Dutch Orthopedic Association

The Hague, January 14–15, 1999

Editor: René Castelein
Department of Orthopedics
De Weezenlanden Ziekenhuis
Groot Weezenland 20
8011 JW Zwolle, the Netherlands

The accuracy of determination of geometrical variables in digital reconstruction images of the scoliotic spinal column

J Cheung[1], D J Wever[1], W J Sluiter[1], A G Veldhuizen[1], B Verdonck[2], R Nijlunsing[2], F A Gerritsen[2], J C Cool[3] and J R van Horn[1]

[1]Dept of Orthopedics, University Hospital Groningen, [2]Philips Medical Systems Nederland B.V., Best, and [3]Dept of Biomechanics, Twente University, the Netherlands

A method was developed for the determination of several geometrical variables in digital roentgen images of scoliosis. The objective of this study is to determine the reproducibility of this measuring method.

Material and methods: Geometrical variables were obtained after placing landmarks on T1–L4. The accuracy of the method was determined after repeated measurements in 30 PA and 10 lateral digital roentgen images.

Results: The mean intraobserver variations for Cobb's angle in the PA and lateral digital images amounted to 2.54° and 3.59°, respectively (2SD). For the lateral deviation and axial rotation of the apical vertebrae they amounted to 1.37 mm and 7.5 degrees, respectively (2SD).

Conclusions: This study shows that the reproducibility of our measuring method is better than that of measurements made in conventional roentgen images. Consequently, the method may be used for accurate clinical evaluation of scoliosis.

The effect of osteogenic protein-1 on the remodelling process of impacted allografts after revision surgery

J J Caron, I C Heyligers, E H Burger, J W van der Eijken and P I J M Wuisman

University Hospital Utrecht, the Netherlands

A major problem in hip revision surgery is coping with the bone loss; use of impacted allografts is a good solution. The remodelling process of the allograft is characterized by a revascularization phase, followed by destruction of the graft (osteoclasts) and formation of primitive bone (osteoblasts). Ultimately, lamellated bone is produced. OP-1 may exert a positive influence on the process of formation of new bone.

Material and methods: Twelve goats were subjected to an operation involving insertion of a hip prosthesis into an impacted allograft. There were four groups of three goats: 1) allograft with OP-1, uncemented, HA-coated prosthesis, 2) allograft without OP-1, uncemented, HA-coated prosthesis, 3) allograft with OP-1, cemented, tapered prosthesis, and 4) allograft without OP-1, cemented, tapered prosthesis. The proportion of OP-1 : allograft was 0.025 : 30 grams. Autopsy was performed 16 weeks after the operation. The allografts were examined at four levels, with radiological, histological and fluorescence techniques.

Results: Four prostheses were adequately fixed, one from every group. In all of them, the remodelling process was clearly visible, and it was especially the HA-coated prosthesis with OP-1 that displayed much formation of new bone at all levels. The larger part of the prostheses were loose (66%). There were two fractures.

Conclusion: More formation of new bone was seen after treatment with OP-1. The proportion of loosenings was large. Further research is in progress.

Discussion: Conceivably, OP-1 in the early phase of the remodelling process stimulates the activity of osteoclasts. This may lead to resorption of the graft. In this way, the large number of loosenings in this study might be explained.

Incorporation of bone chips used for repair of femoral bone defects in total knee arthroplasty —an in-vivo experiment in horses

C van Loon, M de Waal Malefijt, P Buma, P Stolk, N Verdonschot, A Tromp, R Huiskes, A Barneveld

Dept of Orthopedics, University Hospital Nijmegen, the Netherlands

Our objective was to determine the mechanical, radiological and histological properties of bone chips in an in-vivo experiment concerning bone grafting in knee prostheses.

Method: In 12 horses, the metatarsophalangeal joint of the left hind leg was replaced by a human knee prosthesis

(Johnson & Johnson, Raynham, MA). In six horses a standardized metatarsal bone defect was created for implantation of the prosthesis and this defect was repaired with the aid of bone chips. The other six horses served as the control group. The animals were killed after 4–8 months and the bone grafts were examined mechanically, radiologically (CT) and histologically.

Results and conclusion: The bone grafts had the same mechanical qualities as the bone in the control group. Radiologically and histologically, the grafts were incorporated into the host bone. Bone chips are incorporated in an animal model of repair of femoral bone defects in a total knee arthroplasty.

