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RESULTS OF OPERATIVE TREATMENT OF LESIONS OF CRUCIATE LIGAMENTS: A FOLLOW-UP STUDY *B. Barfod & S. Boe*

In 32 knee injuries 28 ruptures of the anterior and 10 lesions of the posterior cruciate ligaments were found. Only four ruptures of the anterior and one of the posterior ligaments were isolated lesions.

A follow-up study of 26 of the 32 knees showed poor results in nine cases, four due to arthrosis; the rest were due to instability, mostly combined with pain. One anterior and four posterior drawer signs of more than 1 cm were found, all in knees with poor results. Five patients had lateral instability, four with poor results.

Conclusion. Evaluation of the consequences of primary repair of the cruciate ligaments is difficult if not impossible due to the presence of other lesions. Meticulous repair of all injured structures is mandatory.

A STRESS-RADIOGRAPHICAL FOLLOW-UP INVESTIGATION OF 30 PATIENTS 2 YEARS AFTER JONES OPERATION *Klaus Jacobsen*

This operation was carried out on very unstable knees with absent anterior cruciate ligaments. It was shown at stress-radiographical follow-up investigation that it was just as satisfactory to use the difference in anterior displacement between the uninjured and the operated leg as a parameter as it was to compare the values of the injured knee preoperatively and at follow-up. A good result was found in 80 per cent of the measurements. Seventy-two per cent of the patients were very satisfied. It was also shown that clinical quadriceps measurements have to be carried out on both legs both prior to operation and at follow-up before an assessment of

postoperative atrophy can be made: Despite a persisting difference a marked bilateral hypertrophy had taken place in many cases at follow-up.

OSTEOARTHRISIS FOLLOWING INSUFFICIENCY OF THE CRUCIATE LIGAMENTS OF THE KNEE IN MAN. A CLINICAL STUDY *Klaus Jacobsen* *Acta orthop. scand. 48, 520-526.*

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KINETICS OF GAIT *Knud Jansen, Erik Jansen & Robert Larsen*

An instrumented treadmill has been used to record the force pattern of gait in patients with gait handicaps. The patient walks on a moving pavement consisting of two parallel conveyor belts. The belts are driven by hydraulic motors and the suspension forces monitored using strain gauges. The signals obtained are the vertical, the transversal and the sagittal force of each foot.

The force curves are recorded on tape for later computer processing. Thus a means of gait analysis under standard conditions has been established. The exact measurements provide information of the kinesiology of gait.

(A movie film illustrated the gait analysis.)

EXTERNAL WORK OF GAIT *Erik Jansen, Robert Larsen & Jens Erik Pedersen*

The external work, produced when walking is considered to be a major expression of gait function, especially in the presence of a gait handicap. Using an instrumented treadmill, the vectors of each foot are recorded and the following calculations are made by a computer. Applying Newton's second law the velocities of the three

directions of movement are obtained. By integration and multiplication of the forces from each foot by the velocities the external work produced by each foot is determined. By this method it is possible to relate the patient's gait handicap to his cardio-pulmonary capacity thus facilitating the choice of treatment.

LATERAL DISCOID MENISCUS COMBINED WITH HYPOPLASIA OF THE LATERAL FEMORAL CONDYLE

Ivan Hvid, Lars Ib Andersen & Henrik Schmidt

Two cases of hypoplasia of the lateral femoral condyle in conjunction with large, primitive discoid menisci are described. Both patients were girls, 9 and 10 years of age at the time of operation. One case showed slight and the other pronounced hypoplasia of the lateral femoral condyle.

It is postulated that this osseous abnormality is secondary to the mechanical impact of the thick discoid meniscus.

IS EARLY WEIGHT-BEARING PERMISSIBLE AFTER INTERTROCHANTERIC FRACTURE TREATED *AD MODUM* McLAUGHLIN?

T. Scherff Sørensen og K. Hougaard

A retrospective study of 176 intertrochanteric fractures treated by fixation with vitallium nail-plate *ad modum* McLaughlin is presented. Seventy-five patients were treated postoperatively without weight-bearing for 12 weeks, and 101 patients were allowed as much weight-bearing as possible from the second postoperative day. The frequency of thromboembolic complications was significantly decreased in the group with early weight-bearing. No differences in the frequency of disruption of the nail-plate junction nor in other complications were found.

