Netherlands Orthopedic Society

Utrecht, October 5, 1991

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The five-year results of total arthroplasty of the hip with the Lübeck cementless hip prosthesis

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In the period 1985–1989, 85 cementless Lübeck hip prosthesis were implanted. The mean follow-up was 3 (1–5) years. The most frequent indications for the operation were primary coxarthrosis and coxarthrosis due to congenital dysplasia of the hip. In 13 patients the anamnesis included a hip operation. The clinical results were assessed by means of the Harris hip score. The results were good or excellent in 89%, fair in 3% and poor in 8%. Postoperative complications occurred in five cases. Eight patients were subjected to reoperations because of persistent complaints of pain and subluxation. In five of them the score remained poor. Pain, mostly slight to mild, persisted in 36%. Radiographic phenomena such as changed posture, para-articular ossifications, calcar resorption, lamellation and console formation were studied. A distinct relationship with pain was observed. Loosening was encountered in only one patient, due to an undersized stem. In all other cases, anchoring was good. Even after rearthrotomy the prosthesis was found to be firmly anchored.

Conclusions: The clinical results of the Lübeck hip prosthesis as measured with the Harris hip score are satisfactory. Anchoring of the prosthesis is good. Implantation of this prosthesis brings about a radiographically distinct bone reaction. Slight to mild pain persists in one-third of the patients. No distinct relationship between radiographic signs and pain was found. Since the persistent pain is unacceptable, use of the Lübeck prosthesis has been abandoned in spite of the good Harris hip scores at evaluation.

The Phemister operation in avascular necrosis of the femoral head

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Between 1983 and 1989 16 patients with femoral head necrosis were observed. In four of them the condition was bilateral. There were six females with a mean age of 40 (29–47) years and 10 males with a mean age of 31 (21–47) years. Etiological factors were use of corticosteroids in 12 hips, alcoholism in three hips, injury in two hips, barotrauma in one hip and unknown in two hips. The surgical technique applied was that described by Phemister (1949) and Bonfiglio and Bardenstein (1958).

With a direct lateral approach under fluoroscopic control two holes are drilled, 8 mm in diameter, through the femoral neck down into the necrotic part of the femoral head. Cortical bone grafts from the ipsilateral tibia, 8 cm long, were inserted into the drilling holes down to the subchondral bone. Weight-bearing on the operated leg was avoided for at least 3 months.

After a mean follow-up of 3 (1–6) years, one hip meanwhile had been treated by arthrodesis while in one other hip a total hip prosthesis had been implanted. The donor tibia caused no postoperative problems. The Harris hip score improved in 15 of the 18 hips. Radiographically, on the other hand, only one of the 20 hips improved, five were unchanged and 14 deteriorated. It is concluded that although the subjective results are satisfactory, the aim of the operation has not been achieved radiographically.

Complications in the treatment of proximal femoral fractures with a gamma nail

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Since December 1989, 65 proximal femoral fractures were treated with a gamma nail. In 12 patients this treatment led to impaired fracture healing. In 10 cases, a technical mistake was made and in two cases, the indication for the gamma nail was not correct. A number of technical mistakes such as introduction of a gamma nail that is too thick, incorrect placement of a screw or use of a femoral neck screw that is too short or too long are well known. However, the majority of the complications were the result of lack of familiarity with the pitfalls which with this otherwise good device frequently manifest themselves only during use, such as extra reaming of the proximal femur in patients under 60, incorrect use of the punch, forcibly drilling-in of the guiding

wire, etc. Shaft fractures originating from the distal screw holes necessitated introduction of a longer gamma nail in four cases. One case of incorrect indication ended up with breaking of the nail 13 months after the operation.

The treatment of congenital vertical talus

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In congenital vertical talus, surgical treatment is virtually always indicated.

Between 1985 and 1990 we treated 23 feet in 14 patients with a congenital vertical talus, nine boys and five girls. Eight children showed other congenital anomalies as well. While treatment was always conservative to start with, surgical intervention could be refrained from in only one child. Of the other patients, most were operated in two stages, the first stage involving correction of the dislocation in Chopart's joint and the second, six weeks later, correcting the talipes equinus. The mean age at operation was 19 (8–42) months . The treatment after every operation consisted of six weeks of immobilization in a plaster cast.

