

Proceedings of the combined meeting of the Netherlands Societies of Orthopaedics and of Physical Medicine and Rehabilitation

Nijmegen, May 9, 1987

Edited by Ad F. M. Diepstraten
Sophia Childrens' Hospital
Gordelweg 160
3038 GE Rotterdam
The Netherlands

An orthopedic view of cerebral paresis

R. Feith and H. R. Klazes

Department of Orthopedics, Hospital "De Malberg,"
Arnhem, The Netherlands

In determining operative indications, the following guidelines should be taken into account:

1. Surgery on the extremities of patients whose locomotor function is lost, is indicated only if dislocation of the hip is imminent.
2. No operative indication exists in children who receive no adequate exercise therapy.
3. Talipes equinus should not be corrected when the foot plays a part in walking.
4. The necessary postoperative therapy (continued exercise therapy and a night splint) should be available.
5. The clinical features on which the indication is based should be constant; the same operative indication should present itself on several consecutive occasions.

Hip anomalies and ability to walk in children with spina bifida

J. J. M. Cluitmans

Rehabilitation Center "Franciscusoord," Valkenburg,
The Netherlands

Hip anomalies are frequent in children with dysplasia of the spinal cord as a result of spina bifida, particularly if there are neurologic lesions at a lumbar level. Well-positioned hips with a good muscular balance and

without contractures are often regarded as prerequisites for walking, and conservative as well as surgical therapy usually focuses on these prerequisites. Yet in the literature, there are indications that these are relatively unimportant factors and that, by far, the more important factors are intelligence, anomalies of the vertebral column, and the neurologic level of the lesions.

The factors were studied in 40 children with spina bifida who were treated at the rehabilitation center "Franciscusoord" during the past 10 years. The level of ambulation was correlated with the neurologic lesion level, the state of the hips, knees, ankles, and vertebral column, the operative history, intelligence and the occurrence of fractures.

There were no indications that hip stability favorably affects ambulation, nor was there convincing evidence that the many hip operations had affected ambulation. Moderate contractures of the hips and knees exerted no influence either. Neurologic lesion level, intelligence, and lesions of the spinal cord proved to be the principal determinant variables of ambulation. In addition, it was found that the level of ambulation influenced the risk of occurrence of fractures.

The findings would seem to justify a reserved strategy as regards operations interfering with the state of the hips in children with spina bifida.

Polyethylene orthoses for lying and sitting

F. T. M. van den Bouwhuysen and G. H. Slot

Department of Physiotherapy, "Boldershof," Druten,
The Netherlands

In the management (and prevention) of deformities

associated with cerebral pases – subluxations, dislocations, scolioses, and contractures – efforts have always been made to find adequate solutions with the aid of appliances. A search was made for corrective devices that could place the patient in an orthopedically correct position and would normalize the muscle tone, enabling the patient to relax during the night. Experiments have led to the development of polyethylene orthoses that meet both requirements for the recumbent patient. Patients without evident deformities were most comfortable in the prone position, while those with deformities were best placed supine. After some time, similar devices (orthoses) were developed for use in wheelchairs. These orthoses are very suitable as aids against decubitus, too, because the material is very soft and they are individually fitted.