Mobility of the tarsometatarsal 1 joint—an anatomical study

F W M Faber[1], G J Kleinrensink[2], M W Verhoog[2], A H Vijn[2], C J Snijders[3], J A N Verhaar[4]

Depts of [1]Orthopedics, Leyenburg Hospital, The Hague, [2]Anatomy, Erasmus University, Rotterdam, [3]Biomedical Physics and Technology, Erasmus University, Rotterdam, and [4]Orthopedics, University Hospital Dijkzigt, Rotterdam, the Netherlands

The problems to be answered by this in-vitro study were: 1) Is TMT 1 mobility demonstrable in the transversal and sagital planes and how does it correlate with other variables?, and 2) Is a stabilizing effect exerted by the m. tibialis anterior (TA), the m. flexor hallucis longus (FHL) and the m. peroneus longus (PL)?

Method: 9 lower leg preparations were fixed in an experimental installation. Angular movements were recorded by video. 30 N tractive force was applied successively in the sagittal and transversal planes to caput MT 1, and 21 N was applied to the three tendons mentioned, with testing of all combinations.

Results: 1) The TMT 1 angular movement in the two planes did not differ, but the contribution of the TMT 1 joint to the total mobility of the first radius is higher in the transversal plane, and 2) the PL, both isolated and in combination with the TA and/or the FHL exerts a stabilizing effect on the TMT 1 joint in the sagittal plane.

Conclusion: 1)The TMT 1 mobility is a relevant factor in the mobility of MT 1 in two directions, and 2) the PL exerts a stabilizing effect on this articulation.

Re-automation of the walking function after extremity-saving surgery

E de Visser, J Duysens, R P H Veth and T Mulder

University Hospital St Radboud, Nijmegen, the Netherlands

Extremity-saving surgery (ESC) is applied in approximately 70% of the cases of malignant bone tumors. Complete re-automation of the walking function is necessary for optimal functioning in everyday life.

Method: 12 patients after treatment were subjected to an analysis of the gait. They walked under three conditions: normal walking, walking with a double task, and walking with visual restriction.

Results and conclusion: The group of patients showed a significant decrease of the duration of the step during walking with a double task and with visual restriction. The results show that a good gait pattern may return after operations of this nature, but the re-automation of the walking does not reach its former level.

Computer-simulated and in-vitro anatomical double-bundle reconstruction of the posterior cruciate ligament

C van Doorn, M A M van der Heijden, L Blankevoort and A van Kampen

Dept of Orthopedics, University Hospital Nijmegen, the Netherlands

Anatomical double-bundle reconstructions of the posterior cruciate ligament were simulated in a computer model with the anterolateral (ALB) and the posteromedial (PMB) bundles tightened in different knee flexion positions. Then, anatomical single-bundle and double-bundle reconstructions of the posterior ligament were performed in 5 cadaver knees. Simulated single-bundle and double-bundle reconstruction with tightening of ALB in 60° and PMB in 0° gave similar results. In-vitro reconstruction of the PMB resulted in recovery of a normal knee laxity to within 1 mm. From 90° of flexion, the ALB reconstruction was underconstrained and the double-bundle reconstruction overconstrained

To conclude, anatomical double-bundle reconstruction of the posterior ligament does not appear to be superior to single-bundle reconstruction.

Hyaluronan restores impaired chondrocyte metabolism caused by irrigation during arthroscopy—an in-vivo study in rabbits

C M Douw, S K Bulstra and R Kuijer

Department of Orthopedic Surgery, University Hospital Maastricht, the Netherlands

Hyaluronan (HYA) is important for joint lubrication and cartilage nutrition. Irrigating solutions remove part of it and inhibit cartilage metabolism. We investigated whether addition of HYA could prevent this effect.

Materials and methods: Control cartilage was compared with cartilage irrigated with NaCl or with NaCl followed by intra-articular injection of HYA. Ex-vivo [35S]-sulfate incorporation into proteoglycans was assessed to establish the

effect on chondrocyte metabolism.

Results: The addition of HYA after NaCl irrigation restored the metabolism of chondrocytes to the level of the control.

Conclusion: Application of HYA after arthroscopy restores chondrocyte metabolism and might reduce the vulnerability of cartilage.