The mean follow-up is 3 (0.5–5.5) years. The correction achieved was retained in all cases; in three patients (4 feet) an additional subtalar arthrodesis according to Grice was performed later. In six feet the hindfoot showed some remaining mobility, in the other feet it was rigid.

At radiographic evaluation according to Hamanishi (1984) 11 feet were classified as excellent and 10 feet as good.

Temporary transpedicular fixation of the lumbosacral spine—technique and indications

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During the period 1987–1991, temporary external fixation of one or several segments of the lumbosacral spine was applied in 66 patients during the preoperative analysis of a spondylodesis. Most of these were patients previously subjected to surgery of the spine, in whom conventional diagnostic methods provided insufficient clarity.

With the patient under general anaesthesia in the prone position, under fluoroscopic control, four 5-mm Schanz screws were introduced into the pedicles of the vertebrae of the segment to be tested. In the first 27 patients (group I), the fixateur was applied first in distraction and subsequently, in a neutral position. In the next 39 patients (group II), a period of non-fixation of which the patient was not informed was intrapolated .

The decision whether or not to perform a spondylodesis was dependent on the effect of the fixation.

In group I, the decision not to perform a spondylodesis was made in four of the 27 patients. In group II it was decided not to perform spondylodesis in 22 of the 37 patients.

It was found that without the period of non-fixation, the test was of very little discriminative value. The number of patients of group II with a sufficiently long follow-up is still too small to justify further conclusions.

How does the approach to the hip joint affect the ultimate result of a total hip arthroplasty?

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Of the three most widely used approaches to the hip joint, the posterolateral approach is the one applied most often in the Netherlands. However, it is notorious for a relatively high frequency of dislocation. The traditionally popular anterolateral approach gives only limited access to the femoral shaft, particularly when prosthesis of modern design are used.

In recent years there has been increasing interest in the direct lateral approach to the hip joint. A retrospective comparative study was made of the influence of the approach to the hip on the ultimate walking function, with special reference to the abductor muscles of the hip. The comparison involved 58 hips subjected to a Stanmore cemented total hip arthroplasty because of unilateral coxarthrosis, 28 of them via the anterolateral (AL) and 30 via the direct lateral (DL) approach. The AL approach was that according to Watson-Jones, the DL approach according to Bauer or Picard, with creation of a so-called gluteal bucket handle flap. Two groups were well matched as regards age, preoperative Harris hip score, general condition and indication for operation. The contralateral non-operated hip was used for comparison. After a follow-up of at least 7.5 months, clinical, dynamometric, electromyographic and radiographic examinations were performed.

Results: Of the total group of 58 patients, one-half walked with a positive Duchenne symptom: 16/28 of the AL group and 13/30 of the DL group. The Duchenne symptom was more pronounced in the AL than in the DL group. Half of the DL patients could walk for over 30 minutes without support, as compared to 1/3 of the AL patients.

Nevertheless, dynamometry showed a slightly lower strength of the abductor muscles, and EMG examination of the abductors more frequently signs of denervation. The fact that in spite of this the DL group exhibited a superior walking function is attributed to the lower frequency of pain and the more favorable positioning of the prosthesis after the DL approach, and to injury to the abductor muscles and more frequent occurrence of complications in the AL group.

The relevance of predisposing factors with regard to heterotopic ossifications after hip arthroplasty

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The relevance of predisposing factors to the development of heterotopic ossifications was investigated in a retrospective study of 739 arthroplasties of the hip, 536 unilateral, 80 bilateral and 43 revision operations.

A univariate analysis showed male sex, preoperative impairment of function in hypertrophic arthrosis and cemented arthroplasties to be risk factors for development of heterotopic ossifications. After a multivariate analysis, however, only male sex remained as a significant predisposing factor.

In patients subjected to bilateral operations, heterotopic ossification occurred significantly more often after the second operation and in addition they had a higher Brooker class. After revision operations, no increase of the number of heterotopic ossifications was found in over one-half of the cases.

This study provided no proof of influence of exogenous factors on the development of heterotopic ossifications. Our impression is that development of such ossifications is determined by endogenous factors.

Indometacin was used for prevention of heterotopic ossifications. In cases of primary hip arthroplasty, a significant effect could be demonstrated. Such a tendency also appeared to exist in revision operations.

