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Temporary percutaneous transpedicular fixation (TPTF) of the lumbosacral spinal column

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Objective of the study was the prospective determination of the value of TPTF in the analysis of patients with low back pain.

Method: Between October 1989 and October 1995, a total of 133 patients were subjected to TPTF including a period of non-fixation. Pain was measured on a visual analog scale.

Results: A spondylodesis was created in 55 patients. The remaining 78 patients served as the control group. The figures between brackets apply to the control group.

The mean preoperative pain score was 76.9 (74.8), the score during fixation was 25.0 (53.4), that during non-fixation was 73.8 (44.4) and that at follow-up was 42.0 (71.1). The degree of abatement of the pain depended exclusively on the spondylodesis (p=0.0000) and the duration of the symptoms (p=0.4).

Conclusion: TPTF is a useful test in the selection of patients for a spondylodesis.

The gait image in children with a leg length difference—a kinematic analysis

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A leg length difference (LLD) in the subject standing erect causes tilt of the pelvis in the frontal view. During walking, compensation is possible by flexion in hip, knee and ankle. This phenomenon was measured in children with an LLD.

Method: 18 children with and 5 without LLD were filmed on a conveyor band. The LLD ranged from 0.2 to 4.3 cm.

Results and conclusion: A larger LLD led to more pelvic tilt and increased excursions of the longer leg in the hip and knee; vertical pelvic movements were not changed. Pelvic tilt was less during walking than while standing still and remained within normal limits, unless the LLD was more than 3.0 cm. Only then did a correction of the LLD reduce the pelvic tilt, but not in patients with a Trendelenburg gait.

Periarticular aneurysms in hemophilia

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Frequent occurrence of spontaneous articular hemorrhages in hemophiliac patients lead to articular destruction. Total knee arthroplasty for major hemophilic arthropathy is often performed. Three times we observed persistent hemorrhages with hemarthrosis and severe pain, caused by periarticular aneurysms.

Method: A prospective study was carried out with the aid of angiography in the preoperative phase. We performed 10 angiographies in 7 patients, without any complications.

Results and conclusion: 7 of the 10 angiograms revealed an aneurysm in the knee area. Spontaneous periarticular aneurysms in hemophilia have not been studied before. Conservative treatment was unsuccessful. Angiography with embolization was found to be a simple and efficacious method for the detection and treatment of these lesions. This finding is of importance to all those engaged in the treatment of hemophiliacs.

A new straight line graph for determination of leg length differences

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The question was studied whether recent growth data improve Moseley's Straight Line Graph (M-SLG) in the planning of physiodesis.

On the basis of measurements of leg lengths of 182 Dutch children, performed between 1979 and 1994, new growth

curves were calculated and a Rotterdam Straight Line Graph (R-SLG) was constructed. In 34 children with physiodesis, the ultimate leg length of the short, non-operated leg was predicted retrospectively with the aid of both graphs, and compared with the adult leg length. R-SLG predicted as well (5) or better (22) than M-SLG.

By correcting for increased leg length and geographical differences, R-SLG could predict leg length and time for physiodesis more accurately in our population.

Cervical spondylodesis with a vascularized fibular chip

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For cervical arthrodesis covering several levels, use of a vascularized fibular chip may be indicated.

Method: 2 patients were treated with anterior cervical spondylodesis with use of a vascularized fibular chip. In case 1, C2 to Th1 were fused because of a dysplastic kyphotic deformity resulting from neurofibromatosis. In case 2, a spondylodesis was created from C3 to Th2 because of instability in the presence of an arteriovenous malformation. Vascular anastomoses were created with the superior thyroid artery and the internal jugular vein.

Results and conclusion: The corrections of the kyphosis amounted to 70° and 20°, respectively. Neurological symptoms disappeared in case 1 and improved in case 2. Consolidation was achieved after 6 weeks and 4 months, respectively.

Use of a vascularized fibular chip for these cervical spondylodeses resulted in rapid fusion and adequate stabilization, with good clinical results.

Minimal osteosynthesis technique in proximal humeral fractures with 3 or 4 fragments

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A minimal osteosynthesis technique was used in fractures with three or four fragments, in order to reduce the risk of avascular necrosis of the head of the humerus.

In 10 patients (mean age 56 years), non-absorbable sutures (Ticron) were inserted through the tendons of the rotator cuff near the greater and lesser tubercles and knotted round a screw in the humeral shaft (guy wire fixation). There were three fragments in one case and four fragments in nine cases.

After an average of 14 (6–33) months, 9 patients showed good functional recovery with a mean Constant score of 89% (77–100), adjusted for age and sex. One patient developed adhesive capsulitis. Temporary block of the radial nerve occurred once. All fractures consolidated in an acceptable position without avascular necrosis of the head of the humerus.

Although the incidence of avascular necrosis may increase with longer duration of follow-up, we regard this technique as a useful alternative to more extensive procedures such as plate osteosynthesis, in particular in younger patients without osteoporosis.

Diagnostic arthroscopy after fracture of the ankle—useful?

