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GAIT PATTERNS BEFORE AND 3 MONTHS AFTER TOTAL HIP ARTHROPLASTY

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Nine patients aged 52–80 years suffering from unilateral osteoarthritis of the hip were tested on an instrumented treadmill the day before total hip arthroplasty (Stanmore or Lubinus) and about 3 months later.

The vertical, transversal, and sagittal forces were registered and total force and individual variations were calculated. It was found that the sagittal force on the operated leg increased significantly after 3 months whereas the other forces and the individual variations were nonsignificant.

The patients' walking speed was increased by 80 per cent.

THE EFFECT ON THE WALKING PATTERN FROM WEARING A PLASTER OF PARIS OR A LIGHTWEIGHT BANDAGE

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Ten normal persons aged 19–38 years were tested on an instrumented treadmill. The gait was analysed during a constant walking speed of 3 km/h. The gait was measured during four test-situations: 1) without a bandage = normal gait, 2) with a conventional short plaster of Paris walking bandage mounted with a standard heel, 3) with the same bandage but mounted with a rocker, and 4) with a lightweight bandage of plastic with a special heel. The non-bandaged legs were without shoes. The external work of the gait, the stride length, the difference in swing-phase for both legs and the unsteadiness of the gait were calculated. We found that the gait pattern was closest to the normal gait when wearing a lightweight bandage in all test-situations.

ARTHROPLASTY OF THE KNEE: A 1-YEAR FOLLOW-UP STUDY OF 200 CASES

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From October 1979 till March 1980 200 alloplastic operations of the knee were performed on 126 women and 31 men with a mean age of 61 years, ranging from 17 to 81 years. Osteoarthritis necessitated surgery in 102 knees, rheumatoid arthritis in 95 knees, haemophilic arthropathy in two cases and fracture sequelae in one case. The Total Condylar Prosthesis was used in 80 per cent of the cases, the Marmor Modular Prosthesis and the hinged Sct. Georg Prosthesis were each used in 10 per cent of the operations. At the 1-year follow-up 89 per cent of the knees had excellent or good result and 4 per cent were classified as poor.

ARTHROSCOPY: SHOULD IT BE DONE AS AN OUTPATIENT PROCEDURE OR DURING HOSPITALIZATION?

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A prospective multicentre study of 549 arthroscopies is reported. Half the patients were treated as outpatients with the arthroscopy done under local anaesthesia with a 2.2-mm needlescope and the other half of the patients were examined under general anaesthesia during hospitalization with a 5.0-mm arthroscope.

No serious complications occurred.

Since arthroscopy has a diagnostic accuracy of over 90 per cent with only minor complications and with a short period of restitution, we recommend arthroscopy on wide indications, and if at all possible done as an outpatient procedure.

ARTHROSCOPY IN ACUTE KNEE INJURIES WITH HEMARTHROSIS

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In a prospective multicentre study of 549 arthroscopies, 49 acutely injured knees with traumatic hemarthrosis were examined. All of these underwent arthroscopy under anaesthesia within 72 hours of the injury. 69 per cent of these arthroscopies resulted in arthrotomy. In 25 per cent combined lesions were found, the most common being a rupture of the anterior cruciate ligament. At arthroscopy the diagnostic accuracy was found to be more than 90 per cent.

It was concluded that traumatic hemarthrosis of the knee represents an injury not to be neglected and arthroscopy is possible with a high accuracy of diagnosis even in the acutely injured knee with hemarthrosis.

THE EFFECTS OF METHYL-METHACRYLATE BONE CEMENT ON BONE

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An *in vitro* system involving the use of mouse calvaria has been used to evaluate the influence of the bone cement components on calcium and proline-release as well as on the alkaline and acid phosphatase activity determined by semiquantitative histochemistry.

The investigations demonstrated that both monomer and polymer caused a significant decrease in all the examined parameters to values as low as found for dead bone.

A decrease in bone-turnover was thus registered *in vitro* indicating a cell toxicity of both bone cement components.

