RECURRING SYNOVITIS AS A POSSIBLE REASON FOR ASEPTIC LOOSENING OF KNEE ENDOPROSTHESSES IN PATIENTS WITH RHEUMATOID ARTHRITIS
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Introduction: Inoue et al. found histological signs of recurring rheumatoid synovitis in the synovium of ten endoprostheses with aseptic loosening. In contrast, Cooke suggested that rheumatoid synovitis does not recur after total joint replacement with complete removal of the antigen-containing cartilage.

Material and Methods: In order to review the contradictory theories of Inoue et al. and Cooke, 56 samples of synovial tissue from knee joints of patients with rheumatoid arthritis (RA) were histologically evaluated. The samples were taken in the course of component revision due to aseptic loosening of a cemented knee endoprosthesis. One control group consisted of 72 knee joints with aseptic loosening of cemented implants in patients with osteoarthritis (OA). A second control group included 21 joints without aseptic component loosening in RA patients which had been revised because of failure of the inlay respectively the coupling system of a constrained knee endoprosthesis. All patients had undergone a total ventral synovectomy before implantation of the primary prosthesis.

Results: Foreign-body reactions and lymphocellular infiltrations were seen in more than 80% of the histologies of all three patient groups. Fibrin deposits were observed roughly in between one third and one half of joints of all patient groups. Typical signs of reactivation of the rheumatoid arthritis such as rheumatoid necroses and/or proliferation of synovial stroma cells were found in 23% of the joints of RA patients with component loosening but not in the OA patients with loosening and in the RA patients without component loosening.

Conclusion: Reactivation of a rheumatoid synovitis occurs after total knee replacement and may be a cofactor in aseptic loosening of endoprostheses in patients with rheumatoid arthritis.
PERIPROSTHETIC MINERALISATION AROUND CEMENTED TITANIUM TOTAL HIP STEMS
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Introduction: The reaction of bone to the implantation of a femoral stem in total hip arthroplasty (THA) may be an important co-factor determining the long-term survival of the implant. Consequently, several attempts were undertaken to predict the bone-remodeling after THA [1]. Using DEXA measurements on retrievals, patterns of predicted bone loss corresponded with these data [2]. The results of these models appear to be reasonable, however, there still exist a lack of validation with human in vivo data. The aim of the study presented here is the collection of quantitative in vivo 3D femoral bone-remodeling data after THA with a prospective and retrospective computerized tomography (CT) study.

Methods: Between 1997 and 1998 7 females underwent unilateral THA with a forgea cemented titanium alloy stem (Marburg system; Sulzer Orthopedics). In this prospective part of the study, spiral CT scanning (Somatom Plus-4, Siemens) was clone postoperatively, 3, 6, 12 and 24 months after surgery. Full weight bearing was permitted immediately after the operation. In a retrospective part, 11 female patients with unilateral THA of the same implant were scanned 12 years after surgery. A slice thickness of 2 mm was always selected, where the distribution of the Hounsfield units (HU) were measured. The contralateral side without THA served as a control.

Results: A data set of about 100 000 bone voxels of each femur was collected. The predominant change is seen during the first year representing an average loss between 100 and 150 HU (approx. 10%). The values differ, however, within the horizontal slices. Density decreases stronger within the lateral femur. The 12 years results of the retrospective part of the study demonstrate similar results to the prospective 2 year follow-up CT density values.

Discussion and Conclusions: The aim of this work was to provide a large data set of time-dependent in vivo CT voxel density information after femoral stem implantation based on a prospective, controlled study design. The loss of CT density observed was between 10 to 15% at the actuel side. No CT density decrease was seen below the prosthesis' tip and at the control side. Major density changes occur during the first year of follow-up, only. The data collection presented here is unique and will be used to validate post operative adaptive bone remodeling simulations. The method is particularly valuable to differentiate THAinduced from medication-induced bone demineralization in rheumatoid patients.


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PHYSICAL ACTIVITY IN RHEUMATOID PATIENTS YOUNGER THAN 55 YEARS WITH MOBILE BEARING TKA.
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Purpose: Outcome of mobile bearing TKA in the younger rheumatoid (RA) population with special regards to patient's activity lever, sports activities, and occupational related changes.

Methods: A questionnaire was sent out to all 79 RA patients younger than 55 years that have undergone mobile bearing TKA with at least 1 year follow-up. Nine patients died since surgery and 57 (81%) cases replied to the questionnaire (80 questions).

Results: Follow-up time was 1 to 11 years, mean total postoperative score was 81.5 points (out of 100). Currently in occupation were 21%. There were 9.5% complications that will be discussed in depth. Of the group 45% participated in regular active exercises with a mean of 65 min/week on 2.5 days. Average walking distance/day ranged from less than one to more than ten km. Sports activities included: swimming, fitness, hiking, cycling, tennis, alpine skiing, and jogging. Daily gardening and housework was noted in over 50%.

Conclusions: There were 3.2 times more RA cases in this young group compared with the entire group of over 3000 TKA in this center. RA patients younger than 55 years old perform better in general physical activity, work performance, and sports activities than compared with older RA patients. Significantly improved quality of life after mobile bearing TKA can be expected in young RA patients. The results of this questionnaire show a high percentage of rheumatoid patient's satisfaction having undergone TKA and support the indication for mobile bearing TKA in young RA patients.
TOTAL ANKLE ARTHROPLASTY IN POLYARTHRITIS.
6 (2-13) YEAR RESULTS WITH THE LCS/BUECHE-PAPPAS MOBILE BEARING PROSTHESIS
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Introduction: The LCS/Buechel-Pappas prosthesis was the first total ankle prosthesis (TAP) using a mobile bearing in order to reduce stresses at the boneprosthesis interface. Compared to 2-component prostheses a 3-component prosthesis with a mobile bearing has better biomechanical characteristics and so could be an viable alternative to arthrodesis. However, few medium to long-terre results with this concept are available, especially in patients with polyarthritis.

Material and methods: Between 1988 and 1998 58 non- cemented LCS/Buechel-Pappas TAP have been implanted in 42 women (8 bilateral) and 8 men with secondary arthrosis due to polyarthritis. Diagnosis was rheumatoid arthritis 54, juvenile chronic arthritis 3 and psoriatic arthritis 1. Age at operation was 55 (27-77) years. Prospective evaluation was carried out by a subjective assessment from the patients, by the LCS ankle score, and by radiographie evaluation.

Results: At follow-up, in 2001, 6 patients had deceased (7 TAP), 1 was lost to follow up and in 2 the implant had been exchanged: 1 for secondary infection and 1 for fate instability (10 years postoperatively, only bearing and talar component). Ten TAP had to be converted into an arthrodesis, 6 for a varus or a valgus deformity, 3 for aseptic loosening of the tibial component and 1 for an early deep infection. At a mean follow-up of 72 months 35 TAP were assessed satisfactory to very satisfactory and only 3 unsatisfactory (no radiographie loosening). The mean ankle score at improved from 37 to 74. Radiolucent fines were frequently seen around the tibial component, especially around its stem. The taler component mostly showed complete osseointegration.

Conclusions: In polyarthritis, the LCS/Buechel-Pappas TAP gives good clinical results if correct alignment is achieved at operation. The main failure modes were varus or valgus deformity of the ankle and aseptic loosening of the tibial component.
Purpose of the study: To evaluate the results and the technical difficulties of Total Ankle Arthroplasty (TAA) in Rheumatoid Arthritis (RA).

Material and method: From 1993 to 1999, 32 TAA were performed for RA (26 females, 16 right ankles) and the mean age at surgery was 55 y (32 to 81). The mean duration of evolution of the RA was 17 y (2 to 35). 18 were treated by corticosteroid and 17 by Methotrexate. The TAA was non cemented with a mobile compartent: 7 Bucchel-Pappas, 5 S.T.A.R. and 20 Salto. Post op, a below knee walking cast was used during 45 days. In 21 cases, a triple arthrodesis (TA) was associated because of a subtalar or midtarsal arthritis (SA) or a ruptured Tibialis Posterior Tendon (TPT). F.U. was based on visite and XR at 3, 6 and 12 months post-op and then each year. None were lost and the mean FU was 45 months (14 to 88). The functional results were analysed with the AOFAS score.

Results: We had two failure needing revision: One loosening of the taler compartment with migration after 4 years required an arthrodesis. One oversized taler compartment was revised after 1 year with a good result (AOFAS score=92). On the 30 remaining cases, the mean AOFAS global and pain scores were respectively 82 (73 to 92) and 35 (20 to 40).

The complications were: 2 skin necrosis, one treated with local treatment and one with plastic surgery. 3 subsidence of components, 1 on the tibia and 3 on the talus.

1 malposition of the taler compartment (anterior translation) was asymptomatic.

2 fractures of the medial malleolus during surgery healed with no consequences.

Discussion. Conclusion: TAA is a treatment of choice of the rheumatoid ankle. The associated lesions of the hindfoot influences the prognosis and the results of the TAA. Preoperatively, analysis of deformity and bone loss are performed on clinical exam, XR and CT-Scan. Any deviation in valgus if due to a SA or a ruptured TPT requires a TA.
Twenty consecutive patients (twenty-nine feet) with rheumatoid forefoot deformities were treated with an operative reconstruction consisting of first metatarsophalangeal arthrodesis, limited fesser metatarsal head resection or arthrolysis and PIP arthrodesis. All patients returned for follow-up at an average of 33.4 months (range 12 to 56 months). All first metatarsophalangeal fusions had healed. The hallux valgus angle had decreased from preoperative 45 degrees to post-operative 16 degrees. The average metatarsophalangeal valgus of the 2nd ray was 10 degrees. Preoperatively 68 (of 116) metatarsophalangeal joints of the fesser toes were dislocated. At follow-up 9 fesser toe MTP joints were subluxated or dislocated. 19 patients (28 feet) rated their result as good or excellent, 1 patient as fair (1 foot). The average AOFAS forefoot score improved from a preoperative value of 32 points (range 5 to 39) to 79 points (range 65 to 90) postoperatively. Complications were a necrosis of the distal phalanx of a previously operated 2nd toe, and a fate infection of a PIP-nonunion caused by inappropriate shoewear.

