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EFFECT OF PREOPERATIVE DISCOGRAPHY ON THE RESULTS OF LUMBAR INTERCORPORAL FUSION

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The results of lumbar intercorporal fusion in 251 patients are described. The operations were performed between 1963 and 1981.

Consolidation occurred in 80 per cent. Of the group without consolidation, 36 per cent showed a good, 30 per cent a moderate and 34 per cent a poor postoperative result.

A group of 109 patients given operative therapy for disc degeneration or spondylolisthesis at an advanced age, was studied in order to establish whether postoperative results had improved after introduction of preoperative discography. This was found not to have been the case. The subgroup with and the subgroup without preoperative discography both showed good results in 69 per cent of cases.

However, after introduction of discography, fusions at level L4-L5 or at several levels simultaneously had increased in number, whereas fusions at level L5-S1 had diminished. Moreover, the number of patients treated by operation had increased after introduction of discography, possibly because this permitted a better selection of patients.

EFFECT OF WIDENING THE INTERVERTEBRAL DISC SPACE IN INTERCORPORAL L5-S1 FUSION

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A fusion was performed in order to establish whether maximal widening had a favourable effect on the com-

plaints during consolidation. No distinct correlation was found between the increase in the height of the intervertebral space and the pattern of complaints.

In the literature (Porter, *Spine* 5 no. 2) there are indications that patients with symptoms of discopathy suffer more frequently from a narrow spinal canal than controls. It may therefore well be that the combination of discopathy and a narrow spinal canal causes complaints. It seems likely that bulging of the arcuate ligament and the posterior longitudinal ligament is responsible for these complaints.

Indications were found that widening of the intervertebral space in relative kyphosis has a favourable effect on the pattern of symptoms.

POSTOPERATIVE MANAGEMENT AFTER LUMBAR INTERCORPORAL FUSION: BED REST OR NOT?

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In lumbar intercorporal fusion great value is attached to widening of the intervertebral space by means of a bone graft. The effect of various forms of postoperative immobilization on bone graft height loss and percentage of consolidation was studied in a follow-up in three different hospitals, where different types of postoperative management were used:

- St. Maartenskliniek: 2 weeks of bed rest and 2½ months of recumbence in a plaster cast, followed by mobilization and 3 months in an ortholene corset.
- St. Radboud Hospital: 2 weeks of bed rest, followed by mobilization and 3 months in a plaster corset with tube.
- St. Elisabeth Hospital: 4 weeks of bed rest, followed by mobilization and 3-6 months in an ortholene corset.

The patients studied had been treated by L5-S1 intercorporal fusion for disc degeneration. Postoperative roentgenograms and roentgenograms

obtained after 6 and after 12 months were studied by the same group of investigators.

The various types of postoperative management proved to have no distinctly different effects on bone graft height loss or percentage of consolidation.

OSTEOTOMY OF THE VERTEBRAL COLUMN (COLUMNOTOMY) IN 15 PATIENTS WITH KYPHOSIS DUE TO BECHTEREW'S DISEASE

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Despite many publications since 1954, this operation is still hardly known and therefore seldom performed in The Netherlands.

Columnotomy was performed on 15 patients (1 woman and 14 men) between 1972 and 1982, achieving an average kyphosis correction of 40 degrees. Complications were of relatively minor importance:

- severe ileus with shock and decubitus, with complete recovery, in 1 case;
- transient drop foot in 1 case;
- transient paresis of the hand in 1 case;
- transient paraesthesia of the upper leg in 2 cases;
- loss of correction from 55° after operation to 19° final correction in 1 case;
- thoracic decubitus over Harrington compression system in the thoracic spine in 1 case.

The osteotomy was performed on the lumbar spine in 13 cases, on the cervical spine in 1, and on the thoracic spine in 1 case.

The final result was very good in 10 cases, moderate in 2 cases, and still unknown in 3 recent cases.

The literature and our personal experience both indicate that internal fixation (used in the latter half of our series) is a valuable asset. Its advantages are:

- a. virtually no loss of correction;
- b. rapid ambulation: about 3 weeks after operation in hip spica with tube;
- c. less risk of vertebral sliding and therefore fewer neurological complications;
- d. less risk of postoperative stiffness, thrombosis, renal calculi, loss of condition, psychological disorders, etc., due to prolonged recumbence.