TOTAL HIP REPLACEMENT IN CONGENITAL DISLOCATION AND DYSPLASIA OF THE HIP

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Twenty one cases of congenital dislocation and dysplasia of the hip were treated with total hip replace-

ment a.m. Charnley. The indications were always severe pain and dysfunction of the hip. It was not intended to reduce the shortening of the leg and the acetabular cup was placed in the neo-acetabulum. It was often necessary to transplant cancellous bone to the lateral margin and to the floor of the neo-acetabulum in order to get sufficient support for the cementing.

It is necessary to have an assortment of small prostheses. The Charnley program appears to be suitable. In the present series there were no complications. The long-term results were comparable to the results achieved in total hip replacements for osteoarthritis.

A PROSPECTIVE STRESS RADIOGRAPHIC STUDY OF 38 LATE REPAIRS OF THE LIGAMENTS OF THE KNEE JOINT

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In a prospective clinical and stress radiographic study comprising 38 patients, the results of repairs of chronic ligamentous injuries of the knee joint were evaluated. All but five patients had isolated ligamentous injuries 16 of which affected the anterior cruciate ligament. The operations were performed from 18 days to 20 years after the injury. In 13 a primary suture could be carried out, 12 patients underwent exploratory arthrotomy only, and the remainder had relevant ligamentous repair. At follow-up after 7 years the instability had been cured in all patients with medial laxity. Nineteen patients had a drawer sign preoperatively, but at follow-up only four had marked drawer signs (> 6 mm). It was difficult to prevent the development of rotatory instability, which was present in six patients preoperatively and in 14 at follow-up. By means of ligamentous reconstruction it was possible to reduce the instability appreciably.

HEMODYNAMICS OF THE JUVENILE KNEE DURING EXPERIMENTAL CHRONIC ARTHRITIS

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In order to evaluate the pathogenetic factors in relation to epiphyseal growth disturbances in chronic juvenile arthritis the relationship between regional blood flow and intraarticular pressure was investigated in 14 immature dogs with unilateral Carrageenin-induced chronic arthritis of the knee.

The resting intraarticular pressure of the arthritic knees was significantly elevated. The regional blood

flow measured by the microsphere-technique in the juxta-articular diaphyseal and metaphyseal bone was increased by 30 per cent and 180 per cent respectively. Severe hyperaemia with a flow increase of 340 per cent was found in the knee joint capsule in contrast to an unchanged blood flow in the epiphyses of the knee and the patella. During an intra-articular pressure increase to above 50 cm of water the regional blood flow of the distal femoral epiphyses and the knee joint capsule of the arthritic knee was found to be significantly decreased compared to the control knee. These observations may be of major importance to the growth disturbances observed.

THE ARTICULATION IN LARGE SIZED KNEES, REPLACED BY THE TOTAL CONDYLAR PROSTHESIS

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The tibio-femoral contact was studied radiologically during flexion in six large sized cadaveric knees, replaced by a Total Condylar prosthesis. A 7.5-mm tibial component was used in three knees and a 15-mm component in three knees. All joints were investigated with the component placed anteriorly and posteriorly on the tibial plateau. It was concluded that the use of a high posteriorly placed tibial component in large sized knees will result in a more central tibio-femoral articulation and therefore in a more optimal distribution of stress on the underlying trabecular bone.

THE RELATIONSHIP BETWEEN THE BLOOD FLOW AND CHANGES OF THE INTRAARTICULAR PRESSURE IN THE JUVENILE HIP JOINT

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The blood flow in the proximal epiphysis was measured in six mongrel puppies by means of labelled microspheres. The intraarticular pressure was controlled by infusing Rheomacrodex® into the joint, the pressure being determined by the elevation of the bottle.

The blood flow in the proximal femoral epiphysis decreased at an intraarticular pressure of 50 mmHg and almost ceased at 150 mmHg. In the femoral metaphysis and in the acetabulum the blood flow did not differ from the control side when the intraarticular pressure was raised.

MICROSURGICAL REPAIR OF INJURIES OF THE BRACHIAL PLEXUS

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Twenty-two patients with lesions of the brachial plexus were reviewed from 3–6 years after microsurgical repair. Four patients with supraganglionic lesions underwent intercostal nerve transfer for the musculocutaneous nerve.

None of these achieved a useful elbow flexion.