Rheumatoid forefoot deformity treated by first MTP arthrodesis and fesser toe alignment results in a stable repair with a high patient satisfaction.
SHORT - AND MIDTERM RESULTS WITH THE S.T.A.R - TOTAL ANKLE PROSTHESIS - INDICATIONS, CONTRAINDICATIONS, COMPLICATIONS (A FOLLOW-UP IN 44 PATIENTS)
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Introduction: In 1994 Kofoed and Sturup already confirmed that within a follow-up of 10 years total ankle arthroplasty demonstrated a significant clinical improvement for the patients. In recent studies a 12 - year survival rate even of 84% was described (Kofoed, 1995).

Methods: In a retrospective study we evaluated the short - and midterm results in 44 patients with unconstrained total ankle arthroplasty and cementless fixation. These ankle replacements were performed between 8/1997 and 12/2000. A critical assessment concerning the indications and contraindications of this arthroplasty was performed due to the fact, that this surgical technique is not yet mentioned as a routinely performed surgical procedure of the ankle. The advantages in comparison to the open or arthroscopically assisted arthrodesis of the ankle were described. As initial diagnosis rheumatoid arthritis (n: 16), posttraumatic osteoarthritis (n: 10) or idiopathic osteoarthritis of the ankle (n: 18) was mentioned. The patients age varied from 24 to 78 years; the 24 years old patient suffered from a posttraumatic osteoarthritis, in the 78 years old patient contralateral total ankle arthroplasty was performed 13 years ago.

Results: There was a delay in superficial wound healing in 11 cases, in 4 cases soft tissue revision and once plastic surgery had to be performed. One female patient with RA had a postoperative deep infection after preoperative radiosynoviorthesis of the ankle. Additionally osteosynthetic reconstruction of the fibula (n: 2) and the talus (n: 1) was necessary. One patient underwent revisional surgery due to progressive wear and fracture of the polyethylene inlay. Furthermore three patients suffered from continuing instability, that one had a secondary open arthrodesis and two a syndesmoplasty combined with revision of the PE inlay.

The radiological examination offered migration and progredient radiolucency fines especially near to the tibial part of the prosthesis in three cases.

Nevertheless more than 80% of the patients were satisfied or very satisfied with their ankle arthroplasty, only 4 patients now would have denied the surgical procedure. As main improvements reduction of pain and increased mobility (ROM: > 40°) were mentioned.

Conclusions: The success of total ankle arthroplasty may depend on exact technique, correct hindfoot alignment and sufficient capsuloligamentous stability of the ankle. So this surgical procedure may provide a high rate of functional improvement for the patients and may prevent the probably necessary arthrodesis.
EVALUATION OF 88 ZWEYMULLER SCREWED THA CUPS IN RHEUMATOID PATIENTS WITH 2 TO 15 YEAR FOLLOW-UP
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Purpose: Mid-term outcome of screwed uncemented acetabular cups in rheumatoid hip arthritis.

Method: There were 88 THA using a Zweymuller screwed cup in 72 rheumatoid patients that were implanted from 1985 to 1994 at the above center. Mean age was 54 years with 17 male and 55 females. Nine cases underwent autologous bone grafting of type III acetabular defects. Complete follow-up data were available in 63 cases with follow-up from 2 to 15 years (mean 5.6 years). All cases were evaluated utilizing IDES questionnaires and Merle d'Aubigne scores both pre- and postoperatively.

Results: Postoperative pain scores improved from a mean of 2.5 to 5.2 (max 6), Scores for range of motion and mobility were 10.9 (of 12). There were no radiolucent fines in 56 of 63 cups with 4 cups showing radiolucencies of less than 3 mm and three (5%) cups demonstrating radiolucencies in combination with cup migration. The later were considered loose and are carefully monitored. Two cups were loose and underwent revision.

Conclusion: Uncemented screwed cups in rheumatoid hip arthritis have shown satisfactory outcome at the mid-term and are, therefore, recommended.
Bilateral hip and knee prostheses in patients with rheumatoid arthritis
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Quadruple arthroplasty may be indicated in the treatment of rheumatoid patients with severe destruction of both hips and knees. The long-term results of this treatment are presented.

Material and Methods: 30 Rheumatoid patients could be selected who had a replacement of both hips and knees. There were 8 males and 22 females. The average age at the onset of the rheumatoid arthritis was 40 years (range 11-66 years) and the average age at the time of the first operation was 54 (range 24 - 68 years). The average follow-up time of the prostheses was 9.5 years. The records and X-rays of all these patients were reviewed. The AIMS and the HAQ score were used. Besides a more joint specific questionnaire was used to assess the relief pain and walking ability. In 23 of the 30 patients both knees were operated as a one stage procedure. Only in 1 patient both hips were operated in one session. At the time of follow-up 8 patients had died. In 7 patients the hip was revised due to aseptic loosening. A deep infection occurred in 3 knee prostheses and the prostheses were revised.

Results: Most patients were satisfied with the result of the operation. The average satisfaction score was 2.7. (0 satisfied, 10 dissatisfied). The average score of the quality of live on the AIMS was 65 (20 good health, 105 bad health). With the HAQ score the average score was 23 (0 minimal invalidity, 51 maximal invalidity). Subscales will be presented that are more specific for the longer limb.

Discussion and conclusion: The complication rate with regard to aseptic loosening and deep infection is high in this patient group. Nevertheless the functional score was still good at the long-term follow-up of 9.4 years. Because the interval between the two hip operations averaged only 16 months one stage operations have to be considered more often.
NEW TKA SYSTEM FOR JAPANESE KNEE BASED ON CT SCAN
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Introduction: Total knee arthroplasty (TKA) has an important place in the treatment of late stage knee destructions in Rheumatoid arthritis. Each country has each culture. In Japan, peoples, especially old peoples, would like to sit in Japanese style, with fullyflexed knee. It is speculated that the Japanese knee joint geometry is different from caucasian knee geometry. So we have developed the new TKA system based on CTscan data of Japanese knee.

Geometry of new TKA: The new TKA system for Japanese knee shows flat oval shape. If lateral and medial size is same, anterior and posterior size is smaller 4 mm than that of American total knee. And, the posterior condyle is larger than American total knee.

Results: Since April 1999, 200 TKA has been performed. And, the results of the new TKA has showed good results. Especially, the range of motion of new TKA system is 10 degrees larger than that of Natural knee system, USA.

Conclusion: The new TKA system based on CTscan of Japanese knee has had good results.
The purpose of the study was to compare the results of rheumatoid forefoot reconstruction according to the surgical procedure of the great toe.

Methods: From 1988 to 1998, ninety consecutive patients had had a rheumatoid forefoot reconstruction. This study included 70 patients (117 feet) in whom a resection arthroplasty of the metatarsal heads of the lesser toes had been performed with an arthrodesis of the metatarsophalangeal joint of the great toe in 57 feet, a Keller procedure in 18 feet, an osteotomy of the first phalanx in 16 feet, a scarf osteotomy in 10 feet, a Swanson implant in 4 feet and without a surgical procedure of the great toe in 12 feet. The average age of the patients at the time of the operation was 56.5 years ± 11.

Results: The mean follow-up was 63.4 months (range, 14 to 221 months). Whatever the surgical procedure of the great toe, the clinical results were satisfying or very satisfying. There were no correlation between the surgical procedure of the great toe and the subjective assessment (p=0.15), the postoperative pain (p=0.46) and the postoperative activities (p=0.3). The M1P1 and M1M2 angles were improved with arthrodesis and scarf, whereas the M1M5 angles was improved with arthrodesis, scarf and Keller. Nevertheless, there was no correlation between the postoperative M1P1 angle and the subjective assessment of the patients (p=0.44). The recurrence of the hallux deformity was larger in the Keller and osteotomy of the first phalanx groupe.

Conclusion: Resection arthroplasty of the metatarsal heads of the lesser toes combined with an arthrodesis of the metatarsophalangeal joint of the great toe seems to be the best surgical method of correcting forefoot deformities in rheumatoid arthritis.
Examination of Serum Cartilage Oligomeric Matrix Protein Levels in Patients with Rheumatoid Arthritis
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Objective: To compare serum concentrations of cartilage oligomeric matrix protein (COMP) levers with the progression of disease in rheumatoid arthritis (RA): the results to be used as indication for surgical treatment.

Method: COMP was quantified by immunoassay in sera of patients with RA. A total of 72 RA patients (mean age 60.1 ± 12 years, duration of disease 11.0 ± 8.2 years) were subdivided into three groups according to severity assessed by X-ray, as follows: small joint destruction group, large joint destruction group and artificial joint reconstruction group. C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), rheumatoid factor (RF), and metalloproteinase 3 (MMP-3), were assessed and compared with COMP.

Results: Serum COMP levels were higher for those who suffered large joint destruction than for those who had small joint destruction (2.1 ± 0.5 micrograms/ml, and 2.8 ± 1.8 micrograms/ml, respectively). Even higher levels were found in the group of patients with artificial joint reconstruction (3.3 ± 2.3 micrograms/ml). Serum concentrations of CRP, ESR, RF and MMP-3 were not correlated with COMP.