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Residual symptoms after ankle fractures are observed regularly. These symptoms may be local or diffuse. It is not clear whether arthroscopy is useful in generalized ankle complaints.

Method: Arthroscopy because of residual symptoms after an ankle fracture was carried out in 34 patients. Two groups were distinguished prospectively. Group I consisted of patients with local impingement symptoms. The symptoms in group II were localized more diffusely and no definite diagnosis could be made before the operation.

Results and conclusion: Arthroscopic treatment consisted of resection of anteriorly localized osteophytes and/or scar tissue. The results after two years were significantly better in the patients of group I. The value of diagnostic arthroscopy of the ankle is limited.

Application of a computer-controlled navigation technique in placement of pedicular screws in the lumbar vertebral column

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Numerous studies have shown that pedicular screws, even in experienced hands, perforate the vertebral cortex in proportions ranging from 5.5 to 39.9%, especially in the direction of the spinal canal.

A computer-controlled navigation system (Easy Guide System), used by neurosurgeons in cranial surgery, was adjusted for operations on the spinal column.

Material and method: By use of a combination of preoperative CT scans and the patient's actual anatomy, any point indicated during the operation can be reproduced in the corresponding place in a virtual computer image. The reliability of this navigation system as compared with fluoroscopy was studied in 25 patients undergoing lumbar spondylodesis with

transpedicular screw fixation. The accuracy of the system was found to be impaired in the first 10 patients by movements during the intervention, which in the next 15 patients could be corrected directly into the computer, with the aid of a socalled 'tracking system'. Postoperatively, the position of the screws was checked in every case with CT scans.

Results: The reliability of fluoroscopy was substantially less than that of the computer-controlled navigation system, use of which in the first 10 patients prolonged the duration of the operation by an average of 38 minutes.

In these cases, the accuracy of the system was not yet optimal; the RMSE (Root Mean Square Error) amounted on average to 4.5 (3.6–5.6) mm. In the subsequent 15 patients, application of the navigation system with tracking prolonged the duration of the operation by an average of 16 minutes, while the accuracy had improved (mean RMSE 3.4 mm). The postoperative CT scans without exception showed correct positions of the screws in the pedicles.

Conclusion: The Easy Guide System is found to be an easily manageable method for positioning pedicular screws correctly, especially in the transverse plane; it is more reliable than fluoroscopy. Absence of exposure to radiation is an additional advantage. The navigation system constitutes a useful aid, especially in major anatomical abnormalities (spondylolisthesis, extensive scarification). The prolongation of the duration of the operation required for implementation of the system is negligible.

The effect of wound irrigation on bacterial contamination of suction instruments in prosthetic surgery

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The suction system is an instrument in which bacterial contamination through air passage has been demonstrated before. This might lead to infection of the prosthesis.

Wound irrigation to reduce contamination is applied frequently. The present study investigated the incidence of contamination of suction tips and the antiseptic effect of povidone-iodine (PVP-I) as compared with physiological saline in wound irrigation.

Method: 80 patients were enrolled in a prospective randomized study in the Onze Lieve Vrouwe Gasthuis in 1993 and 1994. The group comprised 81 total hip and knee operations. 58 patients were men, mean age was 73 years. Wounds were irrigated with PVP-I in group 1 (n=40), and with physiological saline in group 2. All procedures were carried out under laminar air flow conditions. During the operation, a control suction tip was placed outside the operation area in order to objectivate secondary contamination. Both suction tips were cultured. Suction time and aspirated volume were quantified.

Results: 27 active suction tips in the 81 procedures (33%) showed contamination, as against 23 (28%) of the control tips. The organism most frequently isolated in both tips was a Staphylococcus. There were 38 monocultures, 19 in the active suction tip group. Group 1 showed positive cultures in 13 (16%) active suction tips as against 14 (17%) in group 2. Suction time and aspirated volume were the same in both groups.

Conclusion: Bacterial contamination of suction instrumentarium may possibly play a part in wound and prosthesis infections. The bacteria isolated in this study are known from revision operations necessitated by infected arthroplasties. This study failed to show any antiseptic action of PVP-I irrigation, which makes it highly doubtful that this procedure is useful. In view of the high incidence of contamination of suction instrumentarium, using a new sterile suction tube at the start of every intramedullary preparation would appear to be advisable.

To measure is to know—anthropometry in multiple epiphyseal dysplasia

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Radiological anthropometry is a method to determine whether or not a subject suffers from certain pathological conditions. This anthropometric method was applied to a large family with multiple epiphyseal dysplasia (MED) in order to assess its reliability.

Method: Measurements of the distal femora were carried out in 15 members (<16 years) of a family with MED. The height and width of the distal femoral epiphysis and the width of the distal metaphysis were measured, and plotted on a chart. Sensitivity, specificity and predictive values were determined.

Results and conclusions: In 11 of the 12 individuals with MED, the plotted values were lower than two standard deviations below the mean of persons without MED. The sensitivity is 92%, the specificity is 100% and the positive predictive value is 100%. Accordingly, anthropometry is a highly useful method for the demonstration of MED.