The three most common procedures were synovectomy of the knee (13), resection of the radial head in combination with synovectomy of the elbow (12) and hip arthroplasty (12). When comparing the two decades, three differences were observed: a decreasing need for surgery—48 in the 70s and 37 operations in the 80s, increasing age of the patients—average 29 in the 70s and 44 in the 80s, and, finally, a change of procedures e.g. surgical synovectomy of the knee was frequently performed in the 70s (10) and rarely (3) in the 80s.

Due to regular factor replacement therapy the situation of patients with hemophilia has dramatically improved during the last two decades. A child with hemophilia today can expect a practically normal adolescence avoiding the bleeding complications that earlier frequently caused surgical intervention. This is most likely the explanation of the changing panorama of orthopedic surgery in patients with hemophilia today.

90. Improved radiographic survival of the Charnley prosthesis in rheumatoid arthritis and osteoarthritis—the results of new operative techniques in 402 hips

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201 consecutive, primary, noninfected Charnley hip arthroplasties, implanted from 1968 to 1985, incl. due to rheumatoid arthritis with an adult onset, were matched in pairs with respect to year of operation, age and gender with 201 Charnley prostheses implanted due to osteoarthritis. After 10 years, 93% and 89%, respectively, were retained according to a survivorship analysis. Using definite radiographic loosening as a determinant, the 7-year survival rate for stems increased from 80% to 96% for both groups after the introduction of new cementing techniques and the relative risk for stem loosening was decreased to one fifth. The 10-year radiographic socket survival was 78% and 95% in rheumatoid arthritis and osteoarthritis, respectively. In rheumatoid arthritis the 7-year radiographic socket survival increased from 87% to 96%, an increase attributed to the introduction of flanged sockets, bone grafting in acetabular protrusion and the rejection of the original, pilot hole technique.

Knee arthrosis

91. The effects of knee osteoarthritis on the physical and psychosocial health status

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In patients with osteoarthritis, interest has mainly been focused on pain and secondarily on clinical and radiographic findings. Patients experience pain very individually and consequently its influence on functional capability and health status may be different. An increasing awareness of the multidimensional impact of joint disease had led to the development of various quality-of-life measures. Health status instruments have been constructed for assessment of the impact of sickness on physical and psychosocial function. The Sickness Impact Profile (SIP) is a well-known measure of functional health status and it has been used to study patients with different diseases, but to our knowledge not to study patients with osteoarthritis of the knee. The aim of this study was to describe patients with moderate osteoarthritis of the knee, clinically and functionally, and to define physical and psychosocial effects of the disease.

Material and methods: 60 patients, 35 women and 25 men, mean age 63 years, with moderate medial osteoarthritis of the knee and no symptoms from other joints were included in the study. All patients were scheduled for reconstructive knee surgery (tibial osteotomy or unicompartmental replacement). Clinical examination, using the BOA knee function chart (max 39 points), and measurements of self-selected walking speed, pain and effort during walking were assessed using a 10-graded scale. To verify the impact of moderate osteoarthritis of the knee on health status, the Sickness Impact Profile (SIP) was used.

Results: The mean BOA score was 30 (25–34) points and self-selected walking speed averaged 63 m/min and reduced compared with healthy subjects 80 m/min. Mean values for pain and perceived exertion during walking were 3.5 (0–10) and 2.4 (0–7), respectively. The mean SIP score for the patients was 7.4 (1–29), which means that there was a 7.4% reduction of normal health status in these patients. The patients considered that their knee osteoarthritis had the greatest influence on their ambulation (A) 23%, recreation and pastimes (RP) 20%, on sleep and rest (SR) 17%, and on emotional behaviour (EB) 11%. Significant correlations ($p < 0.01$) were found; between pain during walking and the Psychosocial SIP (EB), between BOA score and the Physical SIP; between self-selected walking speed and Total SIP (A and RP).

Conclusion: SIP appears to be a measure with sufficient sensitivity to detect physical and psychosocial changes in patients with moderate gonarthrosis. In clinical assessment, determination of self-selected walking speed and pain during walking were found to reflect their general function.