The diabetic foot

R. M. Bloem, G. J. Onvlee and P. M. Rozing

Department of Orthopedics, University Hospital, Leiden, The Netherlands

The foot problems of 94 patients with diabetic neuropathy were analyzed. Most of the patients had long-standing ulcers showing no adequate healing tendency or gradually increasing in size. Development of pes cavus and hammer toes often causes an abnormal distribution of pressure on the footsole and in ordinary ready-made shoes may easily lead to mechanical pressure. With acceptable vascularization and absence of deep-seated infection, conservative treatment of these ulcers with plaster bandages and special shoes is nearly always successful. After healing of an ulcer, there is a grave risk of recurrence. Custom-made shoes with a foot-bed guiding pressure to uncompromised parts of the footsole and sparing compromised parts (cicatrices, prominent metatarsal heads, etc.) are therefore very important. Recurrent ulcers may nevertheless develop, but this is often due to walking and standing without orthopedic shoes. A deep-seated infection (osteomyelitis, infection of a flexor tendon) often constitutes an indication for surgery. Careful preoperative evaluation of the vascularization is imperative: in the presence of vascular problems the prognosis is uncertain and often poor. In the acute stage, neuropathic arthropathies often require prolonged immobilization in a plaster cast. If there are lesions the tarsus or posterior part of the foot, plaster cast immobilization should be followed by a period during which the foot and ankle are protected by means of an ankle-foot orthosis. In rare cases showing progressive sagging, an arthrodesis combined with a cancellous bone graft may solve the problem.

Elderly leg amputees

M. P. Rulkens

Lucas Foundation for Rehabilitation, Hoensbroek, The Netherlands

From 1980 through 1984, 156 leg amputees aged 70 and over were clinically rehabilitated (52 per cent men and 48 per cent women, with a mean age of 76 years).

In 96 per cent of the rehabilitees, amputations had been performed in view of a vascular disease; 55 per cent were known to suffer from diabetes mellitus. Of the totally 169 amputations, 66 per cent had been performed at the lower leg level, 12 per cent had knee exarticulations, and 21 per cent had been at the thigh level. During the period of rehabilitation, 10 per cent of the rehabilitees died at the rehabilitation center or after transfer to a general hospital; 23 per cent remained dependent on a wheelchair, and 68 per cent were discharged with a minimum walking function, sufficient for indoor ambulation.

Complicating factors were neurologic dysfunctions and contractures that unfavorably influenced the ultimate functional level and the mean hospital stay. The mean hospital stay for the entire population was 24 weeks; 82 per cent of the rehabilitees were discharged to their former residence, a home for the aged, or an adapted residence.

A retrospective study of the functional value of shoulder arthrodesis in persons with lesions of the brachial plexus

C. H. Emmelot and W. H. Eisma

Rehabilitation Department, University Hospital, Groningen, The Netherlands

During the period 1974–1985, the Groningen University Hospital Team for Peripheral Nerve Lesions treated 98 persons with a lesion of the brachial plexus. A shoulder arthrodesis was performed in 23 of 34 persons with a paralytic shoulder. In the remaining 11, shoulder arthrodesis was refrained from in view of absence of pain and/or youth (under the age of consent).

With the aid of a self-designed questionnaire with a hierarchical scale of answers, the subjective experiences and functional state of patients with a shoulder arthrodesis were examined, and the functional state was compared with that in the group without an arthrodesis. The following aspects were considered: daily activities, specific manual skills, recreation, transport, work and cosmetic aspects.

Patients with an arthrodesis reported unequivocal subjective improvement in cosmetic aspects, dressing/

undressing, washing, cycling, driving, walking/running, and sports. An unmistakable difference in functional state was found between those with and those without an arthrodesis.

Conclusions: 1) in patients with a paralytic shoulder, a shoulder arthrodesis led to subjective improvement in function; 2) the group with an arthrodesis functioned better than the group without, improvements being most apparent in daily activities and sports.

Shoulder arthrodesis with the aid of external fixation in patients with lesions of the brachial plexus

H. J. H. Veldman, H. K. L. Nielsen and A. G. Veldhuizen

Department of Orthopedics, University Hospital, Groningen, The Netherlands

A follow-up was performed on 10 patients with a flail shoulder due to a brachial plexus lesion, treated by arthrodesis of the humeroscapular joint. The follow-up period was 23 (3–47) months. In 9 patients the interval between accident and operation averaged 31 months; in 1 patient this interval was 13 years. Osteosynthesis was effected by external pin fixation, supplemented by one or two lag screws through the glenohumeral joint. In 9 of the 10 cases, this technique led to consolidation after 3 months. One patient needed a cancellous bone graft 2 months after the operation in view of delayed union. Apart from superficial pin-hole infections in 3 cases, no complications developed. All the patients were satisfied with the result of the operation. Those with a flail arm had regained some control over the arm, and those with some residual arm function experienced considerable improvement in this after the operation. It is concluded that shoulder arthrodesis clearly improves the situation for patients with brachial plexus lesions in functional terms and especially, subjectively; the technique making use of external pin fixation proved very suitable.