Nerve grafting was performed in six patients of whom five recovered a useful motor function in at least one important area.

Twelve patients had neurolysis. A useful motor function in at least one important area was achieved in eight of these patients.

Protective sensibility was achieved by 80 per cent of the patients.

A CRITICAL REVIEW OF THE MOORE PROSTHESIS AS PRIMARY TREATMENT FOR FRACTURES OF THE FEMORAL NECK

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One-hundred and six fresh fractures of the femoral neck were treated with a Moore hemialloplasty. The mean age of the patients was 82.5 years (65–91). The 2-year follow-up was attended by 71 patients. Twenty-six of these patients were in need of or had already had the Moore Prosthesis converted to a total hip replacement.

When only those patients living at home were considered the demand for total hip replacement was 55 per cent (26/47). Secondary acetabular derangement was the most important reason for further surgery. It is suggested that the future treatment of these fractures should be thorough reduction and pinning. In cases where this can not be accomplished, a primary total hip replacement should be considered.

THE TREATMENT OF FRACTURES OF THE FOREARM WITH INTERNAL FIXATION A.M. AO

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Twenty-nine children and 46 adults sustained 116 displaced fractures of the radius and ulna. The fractures

were stabilized with AO plates. One half of the patients were treated as emergencies. All fractures among the children healed in less than 12 weeks. In the adult group the rate of non-union in high energy fractures was 19 per cent and 5 per cent in low energy fractures. Fractures that did not heal showed a significantly higher rate of technical failures. There were four cases of deep infection.

Fixation with AO plates has not solved the problems in the treatment of high energy fractures of the forearm.

FRACTURES OF THE TIBIAL SHAFT

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Eighty-nine adult patients with fractures of the tibial shaft were re-examined in order to compare two methods of treatment: operative treatment (1973–75) and conservative treatment (1976–79). The material comprised 47 per cent high energy fractures and 40 per cent of all fractures were comminuted.

The final result in the whole group was 73 per cent "good" 13.5 per cent "fair" and 13.5 per cent "poor". No significant difference in the final results between the two types of treatment was demonstrated. The study did, however, point out the increased risk of complications in primary operative treatment in high energy fractures.

INTRAARTICULAR FRACTURES OF THE DISTAL TIBIA

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Eighteen out of 23 patients with intraarticular fractures of the distal tibia were re-examined with an average follow-up time of 5.4 years. Two major fracture patterns were identified: Type A, a rotational pattern and type B, a compressive fracture pattern. The type B fractures were subdivided into isolated fractures of either the anterior or the posterior margin, extraarticular comminuted fractures with articular involvement and comminuted intraarticular fractures. The comminuted intraarticular fractures that were treated surgically gave poor results, especially when the initial displacement was severe or the accuracy of reduction was poor. In contrast the extraarticular comminuted fractures showed clinically acceptable results.

REMOVAL OF A SURGICAL IMPLANT 24 YEARS AFTER INTERNAL FIXATION

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Long-term complications to internal fixation of fractures include hematogenous infection, failure of the implant and metallosis. Late debut of complaints following an otherwise uncomplicated osteosynthesis is illustrated in a case report.

A 42-year-old male had a plate osteosynthesis of a tibial fracture in 1958. Twenty-one years later he experienced increasing pain and tenderness in the affected leg. The implant was removed whereafter the complaints subsided. No signs of inflammation were found at surgery and it is concluded that early removal of the implant is easier and more atraumatic than late removal.

SPONGOSTAN®: A REPLACEMENT FOR CANCELLOUS BONE GRAFT

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Spongostan® was used in six cases to replace resected bone. The diagnosis were cartilaginous exostosis, bone cysts and osteoid osteoma. In all cases the periosteum could be sutured to cover the Spongostan. The bone structure normalized within a few months as seen in the radiological picture. The patients were followed for 1–1½ years with no signs of recurrence of the local lesion. It is concluded that Spongostan might have a place if large bone defects in children have to be filled where it is difficult to find sufficient cancellous autograft.

MEASUREMENTS OF POSTURAL STABILITY USING A COMPUTERIZED FORCE PLATE

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The ability to stand is essential to man. Various drugs and treatments influence the postural stability.