Conclusions: Serum COMP levels cannot be directly correlated with inflammatory mediators of the disease. Changes in serum COMP levels may have significance in prognosis of the degree of severity in RA. Accordingly we may consider serum COMP levels as indicative of surgery such as total hip and knee replacements.
BONE MINERAL DENSITY AFTER TOTAL KNEE ARTHROPLASTY IN RA VS. OA - THE EFFECT OF PREVENTIVE ETIDRONATE ADMINISTRATION

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Introduction: Since rheumatoid arthritis is a systemic disease that results in significant osteoporosis with a high incidence of bone failures it seems appropriate to consider clinical intervention. Bone quality is important for the success of total hip and knee arthroplasties (TKA). Clinicians responsible for the care of RA patients should consider osteoporosis to be one of the important complications facing their patients. A study is conducted to investigate prospectively the influence of bisphosphonates on the early adaptive bone remodeling of the distal femur and the proximal tibia after TKA and to assess the risk of loosening.

Material and methods: A dedicated densitometric analysis protocol of the trabecular bone adjacent to the TKA components was designed defining four regions of interest (ROI) in the proximal tibia and three ROIs in the distal femur. BMD was measured using dual-energy-x-ray absorptiometry (DXA). The precision of the measurement was improved by a leg brace in 15° internal rotation.

A total of 149 patients were enrolled in the study including 109 patients with osteoarthritis (OA) and 40 patients with rheumatoid arthritis. Radiographic and osteodensitometric investigation was performed preoperatively, two weeks, 6,12 and 24 months postop. after TKA. The two weeks measurement was performed as an individual reference value to be compared for the further follow-up. We implanted without exception the same type of unconstrained TKA.

The clinical outcome was documented using the Knee Society Rating System.

73 patients (group 1) did not obtain any drug influencing BMD, 76 patients (group 2) received bisphosphonates, Etidronate was given to the standard cyclical schedule, 400 mg/d for a period of 14 days followed by 76-days interval with calcium supplement.

Results: Both groups were comparable in terms of patients data. They did not show changes of bone remodeling at the 14-days follow-up.

The first group demonstrated a progressive decrease of BMD at 6 months in all ROIs of the tibia (- 8.3%) and of the femur (- 14.4%). At the 1-yr. and 2- yrs. FU the BMD values were at the preop lever. In contrast to this all patients offered no decrease but an obvious increase of BMD of the ROIs (tibia!: +9.4%; femoral: +5.1%). The RA patients showed a stronger influence. 6 months after TKA the BMD was reduced - 15.9% without bisphosphonates (n=19). Group 2 (n=21) presented a significant increase of BMD of +12.7%.

Conclusion: Total knee replacement leads to changes of BMD that may be effective for 12 months. Bisphosphonates enforce the BMD and changes the negative effect of the TKA. The association of significant BMD increase may prevent early migration and loosening of the implants in RA patients. There is need for wider monitoring of populations of RA patients to identify those in need of prevention and treatment.
"SPECIAL ASPECTS OF OPERATIVE RHEUMATOLOGY IN MUSICIAN'S HAND"
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Introduction: Untreated Rheumatic arthritis generally leads to destruction of all systems of the hand and thereby to inability for professional need. However, combining a tight internal-medicinal treatment with proficient surgical procedures may give the musician a real chance to stay in professional career, at least for some years. In operative rheumatology in musicians, the basic rules of Handsurgery often need to be modified to avoid loss of professional skill, concerning:
A) Indication for operative procedure
B) Kind of operation
C) Details of operation

A) Indication for operative Procedure:
In the early stages, where You won't find essential structural damages of joints and tendons, excisions of the inflamed synovia of joints and tendons and corrections of minor mispositions are done. Differing from non-musicians, we have to discuss operative procedures in musicians very soon, to correct mispositions worsening professional skills and to minimize the risk of joint- and tendon-destruction.
In late stages, where You find destruction of joints, ruptures of tendons and considerable mispositions, original anatomical and functional conditions can usually not be restored. Most operations, which can be clone in this stage will have disadvantages, which have to be considered concerning the effects for professional instrumental playing.

B) Kind of Operation:
In musicians, this is essentially depending from the played instrument. Very individuel decisions have to be made. F.e., it must be decided, if a tendons rupture may be corrected by tendon transposition or better by free tendon transplantation, or if in case of destructed joint a stabililizing operation (arthrodesis) or a mobilizing procedure (arthroplasty) has to be preferred.

C) Details of Operation: Especially in reconstructive procedures, the details must be planned preoperatively very exactly, f.e. where to make the incision, where to take a tendon from for a free tendon transplantation and the length of the transplanted tendon. Another exemple is the exact planing of the angle of joints, which are due to be blocked by tenodesis or arthrodesis: This angle may differ very much depending from the used instrument, even from one finger to another. The optimal angle should be found by simulation usina plastic test sprints or test-plasters in different angles during a preoperative test-play on the instrument.

D) Conclusions: The absolute requirement for a successful operative treatment of rheumatic arthritis of the hand are profound knowledges and experience as well in handsurgery as in special rheumatological operations. In musicians, the deliberations about the indication, the kind of operation and its details, the disadvantages of each possible porcedure require additionally some basic knowledges about musical instruments and how to play them. If anyhow possible, the expected result of an operation should be checked during a preoperative test-play by using static or dynamic test-sprints.
RESULTS OF ELBOW ENDOPROSTHESES IN PATIENTS WITH RHEUMATOID ARTHRITIS IN CORRELATION WITH PREVIOUS OPERATIONS
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Aim of the study: The influence of previous operations for the results of elbow endoprostheses in patients with rheumatoid arthritis should be analyzed.

Material and Methods: 61 patients with rheumatic destruction of the elbow received 20 St. George, 20 GSB III-, 13 Souter-Strathclyde and 13 Kudo-endoprostheses. The joints in the various prosthetic categories had previously been operated on in 43.9% (a previous synovectomy had been performed in 19 joints at an average of 4.1 ± 3.7 years and a resection interposition arthroplasty had been performed in 19 cases 4.2 ± 1.8 years before endoprosthetic replacement). 51 patients with 54 prostheses were examined after a follow-up of 5.7 ± 4.1 years using the Inglis score and analyzing all X-rays.

Results: Complications occurred in 20% of the St. George and the GSB III prostheses as well as in 18% of the Souter-Strathclyde joints. Six (30%) of the St.Georg prostheses had to be exchanged, also four (20%) of the GSB III prostheses and four (30.7%) of the Souter-Strathclyde prostheses. Of the primarily implanted joints the St.Georg prostheses measured 77.7 ± 7.7 on the Inglis score, the GSB III prosthesis 89.6 ± 7.2, the Souter joint 88.4 ± 6.5 and the Kudo prosthesis 89.7 ± 4.4. Radiolucent fines of more than 1 mm were observed in 26% of the St.Georg prostheses, in 23% of the GSB III prostheses, in 27% of the Souter-Strathclyde and in 9% of the Kudo joints. In contrast to the clinical results the intraoperative and postoperative complications as well as the rate of failures and radiolucent fines showed a statistically significant correlation to previous operations of the joints with the resection interposition arthroplasty in a prominent position.

Conclusion: Resection interposition arthroplasty seems to be associated with complications and failures when a subsequent endoprosthesis is used.
Evolution of the results of synovectomy and Sauvé-Kapandji procedure for rheumatoid wrist, apropos of 34 cases reviewed at 5 and 9 years of mean follow-up
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Introduction: The early satisfactory results of the synovectomy with Sauve-Kapandii procedure (SSK) for rheumatoid wrist are now well known at intermediate follow-up, but could get worse with time. The aim of this study was to compare the clinical and radiographic outcome of a continuous series of 34 SSK evaluated twice at 5 and 9 years of follow-up.

Material and method: 39 SSK were performed by the same surgeon between 1984 and 1995 in 32 patients, combining an extensor synovectomy, a Sauve-Kapandji procedure and a division of the posterior interosseous nerve. 5 wrists (5 deceased patients) were excluded. 34 SSK (18R, 16L, because of 7 bilateral) in 27 patients (23W, 4M, 44 years at time of surgery, 53 years at maximum follow-up) were reviewed first at the mean follow-up of 107 months (54-180) by a first examiner (CC), then at the mean follow-up of 106 months (54-180) by another one (GR). The pain was evaluated through 5 stages. The wrists were classified according to Larsen modified by Alnot, and Steinbrocker. Carpal height and ulnar translation were measured. McMurtry and Shapiro indexes were calculated.

Results: At 5 years, the wrist was totally pain free in 22 cases, sometimes painful in 10 cases, painful at work twice; at 9 years, the wrist was totally pain free in 20 cases, sometimes painful in 12 cases, painful at work twice. Wrist flexion varied from 29.6° to 25.4°, extension from 42.9° to 43.6°, radial deviation from 6.9° to 9.1°, ulnar deviation from 24.7° to 24.4°, pronation from 84.2° to 82.3°, none of these modifications was statistically significant; supination varied from 87.2° to 80.8° (p=0.03). Radiographic staging according to Larsen-Alnot was slightly modified: 27 wrists kept the same stage (1 stage 1, 1 stage 2, 14 stages 3, 10 stages 4B and 1 stage SB), only 7 get worse by one stage (2 stages 0 become stage 1, 3 stages 2 become stage 3, 2 stages 3 become stage 4B). Radiographic staging according to Steinbrocker was slightly modified: 29 wrists kept the same stage (2 stages 1, 2 stages 2, 10 stages 3 and 15 stages 4), only 5 wrists get worse by one stage (5 stages 2 become stage 3). Carpal height was slightly modified, from 3.23 to 3.11 (p=0.037), McMurtry index too, from 0.507 to 0.488 (p=0.24). Ulnar translation of the carpus was slightly modified, from 9.31 to 9.74mm (p=0.59). Shapiro's angle was slightly modified, from 125° to 122° (p=0.15).