Infection of hydroxyapatite coated and non-coated Ti6A14V implants after direct contamination in a rabbit model—a bacteriological and histomorphometrical study

H L H Vogely, C J M Oosterbos, E W A Puts, M W Nijhof, A J Tonino, A Fleer, W J A Dhert and A J Verbout

Academic Medical Center, Utrecht, the Netherlands

Implant infection in orthopedic surgery is a serious clinical problem resulting in complicated and costly revision arthroplasties with high mortality. While there is an increase in the use of noncemented implants, which derive their success from a biocompatible or bioactive surface, the susceptibility of such materials to infection is not yet understood. The purpose of the present study is to investigate the effect of implant type after comtamination in an animal model of direct infection.

Animals and methods: 36 mature female NZW rabbits were operated on both legs. Under sterile conditions a cylindrical implant was inserted press-fit into the medullary cavity. 16 rabbits received grit-blasted, non-coated Ti6A14V (Ti) implants, and 16 rabbits hydroxyapatite coated T16A14V (HA) implants, in both tibias. Before implantations, the implant bed of one tibia was contamined with 0.1 cc of a serial tenfold dilution (10E3, 10E4, 10E5 and 10E6 CFU/ml of S. aureus (Wood 46)). The implants were allowed too heal for a period of 4 weeks. After 28 days, the animals were killed and tibial bone adjacent to the implant was harvested for bacteriological and histomorphometric examination. After preparation, bacterial counts of the milled bone suspension were quantified by plating serial dilutions on blood agar (minimum detectable level 1000 CFU/g). The percentage of bone apposition on the implant sides was measured for both implants on 10 µm sections. Differences between groups were statistically analysed by general factorial analysis of variance (dosage and implant type as factors; p 0.05).

Results: The bacteriological data show a significant effect of inoculum dose and implant type on the culture outcome. More bacteria were retrieved from the HA coated implants than from the noncoated Ti implants. In 7 of the 16 Ti treated animals against 9 of 16 HA treated animals, bacteria were found in the local implant bed. Four rabbits died within one week due to a S. aureus sepsis and were excluded from our study. No significant differences in bone apposition between the controls and the contaminated implant bed was found for HA coated and non-coated Ti implants.

Discussion: These studies clearly demonstrate an effect of the implant type on susceptibility to infection. More bacteria were retrieved from the hydroxyapatite coated Ti implants than from the non-coated Ti implants. No significant difference was found in bone apposition on the two implant types. Since we used implants as they are applied in clinical practice, the implant surface was not standardized with respect to surface area and porosity. Thus, we can only hypothesize on the role of material properties in susceptibility to infection between implant types. These data are especially of interest since previous studies on HA coated implants report success without higher infection rates.

Co-ordination of movement in aspecific low back pain

C J C Lamoth[1], O G Meijer[1] and P I J M Wuisman[2]

[1]Faculty of Kinesiology, Free University Amsterdam, and [2]Dept of Orthopedics, Academic Hospital, Free University Amsterdam, the Netherlands

No valid classification of persistent aspecific low back pain (pALBP) exists yet. The co-ordination of movement of persons with pALBP has been studied very little.

We investigated the co-ordination of movement in 12 healthy subjcts and 14 patients with pALBP. Patients reported actual pain on a VAS. Horizontal rotations of pelvis and thorax were recorded during walking at different speeds. The relative phase between rotations was determined. The out-of-phase rotation characteristic of healthy subjects during walking at higher speeds was decreased or absent in patients with pALBP. Actual pain showed a negative correlation with the relative phase.

Further investigations will have to show whether co-ordination of movement in pALBP may lead to a valid classification.