FEMORAL SHAFT FRACTURES TREATED WITH CLOSED INTRAMEDULLARY NAILING

O. Fedders

Out of 274 femoral shaft fractures 190 were treated with intramedullary nailing and of these 172 were treated with closed reduction and nailing. One fracture developed pseudarthrosis and three osteitis (two of these after secondary surgery). None of these complications occurred in the group receiving closed treatment.

THE TREATMENT OF PER- AND SUBTROCHANTERIC FRACTURES *AD MODUM* ENDER

P. Ramsing & I. Tovborg Jensen

The Ender method of intramedullary fixation of per- and subtrochanteric fractures was used in 84 patients. The average age was 75 years and the mortality rate was 15 per cent. In two cases infection occurred and in one case there was non-union 8 months after the operation.

The results were particularly favourable in patients who were able to walk without canes at the time of injury. In 25 per cent a shortening of more than 1 cm or a malrotation of more than 20° was observed.

The advantage of the Ender method is a reduction in the length and severity of the operation and the possibility of early weight-bearing.

OPERATIVE OR CONSERVATIVE TREATMENT OF LESIONS OF THE LATERAL LIGAMENTS OF THE ANKLE

Jes Erin-Madsen & E. Korsholm Nielsen

A total of 143 patients were operated on for lesions of the lateral ligaments of the ankle and a further 59 patients were treated, in the following period, with plaster of Paris; 138 and 59 respectively were re-examined. At operation the ligaments were found to be totally ruptured in 85 per cent of cases and partially in 4 per cent.

At follow-up two thirds of the patients in each group were symptom-free. Nineteen per cent in the operated group and 10 per cent in the group treated with a cast had feelings of instability, the former group showing the more stable ankles at secondary stress inversion X-ray examination. It is concluded that the operative treatment did not give better results than the treatment with a cast.

RADIONUCLIDE UPTAKE OF ^{99m}Tc-PHOSPHATE COMPOUNDS IN HUMAN OSTEOARTHRITIC FEMORAL HEADS ILLUSTRATED BY AUTORADIOGRAPHY, IMPULSE COUNTING, AND COMPARATIVE HISTOLOGICAL-HISTOCHEMICAL STUDIES

Steen Bach Christensen

Autoradiography was performed on macroscopic specimens from osteoarthritic femoral heads of patients who had received 10 mCi ^{99m}Tc-polyphosphate or ^{99m}Tc-methylendiphosphonate before replacement surgery. The

radionuclide accumulated mainly in the walls of cysts in the weight-bearing area and at the osteochondral junction in the osteophytes. Impulse counting corroborated the auto-radiographical findings. Morphological studies revealed the areas of accumulation of radionuclide to be areas of bone formation, particularly enchondral ossification. This was found in the osteophytes and in cysts with cartilage metaplasia in the cyst wall. High alkaline phosphatase activity was correlated with an increased uptake of ^{99m}Tc -phosphate compounds, but this was not located in the cells with high enzyme activity, but rather in the cell product, the immature, newly formed bone.

THE VALUE OF ROUTINE X-RAY EXAMINATION OF THE CERVICAL SPINE IN CASES OF ACUTE TRAUMA TO THE HEAD AND NECK

Vilhelm Møller Pedersen

During a period of 45 months in 1972-1976, 1112 patients with injuries to the head and neck were admitted to the Department of Surgery, Holbaek Hospital. All of these patients were submitted to X-ray examination for possible lesions of the cervical spine. Five cases with lesions of this type were revealed by radiographic examination; there had not been any preliminary clinical suspicion of lesion of the cervical spine. It is concluded from this survey that it is not reasonable to require routine X-ray investigation of the cervical spine in all cases of trauma to the head and neck admitted to hospital.

CONGENITAL PSEUDARTHROSIS OF THE ANTEBRACHIUM

R. Jølnes

A case of congenital pseudarthrosis of both bones of the forearm, with fibrous dysplasia at biopsy, is presented.