Discussion/Conclusion: We confirm the stability of the results after SSK, already reported by Allieu and al. about 25 wrists reviewed at 13 years. The results on pain was slightly modified, radiographic staging too. These good results invite us to propose first a conservative treatment of rheumatoid wrist: 3 patients out of 4 may benefit from SSK; radiolunar or total arthrodesis is rarely indicated in our department, only in case of sagittal instability or Simmen type 3.
A MODIFIED BIER BLOCK AS AN ALTERNATIVE WAY TO ADMINISTER CORTICOSTEROIDS IN JUVENILE CHRONIC ARTHRITIS

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Treatment of synovitis in the juvenile rheumatic wrist and hand is preferable to avoid ligament and joint destruction. Systemic medication forms the basis of the treatment, but surgery sometimes is required. Surgical arthro- and tenosynovectomi reduce pain, but requires the young patient to be able to cope with the often intense post-operative training. Decreased mobility has been shown to be frequent in the long term. Corticosteroids can be administered locally into tendon-sheets or into joints. When multiple joints and tendons are involved, the total dosis become high, and systemic side effects may appear. We have used a modified Bier's block, with injection of corticosteroids instead of local anestheticum. The present study evaluates the method and its effect over a longer time.

Between 1996 and 1999, 28 wrists in 15 patients were treated. The indications were longstanding multiple joint swellings and/or tenosynovitis that had not responded to alterations in systemic medication and/or locally administered corticosteroids. The mean age was 10 (6-18) years and all children had a diagnosed JCA. Since the patients came from all over Sweden, they often travelled back home before full effect has been achieved and the follow-up was made at the next visit at our clinic, 4 to 12 months (mean 6 months) after treatment. The patients were examined preoperatively and at the follow up, by one physioterapist. Grip strength and range of motion were measured and grip strength was chosen as the main outcome parameter.

Under general anesthesia, a tourniquet was applied after exsanguination of the arm, and 150 mg of Solu-Cortef (hydrocortisone) diluted in 40 ml saline was injected. Often both arms were treated simultaneously. The tourniquet was released after 20 minutes. No adverse effects were noted. In 16/28 wrists and hands, increased grip strength were recorded. The mean grip strength increased for the whole group from 53 to 62 N (SD 21, p=0.01, paired t-test). The change in ROM was not significant.

In conclusion, intravenous and regional administration of corticosteroids is a safe method to treat synovitis in the juvenile arthritic patient. The effect in a long perspective may be limited, but in our series, half of the patients show a considerable improvement after half a year. Maybe surgical synovectomi can be postponed and in some cases even omitted.
THE WRIST FUSION ROD (WFR) FOR RHEUMATOID WRIST ARTHRODESIS

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Background: Total wrist arthrodesis with the use of an intramedullary rod is a reliable procedure for severely deteriorated unstable wrists affected by rheumatoid arthritis. Between 1982 and 1998, we performed 78 wrist arthrodeses with the technique of Millender and Nalebuff (1973). The clinical and radiological results were satisfactory in regards to stabilization of the hand and pain relief. However, there were certain technical problems during the operation, including poor distal fixation if the rod was placed in the intermetacarpal space with poor carpal bone stock and difficulty in obtaining the desired position of the wrist. After considering these problems, in 1999, we developed a new cannulated titanium rod, which could be buried in the third metacarpal and bent at the wrist lever. The rod had proximal fins and a distal transverse pin to prevent migration and rotation in the medullary canal.

Materials: Total wrist arthrodesis with this new rod was performed on 20 wrists in 17 rheumatoid patients. The mean age at the operation was 60 years (range, 34-74 years), and the mean duration of the disease was 11 years (range, 2-40 years). The mean follow-up period was 12 months (range, 4-24 months). Extensor tendon reconstruction for the ruptured tendons was combined in 9 wrists.

Operative technique: After bone preparation, the rod, 4 mm in diameter, was inserted distally through a guide pin from the carpus to the neck of the third metacarpal to decrease the risk of metacarpal fracture. Then it was inserted proximally into the radius usina an introducer, and countersunk until the distal end of the rod reached the metacarpal isthmus. After burying the straight rod in the medullary canal, it was bent usina a special bender to the desired angle (neutral or slight extension), if necessary. The rod had adequate elasticity and strength for wrist arthrodesis. At the final step of these procedures, a transverse pin was inserted through a distal portion of the rod using a targeting device. If the bone was very fragile, a supplemental fixation with staples or Kirschner wires was incorporated in this intramedullary fixation. Postoperative immobilization using a short arm cast or a wrist orthosis was continued for 4-8 weeks.

Results: There were no major intraoperative complications. Desired wrist position (almost neutral) was obtained easily. There was no migration and rotation of the rod. Preoperative pain and swelling disappeared in all operated wrists, and grip strength increased significantly. Palmarly and ulnarly displaced carpus was reduced in a satisfactory position and bone union occurred at the radiocarpal joint in all wrists. In one wrist, nonunion at the third carpometacarpal joint occurred, and iliac bone grafting was added.

Conclusion: With the use of this new intramedullary rod, secure fixation at the desired angle was obtained in the total wrist arthrodesis and technically it was simple, safe and fast to use.
SYNOVIALECTOMY OF THE METAPHALANGEAL JOINTS WITH REKONSTRUCTION OF THE RADIAL COLLATERAL LIGAMENTS - LONG TERM RESULTS OF PATIENTS WITH RHEUMATOID ARTHRITIS
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Introduction: The synovialectomy of the MP joints of patients suffering from rheumatoid arthritis intends to stop the inflammation and destruction of the joints to achieve the best possible active range of motion and stabilization of grip functions. We put special regard to the reconstruction of the radial collateral ligaments. This study shows long term results of our patients.

Material and Methods: Patients with synovialectomy of minimum 3 joints per hand were examined, as well as resection arthroplasties or Swanson implants. Our basic investigation comprised of the following aspects: active range of motion (extension/flexion), stability (ulnar/radial deviation, stability of collateral ligaments), x-raye (arthrosis - lysis - destruction - subluxation - luxation), inflammation of the joints and medicines; comparison of pre- and postoperative statue.

Results: 59 out of 115 patients/76 hands/292 MP joints were examined average 58 months (12 - 204) after surgery; age average 60 years (37 - 73).

Postoperative extension increased from D2 to D5, flexion decreased. The collateral ligaments were stable with 81% of patients, partly instable with 12%, instable with 7%. No significant decrease of the active range of motion within time of 1 to 10 years. Best results with patients older than 70 years. X-rays: 258 joints comparable; 35 improved, 125 without change, 98 worsened. No statistical correlation between X-raye and active range of motion. Inflammation of operated joints was less in comparison to not operated hand and finger joints.

Conclusion: With all surgical procedures the loss of active motion was only 10° in comparison pre /and postoperative. Ulnar deviation and stability of collateral ligaments improved significantly. Radiologic deterioration does not indicate deterioration of active motion. The reconstruction of the radial collateral ligaments results in sufficient active motion and stabilisation of the MP joints.
RADIO-LUNATE ARTHRODESIS IN THE RHEUMATOID WRIST-CLINICAL AND RADIOLOGICAL LONGTERM FOLLOW-UP
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A retrospective study was performed to investigate clinical and radiological results of radio-lunate arthrodesis in the rheumatoid wrist. Of 118 operated wrists 91 wrists in 78 patients could be investigated at a mean follow-up of 60 months. The preoperative radiographic wrist involvement according to the Larsen Classification was grade II in 22 (24%), grade III in 29 (32%) and grade IV in 40 (44%) wrists. Most patients were painfree and content with the overall result. The range of wrist movement was significantly reduced except for forearm rotation which is improved after ulnar head resection. In 68 wrists the carpus could be repositioned or maintained in a neutral or slightly ulnar position and no further translation occurred. The Chamay-Index was significantly reduced postoperatively. Midcarpal luxation occurred in ten and midcarpal rotation in 13 wrists. The midcarpal joint suffered further arthritic destruction in 34 wrists and secondary arthrosis in 32 wrists. In 25 wrists the midcarpal joint space remained unchanged. Calpal height continued to deteriorate postoperatively. Radio-lunate arthrodesis does stabilize the carpus in the rheumatoid wrist while maintaining a functionally important range of motion and relieving pain. It does however not stop the disease process and cannot reestablish or maintain carpal height. It can successfully be performed in wrists even with advanced destruction. In cases with fixed carpal collapse anatomical repositioning of the lunate and restoration of carpal height should not be attempted. This induces midcarpal luxation or rotation or precipitates secondary arthrosis.
Tendon suspension and interposition arthroplasty of the wrist
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Total wrist replacement and silicone implant have been used for rheumatoid patients. Despite the early enthusiastic applications, long term results with these arthroplasties are disappointing. Radio-lunate fusion is an excellent procedure when the mid carpal joint is preserved. Palmar shelf arthroplasty and fibrous nonunion combined with dorsal stabilization are other historical techniques for more advanced destruction; but, total arthrodesis is probably the most promising established choice for the most advanced conditions. Our experience, however, makes us believe that total arthrodesis can be avoided even for failed arthroplasty if bone resection is limited to a minimum.

We report new surgical procedure for wrists with destruction in both radiocarpal and mid carpal joints. Tendon suspension and interposition arthroplasty (TSIA) of the wrist was designed to create a space by joint debridment and proximal row carpectomy; to stabilize the wrist (usina wrist tendons), and interpose these tendons into the space. One wrist extensor (ECRB or ECRL) and one flexor (FCR or FCU) are incised proximally, kept attached distally and used as suspensioninterposition between capitale and radius. The wrist flexor is passed from voler to dorsal via a hole made at the distal radius (vole to dorsal stabilization); half of the extensor is passed from capitale to radius through boney holes made in the center of the joint (central stabilization); the other half of the extensor is passed through a dorsal hole in the radius (dorsal stabilization). Each tendon slip is then anchored around the tendon that is located in the center of the joints.