The preferable osteotomy sites are:

- a. in the lumbar spine at level L2-L3 or L3-L4;
- b. in the thoracic spine with still mobile discs, several osteotomies to avoid sharp angulation;
- c. in the cervical spine at level C7-T1, if necessary under local anaesthesia according to Simmons.

Our findings warrant the conclusion that, with modern anaesthesia and postoperative management, this method is not too risky and can be successful in patients under 60 years of age, particularly when osteosynthesis permits ambulant postoperative management in a plaster corset with tube.

FIRST EXPERIENCES WITH LORD'S CEMENTLESS TOTAL HIP PROSTHESIS

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In the past few decades developments in total hip replacement have led to, among other things, the use of cementless total hip prostheses. Of these prostheses, we chose the Lord prosthesis, especially because its pellet surface provides a very good contact surface and permits good bone ingrowth. The presence of solid, well-vascularized bone is a prerequisite for the use of this prosthesis. Bone defects can be filled with cancellous bone.

In inexperienced hands there is a grave risk of peroperative fissures or fractures.

A follow-up study was made of the first 100 Lord prostheses inserted; the duration of follow-up averaged 15.8 months. The principal operative indication had been coxarthrosis. Bone ingrowth was observed after an average of 6.5 months. Fractures/fissures developed in 23 per cent of cases. With increasing experience this percentage later diminished.

Consolidation of trochanteric fissures proved to take an average of 2.5 months, and that of femoral fractures an average of 4.5 months. In two cases the acetabular ring of the prosthesis had to be revised, and a cancellous bone graft was needed. Secondary protrusion was the indication for revision. In both cases a strong new acetabular floor formed.

It can be concluded that the cementless hip prosthesis according to Lord is a good prosthesis in experienced hands.

EARLY RESULTS AFTER TOTAL CONDYLAR KNEE REPLACEMENT

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The use of knee prostheses has significantly increased in the past few years. Initially there were many failures due to material fractures, infection and loosening. The total condylar knee prosthesis has been used in the Leiden University Orthopaedic Department since 1979, in 54 knee replacements in 44 patients, with a follow-up over at least a year. The preoperative diagnosis had been rheumatoid arthritis in 39 knees and primary gonarthrosis in 15.

Distinct improvements were attained in pain while walking, pain at rest, knee function and knee excursion. For example, the flexion improved from 75 degrees before to 98 degrees after operation.

During this follow-up there was no radiological evidence of loosening or sagging of the prostheses.

The preliminary result is that 91 per cent of the patients

have shown unmistakable improvement after insertion of a total condylar knee prosthesis. The few complications have not influenced the postoperative result. Late complications (loosening, infection or luxation) have not so far developed.

FUNCTIONAL ANATOMY OF THE ANKLE-JOINT

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Most discussions of the form and function of the ankle-joint tend to emphasize the primary importance of the articular geometry. However, the geometry is far from regular and consistent, but may vary widely and the contact area is likely to change continually during motion. For this reason ligaments should be regarded as equally important guiding structures, although it is difficult to identify the functional role of individual fibres. Moreover, most experiments to establish axes of motion have been performed under unloaded conditions. However, body weight and the long muscles of the foot act as forces which to some extent determine the shape of the ankle mortise, the extent of articular contact, the tension of ligaments and tendons as factors of relevance to the guidance of articular motion. Consequently it seems at least doubtful to consider the ankle functionally as a rather simple hinge-joint.

The ankle is one of the movable connections within the kinematical chain of the lower extremity, and its function should be considered in relation to that of other joints, especially the subtalar and midtarsal joints.

THE UNSTABLE ANKLE GIVING WAY AND A METHOD OF OPERATIVE THERAPY

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The aetiology and physiopathology of giving way of the ankle are discussed.

Since 1980 the orthopaedic department of the Leyenburg Hospital has resorted to operative therapy according to Duquenois when conservative therapy produces insufficient results in these cases. The ligaments torn off the malleolus are re-inserted and restored to normal tension.

