COMBINED REALIGNMENT PROCEDURE (FEMORAL AND ACETABULAR) OF THE HIP JOINT IN AMBULATORY PATIENTS WITH CEREBRAL PALSY AND SECONDARY HIP DISLOCATION

J. JEROSCH, S. SENST, I. HOFFSTETTER

In a retrospective study we evaluated the results of 11 patients with cerebral palsy and concomitant hip dislocation who were still able to walk. They had been surgically treated with proximal femoral osteotomy (varization and derotation) and acetabular osteotomy (triple osteotomy) in order to achieve stabilization of the hip joint. The patients' mean age was 14.4 ± 3.7 years. The female : male ratio was 7 : 4. All 11 hip joints were successfully stabilized. The range of passive abduction significantly increased from 20° preoperatively to 42° postoperatively. The range of flexion slightly decreased from 101° to 92°. Internal rotation significantly decreased from 51° to 37°. External rotation increased from 27° preoperatively to 41° postoperatively. Preoperatively 4 of the 11 patients had been able to walk without any walking aids ; 7 had been able to walk with support. Concerning the ambulatory status, mild improvement was achieved postoperatively in 3 patients. The CCD-angle decreased significantly from 138.9° preoperatively to 118.7° postoperatively. The migration index according to Reimers improved significantly from 50.2% preoperatively to 24.2% postoperatively. Prior to surgery 4 cases showed a grade 1 dislocation, 6 cases a grade 2 dislocation, and 1 case a grade 3 dislocation. We succeeded in performing a complete reposition in all patients. Preoperatively the CE-angle was only -3° (± 11.3°) and was improved to 27.1° (± 5.3°). The ACM-angle measured 45.4° preoperatively and 49.5° postoperatively. The sitting balance was improved in all patients. Furthermore the problem of anal care was reduced. However, it took a significantly longer period to regain the preoperative status in comparison to non-CP-patients. A rehabilitation period of 8 to 14 months must be expected. In summary we feel that the technique presented with a combined osteotomy for redirection of both the acetabulum and the proximal femur restores the anatomy best in this patient population. Our results justify this approach, whereas long-term evaluation is necessary to prove whether the results do stand the test of time.

Keywords : cerebral palsy ; hip dislocation ; femoral osteotomy ; triple osteotomy.
Mots-clés : infirmité motrice cérébrale ; luxation ; hanche ; ostéotomie fémorale ; triple ostéotomie.

INTRODUCTION

According to the literature the incidence of secondary hip dislocation in patients with cerebral palsy ranges from 2.5% to more than 50% (5, 23, 35, 40). This variation can be explained by the fact that the risk of dislocation increases with the grade of cerebral palsy. Howard *et al.* (20) reported an incidence of 59% in tetraspastic patients, whereas only 6.5% of the patients with diplegia were affected. Similar results were published by Lonstein and Beck (22) and by Cooke *et al.* (10). The risk of secondary hip dislocations seems to depend on the individual ambulatory status. Dislocations are seen mostly in the nonwalkers. The consequences of the unstable situation of the hip joint are variably assessed in the literature. According to Pritchett (28) hip dislocation does not cause any pain or problems in hygiene or increase the incidence of skin ulcers. Feldkamp and Treppenhauer (14) as well as Heimkes *et al.* (16) were

Department of Orthopedic Surgery, Westfälische-Wilhelms-University Münster, 48149 Münster, Germany.
Correspondence and reprints : J. Jerosch.

disappointed by their own operative results, and therefore they recommended a wait-and-see policy until the onset of complaints. However, the permanently untreated dislocation can cause painful osteoarthritis.

After a follow-up of 18 years Coopermann *et al.* (11) reported that more than 50% of their patients suffered from pain due to hip dislocation caused by spasticity. The risk of hip complaints in cerebral palsy is also assessed as up to 40-70% by other authors (3, 7, 11, 24, 25, 28, 33, 43). In case of severe degenerative joint disease the probability of effective improvement of the joint situation is very low (30).