Twenty-one wrists (19:RA.2:OA) in 20 patients aged 29 to 67 were operated in past 6 years, with minimum follow up of 12 months (average, 29.5 months). Mean post-operative flexion/extension arc was 35 degrees active and 62 degrees passive. Grip strength doubled on average compared to pre-operation in 17, no change in 2, decreased in 2. Pain relief and patients' satisfaction were excellent except for 3. There were one delayed wound healing and two ulnar nerve palsy and no infection. The two patients with ulnar palsy underwent nerve release, and one recovered completely but the other developed RSD. Joint space created this operation decreased within 6 months, however no ankylosis was observed.

Advantage of this operation include use of no foreign materials, preservation of minimum motion for ADL's and excellent pain relief. Although further follow up and more cases are required, this operation has proven to be a very good alternative to prosthetic total joint replacement or total fusion.
Endoprosthetic surface replacement of the humeral head in rheumatoid arthritis
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Aim of study: The concept of an endoprosthetic surface replacement of the humeral head differs from that of stemmed endoprostheses. It is the replacement of the destroyed joint surface with reconstruction of the normal anatomy and minimal bone resection. The aim of this prospective study was to evaluate the results of a new developed cup arthroplasty (Durom-Cup) for the humeral head in rheumatoid arthritis.

Material and Methods: Of the more than 60 implanted Durom-Cups, 24 patients (16 women, 8 men) with 29 Durom-Cups had rheumatoid arthritis and were evaluated preoperatively and every 3 months postoperatively. One shoulder had rheumatic destruction of stage Larsen III, 22 of Larsen IV and 6 of Larsen V. The average age was 61.6 ± 11.4 years and the average follow-up 24 ± 9 months. The Constant-Score and SAS-function-Score were used and the cups were examined radiologically.

Results: The Constant-Score increased from 21.42 ± 9.51 points preoperatively to 46.80 ± 13.53 3 months postoperatively, to 47.05 ± 10.25 6 months, and to 55.73 ± 8.44 9 months postoperatively. At this level the Constant-Score stayed during further follow-up and was 55.14 ± 13.5 12 months, 56.12 ± 8.56 18 months, and 56.14 ± 3.6 24 months postoperatively. No complications, component loosenings, or changes of cup position were observed. One patient suffered from extraarticular biceps tendon rupture not related to the joint replacement.

Conclusion: The results of the Durom-Cup are encouraging, so that cup arthroplasty seems to be a good alternative to stemmed prostheses. The main advantages of the humeral head resurfacing are the bone preserving fixation technique and the relatively simple surgical technique. In cases of aditional cuff arthropathy the cup can be placed in a more valgic position to articulate with the glenoid and the acromion.
Grommets or not in silicone implant arthroplasty of the metacarpophalangeal joints?
Comparative retrospective study with high follow up
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Introduction: To protect spacers from breakage, additionnal titanium sleves fixed to the implants (grommets) have been used. A retrospective study is reported comparing two groupe of silicone arthroplasty of metacarpophalangeal joints in rhumatoid arthritis with and without grommets.

Material and Methods: Between 86 an 96, 38 arthroplasties with Swanson silastic spacers were performed by one surgeon on the MCP joints of 9 patients. The mean age was 62,7 (52-76). The implant was inserted as described by Swanson without any procedure concerning ligaments. Group 1 (with grommets): 4 patients, 1 male, 13 implants, with a mean duration of the disease of 19,25 years (13 - 26). Group 2 (without grommets): 9 patients (1male), 8/9 inactifs, 25 implants with a mean duration of the disease of 20,4 years (13 - 33). The follow up included active passive arc of motion and satisfaction of the patients. The position and possible damage of the implant were assessed by AP plain radiographs.

Results: The mean follow up was 9,89 years (4-14). Group 1 (with grommets):
All patients were satisfied. The mean arc of motion in flexion was 42,3° (10-80), the mean arc of motion in extension was 66,9° (50-90). 12/13 implants were intact. Only one dislocation with fracture of the implant was noted. Group 2 (without grommets): Two patients would refuse to be operated. The mean arc of motion in flexion was 35,2° (10-70), the mean arc of motion in extension was 71,8° (40-90). 8/25 implants implants were intact. 17/25 cases showed fracture and dislocation of the implant.

Conclusion: Schmidt and Mielke did not report significant differences in two groupe with and without grommets. The mean follow up was shorter (4 years). With 10 years of follow up, the authors (with two little groupe of implants) report advantages to implant grommets.
Advantages in cementless, non-constrained mcp-arthroplasty in patients with ra using the new design of hm-prosthesis
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Introduction: For reconstructive surgery of the deteriorated rheumatoid MCP-joints silastic implants are used in general. Though realignement and stability after silastic joint replacement is achieved many disadvantages as reduced ROM, fractures and osteolysis are known. The first study of the cementless, non constrained MCP- arthroplasty with HM-prosthesis showed a high rate of subluxation and synovitis. Therefor the design of the HM-prosthesis was changea with an PE-head to avoid wear and an increase of the diameter of the phalangeal base of 30% to get more stability.
In prospective study we replaeced 20 MCP joints in RA with this new designed prosthesis.

Material and Methods: short-lime results after a mean Fu-period of 6 month (2-12 month) are now reported. In al cases a total replacement was performed. Clinical and radiographie re-examination could performed in all cases.

Results: In all cases we found an osteo-integration, no infection was seen. A luxation or subluxation as we have seen in the old design was not seen in any new designed prosthehesis. In all cases pain-reduction was reported. The range of motion improved in all cases (flexion/extension 70/5/0).

Conclusion: The results after changing the design of the HM-prosthesis show an improvement of stability and shows no wear, luxation or subluxation. The Improvement of mobility and pain-reduction is still seen as published in our studys before. This first results have to be verifted by longer FU-periods an a higher number of patients.
Evolution of functional results of wrist synovectomy in Rheumatoid Arthritis
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We reviewed 147 patients over a continuous series of 350 wrist synovectomies for Rheumatoid arthritis. 24 were men and 123 females with an average age of 53.9 (extremes 47 to 84 years).

Patients were operated fate in the course of the disease as the average time between surgery and the onset of the disease was 13 years (extremes 1 to 56 years). The mean Larsen stage was 3.09 preoperatively.

Surgical technique included tenosynovectomy. Distal radio ulnar joint synovectomy was associated with a Darrach or Bowers's procedure in almost 2/3 of the patients. A Sauvé-Kapandji arthrodesis is now performed in almost every patients.

Radio-carpal and mid-carpal synovectomy was always done.

Wrist stabilisation was performed with soft-tissue reconstruction, in almost all patients. Radio-lunate fusion was scarcely done.

In the most advanced cases, bony resection was done, realising a first row carpectomy in 12 patients.

Patients have been reviewed with an average follow-up of 5 years (extremes 3 to 17 years). Evolution of the results was as followed:
RADIO-LUNATE ARTHRODESIS IN SURGICAL MANAGEMENT OF THE RHEUMATOID WRIST:
24 cases with an average follow-up of 7.5 years
T. DREANO, F. LANGLOIS, P. SIRET, F. LANGLAIS

We reviewed 24 cases of rheumatoid wrist stabilization using radio-lunate arthrodesis.
The average mean of our study was 7.5 years.
All the patients were clinically and radiologically reviewed.
According to Alnot's classification, there were 14 stage III and 10 stage IVa.
According to Simmen's type, there were 1 type I, 14 type II, and 9 type III.
At follow-up, 75% of patients had no pain. Mobility was satisfying with an average range of movement of 50°.
Radiologically, this arthrodesis slowed clown the decrease of the carpal height, the ulnar translation and the radial carpal deviation.
The stabilization is better in type II.
44% of the type III operated with this technique later needed a total radio-carpal arthrodesis after an average of 7.5 years.

In the end, radio-lunate arthrodesis finds its best indication in type II and in stade III and IVa with stable results at long term.
In type III, the indication depends on the digital chains state.
Early results of metacarpo-phalangeal non constrained pyrolytic carbon prosthesis in rheumatoid arthritis
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Aim: The metacarpo-phalangeal (MCP) joints are often affected in Rheumatoid Arthritis. As artificial joint replacements, silicone spacers are the most commonly used. Due to their limitations, such as poor range of motion and fracture of the implant, prosthetic replacement is often performed rather later in the evolution of the disease. A new surgical approach and prosthetic design has evolved, enabling early treatment.

Material and Methods: These articulating prostheses are non-hinged, and consist of a stemmed metacarpal hemispherical head and a stemmed concave phalangeal component. The prostheses are made of pyrolytic carbon, shown to be a biologically compatible, wear resistant material for arthroplasty. No cement was used. The technique rely on better preserved soft tissues to achieve joint stability, and great demand on the design to avoid voler subluxation. On the other hand a better range of motion might be offered, and the risk for a fatigue fracture of the hinge is eliminated.

We report the early results of 9 patients and 25 MCP joints with a follow-up of one year. All patients were women with a diagnosed rheumatoid arthritis. The mean age was 53 (36-67) years.

Results: No infection occurred. One joint dislocated and was revised with a Swanson silicone prosthesis. 7 of 9 patients became painfree and increased function. Ulnar deviation was corrected and stability of the joint achieved. 18 of 25 MCP joints increased their range of motion. In 4 joints a detectable prosthetic subsidence was observed in the metacarpals but seemed to stop later on. In the revised joint no pigment deposit was observed.