Radiographic evaluation of the long-term effects of distal ulnar resection in the rheumatoid hand

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The results of distal ulnar resection in the rheumatoid hand have been the subject of much clinical research. Allegedly, this operation reduces pain and improves the mobility of the wrist and its use in activities of daily life. The distal ulnar resection is also alleged to be followed more often by ulnar translation and radial rotation of the carpus, ulnar deviation of the fingers in the metacarpophalangeal joints and radialization of the ulna. The question is whether these alterations are effects of the distal ulnar resection or consequences of the rheumatoid process itself.

This report concerns a retrospective study of 28 patients who had been subjected to a unilateral distal ulnar resection. Parameters of the operated hand were compared with those of the non-operated hand, using radiographs obtained preoperatively and 4 to 8 years postoperatively. Only those patients were included in the study in whom the Larsen staging (the radiographic classification of rheumatic lesions) showed at most a one-point difference between the operated hand and the non-operated hand, both pre- and postoperatively.

Results: In the operated wrists there was a mean ulnar translation of 5.3 mm, as compared to 3.7 mm in non-operated wrists, a significant difference. It could also be demonstrated with statistical significance that after operation there occurred an average of 12 mm more radialization of the ulna. If an erosive lesion was present on the ulnar side of the radius, the ulnar translation of the carpus appeared to increase, while presence of an ankylosis appeared to protect against further ulnar translation. No correlation between time and the ulnar translation and time and the radial rotation of the carpus was noted. The radial rotation of the carpus was not increased by distal ulnar resection. There was a significant positive correlation between the radial rotation of the carpus and the ulnar deviation of the fingers in the metacarpophalangeal articulations. The Larsen staging proved to be a reliable parameter.

It may be concluded that the distal ulnar resection is an adequate operation, because the various displacements within the carpus are determined not by the operation, but rather by the progression of the rheumatoid process itself.

No dislocation of the hip prosthesis after the capsule-preserving posterolateral approach

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The posterolateral approach to the hip has a bad reputation in regard to the stability of the hip implant, with 8-20% risk of dislocation in primary total hip arthroplasty.

Curiously enough, the role of the traditional partial or total capsulectomy in this connection, and its value, if any, have rarely been subjects of research.

A capsule-preserving modification was introduced. The ventral capsule is left undisturbed irrespective of an existing restriction of exorotation. After implantation, a dorsal capsulopexy is performed via drill holes in the greater trochanter.

In 60 Charnley total hip arthroplasties no dislocations occurred with this technique.

If exorotation was limited, it spontaneously returned to normal within a few months.

Conclusion: preservation and reconstruction of the capsule with the posterior approach protects against early dislocations, simplifies the post-operative treatment and does not interfere with good restoration of function.

Epiphysiodesis for correction of leg length discrepancy using the Straight Line Graph

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During the period 1980-1988, 33 Phemister epiphysiodesis were carried out in 15 girls and 15 boys because of leg length differences (LLD) of various etiologies. The time for epiphysiodesis was determined using Moseley's Straight Line Graph based on orthoradiographic measurements.

The mean predicted LLD without treatment was 5.2 cm (3.0–11.0) and the mean ultimate LLD 1.4 cm (0–4.3). Twenty-one patients ended up with an LLD <1.5 cm) which in two cases required performance of a second epiphysiodesis. Nine patients ended up with an LLD >1.5 mm; in one of these, a second epiphysiodesis was carried out. Causes of an LLD >1.5 mm were: follow-up less than one year (n=3), unexpectedly early fusion of the epiphyses (n=3), failure of skeletal age to advance (n=3), inadequate epihpysiodesis (n=1), and incorrect estimation of the residual growth (n=1).

After analysis of the failures, the following recommendations are made: 1. to gain optimal insight into growth and development of the skeleton by having sufficient measurements made and by performing the epiphysiodesis as late as possible; 2 to allow for retardation or acceleration in development of the skeletal age in Moseley's Graph; 3) always to compare injured epiphyses with contralateral epiphyses and in a deformed hip joint, to use the posterior inferior iliac spine as a point of reference.

Rotation plasty of the leg as a salvage procedure instead of amputation for patients with non-oncological diseases

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Rotation plasty of the leg after resection of a segment of the lower extremity because of a malignant bone tumour is a well-known surgical method.