Development of a new device that facilitates and accelerates the removal of fixation screws in orthopedic trauma surgery

S K Bulstra[1], M-A B Kruft[2], A Benzina[2], A Supit[1], T H Bulstra[3], L H Koole[2]

[1]Dept of Orthopedic Surgery, University Hospital Maastricht, [2]Center for Biomaterials Research, University of Maastricht, and [3]DMD, Voorburg, the Netherlands

In order to facilitate the locating of screws without the need for fluorography, a new device called the screw cap was developed, made of radiopaque and biocompatible polymeric biomaterial. This biomaterial is made of a new polymer, of methylmethacrylate (MMA) and 2-[4'iodobenzoyl]-oxoethylmethacrylate, and fits exactly in the hexagonal heads of AO/ASIF screws. The screw caps were tested according to European rules (CE); these tests include sensitization, cytotoxicity, chronic toxicity and carcinogenicity (Ames test). Also, the biocompatibility of the screw cap materal and the

concept of facilitation of screw removal were tested in an animal model (goat). The screw cap was subsequently used in a pilot study in 5 patients undergoing surgery for a fracture. Extensive in-vitro biocompatibility tests did not show any adverse effects. In the animal model, location of single screws with the screw cap proved to be easy and without complications. Histology showed presence of bursa-like tissue over the screw cap. In the patients, location of single screws proved to be easy, even in submuscular areas, without use of fluorography.

Conclusions: The screw cap proved to be a safe and simple tool facilitating screw location and removal without the need for fluorography.

How does a hip with limited abduction develop?

R M Castelein[1], and J Korte[2]

Depts of [1]Orthopedics, Isala Clinics, Location De Weezenlanden, Zwolle, and [2]Radiodiagnostics, Isala Clinics, Location De Weezenlanden, Zwolle, the Netherlands

Should every infant's hip with limited abduction be treated?

Method: 174 infants from a larger study group showed a pronounced limitation of abduction at a normal ultrasonographic examination. These infants were not treated, but followed up radiologically after at least 2 years.

Results: All children had developed normally, both clinically and radiologically. The mean acetabular index at the time of the follow-up examination amounted to 15° for the right hip and to 17° for the left hip.

Conclusion: If ultrasonography during the first year of life shows a normal development of the hip, an infant with limited abduction requires no treatment or follow-up.

Necrosis of the head of the femur in congenital dislocation of the hip—risk factors of traction treatment

B G Schutte, F J Custers and B J Burger

Dept of Orthopedics, Medical Center Alkmaar, the Netherlands

Between 1978 and 1987 a total of 54 children (59 hips) were treated clinically for a congenital hip dislocation. Necrosis of the head developed in 10 hips. The risk factors for development of femoral head necrosis were investigated in a retrospective study.

Method: Radiological and clinical data were collected and analysed. The group with femoral head necrosis was compared with a group free of this condition, attention being given to significant differences regarding risk factors for femoral head necrosis (age, traction period, sex, degree of dislocation, degree of dysplasia).

Results: A significant difference was found for the age at which treatment was started. The other factors were identical.

Conclusion: The age at which treatment is started affects the development of femoral head necrosis.

Long-term results of closed repositioning in congenital dislocation of the hip

T Sybesma and M Heeg

University Hospital, Groningen, the Netherlands

A retrospective study was carried out of the long-term results of closed repositioning and traction treatment of congenital dislocation of the hip (CDH). 61 patients were available for evaluation. The age at the start of the treatment was 8.5 (2–22) months; the traction treatment lasted 5 (3–12) weeks and was followed by plaster cast and/or brace treatment. The follow-up lasted 17 (13–27) years.

Results: All patients had complete mobility of the hip; five patients had pain during walking. Radiologically, 54 patients had a normal joint, three had a Severin grade Ia+Ib, three a grade II and four a grade III, characterized by residual dysplasia. Retrospectively, the development of the acetabulum was found to have stopped at the mean age of 5.2 years. Avascular necrosis was observed in 3 patients, in 2 of these patients this condition became visible after the 5th year of age.

Conclusion: Traction treatment is safe. However, it is advisable to follow up all children until skeletal growth is complete.

Avascular necrosis and redislocation in the surgical treatment of hip dislocation diagnosed late

A F M Diepstraten

Dept of Orthopedics, Sophia Children's Hospital, Rotterdam, the Netherlands

Development of avascular necrosis of the head of the femur and occurrence of redislocation have a considerable effect on the results of the surgical treatment of congenital dislocation of the hip in children older than 18 months. In the period 1972–1996 a total of 121 hip joints were treated with open repositioning and pelvic osteotomy according to Salter. After 1983 (59 hips), tenotomy of the iliopsoas muscle and if necessary, of the adductors, was added routinely to the surgical procedure. This measure eliminated the development of avascular necrosis of the head of the femur and occurrence of redislocation.