Besides the aspect of pain, the loss of sitting balance as well as the risk of scoliosis must be taken into consideration. Regarding this aspect the literature also shows different opinions, especially concerning the risk of scoliosis. Most authors take the view that the dislocated hip will lead to secondary problems such as loss of sitting balance, pelvic obliquity, scoliosis and hygienic problems (7, 11, 19, 25, 29, 33).

Based on our own experience we share the opinion of Sharrad *et al.* (35), Baumann and Feinstein (4), Coopermann *et al.* (11), and Mubarak (26), as well as Carstens *et al.* (8), and we recommend early operative intervention in case of hip dislocation in patients with cerebral palsy.

Most authors agree with the conclusion that in case of hip dislocation a bony procedure should be combined with a soft tissue release (2, 5, 19, 21, 38). A muscle release and a femoral osteotomy are usually performed. Recently, an additional acetabular osteotomy in order to stabilize the hip joint has been proposed (8, 26). This surgical procedure on the acetabular side is almost always done as an acetabuloplasty using different techniques. The Salter osteotomy is successful in congenital hip dysplasia, but in patients with cerebral palsy it leads to various problems (31, 32). In this respect the Chiariosteotomy can be assessed similarly, especially in the presence of an elongated acetabulum with a cranial defect. Considering these aspects we combine the soft tissue release and the femoral osteotomy with a reorientation of the acetabulum using the Tönnis osteotomy (42). In this presentation we report our experience with this surgical approach to the problem of secondary hip dislocation in cerebral palsy patients who are still able to walk.

MATERIALS AND METHODS

Indications : The combination of the procedures mentioned above is indicated in the CP-patient with a secondary hip dislocation or a dislocation with a typical adduction-flexion contracture of the hip joint and a cranial defect of the acetabulum. At this time we only included patients who were still able to stand and walk on their own. In some rare cases the indication was present for patients who were only able to sit. Patients who were not able to sit on their own were excluded from this procedure. In patients younger than 5 years we performed an acetabuloplasty instead of the triple osteotomy. These patients were not evaluated in this study. The triple osteotomy is not contraindicated after the closure of the acetabular triradiate physeal cartilage, and neither is the presence of few or moderate degenerative changes and secondary incongruence of the femoral head a contraindication.

Operative technique : The adductor longus and gracilis muscles were released through a medial approach. Tenotomy of the psoas muscle was performed either through the medial approach or through the lateral approach after completion of the femoral osteotomy. In all cases the femoral osteotomy included a derotation, shortening and varization. The degree of derotation, shortening and varization in order to adjust the femoral head within the acetabulum depended on the individual situation. The stabilization was obtained by a 90° — angle plate. For the Tönnis triple osteotomy two surgical approaches were used (42). The osteotomy of the ischium was performed through a dorsal approach ; the osteotomy of the ilium and the pubis was performed through a ventral approach. Depending on the quality of the bone we used Kirschner wires or screws for fixation of the triple osteotomy (fig. 1).

Postoperative care : All patients were immobilized in a hip spica for 6 weeks, whereupon the mobilization started. Hardware removal was not performed earlier than 12 months after surgery.

Patients : From April 1992 through May 1994 11 patients underwent surgery using the technique described. The patients' mean age was 14.4 ± 3.7 years. Seven were females and 4 were males. Table I shows the patients' preoperative ambulatory status. The time for surgery ranged from 3.74 to 5.25 hours (mean : 4.47 ± 0.52). The average blood loss was 766 ± 382 ml.