The patient is a 6-year-old girl. Two years previously an operation with homograft was undertaken. The graft resolved. Due to complaints and signs of irritation of the median nerve, another osteoplastic operation was attempted. The graft was taken from the body of the fibula. The result is still uncertain.

Six of the 10 cases with congenital pseudarthrosis of one or both bones of the forearm, reported in the literature, were operatively treated. In four cases the lesions healed, with an average of three operations per patient. There was only a slight decrease in the

function of the forearm and none of the hands and fingers.

FRACTURES OF THE PHALANGES OF THE HAND

A. P. Højlund & P. Riegels-Nielsen

A review of 90 patients with 94 uncomplicated fractures of the proximal and middle phalanges of the fingers, treated at the Hospital of Orthopaedic Surgery in Sorø, Denmark, showed that one third of the patients had residual complaints such as a feeling of coldness or pain on strenuous use of the hand. Fourteen patients had unsatisfactory function of the hand, and 12 fractures healed with residual deformity. Splintage should not be used for more than 3 weeks as no fracture showed secondary dislocation after this period. The finger should be splinted in the "safe position". Accurate reduction also with regard to rotation is mandatory for a good result.

TREATMENT BY TRACTION *AD MODUM* COTREL IN IDIOPATHIC SCOLIOSIS

Claus Kromann-Andersen

Cotrel traction has two components; an active autoextension and a passive night traction. This system has been used at Department O, Odense Hospital, since September 1976, to treat idiopathic scoliosis. Having been examined clinically and radiologically the patients are instructed in the techniques of a special training programme and in the traction method itself. It has been possible to carry out the treatment at home with outpatient visits every 3 months. Apart from the daily treatment sessions we have not suggested any restrictions in the patient's personal activities.

Twelve patients are under treatment and are being regularly examined. The short observation time does not allow any conclusions to be drawn as yet.

A HISTOCHEMICAL STUDY OF ALKALINE AND ACID PHOSPHATASE ACTIVITY IN SUBCHONDRAL BONE FROM OSTEOARTHROTIC HUMAN HIPS

Inge Reiman

Frozen sections from 24 osteoarthrotic femoral heads were prepared for study of alkaline and acid phosphatase activity using the enzyme-histochemical methods described by Burstone, and by Barka & Anderson. Different areas of the subchondral bone, viz. weight-bearing, non-weight-

bearing and osteophytes, as well as central regions, were investigated. The cartilaginous changes were determined by histological-histochemical grading.

The data obtained showed wide variation within the same femoral head with significantly greater activity of alkaline as well as of acid phosphatase in weight-bearing than in non-weight-bearing areas and in subchondral than in central regions. The activity correlated with the degree of cartilage changes.

MIGRATION OF THE FEMORAL HEAD IN LEGG-CALVÉ-PERTHES' DISEASE AND ITS SIGNIFICANCE FOR THE PROGNOSIS

J. Reimers, B. Edsberg & B. Rubinstein

The treatment of Legg-Calvé-Perthes' disease (LCPD) employs to an increasing degree the containment principle in the form of femoral osteotomy, based on the hypothesis that the decisive factor for the prognosis is centralization of the femoral head, and not relief of weight-bearing by the hip.

A follow-up examination of 48 unilateral LCPD hips treated by strict bed rest showed a poor correlation (best value $r = -0.385$) between the degree of lateralization of the femoral head (the migration percentage) during the course of the disease and the sphericity quotient at follow-up. The hypothesis therefore must be rejected.

The lateralization increased during the first 1.8 years and then decreased. This phenomenon is explained mainly by changes in the balance between the abductors and adductors of the hip.

LATERAL RELEASE IN THE TREATMENT OF DISLOCATION OF THE PATELLA AND OTHER DISORDERS OF THE KNEE

N. O. Christensen

Twenty-six patients with recurrent dislocation of the patella were treated by section of the lateral fibrous capsule and medial tightening. In only three cases was the tibial tuberosity advanced.

In the present series three patients had recurrence of the dislocation. Two of them had significant patella alta (one was spastic) and stability was achieved after additional advancement of the tuberosity. The third patient had a remarkably shallow patellar sulcus and reoperation has not yet been carried out. The rest of the patients have stable patellae and no complaints or only trivial ones.