The value of computer tomography in the follow-up of congenital dislocation of the hip

G H G Dekkers[1], L W van Rhijn[1] and J E H Pruijs[2]

Depts of Orthopedics, [1]University Hospital Maastricht, and [2]University Hospital Utrecht

In hip spica cast fixation of congenital dislocations of the hip, conventional radiography supply insufficient information about the anteroposterior position of the femoral head in relation to the acetabulum. This can be solved by evaluation by means of CT scanning.

Material and methods: In 7 patients in whom conservative management had failed, an arthrogram was prepared under anesthesia in addition to a conventional radiography. After closed reduction and application of a bilateral hip spica, further analysis was carried out by means of CT scanning.

Results: In 6 patients, with an average age of 17 months, a seemingly acceptable position of the head was achieved. However, in 4 of these patients CT nevertheless revealed a posterior dislocation which necessitated one or more interventions.

Conclusion: Computer tomography is indispensable in the follow-up of stubborn congenital dysplasia of the hip.

The Pavlik bandage in the repositioning treatment of a hip dislocation

A K Mostert, N J A Tulp and R M Castelein

Isala Clinics, Location De Weezenlanden, Zwolle, the Netherlands

In a prospective study the effect of the Pavlik bandage was studied by ultrasonic examination.

Method: 41 dislocated hips were treated with the bandage. All hips were classified according to Graf (1986) by means of ultrasonography.

Results: All 29 IIIa hips had resumed a normal position after three weeks; 5 of the 12 type IV hips could not be repositioned in this manner and required traction treatment. Necrosis of the femoral head did not occur.

Conclusion: The Pavlik bandage enables successful repositioning of type III hips, while type IV hips in many cases (42% in this series) require supplementary traction.

Treatment of dysplasia of the hip by means of triple osteotomy—long-term results

M de Kleuver, M A P Kooijman, P W Pavlov and R P H Veth

Sint Maartens Clinic, Nijmegen, the Netherlands

Hip dysplasia in adolescents is characterized by reduced cover of the femoral head by the acetabulum and valgus antetorsion of the proximal femur. By means of a triple osteotomy, the acetabulum can be tilted towards a more physiological position with a view to reducing the symptoms.

Method: A triple osteotomy was carried out in 51 hips. 48 hips were subjected to clinical and radiological follow-up after an average period of 10 years.

Results: Clinical score: 81% better than preoperatively, 60% good or excellent. Radiologically: mean improvement of the center edge angle by 19°; of the acetabular index by 12° and of the VCA angle (Ventral Center edge Angle (on the standing Faux-Profile)) by 26°. Progression of arthrosis by one degree in 21%.

Conclusion: The results are satisfactory, and we recommend this treatment for adolescents with symptomatic dysplasia of the hip.

Results in the medium-long term after surgical correction of the clubfoot—relationship between clinical and radiological findings

D Eygendaal[1] and C F A Bos[2]

[1]Leiden Academic Medical Center, Leiden, and [2]Juliana Children's Hospital, Leiden

The clinical and radiological results after surgical correction of the clubfoot are evaluated in this study.

Method: 20 children with 28 clubfeet were operated on between 1982 and 1991 and evaluated after 11 (7–16) years.

Results and conclusion: The McKay score was excellent or good for 17 feet and fair or poor for 11 feet. The mean dorsal and plantar flexions amounted to 9 (5-20) and 29 (0-45) degrees, respectively. Radiological deformation or subluxation of the navicular bone was seen in 18 feet, and flattening of the talar cylinder in 14 feet. These abnormalities correlated with a poor McKay score.

We conclude that radiological abnormalities of the navicular bone and talus appear to be related to a less good result.

The posteromedial release à la carte for the treatment of idiopathic clubfoot

S T Hokwerde and M Heeg

University Hospital, Groningen, the Netherlands

This study describes the results of the release performed à la carte as performed in our clinic since 1980.

Method: The surgical technique differs from a standard posteromedial release in that no more structures are lengthened or severed than necessary to achieve an adequate correction of the posture. K wires, also, are used only as required. The after-treatment consists of 12 weeks' immobilization in a plaster cast and a boot brace during the night until the age of 7. The retrospective study comprises 39 patients with 62 clubfeet treated surgically; it consisted of a clinical and a radiological part. Mean follow-up was 4.8 (2.0–14.4) years.