Discussion: The results of this non cemented non constrained pyrolytic carbon MCP prosthesis are encouraging for allowing earlier surgical intervention in the treatment of the rheumatoid MCP joint. The patients report mobile, stable, painfree joints. This follow-up is short in term of prosthesis survival and a longer follow-up has to be made.
The GUEPAR nonconstrained Total Elbow Prosthesis was developed in 1985. In 1995, the authors reported on a first series of 40 first generation prostheses, implanted in rheumatoid patients with painful elbow, instability, and severe radiological bone destruction (stage III to V according to the Larsen classification).

Results of 38 cases - excluding two early failures due to infection - were rated by the Mayo Clinic score. Eighty-three per cent of the elbows were rated excellent or good. Four biomechanical complications occurred, including: one loosening of the humeral component with self locking of the stem in a stable, mobile elbow, which did not require surgical revision; 3 patients had valgus instability with damage to the ulnar component. After 3 years follow up, these patients had to be reoperated on. Surgical revision consisted of medial collateral ligamentoplasty and addition of a Swanson radial head, with 2 good results and 1 fair result.

This prompted us to make some modifications. A radial extension was added to the humeral component, primarily to enhance anterior-posterior stability with a clip effect, and also to provide an articuler surface for the radial head. The radial head is a mobile polyethylene cup.

The first 12 prostheses implanted between 1994 and 1997 combined an ulnarhumeral component and a radial head. Results at a minimum 3-year follow-up improved from 21-80 points to 100 points (according to the Mayo Clinic score) and were judged satisfactory. Stability was improved and no implant modification or loosening was noted. Using a posterior approach through the biceps tendon, making a V shaped incision, did not induce any loss of strength.

Long-term follow-up will be necessary to confirm these early good results.
One-stage ipsilateral shoulder- an elbow arthroplasty in patients with rheumatoid arthritis.
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Introduction: In rheumatoid patients shoulder and elbow arthroplasty have become a well accepted treatment. There is often an indication for performing an arthroplasty of multiple joints in the same upper extremity. Only a few studies have been published on the results after arthroplasty of ipsilateral shoulder and elbow joint especially performed as one stage procedure.

Material and methods: 29 Patients who had a replacement of the ipsilateral shoulder and elbow joint were scored clinically and radiographically before the operation and at regular intervals after the operation. 5 Patients had a bilateral procedure so this study concerns 34 extremities. In 7 patients (9 extremities) the elbow and shoulder arthroplasty was performed as an one stage procedure. 5 patients had quadriple prosthesis in the upper limb.

Results: The functional results of shoulder arthroplasty were evaluated with use of the HSS scoringsystem. A substantial relief of pain occurred although 50% of the shoulders still had some mild or moderate pain. Functional improvement was scored on different items and most improvement occurred on the items "Lifting weight" and "lying on the shoulder". The elbow was assessed with the "Souter score". Most of the patients improved with regard to pain function and range of motion. Of 5 activities of daily living most improvement was seen with the tasks "bringing the hand to the mouth" and "lifting an object". The average gain in the arc of flexion was 34 degrees.

Discussion and conclusion: Ipsilateral shoulder and elbow replacement is rewarding surgery for the patient. One-stage arthroplasty of the shoulder and elbow facilitates the post-operative rehabilitation because there is no hindrance by pain rising from the joint next to it when the surgery is performed as a two-stage procedure. In ipsilateral shoulder and elbow replacement the use of long intermedullary stems carries the risk of humeral fracture between the implants.
Long-term results of radiolunate arthrodesis in rheumatoid wrists
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Objective: The wrist joint is commonly involved in R.A. Surgical radiolunate arthrodesis appears to be an appropriate procedure to stabilise collapsing rheumatoid wrists. The study was performed to analyse long-term results of radiolunate arthrodesis.

Materials and methods: From 1988 to 1991, radiolunate arthrodesis was performed on 58 unstable rheumatoid wrists with subluxation of the lunate. 29 operated wrists were followed at a mean of 15 month and at a mean of nine years postoperatively.

Results: Average ROM was concerning extension, flexion, radial and ulnar deviation was 34°, 43°, 13° and 15° preoperatively, 27°, 18°, 9° and 9° at one year and 18°, 18°, 3° and 12° at nine years postoperatively. Pain and swelling has decreased markedly at one year postoperatively, but showed at slight increase at nine years follow-up. Radiographically further deterioration was observed. Mean carpal height decreased slightly from 32 mm preoperatively to 30 mm at one year and 27 mm at nine years postoperatively. Also mean ulnar translation decreased slightly from 20 mm preoperatively to 21 mm at one year and 22 mm at nine years postoperatively. Ulnar drift of the fingers was improved from 18° preoperatively to 16° at one year and 15° at nine years. Shapiro-angle was corrected from 73° preoperatively to 60° at one year and 59° at nine years. Grip strength showed a mean of 16kp preoperatively, a mean of 12kp at one year and 17kp at nine years postoperatively. At one year follow-up 24 of 29 patients and at nine years 28 of 29 patients were content with the clinical outcome.

Conclusion: Though in the long-term radiolunate arthrodesis only partly stabilises ulnar translation and radial deviation of the wrist, good clinical function can be preserved.
Metacarpophalangeal joint arthroplasty is increasingly being undertaken in patients with rheumatoid arthritis. Various prosthesis have been used with variable success.

Traditionally the surgical exposure (Swanson) involves a transverse skin incision centred over the dorsal aspect of the joints. This technique does not permit a good exposure and hence easy intrinsic transfert In addition the dorsal nerves and veins may be compromised resulting in painful neuromas or dysesthesia and/or increase the risk of postoperative swelling and wound healing problems with the resultant adherence of the extensor mechanism.

We describe a surgical exposure that involves an inverted Y skin incision with the distal limbs extending over the dorsum of the corresponding fingers. The resulting flap is supplied by the intercapitular vessels. In addition this new exposure preserves the longitudinal dorsal vein, provides an excellent surgical exposure facilitating easy repair of the soft tissues and intrinsics. Over the past 15 years this technique has been used in 100 cases undergoing metacarpophalangeal joint arthroplasty with no reports of infection and wound breakdown and provides an aesthetic scar.
Elevated risk of dislocation in primary total hip arthroplasty in patients with rheumafactor positive rheumatoid arthritis
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Introduction. Dislocation after total hip arthroplasty (THA) is relatively infrequent, but for the individual patient often is a very disturbing complication. Multiple factors contributing to an elevated risk for dislocation have been identified, such as: surgical approach, longer lever of experience of the surgeon, small diameter of the bail head, malposition of the prosthetic components, osseous impingement, revision surgery, etc. To our knowledge, there have been no reports whether inflammatory arthritis (IA) is an independent risk factor or not.

Patients and methods. All 498 primary THAs in 396 patients carried out in our institution between May 1995 and December 1999 with one single prosthesis: EPF-PLUS® acetabular cup and SL-PLUS® femoral stem, all combined with a 28 mm. ceramic bail head (PLUS Endoprothetik AG, Rotkreuz-CH) have been evaluated for the incidence and cause of dislocation as part of a prospective study. Specific risk factors assessed were: diagnosis, position of the acetabular component and intersurgeon variance. In all patients either a standard transgluteal or a modified straightlateral approach was used.

Results. Regarding diagnosis, the incidence of dislocation was 14 in 405 THAs for osteoarthrosis (3.5%), and 7 in 93 THAs for IA (7.5%). Subdivision of the arthritis group showed that the risk was elevated only in THA for rheumafactor positive rheumatoid arthritis (RA): 6 out of 61 (9.8%). Excessive inclination of the cup (more than 55°) was seen in 33% of THAs which dislocated and in only 8.3% of THAs which did not dislocate. Dislocation occurred in 4% of 420 THAs carried out by senior or junior orthopaedic surgeons (inter-surgeon variance rangea from 0% to 25%) and in 5.1% of 78 THAs carried out by residents.

Conclusions. Rheumafactor positive RA is an independent risk factor for dislocation after THA. Furthermore, increased inclination of the acetabular cup is another substantiel risk factor. Finally, our patient material shows that there is a large inter-surgeon variance of dislocation after THA, and that not all orthopaedic surgeons perform better than their residents with regard to the incidence of dislocation.
Open synovectomy with proximal radial shelf arthroplasty for the elbow of rheumatoid arthritis
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Background and Purpose Open synovectomy for the elbow of rheumatoid arthritis (RA) is generally performed with radial head excision. We sometimes experienced instability and valgus deformity after the operation. The purpose of this study was to investigate the results of open synovectomy combined with proximal radial shelf arthroplasty (PSA).

Patients and Methods We reviewed 15 elbows performed with PSA and 6 elbows performed with radial head excision (RHE) for RA patients from 1984 to 1996. The mean follow-up time was 75 months in PSA and 82 months in RHE. We assessed the results with pain for The Mayo Elbow Performance Score (MEPS), the valgus angle and the stability of the elbow. In PSA technique, the excised radial head was fixed on the proximal ulna to stabilize the elbow after the radial head excision and synovectomy.

Results The average preoperative MEPS were 9 points in PSA group and 8 points in RHE group. At the final follow-up, the score improved to 24 points and 23 points, respectively. The increase of more than 5 degrees elbow joint instability was observed in 10 out of 15 elbows in PSA group and all 6 elbows in RHE group. The mean valgus angle of the operated elbows was 18 degrees in PSA group and 25 degrees in RHE group at the final follow-up and there was significant difference between them.