Few dislocated patellae have such a high position that advancement of the tuberosity is

necessary or even justified. Undoubtedly severe chondromalacia may follow advancement in patients who do not need it.

In another 14 patients a lateral release was performed for patellar arthrosis and chondromalacia, in an attempt to follow the indications of Ficat. About half of the patients were relieved of pain. As there is no satisfactory alternative treatment for these patients 50 per cent success is perhaps acceptable.

ON THE SKELETAL AGE IN COXA PLANA

Hans Bohr

In 154 cases of Coxa Plana (CP) from Denmark, the skeletal age, determined according to Greulich & Pyle, was delayed by 19.5 months in boys and 15.7 months in girls. This retardation is significant compared with a control material of Danish children in the same age group. In boys younger than 5 years the delay in skeletal age increases in the following 5 years, while it decreases in boys over the age of 8 years. There was no correlation between the delay in skeletal age and the duration of the disease. Height, weight and growth rate were normal.

A COMPARATIVE INVESTIGATION OF ACUTE LATERAL ANKLE INJURIES EVALUATED RADIOLOGICALLY FOR ANTERIOR SUBLUXATION AND TALAR TILT

E. Larsen

Forty-nine patients with acute lateral ankle injuries have been investigated radiologically for anterior subluxation of the talus and for talar tilt.

A better correlation was found between the results of the examination for anterior subluxation and the operative findings, than between talar tilt and the operative findings.

In addition, the examination for anterior subluxation was significantly less painful than the examination for talar tilt.

NECROSIS OF THE FEMORAL HEAD OF 8 YEARS DURATION WITHOUT RADIOLOGICAL COLLAPSE

J. Grieff

A 70-year-old male sustained a medial fracture of the femoral neck, which was treated with an osteosynthesis *ad modum* MacLaughlin. Two years later the implant was removed due to persis-

tent pain, and shortly afterwards a femoral neck pseudarthrosis was diagnosed. Bone-grafting was performed unsuccessfully. Eight years after the injury a scintigram showed no uptake in the femoral head and necrosis of the femoral head was anticipated. A replacement of the femoral head was performed, and the histological examination verified the scintigraphic diagnosis. Neither radiological or macroscopic examination revealed collapse of the femoral head.

Conclusion. The diagnosis "necrosis of the femoral head" has to be based on either scintigraphic or histological examination, while the diagnosis "collapse of the femoral head" can be based on radiological or macroscopic examination.

LESIONS OF THE CRUCIATE LIGAMENTS OF THE KNEE JOINT

Sten-Otto Liljedahl

Injuries of the ligaments of the knee are mostly multiple, isolated ruptures are unusual. Examination under anaesthesia and arthroscopy gives the required accuracy of diagnosis. Especially in older injuries arthroscopy can be helpful.

In anteromedial rotatory instability the medial collateral and posterior capsular ligaments are sutured, supplemented with a pes anserinus plasty. Anterolateral rotatory instability is treated by transfer of the medial one third of the patellar tendon or by an extraarticular plasty *ad modum* Ellison. The

posterior cruciate ligament is reconstructed sometimes using the medial meniscus or the popliteus tendon. The late results are good, except in cases with pan-compartmental osteoarthritis where a pronounced scarring of the ligaments was often found.

CLASSIFICATION AND TREATMENT OF OSTEITIS

Villem Damholt

The incidence, morbidity and mortality of osteitis are increasing. For relevant prophylaxis, differentiation between hematogenous and exogenous infection is required. Both forms can be seen clinically at different stages: Imminent infection, acute manifest purulent infection, permanent or intermittent chronic suppurative infection.

In the treatment, cooperation between a specially trained nursing staff, the microbiologists and the orthopaedic surgeons is emphasized. The treatment of chronic osteitis is discussed according to the principles:

- 1) Preliminary systemic treatment of the patient.
- 2) Topographic and microbiological diagnosis.
- 3) Radical operation, primary closure, suction drainage.
- 4) Postoperative treatment, mobilization.

Nineteen patients were operated on; primary healing was obtained in 17 cases, secondary healing in one, and there was a recurrence in one patient.