Perthes' disease: a follow-up of conservative therapy

C. G. B. Maathuis, M. P. Hofman and A. P. P. M. Driessen

Rehabilitation Center "Het Roessingh," Enschede, The Netherlands

A follow-up study was performed to assess the effect of strictly conservative therapy (wheelchair/abduction method) of 35 children with Perthes' disease over the period 1974–1983. In addition to evaluation of purely

somatic aspects, an attempt was made to gain insight into the influence of this conservative therapy on the past and present psychosocial development of the Perthes' patients (and their parents).

The follow-up study (end of 1983/start of 1984) ultimately concerned 29 children whose mean age at onset of Perthes' disease had been 6 years. The follow-up period averaged 50 months. According to the Catterall classification, the unilateral cases included two grade I, nine grade II, five grade III, and six grade IV hips. Of the 22 unilateral hip diseases, five scored excellent, 14 good, two moderate, and one poor. Of the seven bilateral hip diseases, six hips scored good and eight moderate.

The psychosocial follow-up revealed that the therapy period had placed considerable stress on the parents; the children generally seemed to have fewer problems (repression?). Despite the long hospital period, no signs of hospitalization were observed.

We have concluded that strict conservative therapy of Perthes' disease gives good results in somatic terms (clinical and radiographic features of the femoral head). In psychosocial terms, the children treated showed no very distinct problems, but the therapy period had placed considerable stress on the parents.

Functional treatment at a rehabilitation center after anterior cruciate ligament reconstruction

C. A. Stuurman

Rehabilitation Center Muiderpoort, Amsterdam, The Netherlands

Of the 146 patients who underwent reconstruction of an anterior cruciate ligament at the Onze Lieve Vrouwe Hospital from January 1982 through October 1985, 86 received functional postoperative treatment at a rehabilitation center. Three different reconstructions were involved: combined extraarticular and intraarticular iliotibial tract augmentation (group 1), combined extraarticular iliotibial tract and central patellar ligament reconstruction (group 2), and isolated extraarticular anterolateral iliotibial tract reconstruction (group 3).

Functional postoperative treatment included cautious mobilization of the knee from the second postoperative day on, with mobilization of the patella and muscle-strengthening exercises. After about 2 weeks, the patient was discharged with a posterior splint and canes. Then followed a long period of physiotherapy in a group setting at the rehabilitation center. During the first 8 postoperative weeks, daily exercises with the splint removed and the knee mobilized; muscle-strengthening exercises were performed with the splint in position. Six

weeks after the operation, the patient gradually abolished the splint, and weight bearing was increased, in combination with proprioceptor exercises and walking exercises. The canes were gradually discontinued 10 weeks after the operation, and the condition further improved. Treatment was completed after 5 to 7 months. More strenuous sports were allowed after 1 year. The duration of treatment averaged 7.5 months in groups 1 and 2, and 5.3 months in group 3. In groups 1 and 2, light work was resumed after an average of 4 months (2.5 months in group 3). Corresponding figures for strenuous work were 8.3 and 5.4 months.

Conclusion: Functional postoperative treatment after anterior cruciate ligament reconstruction generally gives good results as to resumption of sports and work (even strenuous work). The ultimate result largely depends on additional factors such as the condition of the articular cartilage. Exercises in a group prove to be a good stimulus in this protracted treatment.