This operation has so far been performed in 13 cases. The preliminary results are good.

ENDOGENOUS OSTEOCHONDRAL FRACTURES IN THE KNEE-JOINT

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Osteochondral and chondral fractures of the knee-joint are by no means rare, particularly not in athletes. The arthroscope is an important tool in the diagnosis of these lesions. Chondral lesions can be treated effectively by drilling according to Pridie, but in these cases postoperative management for at least a year is required.

Replacement with osteosynthesis carries a good prognosis if the diameter of the osteochondral fragments exceeds 1 cm.

Immobilization during 2–3 weeks seems recommendable both after osteosynthesis and after drilling.

With a differentiated approach, in which localization, extent and depth of the lesion determine the therapy of choice, the long-term prognosis of these lesions is good. Indications and results are discussed with reference to 13 patients.

HUMERAL FRACTURE BRACING

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Humeral fracture bracing was used in the treatment of 20 patients, including eight who were older than 70 years. Union was achieved within 8 weeks in 15 patients. All fractures united within 12 weeks. One re-fracture occurred in a young adult whose fracture was thought to have united after 8 weeks. There was one mal-union in an antecurved position of 30 degrees, limiting elbow flexion to 110 degrees; this was most likely due to the patient's prolonged recumbence after the extensive injury.

The brace was applied on the day of injury in 10, and within 1 week in 7 patients. Shoulder abduction was limited to 90 degrees after 3 months in seven patients, after 6 months in five and after 12 months in one.

The advantages of humeral bracing are: no immobilization of joints and less muscular atrophy; the brace is hygienic and easily adjusted as well as convenient to the patient, giving good fracture alignment and permitting ambulatory treatment.

Contraindications are: extreme swelling of the arm at the time of injury, circulatory problems, lack of patient cooperation and obesity.

GRAPHIC RECONSTRUCTION OF THE VERTEBRAL COLUMN WITH THE AID OF THE CT-SCAN

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The parallel "sections" obtained at CT-scanning can in principle be used as a basis for three-dimensional reconstruction techniques. A reliable three-dimensional reconstruction of the original structure can be produced

if certain criteria are fulfilled: known magnification, known section thickness and frame of reference (fixed points to permit vertical stacking).

Attempts were made to establish whether clinically useful three-dimensional pictures of the vertebral column can be obtained by graphic reconstruction using the oblique view technique. Reconstruction drawings of the vertebral columns of four patients were made for this purpose. The procedure used and the problems encountered are discussed. A section thickness of 3 mm or less proved to be necessary.

Radiologically visible phenomena such as angle of scoliosis, torsion, costal and vertebral arch abnormalities, disc lesions, fused vertebral bodies and malformations of the intervertebral foramen and vertebral canal were all demonstrable in reconstructions (which on some points in fact proved to be superior).

The value of this method in preoperative evaluation and in anatomical research is evident.

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ALLERGY AND TOTAL HIP REPLACEMENT

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Between September 1979 and July 1982 a prospective study was made of the relation between delayed-type allergy to metals and cement constituents and implantation of metal/plastic hip prostheses, with special reference to possible sensitization to prosthesis material and loosening. The results obtained in 85 patients are described. Preoperative and postoperative patch tests were performed with the substances listed below.

Nickel sulphate	2.5% in petrolatum
Cobalt chloride	1 % in petrolatum
Potassium bichromate	0.5% in petrolatum
Titanium dioxide	5 % in petrolatum
Ammonium molybdate	1 % in water
Ammonium vanadate	1 % in water
Methyl methacrylate	10 % in olive oil
	25 % in petrolatum
Benzoyl peroxide	1 % in petrolatum
Hydroquinone	1 % in petrolatum

In all, 40 positive results were obtained (in 27 patients). The 25 instances (20 patients) of a postoperative positive result included 19 instances (16 patients) in which sensitization could be assumed to have been caused by constituents of the hip prosthesis. In none of these cases did possible sensitization to prosthesis material lead to loosening.

In none of the 10 cases of loosening in the group of 85 patients studied was any indication of contact allergy to prosthesis material found.

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