Conclusion Our study showed that PSA technique was able to remove pain enough and to inhibit the valgus deformity and instability after the open synovectomy.
Bacteriologic Studies and Immunoglobulins (IgG, IgM, IgA) Detection in Synovial Fluid From Inflamed Joints in Rheumatoid Arthritis Patients Receiving Immunosuppressive Therapy undergoing total Knee Arthroplasty
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Background: Septic arthritis complicating rheumatoid arthritis (RA) still representing difficulty in the diagnosis due to similarity of aggressive rheumatoid arthritis to infection particularly in joints. The incidence of infections has paralleled the use of glucocorticoid and immunosuppressive agents.

Material and Methods: In a prospective controlled study a cohort of 40 rheumatoid arthritis patients (group I) - 31™, 9¢ - with a mean disease duration of 8 years and a control group of 20 osteoarthritis patients (group II) - 15™, 5¢ - with a mean disease duration of 12 years were enrolled in this study. All patients in both groups showed active synovitis of the knee joints with effusion. In group I, 17 patients were given MTX alone while 23 patients were given MTX combined with other disease modifying antirheumatic drugs (DMARDs). In group II, patients were taking only NSAIDs. A 5 cc sample of synovial fluid was aspirated and sent for cytological studies, culture for aerobic and anaerobic organism and Immunoglobulin (IgG, IgM, IgA) levels detection.

Results: Analysis of the synovial fluid specimens showed micro-organism in 5 rheumatoid arthritis patients. Staphylococcus aureus, staphylococcus coagulase negative and gram negative bacilli were recovered on culture. RA patients with infection showed a significantly higher number of leucocytic counts (mean, 21,280 cell/mm3) in comparison to RA without infection (mean, 3,973 cell/mm3) and control group (mean, 443 cell/mm3). In the synovial fluids of RA patients immunoglobulin (IgG, IgM, IgA) levels were significantly higher (p < 0.05) than in control group. Only IgG levels in the synovial fluid of RA patients with infection were significantly higher (p < 0.05) than in RA without infection.

Discussion and Conclusion: Although RA with infection showed a significantly higher leucocytic counts, synovial fluid cytology alone may be misleading due to decrease migration of cells into the synovium and inhibition of polymorphonuclear leukocytes (PMNs) chemotaxas by immunosuppressive drugs. Bacterial infection could induce a secondary immune response with the production of a significantly higher level of IgG. However, the value of gram staining and culture should be over emphasised and a routine culture should be obtained on all synovial fluid from rheumatoid arthritis patients under immunosuppressive therapy before planning for a total joint arthroplasty.
A Clinical Histological and Immunohistological Study in Failed Cemented and Cementless Total Hip Arthroplasty
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Background: Aseptic loosening have emerged as the most serious long term complications of total hip arthroplasty and the most common indications for revision. The aetiology of loosening is multifactorial. In addition to mechanical causes, it has been suggested that biologic reactive processes may be implicated. The aim of this study was to elucidate some of the biologic reactions that could be responsible for the periprosthetic loosening in cemented and cementless cup following a total hip arthroplasty.

Materials and Methods: A histological and immunohistological study of the new capsule and the interface membranes surrounding the acetabular component of failed cemented and cementless total hip prosthesis was undertaken. The new capsules and the interface membranes were obtained from eight patients (group I) - 5 ± 3 - with a mean duration of 14 years (range, 4 - 27 years) to revision after cemented total hip arthroplasty and 12 patients (group II) - 2 ± 10 - with a mean duration of 7 years (range, 4 - 17 years) to revision after cementless total hip arthroplasty. A tris tological analysis was performed according a modified Mirra's grading system (1976). Particulate debris viewed by bright field polarised lights and electron microscopy. An immunohistological analysis was performed using antibodies against IL-1α, IL-1β, TNF-α, IL-6 and anti-CD68. Bound antibody was detected using the DAKO-APAAP-Kit.

Results: Microscopic analysis of the new capsules and the membranes revealed no difference between the two group. An inflammatory reaction characterised by the presence of macrophage cells and giant cell proliferation was observed. A large number of birefringence foreign bodies can be detected. Such abundant foreign body depositions, clearly identified as flakes of high density polyethylene under polarised light microscope. It was difficult sometimes to differentiate between metal and cement debris, however a mild grade of inflammatory reaction was observed. Immunohistological analysis of the membranes revealed that the quantities of the cells staining positively with anti-IL-1, IL-6, TNF-α antibody were greater in group II than in group I.

Discussion: The results of this study show that in membranes and new capsules of patient that require revision, polyethylene debris was the most important and potentially deleterious factor in initiating an inflammatory foreign body reaction with giant cell proliferation in total joint arthroplasty. The presence of polyethylene in the new capsule suggest the cell had migrated from the joint or in the joint. The amount of particles required to induce such reaction is probably much smaller in case of polyethylene debris than in case of metal or cement debris. Cytokines such as interleukin-1 (IL-1), interleukin-6 (IL-6) and tumour necrosis factor (TNF) are potent stimulators of osteoclastic bone resorption. Cytokines IL-1, IL-6 and TNF-α which are produced by macrophages, fibroblasts and endothelial cells may promote the osteolysis in failed total hip prosthesis.
Acro rheumatoid arthritis, a particular entity
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Acro Rheumatoid Arthritis is manifested by destructive lesions of the forefoot, wrist and hands without any destruction of other joints. Our study is based on 86 patients (172 surgeries) with an average age of 61.7 years and an average follow-up of 5.7 years. Among them, we followed-up 8 patients (14 wrists) for more than 10 years. At the lever of the forefoot, 25 resections of the metatarsophalangeal heads of the lateral 4 rays and arthrodesis of the metatarsophalangeal joint of the big toe were carried out. Global results are good with significant relief of pain without any need for specially made medical shoes.

At the level of the wrist, our series consist in 20 synovectomies of common flexor tendon sheath and of the carpal tunnel, 83 dorsal synovectomy realignment and stabilisation (SRS) (fixation being clone by inferior radio-ulnar arthrodesis (73 cases) or radio-lunar arthrodesis (10 cases), 4 wrist arthrodesis, 1 wrist prosthesis. At the lever of the hand, 11 metacarpophalangeal (MP) arthrodesis of the thumb and 28 realignments of the metacarpophalangeal joints of long fingers (by synovectomy realignment or Swanson arthroplasties) were done.

We studied the range of motion at the wrist joint (flexion extension, pronation supination), the grip force (Jamar), the pulpe-palmar distance, Kapandji’s index, as well as radiographic index of Larsen, the height of the carpus and the anterior and ulnar translation of the carpus.

In 75% of cases, we obtained good results at the lever of the wrist with satisfactory relief of pain, useful range of motion and no apparent major radiological articular destruction (constant Larsen index). The thumb-digital opposition was satisfactorily restored after MP-surgery and was maintained. Ninety-four percent of patients were satisfied.

Peripheral rheumatoid arthritis represents a particular entity, notoriously being resistant to medical treatment, for which surgery has to be rigorous. In case of combined wrist-metacarpophalangeal lesions, surgery classically aims at wrist stabilisation first, with SRS most currently. Afterwards, surgery at the lever of the metacarpophalangeal joints improves the grip as long as the adjacent joints (PIP) are intact. In this case, either SRS is carried out, sometimes being the definitive treatment, or a Swanson arthroplasty is clone which remains the only possibility in case of articular destruction, with satisfactory results as long as there are non associated deformities especially swanneck deformity.
Physician practice patterns with respect to investigation and treatment for osteoporosis in fragility fracture patients
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Patients who present with a fragility fracture (wrist, shoulder, vertebra or hip), resulting from a simple fall, frequently have underlying osteoporosis, but are usually unaware of their condition and are at high risk of future fracture. These patients require appropriate investigation and treatment of their osteoporosis to prevent future hip and vertebral fracture.

We studied physician practice patterns in Ontario, Canada with respect to osteoporosis investigation and treatment following fragility fracture. In a study of 2,694 fracture clinic visits in three urban community hospitals, 227 individuals (8.4%) with fragility-type fractures were identified, and 73% of the fragility fractures were of the wrist. Of the 108 (47.6%) eligible individuals (83 post- and 13 premenopausal women and 12 men) who were interviewed, 43 (39.8%) had experienced at least one other fracture, in addition to the index fracture, in the preceding 10 years. At interview, only 20 of the 108 fragility fracture patients (18.5%, all post-menopausal women) had been diagnosed with osteoporosis.

Since only 18.5% of patients with fragility fractures received appropriate osteoporosis follow-up, we evaluated the effectiveness of an administrative intervention in five other fracture clinics in Ontario community hospitals. The intervention involved: 1) informing the patient of their risk for osteoporosis; and 2) recommending follow-up with the primary care physician for investigation and treatment. Although there was a significant increase in osteoporosis investigation from preintervention controls (bone densitometry was performed in 69% of intervention patients versus 26% of control patients, p=.001), there was no significant increase in treatment of osteoporosis following the intervention (24% in the intervention group versus 17% of controls, p=.2, N.S.).

Conclusion: The current pattern of osteoporosis treatment in Ontario, subsequent to fragility fracture, is unsatisfactory in protecting individuals known to be at risk from subsequent hip and vertebral fracture. Our current efforts are to document the categories of fragility fractures treated at our own hospital and to develop effective strategies for follow-up. These strategies include: identifying groups most likely to benefit from intervention; developing a system for routine referral of patients to osteoporosis specialists; and developing information materials to promote patient and doctor awareness of effective osteoporosis management for patients with fragility fractures.
Early results after primary hip replacement with the "centega" stem
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Objectives: The "Centega" stem is an anatomical stem for primary hip replacement. It is a collarless femoral component with a centralizer and an anterior rim against rotation. The stem implantation was performed with modern cementing technique. This is a short-term follow-up of the first 135 "Centega" femoral components that were operated.