Results: A second intervention was necessary in two cases. The clinical results were excellent in 16 (25%), good in 29 (46%), fair in 12 (19%) and poor in 6 (10%). The mean TC angle was 23° (5–46°) in the AP projection and 36° (19–56°) in the lateral projection.

Conclusion: These results are comparable with those of standard posteromedial releases and with those of the extended subtalar releases as described in the literature.

Ilizarov reconstruction in clubfoot deformities of long standing

M Heeg

University Hospital, Groningen, the Netherlands

Recurrence of clubfoot in the older patient is characterized by rigid, shortened soft tissues with residual postural abnormalities and torsion of the foot and of the lower leg. Such deformities may be corrected gradually by means of the Ilizarov technique, until an acceptable position of the foot is achieved.

Method: The Ilizarov technique was applied in four patients, while derotation osteotomy of the tibia was performed as well in three of them. The position of the foot was corrected by an osteotomy of calcaneus and talus; in two patients, lengthening of the foot was performed as well. Total duration of the treatment amounted to 5 months on the average.

Results and conclusions: The position of the foot showed subjective and objective improvement in all four patients. The average difference in size was reduced from 4 preoperatively to 2. All patients were highly satisfied with the results achieved, in spite of the long duration of the treatment, which was tolerated well. This technique has the advantage that the position of the foot can be controlled, no loss of length occurs and no extensive dissection is necessary.

The unlucky ones

G Olijhoek

Hospital Velp, District Hospital Zevenaar, the Netherlands

Some 20 orthopedic surgeons, members of the Dutch Orthopedic Association, are actively supplying orthopedic care in socalled developing countries. Just as the disciplines of plastic surgery and ophthalmology, the discipline of orthopedics is particularly suitable for instruction of local personnel in the performance of simple interventions and treatment of fractures. For this purpose, use is made of techniques which were common in the 'modern' West until 25 years ago but which have not lost their value, certainly not in primitive regions. Considering the fact that two-thirds of the world's population are still living under primitive circumstances, the authors emphasize that this knowledge should not be lost. It is shown with the aid of a number of photographs and slides how much can be achieved even with simple techniques.

Anisomelia—comparison of the lengthening techniques proposed by Wagner, De Bastiani and Ilizarov

H G J van Cappelle[1], M Heeg[1] and J /D Visser[2]

[1]University Hospital Groningen, and [2]Wilhelmina Hospital, Assen, the Netherlands

37 leg-lengthening operations were carried out in 30 patients. The results of the three techniques used were compared.

Method: The success indices were calculated by deviding the number of treatment days by the lengthening in centimeters. The remaining difference in leg lengths was determined using the board method.

Results and conclusions: The success indices of the 10 Wagner lengthenings were higher than those of the 14 De Bastiani and the 13 Ilizarov lengthenings. The desired lengthening was not achieved by 6 Wagner procedures, 1 De Bastiani and 1 Ilizarov procedure. 7 patients are still being treated. 3 grownups have an undesirable residual anisomelia. Wagner lengthenings are inferior, the lengthening techniques of De Bastiani and Ilizarov are similar. The final results per patient are good.

The development of the shoulder joint in obstetrical injury of the brachial plexus

C van Egmond and A J.Tonino

Brachial Plexus Team Atrium, Medical Center Heerlen, the Netherlands

Progressive reduction of movement in children with obstetrical damage to the brachial plexus is caused not only by contracturing but also by impaired development of the shoulder joint.

Method: For the last 3 years, the development of the shoulder joint has been followed up radiologically in children with an obstetrical plexus injury.

Results: All patients displayed a left-right difference, with particularly evident retardation of the growth of the head of the humerus and an increase in retroversion of the glenoscapular angle.

Conclusion: In case of inadequate spontaneous normalization of the obstetrical brachial plexus lesion, the development of the shoulder joint is impaired.

Results in the longer run of conservative treatment of cysts of the popliteal fossa in children

L W van Rhijn and J E H Pruijs

University Hospital Maastricht, the Netherlands

This study was carried out to gain an impression of the results in the longer run of conservative treatment of cysts of the popliteal fossa. It was a retrospective follow-up study of cysts of the popliteal fossa treated between 1986 and 1992. Apart from the cyst of the popliteal fossa, the patient population had no diseases. Three patients were lost from view, so that ultimately 18 patients with 20 cysts could be seen for analysis. All cysts had been treated in the first instance by conservative methods for at least one year. Ultimately, it was decided that six cysts required surgical intervention. In the group treated exclusively conservatively, with a mean follow-up of 7 years, it was found that the cysts had grown smaller (n=6) or had disappeared (n=8).