The natural course of idiopathic thoracolumbar scoliosis

F. M. C. van der Eeden and H. J. A. Kruls

Department of Orthopedics, University Hospital St Radboud, Nijmegen, The Netherlands

A retrospective study was made of 68 case records and radiographic files; 44 patients with idiopathic scoliosis were given more detailed attention. Their lumbar and thoracolumbar curvatures had shown further progression in the course of the years. Backaches were indicated by 33 of the 44 patients. No correlation was seen between backache and severity and/or localization of the scoliosis. Patients showing so-called "rotary slip" as a rule had backaches. Lung function tests showed restrictive functional disturbances related to the severity of the thoracic curvature.

Patients were divided into two groups: early-onset and late-onset scoliosis. The boundary between early and late onset was the 8th year of life.

Severe cardiopulmonary problems were observed in 17 patients: 12 of the 14 patients with early-onset and only 3 patients with late-onset scoliosis (time of diagnosis was unknown in 2 cases with cardiopulmonary problems). The scoliotic curvature averaged 150° according to Cobb in the early-onset type and 80° in the late-onset type.

Scoliosis patients remain single more frequently than normal persons. Cosmetic aspects related to the curvature not infrequently cause psychological problems. The

symptoms found confirm the need for early correction (at the time of adolescence) in order to avoid subsequent disabilities like those observed in this group.

The value of the silicone prosthesis in hallux rigidus

J. A. N. Verhaar, S. K. Bulstra and G. H. I. M. Walenkamp

Department of Orthopedics, University Hospital, Maastricht, The Netherlands

In the past few years, silicone hemiprotheses according to Swanson were implanted in patients with a hallux rigidus refractory to conservative therapy and without prominence of the valgus component. The theoretical advantage of this technique over resection/arthroplasty is that the toe retains its length, which conserves flexor strength (and thus push-off), as well as cosmetic aspects.

A follow-up study was made of patients thus treated during the period 1980-1985; patients with rheumatoid arthritis and gout were excluded.

The group comprised 44 patients, including 13 with a bilateral prosthesis - a total of 57 implantations of silicone hemiprosthesis. All were available for a follow-up after 5 (2-7) years. A history was taken and the patients were examined as to gait, metatarsophalangeal mobility, and flexor strength (a special measuring device was developed for the latter). Most of the patients were satisfied with the result obtained: 35 patients no longer or only rarely felt pain, and the walking distance was unrestricted; 38 patients indicated considerable improvement since the operation. Flexor strength had remained normal in 33 cases. Radiographic examination regularly revealed cyst formation around the implant. The long-term significance of this finding is still obscure.

Myoelectric hand prostheses in preschool children: 7 years of experience

R. Soerjanto

Department of Rehabilitation, University Hospital, Leiden, The Netherlands

The Leiden University Hospital Department of Rehabilitation and the Rehabilitation Center "De Hoost-raat" in Leersum fitted preschool children with a myoelectric prosthesis (MEP) from early 1980 through 1986. All except 1 were children with a unilateral

congenital transverse reduction defect of the forearm or peromelia; the exception was a child with a traumatic forearm amputation.

The method was introduced by the Swedish neuro-physiologist R. Sörbye and has been adapted to the Dutch situation at the Leiden University Hospital.

Although the project was designed for preschool children, older children who had previously been unable to benefit from the MEP were also treated. Children under treatment by the end of 1986 ranged in age from 18 months to 15 years.

Evaluation of the results of functional treatment after operations for anterior cruciate ligament insufficiency

W. C. Neve and B. E. E. M. J. Veraart

Department of Orthopedics, Onze Lieve Vrouwe Hospital, Amsterdam, The Netherlands

During the period 1982–1985, 146 patients underwent a stabilizing operation for insufficiency of an anterior cruciate ligament; 88 per cent were available for a follow-up after 12–58 months, and 114 patients of this group had received functional postoperative treatment. In the acute phase, active young patients were mostly treated by combined extraarticular and intraarticular iliotibial tract reconstruction (group 1). In the chronic phase, after failure of conservative measures, most were treated by combined extraarticular iliotibial tract and central patellar ligament reconstruction (group 2) or isolated extraarticular iliotibial tract reconstruction (group 3).