The patient's centre of gravity is measured while standing on a force plate. The centre of pressure of the feet and the average excursions from the centre of gravity are calculated by a computer. Studies have been made on normal persons of different ages and on persons after anaesthesia and premedication.

The influence of various drugs has been studied and in patients having received a unilateral total hip-prosthesis the postural stability was found to be im-

proved. The method may have a wide field of application: it is easy to use, non-invasive, and results are reproducible.

BONE MINERAL CONTENT IN THE LUMBAR SPINE, FEMORAL NECK AND FEMORAL SHAFT IN NORMAL WOMEN AND IN PATIENTS WITH FRACTURES OF THE FEMORAL NECK

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Bone Mineral Content (BMC) was determined in the lumbar spine (v. 1.2–4), the femoral neck and the femoral shaft with dual photonabsorptiometry. In 80 normal women from 20 to 90 years old there was a significant fall in BMC with age preferably for the spine and the femoral neck. For the femoral shaft the fall in BMC was only significant after the age of 60 years. The difference between BMC of the femoral neck and shaft of the right and left leg was not significant. Measurements of BMC in 48 female patients with unilateral fractures of the femoral neck (18 medial and 30 lateral) showed no significant difference from the normal values of the same age group as regards the lumbar spine and the femoral neck. For the femoral shaft BMC was, however, significantly reduced. There was no significant difference between BMC values for the medial (trans-cervical) and the lateral (pertrochanteric) fractures.

DELIVERY AND PELVIC FRACTURES. A FOLLOW-UP OF 34 OBSTETRIC PATIENTS WITH A HISTORY OF PELVIC FRACTURES

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Obstetric complications in 34 women with a history of pelvic fractures were evaluated. Ten patients developed increasing or recurrent pelvic pain in the course of their pregnancy. There were 27 uncomplicated deliveries by the vaginal route including 13 in patients who had had displaced pelvic fragments. Seven deliveries showed complications but only three could be attributed to the previous pelvic fracture. Two patients developed re-symphysisiolysis and one Caesarian section was carried out as vaginal delivery was considered too risky.

It is concluded that separation of the symphysis is a more serious complication during a subsequent delivery than displacements of the bony birth canal.

COLLES' FRACTURE: RADIOLOGICAL HEALING, FUNCTIONAL AND SOCIAL RESTITUTION

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In a prospective study the relationship between the degree of anatomical reduction and the functional and social restitution was investigated in 136 patients. The fractures were all reduced under local anaesthesia and immobilized for 6 weeks. A statistically significant correlation was found between the anatomical end result and the functional status after 7 weeks. A significant correlation was also observed between the fracture type according to Frykman and the functional status. As an isolated parameter the relative grip strength was found to be a good indicator of the total functional status. All Colles' fractures were radiologically healed after 6 weeks, while functional restitution took from 12 to 24 weeks, and the average time till social restitution occurred was 8 weeks.

THE RESULTS OF BONE-GRAFTING BY THE MATTI-RUSSE OPERATION FOR NON-UNION OF THE SCAPHOID

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During 1971–80 23 patients were treated with bone-grafting according to Matti and Russe for non-union of fractures of the carpal scaphoid bone. The postoperative follow-up ranged from 1½ to 10 years with a mean of 4 years.

Union was achieved in 19 patients and these had far better subjective and objective results and the patients with persistent non-union of whom one developed secondary osteoarthritis. The median duration of sick-leave was 5½ months for the fractures that healed and 12 months for the patients in whom union was not achieved.

PROCEEDINGS OF THE NORWEGIAN ORTHOPAEDIC ASSOCIATION

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EDITOR: BERNHARD PAUS

PES EQUINO-VARUS PSYCHOGENICA

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Two patients with pes equino-varus of psychogenic origin were reported. A woman of 37 years of age gradually developed this deformity over a period of several years. She could not walk without crutches and only touched the ground with the lateral part of her foot. The foot could not be redressed, except in narcosis, when the foot resumed a normal position and had totally free passive movements of all the joints.