Background: Despite stem survival rates of more than 95% beyond 10 years a surprising number of series of early failure of cemented stems have been reported. Therefore we assessed early follow-up data with the new prosthetic stem to control that the "Centega" stem obtains reliable results.

Results: 103 of the first 135 patients with this prosthesis were interviewed, examined, and underwent radiographic control 20 months (range, 15 to 25 months) postoperatively. The average age of the patient was 69.7 (± 6.1) years, 70 of them were women, 33 men. The mean preoperative Harris hip score of 39 improved to a mean of 92 points at the time of the review. No hip had to undergo femoral component revision. There was no radiographic loosening. Femoral osteolysis was seen in one hip (1 percent). There was no further evidence of radiolucencies, debonding, migration, osteolysis, or subsidence.

Conclusion: The clinical follow-up and benign radiographic appearance suggest that this type of stem geometry in combination with a modern cementing technique is capable of producing consistent long-term results.
Comparison of radiosynoviorthesis in rheumatoid arthritis and haemophiliac arthropathy

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We performed radiosynoviortheses in the abovementioned indications in the lest 11 years. There were 12 patients with rhematid arthritis /RA/ including juvenile chronic arthritis /JCA/ and 30 patients with haemophiliac arthropathy. We applied always 90 Yttrium/Amersham, Englad/. The dose of the isotope varied according to the extent of the synovial membrane: for the knee 4 mCi /148 MBq/, for the shoulder, elbow and ankle 3 mCi /111 Mq/ for the knee joint, for other joints 1-2 mCi. There was recurrence in haemophiliacs in 25% of cases but none in patients with RA. We reated the radiosynoviortheses in haemophiliacs 7 fines, in RA patients there were no repeated injections. We didn't observe any complications, all patients tolerated the treatment well.
Bilateral total hip and knee arthroplasty in RA patients - long term results.
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Aim of the study was evaluation of long term results and assessment of clinical value of bilateral THA and TKR performed in RA patients. From 1974 to 2000 bilateral THR and TKR were carried out in 87 patients (68 women and 19 men). Follow-up included 52 patients, 15 died, 20 were lost for final evaluation. There were 47 women and 5 men of mean age 43 (from 21 to 73) in examined group. The operated hips were evaluated using M. d'Aubigne and Postel method modified by Charnley. For the knees C.R.S. of H.S.S. method was used. To the patients who couldn't come the questionnaire was sent out. Relieve of pain in operated joints was observed in almost every patient. ROM in the hips and knees was markedly improved in all cases. One hip and one knee prostheses were removed because of deep infection. All patients except 3 were satisfied with final results.

Conclusion: the study has shown that bilateral THR and TKR in RA patients provides pain relieve, improves walking ability and facilitates daily activities. One of the most important factors is the motivation of the patient and his cooperation in postoperative rehabilitation.
Arthroscopic synovectomy for systemic inflammation in RA
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Introduction: RA synovium is the immunocompetent tissue and releases many kinds of cytokine and enzyme by an immuno-chemical analysis of RA synovium. According to the preliminary study, the arthroscopic synovectomy was performed for 274 joints of RA knee. Over all assessment shows improvement for 129 joints (47.1%), no change for 102 joints (37.2%) and aggravation 43 joints (15.7%). By the arthroscopic synovectomy, knee symptoms has improved in many knees. Also, it is supposed that there would be some influences for RA systemic inflammation by the arthroscopic synovectomy.

Materials and methods: 50 arthroscopic synovectomy were evaluated on morning stiffnesses, grip power, laboratory data and dosage of steroids, before one year and after one year of surgery.

Results: In comparison of control of RA inflammatory activity between before and after one year of arthroscopic synovectomy of 50 cases, 8 cases (16%) showed excellent results, 22 cases (44%) good results, 16 cases (32%) no change in results and 4 cases (8%) poor results.

Conclusion: The arthroscopic synovectomy for RA knee synovitis is not only reducing the knee symptoms, but also controlling the RA systemic inflammatory activity.
A new minimal invasive technique of Dens axis and posterior C1/C2 instrumentation
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Introduction: The use of minimal invasive techniques such as thoraco- or laparoscopic techniques is increasingly important in spine surgery. Anterior and posterior cervical surgery however is still limited to open procedures with consequent tissue damage especially in cases with fracture or dislocation C1/C2 due to rheumatic changes. We therefore have developed a technique and a guiding instrument to avoid extensive tissue damage.

Material and Methods: The device was designed and developed based on trial operations on corpses. After having proven its accuracy we were able to perform 9 anterior and 4 posterior stabilizations of Dens axis/C1-C2. 9 Patients with fractures dens and 4 rheumatic dislocations C1-C2 were stabilized using our new instrument. The posterior stabilisations were performed after the Magerl/Gallie techniques. In all cases Knöringer double threaded screws were used.

Results: Like with any technique we were experiencing a learning curve and were able to perform the operation more rapidly later on to an average of 45 min. per operation. During the operation we frequently saw a bending of the drill, which did not occur after using a specially enforced drill. The average blood loss was less than 100 cc. Although described by the original author we did not see any pseudarthrosis but this experience is limited to the small number of cases and is entirely independent from our technique. In bigger series we should therefore see the same amount of pseudarthrosis as Knöringer, which ranges around 5%. Besides the occasional bending of the drill we saw no other complications. There was no postoperative increase of the neurological deficit. Using our instrument we felt much more secure with drilling, reaming and screw insertion. Furthermore the capacity of a 360° range of the grip allows a safe and good use of the instrument without to much force and muscle ache due to contorted position of the assistant.

Conclusion: Current techniques of the stabilization of the Dens include a good exposure of the Dens using retractors. This is causing additional tissue damage, which does not occur using our device. Furthermore the risk of repeated drilling of the Dens with subsequent unstable conditions and loss of bone stock can be reduced to a minimum. In posterior stabilizations the need for wide exposure can be reduced to one small incision to guide the instrument.
The described new device is enabling the surgeon to perform a rapid and safe stabilization of fracture of the Dens axis and stabilisations C1-C2 and is another tool in realizing minimal invasive techniques in spine surgery.
We reviewed 26 cases of total radio-carpal arthrodeses to evaluate the clinical results of this type of surgery and to check if the position of the arthrodesis has an effect on the deviation of fingers. The average mean of our study was 10.5 years. These 26 arthrodeses were performed according to Mannerfelt technique on severe rheumatoid wrists stage 4A and 5A in Larsen Bichat and Simmen classification. In 12 cases, the Rush pin was introduced through the medial side of the third metacarpian. In 12 cases, the Rush pin was introduced through the medial side of the second metacarpian. Finally, in 2 cases, the pin was introduced between the second and the third metacarpian.

The long-term clinical results were good; 89% of patients had no pain and 77% had an improvement in their strength. Furthermore, 86% of patients considered their function as normal or appropriate and 78% were satisfied. Insatisfaction of the patients was more related to the deterioration of fingers than the arthrodesis which eliminated the pain. As a consequence, we checked if the position of the arthrodesis, which partially depends on the introduction site of the pin, had an influence on the ulnar deviation of fingers. The arthrodesis was in slightly extended position (5 to 20°) in 14 cases, and in neutral position in the 12 other cases. An ulnar inclination (5 to 25°) was reported in 20 cases.

The introduction of the Rush pin in the third metacarpian is highly recommended. This gives a correct position to the carpus (T= 0.096) which is not the case if the pin is introduced through the second metacarpian (T=0.162). Moreover, this leads to a significant correction of 8° of the ulnar deviation of fingers (p<0.05) while the radial deviation of the carpus is the same in the two groups. In the end, the total radio-carpal arthrodesis is a reliable surgery at long term. The introduction of the Rush pin through the third metacarpian is highly recommended.
MODULARITY AND “M.B.A.” CONCEPT
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Introduction:
The main goal of research in modularity of a total hip prosthesis is to improve the prosthesis adjustment and to simplify revisional procedures. The modularity at the metaphysis level allows a specific orientation of the neck in the three planes.

Material and Methods:
A biomechanical test for wear and tear was carried out. It consisted in carrying out 7.6 million cycles at 380 daN (patient weighing 88 kg and walking at 5 km per hour). This test was performed on a varus neck and long head (+10). A study of the range of motion was carried out in two different ways. Firstly, a study of the theoretical range of motion on an experimental model. Secondly, a clinical study compared the range of motion evaluated by the Postel-Merle d’Aubigné score of 200 modular prostheses implanted for coxarthrosis to the post-operative range of motion of 100 modular monoblock prostheses implanted.

Results:
Resistance: The modular neck in welded alloy of cobalt, chromium and molybdene did not present any evident deterioration, nor deformation, nor fissuring after 7.6 million cycles at 380 daN load. The resistance limit was considered as probably attained.
Particle Debris: The laser granulometric analysis of a solution collected during a resistance test did not show any presence of metal particles (of sizes between 0.04 and 1000 µm) after 5 million cycles at 30 to 380 daN.
Range of Motion: The results of the study of range of motion on the experimental model showed that the range of motion was far higher than the standard norms. In our clinical series of 200 modular prostheses implanted, the average score of pre-operative mobility was 3.98 and 5.75 at 1 year. This series was compared to a series of 100 Charnley monoblock implants (RCO 1996, 82) in which the pre-operative mobility score was 4.38 and 5.84 at 1 year.

Conclusion:
The first clinical and experimental results allow to think that the modularity of the prosthetic neck does not affect the results. The advantages of modularity seem more important than the theoretical drawbacks. A longer term follow-up is essential, but at this stage of our experience we can conclude that the cervical modularity does not limit articular range of motion, does not weaken the prosthesis and does not, in vitro, result in particle debris.