Evaluation was based on the Lysholm score, the Marshall score, the pivot shift, and the subjective results.

	Lysholm pre/post	Marshall post	pivot shift pos.	subjective result poor
group 1 (n 27)	100/87	40	8%	4%
group 2 (n 56)	63/90	42	9%	13%
group 3 (n 31)	55/85	40	37%	13%

Conclusions: 1) functional postoperative treatment does not detract from stability; 2) results in group 2 were good; 3) better selection is required for group 1; 4) extraarticular reconstruction is satisfactory for older, less active patients.

Steindler's flexor graft in paralysis of the elbow flexors

R. G. Pöhl and G. J. Onvlee

Department of Orthopedics, University Hospital, Leiden, The Netherlands

In paralysis of the brachial biceps muscle, several muscle graft techniques may be used to restore the flexor strength of the elbow. One of the alternatives is Steindler's graft, in which the insertion of the flexor group of the forearm – the medial humeral epicondyle – is transposed to the proximal aspect of the humeral diaphysis. Steindler's flexor graft is less drastic than most other grafts used in these cases, and often ensures a remarkable improvement of the arm function.

Between 1982 and 1986, we performed this operation on 5 cases with a traumatic lesion of the brachial plexus. The mean age at operation was 21 years; the mean interval between accident and operation was 40 months. In 3 cases the shoulder was stabilized simultaneously. All the patients were evaluated after a mean follow-up period of 28 months. All of them were satisfied with the result of the operation.

Active flexion of the elbow joint averaged 100°, and a weight ranging from 0.2 kg to 4.5 kg could be lifted up to 90° flexion. The mean limitation of extension was 5°, active pronation 80°, and supination 40°.

Conclusion: The Steindler operation should be considered in paralysis of the elbow flexors with more or less extensive dysfunction of the brachial plexus. Fair-to-good elbow function and slight-to-moderate flexor strength of the elbow may be expected.

Treatment of thoracolumbar vertebral lesions with signs of neurologic dysfunction

H. H. J. van As, J. R. Sloodman and H. D. Been

Rehabilitation Center Muiderpoort, Amsterdam, The Netherlands

Over a period of 4 years (1983 through 1986), 24 patients with a thoracolumbar vertebral fracture and neurologic signs of dysfunction were transferred to the rehabilitation center after an operation (stabilization) performed at the Academic Medical Center, Amsterdam.

The more common causes were suicidal attempts (10 cases) and traffic accidents (9 cases); 20 patients were younger than 40 years. Ten patients had a lesion of the high-thoracic or mid-thoracic vertebrae (Th₁-Th₈), with irreversible paraplegia. The remaining patients had a fracture at the thoracolumbar junction (Th₁₂-L₁; 10 cases) or lower (4 cases).

The average period in the hospital was 26 weeks. Neurologic recovery was regularly observed. Particularly in patients with vertebral fractures at the thoracolumbar junction or lower, with (in)complete cord lesion and/or caudal lesion, repeated detailed neurologic examination is important.

All the patients except 1 were able to return home and were entirely independent in daily activities. Twelve patients were totally dependent on a wheelchair; 6 walked functionally indoors and 6 outdoors as well. Only 3 patients had no or minor micturition disorders.

Operative treatment of patients with lesions of the thoracolumbar vertebral column

H. D. Been and H. H. J. van As

Department of Orthopedics, Academic Medical Center, Amsterdam, The Netherlands

Between January 1983 and January 1987, 70 patients with thoracolumbar vertebral lesions underwent an operation for thoracolumbar fracture. The series included 43 men and 27 women; the mean follow-up period was 26 months.