No description has yet been given of use of this method instead of an amputation or exarticulation for diseases other than malignant bone tumors.

In five patients a rotation plasty was carried out after resection of the pathological segment instead of the initially planned thigh amputation or exarticulation.

Conclusion: in patients under 40 years of age with good vessels, in whom a thigh amputation or exarticulation in the hip joint is considered because of a disease other than high-grade malignancy, a rotation plasty is to be preferred.

Two patients with extreme abrasion of the polyethylene of a total knee prosthesis

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In two patients with a PCA total knee prosthesis, the polyethylene of the tibial plateau was found to have been completely worn away three years after implantation. Clinical examination revealed synovitis of the knee and the diagnosis could be made on the basis of weight-bearing radiographs.

Factors that influence wear in a total knee prosthesis include: patient-linked factors (body weight, diagnosis and duration of the implantation), design-linked factors (preservation of the posterior cruciate ligament, size and shape of the contact surface and the thickness of the polyethylene) and material-bound factors (molecular weight, production technique, elasticity and structure of the polyethylene). Since recently several cases of accelerated wear have been reported, especially of the PCA knee prosthesis, considerable attention was paid to the material-linked factors. Molecular weight was determined and crystallinity calculated using differentiated scanning calorimetry. The morphology of the material was examined by optic microscopy in sections of 7μ thickness.

It can be concluded from the study that the manufacturer used a polyethylene with relatively high crystallinity, and that the material had not been sintered optimally. A surface treatment had been applied that was responsible for an altered morphology of the top layer of the material in particular and consequently for the premature wear that had occurred.

Familial multiple epiphyseal dysplasia

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Prompted by several cases of epiphyseal dysplasia in the files of the St Joseph Hospital, Veldhoven, an extensive genealogical study was carried out. Within one large family, 30 persons definitely had lesions compatible with multiple epiphyseal dysplasia, and 16 persons possibly (symptoms but no radiographic confirmation). The clinical picture varied greatly owing to variable penetrance of the gene and consequently there is no correlation of severity, localization of the abnormalities observed and heredity. The lesions encountered were frequently misdiagnosed and treated as osteochondritis dissecans or Perthes' disease.

Results of treatment of clubfeet

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In the above-mentioned hospitals in the period 1980–1990 70 patients with 97 classical clubfeet were operated. The severity of the lesions observed determined what tendons were to be lengthened and whether the interosseous ligament, the syndesmosis and the abductor hallucis were to be severed. The results were assessed clinically by Magone's method and radiographically by Simons's method.

Results: Available for clinical follow-up were 63 patients (87 feet). Their mean score was 88,2 (max.=100) with a mean follow-up of 6 years. In 61 feet the Range Of Motion (ROM) of the talus could be measured in recent radiographs. Addition of the number of points assigned to this plus the clinical score equals the total score. This amounted to 79.4 on average (max.=100) with a mean follow-up of 5.5 years.

Conclusions:

1. With current therapy the ROM of the talus is a parameter where the clubfoot lags greatly behind the normal foot.

2. In classical clubfoot in which posterior release is the intervention of first choice, the results are assessed clinically as excellent or good in 86% of the feet.

3. The total score of this series (79.4) matches the total scores of Carroll's postero-medial release (77.6) and McKay's posteromediolateral release (78.8).

Osteosynthesis of subcapital and shaft fractures of the humerus according to Hackental's method

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Most subcapital humeral fractures can be treated conservatively. In fractures with marked dislocation osteosynthesis may be indicated.

Osteosynthesis by Hackental's method was performed in 23 patients. After closed reduction, fixation is effectuated by insertion of several intramedullary pins, diameter 2.5 mm, from the distal humerus. Since the fracture is not approached operatively, the operation can be performed very quickly with a minimum of blood loss.

In 18 patients, a very good position of the fracture was achieved, resulting in good functional results, as well. Poor anatomical results are mostly the consequence of erroneous indications.

The indication for osteosynthesis is the simple subcapital fracture of the humerus (AO 11A3). More comminuted subcapital humerus fractures (AO 11B2) were also treated successfully. Fractures of the humeral shaft may also be treated by this method. Osteosynthesis of a humeral shaft fracture was performed in 17 patients. The osteosynthesis is carried out quickly and easily and provides fairly good stability. All these fractures healed in adequate position without complications.