A 16-year-old girl developed the deformity in a year. It started with seizures resembling epileptic fits. They proved to be of hysteric nature. Thereafter the foot gradually became twisted in equino-varus-position. This position became impossible to redress, even in narcosis.

RUPTURE OF THE ROTATOR CUFF

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The clinical diagnosis of injuries of the rotator cuff is often difficult. Arthrography of the shoulder joint is a simple and reliable aid in diagnosing this condition. Three cases with the clinical diagnosis of rupture of the rotator cuff were reported. They all had positive X-ray findings by arthrography. While waiting for operation, in the course of a few weeks they all had spontaneous remission of pain, and operation was postponed. The question of which patients should be operated and at what time to operate for rupture of the rotator cuff was discussed.

VARUS-DEROTATION SUBTROCHANTERIC OSTEOTOMY IN CALVÉ-LEGG-PERTHES DISEASE

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Seven patients, four boys and three girls, average age 6 years, operated on with varus-derotation subtrochanteric osteotomy for Calvé-Legg-Perthes disease were reported.

At follow-up examination with average observation time of 6 years and 5 months, three patients had shortening of the operated extremity and needed epiphyseodesis. Three patients had an increased external rotation of the hip and one needed corrective derotation osteotomy.

X-rays of hips at follow-up showed correlation with the clinical observation.

More accurate measurements of preoperative rotation deficiency and not removing the medial bone peg during the operation might improve the results.

DWYER'S OSTEOTOMY OF CALCANEUS

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Thirteen patients operated with Dwyer's osteotomy of calcaneus between 1967 and 1979 were reported. Ten patients had a varus heel deformity, in one case marked and in the other nine moderate. Three patients had a relapsed congenital club foot deformity; one of these was severely and bilaterally affected.

The varus position of the heel was corrected in all 13 patients, resulting in a normalization of the gait. The cavus deformity was reduced even if a high arch persisted. Shoe wear was reduced. Pain was relieved, in some cases entirely. Altogether the results were good in all patients except the one with severely affected club-foot.

THE SNAPPING KNEE OF INFANCY

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Two children with the typical picture of "snapping knee" were admitted to the Orthopaedic Department, Sentral Hospital in Rogaland in 1978. Both patients were approximately 6 months old and had typical "jumping joints" as described by Rodney & Beals (*Bone Joint Surg.* (1978) 60-A). In both patients, the symptoms and signs disappeared in the course of 1 year without specific treatment.

Our third patient began with "popping of the knee" at 6 months of age. Examination at 3 years of age, showed the patient's ability to subluxate the knee joint at will. X-ray showed typical lateral displacement of the tibia. According to the above mentioned article, this condition will correct itself at 5-6 years of age, and we will keep this patient's progress under observation.

SYME AMPUTATIONS

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This is a retrospective study of 23 Syme amputations during the period from 1970 to 1980. Determination of amputation level was made only on clinical grounds. The technique was the classical one stage Syme. One amputation was done because of trauma, eight for arteriosclerotic reasons and 14 because of diabetes. Thirteen amputations healed and the patients received prostheses, a success rate of 57 per cent. The diabetics had a significantly higher success rate than the patients with arteriosclerosis.

ARTHROSCOPIC SURGERY

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Experience from our first 50 attempts at arthroscopic surgery is presented. The procedures in the 42 male and eight female patients were performed for the following diagnoses: meniscus lesions – 33 (11 bucket handles), medial shelf – 8, loose bodies – 5, chronic synovitis (biopsia) – 4, chondromalacia patellae – 1, foreign body (screw) – 1. Mean operating time for successful removal of a bucket handle fragment was 1 hour, while an unsuccessful attempt plus redraping and arthrotomy took 2 hours, including diagnostic arthroscopy. The other operations took from 20 to 100 minutes. No complications were registered; long term results, however, remain to be evaluated. The mean hospital stay for meniscus operations performed under arthroscopy was 2.24 days, and 5.25 when an additional arthrotomy had to be performed. We feel that arthroscopic surgery definitely has a place in the treatment of knee lesions, and even in the initial stages of skill little time is lost in the operating theatre, considering that most knees will undergo arthroscopy before even an ordinary arthrotomy.