The most common causes were a fall from a height while working, an attempt at suicide, and traffic accidents. Most fractures were localized at the thoracolumbar junction.

When presenting at the hospital, 31 patients showed signs of neurologic dysfunction; 13 presented a complete paraplegia, and 18 patients an incomplete paraplegia.

Thirty patients had sustained a burst fracture, while the remaining cases mostly had a flexion-rotation or flexion-distraction injury.

In 36 cases treatment consisted of an anterior approach and stabilization of the Slot-Zielke procedure. Dorsal stabilization was effected in 32 patients, usually by the Harrington-Luque procedure. Two patients were treated both by anterior and by posterior stabilization. Pseudarthrosis developed in 1 case.

Most patients with incomplete neurologic dysfunction showed improvement. One patient developed a deep infection necessitating premature removal of the osteosynthesis material.

Fibrositis syndrome or fibromyalgia

H. C. M. Janssen

"De Wever" Hospital, Heerlen, The Netherlands

Not only the rheumatologist, but also the orthopedic surgeon, and the rehabilitation specialist are likely to

encounter patients whose condition might be diagnosed as fibromyalgia. The incidence of this syndrome is estimated to be 5-20 per cent of all new problems presented to the rheumatologist. The diagnosis will often depend on the interests and knowledge of the attending physician. In 1976, Smythe and Moldofsky formulated criteria for identification of this so far ill-defined syndrome: fibromyalgia regarded as an entity.

A literature study and a retrospective study of the incidence of fibromyalgia over a period of 18 months gave rise to several critical questions. A prospective study is to be based on the following hypotheses: 1) there is no difference between primary and secondary fibromyalgia; 2) the "tender points" concept is ill-defined and unsuitable as an instrument of investigation; 3) a positive skin-roll phenomenon is an obligatory finding that can be accurately described as an aid to diagnosis; 4) defined disorders in daily functions often seem typical of fibromyalgia; 5) several minor criteria described are not typical of fibromyalgia, but in fact more suggestive of vegetative lability; 6) "harder" minor criteria; 7) the value of clinical psychological studies is debatable.

Rehabilitation medicine (and thus the patient with fibromyalgia) would benefit from more strict criteria in diagnosing fibromyalgia so that rehabilitation strategies may be evaluated for a disease so far described as refractory to all therapy.

Movement or weight bearing after plate osteosynthesis of a lower leg fracture

E. L. F. B. Raaymakers

Department of Surgery, Academic Medical Center, Amsterdam, The Netherlands

Operative therapy of fractures aims at exercise stability. On the one hand, however, not all the patients make (proper) use of this exercise stability. On the other hand, postoperative use of a walking cast enables the patient to walk unaided, and refracture due to another fall is virtually avoidable. At the Academic Medical Center, fracture patients are admitted alternately to the surgical and the orthopedic department. From 1975 to 1983, 138 lower leg fractures were treated by plate osteosynthesis, both departments applying similar indications and technique. The patients had similar fracture types and soft-tissue lesions. Removal of the postoperative splint on day 5 was followed by a functional period. In order to study the advantages and disadvantages of a walking cast and functional postoperative treatment, 62 orthopedic patients were treated functionally: walking with the aid of two crutches and 5-10 kg weight bearing. On the other hand, 76 surgical patients were discharged with an upper leg walking cast for 6 weeks, followed by a lower

leg walking cast until complete weight bearing without a cast was possible. Re-osteosynthesis was required in 7 cases of the functional group and in 3 of the walking-cast group.

The mean duration of unfitness for work was 23 weeks in the functional and 28 weeks in the walking-cast group. The period of complete weight bearing without a cast was 1 week shorter in the walking-cast group. All the patients appreciated walking without a cane.

The groups did not differ significantly in incidence of dystrophy, knee mobility, ankle mobility, and resumption of sports.

These findings seem to warrant a preference for the use of a walking cast after plate osteosynthesis of lower leg fractures.