Moebius' syndrome—a life without smiling

H A Schuppers

District Hospital Midden Twente, Hengelo, the Netherlands

Moebius' syndrome is a rare disorder of the development of certain cerebral nuclei. It results in an incapacity to smile. To remedy this, procedures of plastic surgery have been developed which, however, in Europe are not yet being applied on a large scale. Orthopedic abnormalities belonging to this syndrome are mostly clubfeet, which are said to occur in one-third of the patients and to entail a poorer prognosis. Other orthopedic abnormalities include syndactily, pectoralis major aplasia and disorders of the development of toes and metatarsal bones. An association of patients suffering from this syndrome was recently founded in the Netherlands. The lack of familiarity with the syndrome makes it difficult to recognize. The purpose of this paper is to present a short sketch of the syndrome, to call the attention of the Dutch orthopedic surgeons to the patients' association and to inventory orthopedic abnormalities in the members of the patients' association, who by now already number 50.

Comparison of the conservative and surgical therapies of Perthes' disease

R H G P van Erve, C G B. Maathuis and A P P. Driessen

Deventer Hospital Roessing Rehabilitation Center Enschede, the Netherlands

We compare the long-term results of varus derotational osteotomy (VDO) with traction treatment in Perthes' diseases, Catterall classification 3 and 4.

Method: Prior to 1985, the treatment consisted of prolonged traction (21 times), subsequently of a DVO (29 times). A retrospective study was made of all patients diagnosed between 1974 and 1997.

Results: The mean follow-up durations of the two groups were 17.6 and 7.7 years, respectively. Residual abnormalities after treatment: limitation of rotation in three and five cases respectivey, anisomelia in one and five cases respectively, other limitations of movement zero and two cases respectively. Radiological examination revealed abnormal shape of the head of the femur in 10 and 12 cases respectively.

Conclusion: The results of conservative treatment by means of very prolonged traction and those of surgical treatment by VDO are good in approximately the same proportions of the cases.

The functional treatment of Perthes' disease

J A van der Sluijs[1] and J E H Pruijs[2]

[1]Free University Hospital, Amsterdam, and [2]Wilhelmina Children's Hospital, Utrecht, the Netherlands

We studied the results of the functional treatment of Perthes' disease in 24 children.

Method: Between 1986 and 1993, 24 children [aged on average 5 (3–10) years] with 26 hips received function treatment. The relationship between the lateral pillar classification and the results according to Stulberg was investigated.

Results and conclusion: After an average follow-up of 8 (5–12) years, all hips are to be classified as Stulberg 3 (n=10) or better. This is in agreement with the results of surgical treatment. Functional treatment of children with Perthes' disease is justified.

Shelf arthroplasty in Perthes' disease with a follow-up of 12.5 years

P de Smet, I van der Geest, M Kooijman, M Spruit and P Anderson

St Maartens Clinic, Nijmegen, the Netherlands

We analysed the long-term results of shelf arthroplasty in Parthes' disease.

Method: 31 patients with an average follow-up of 12.5 years had undergone a shelf arthroplasty for Perthes' disease in Catterall stages III or IV.

Results and conclusion: The mean lateral subluxation improved from 49% before operation to 20% at follow-up ($p = 0.012$). According to the Stulberg classification, which was available for all adult patients (23/31), 35% had a good result (Stulberg 1 and 2), 57% a moderate result (Stulberg 3), and 9% a poor result (Stulberg 4 and 5).

Computerized analysis of the gait pattern for consideration of the indication of surgical treatment in patients with infantile encephalopathy

J A van der Sluis, J G Becher, I C Heyligers and P I J M Wuisman

Free University, Amsterdam, the Netherlands

In some children with cerebral palsy, abnormalities of the gait pattern can be treated surgically. We studied the differences between the definitions of the indication on the basis of clinical examination and after examination of the gait pattern by means of surface EMG.

Method: A study was made of the differences in 12 patients with an average age of 18 (5–40) years with cerebral palsy (7 diplegia, 5 hemiplegia).

Results and conclusion: Analysis of the gait pattern leads to a more differentiated definition of the indication and better performance compared with clinical examination alone.

Surgical repositioning of dislocated hips in cerebral palsy

M Heeg and J D Visser

University Hospital Groningen, the Netherlands

A description is presented of the results of open reduction of 29 dislocations of the hip in 28 quadriplegic children, ranging in age from 2 to 14 years.

Method: 23 patients were confined to wheelchairs, 5 were household ambulators. The operation consisted of open reduction combined with soft tissue release and a varus proximal femoral osteotomy. A pelvic osteotomy was performed in 17 patients. A retrospective study was carried out after an average of 6.5 years.

Results: The sitting balance was unsatisfactory in 4 patients, due to redislocation or a malposition of the femur. The other patients all had an improved sitting balance and capability of >30° abduction. Postoperatively, the CE angle was 21°, the proportion of migration 17° and the CCD angle 142°. Retrospectively, inadequate acetabular coverage was present in six patients. Complications were: 3 pressure sores and 1 superficial wound infection.

Conclusions: Open reduction with soft-tissue and osseous stabilization gives good long-term results. However, the operation should be reserved exclusively for dislocations without degenerative articular alterations.

Proximal femoral resection as a last resort for patients with a painful dislocation of the hip in cerebral palsy

N Verschoor and F J Custers

Medical Center, Alkmaar, the Netherlands

A proximal femoral resection is a last resort in spastic patients unable to walk with a painful dislocation of the hip. What are the long-term results?

Method: All patients subjected to a proximal femoral resection in our hospital were followed up and asked about pain, problems with sitting and problems with nursing and care.

Results: 8 patients were subjected to a proximal femoral resection between 1982 and 1993. Reoperation because of pain was necessary in 4 patients. Mean duration of follow-up was 8.6 years (52–193 months). All patients ultimately were free of symptoms, had a good sitting function and could be cared for without problems.

Conclusion: Proximal femoral resection offers good results, also in the long term, in painful hip dislocations in patients with cerebral palsy.

Results of subtalar arthrodesis by Batchelor's method

T U Jiya, J A van de Sluijs, I C Heyligers, R Louwerse and P I J M Wuisman

Academic Hospital Free University of Amsterdam, the Netherlands

Symptomatic valgus position of the foot in children with a neuromuscular disease in the past used to be treated by the less well known Batchelor subtalar arthrodesis.

Method: The subtalar arthrodesis according to Batchelor's method was evaluated retrospectively in 12 patients (20 feet). The results were judged according to the Gross criteria.

Results and conclusion: The mean age was 7.3 years with a mean follow-up of 4.3 years. 12 of the 20 feet were clinically unsatisfactory. Graft fracture occurred in 8 of the 20 feet. Reoperations were carried out in 5 of the 20 feet. The authors advise against the Batchelor procedure for treatment of valgus malposition of the foot in children with neuromuscular disease.

The effect of soft-tissue operations in children with impaired tonus regulation and progressive deterioration of the gait

S K Bulstra[1] and L Speth[2]

[1]Dept of Orthopedics, University Hospital Maastricht, and [2]Children's Rehabilitation Center Franciscusoord, Houthem, Valkenburg, the Netherlands

In this study the results are described of a combined intervention carried out in children with impaired tonus regulation, who progressively lapse into hip flexion, endorotation and knee flexion, greatly reducing the capacity to walk.

Material and method: 6 children about 6 years of age were subjected to the following operations: adductor tenotomy, distal severing of the semitendinosus and gracilis muscles, dislocation of the semimembranosus muscle to the medial head of the gastrocnemius muscle and if necessary, lengthening of the Achilles tendon and posterior release of the knee. After-treatment was intensive and protracted with, among other things, an abduction cast usually followed by a knee-ankle-foot orthesis.

Results: After the operation, the walking patterns and walking distances of all children improved considerably. 2 children were even capable of walking without aids. There was 1 complication in this group, viz. temporary loss of the function of the peroneal nerve due to overstretching.

Conclusion: The operation according to Blaise appears in our hands to result in good improvement of the walking pattern in children with impaired tonus regulation and risk of losing the capacity to walk.