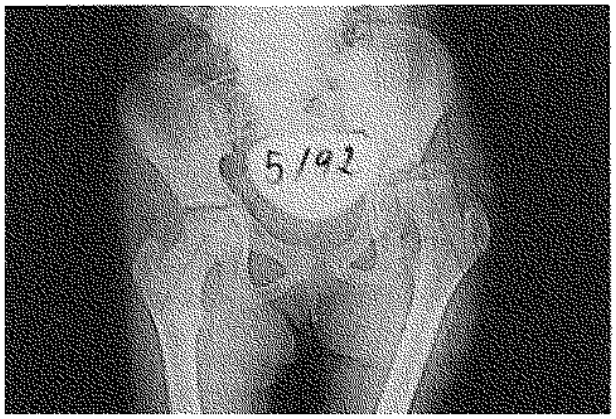

Fig. 1a

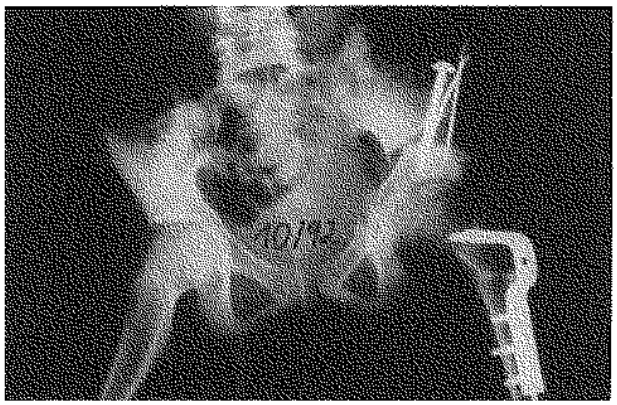

Fig. 1b

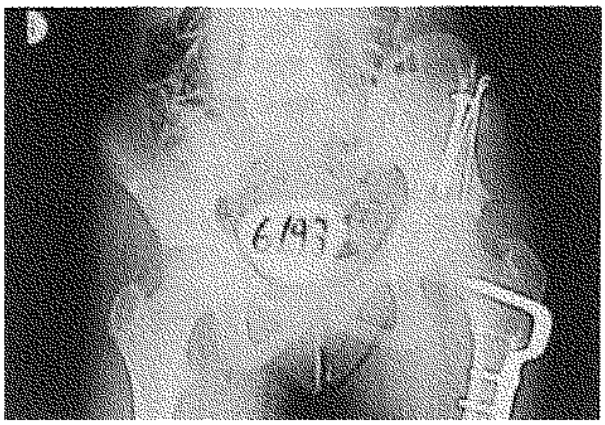

Fig. 1c

Fig. 1a. — Hip dislocation in a patient with cerebral palsy.
b. — Immediate postoperative xray after derotation-varisation osteotomy of the proximal femur and triple osteotomy of the acetabulum.
c. — Xray 8 months after combined hip stabilization.

Table 1. — Ambulatory status of patients

Walking without any support : 4 Ranchos Los Amigos I
Walking with little support : 2
Walking with bilateral canes : 3 Ranchos Los Amigos II
Walking with walkers : 2

Documentation : The surgery was performed by two orthopedic surgeons. Besides the clinical findings, objective data for the evaluation were available through the patients' chart and the xray investigations. Subjective information given by the patients or their families was included as well in a standardized manner. The patients were examined pre- and postoperatively by an independent examiner. All 11 patients were seen for follow-up after 12.4 ± 4.7 months.

Xray investigations : In all patients standardized xray investigation was performed pre- and postoperatively. On the AP and axial views of the hip joints the ACM-, CE- and CCD-angle as well as the Reimers migration index were bilaterally measured and documented.

Previous operations : Only 3 of the 11 patients had not undergone a previous operation. An adductor release had been performed previously in 5 patients, and 3 patients had undergone a bony operation (2 Chiari osteotomies, 1 derotation osteotomy).

RESULTS

Clinical results : We were successful in stabilizing all 11 hip joints. All patients were pain free at the time of follow-up. The range of passive abduction increased significantly from 20° preoperatively to 42° postoperatively. In 2 cases the range of abduction decreased postoperatively, but it still remained over 30°. The range of flexion decreased slightly, from 101° preoperatively to 92° postoperatively. However, the range of internal rotation significantly decreased from 51° to 37°. In contrast, external rotation increased from 27° to 41°. This resulted partly from the derotation osteotomy.

Effect on ambulation : Preoperatively 4 of the 11 patients were able to walk without any walking aids ; 7 were able to walk with support. Postoperatively a mild improvement in the ambulatory status was achieved in 3 patients, and ambulation did not worsen in any patients.

Radiologic results :

CCD-angle : The CCD-angle decreased significantly from 138.9° preoperatively to 118.7° postoperatively.

Migration index : The migration index according to Reimers improved significantly from 50.2% preoperatively to 24.2% postoperatively.

Grade of dislocation : Based on the classification of Tönnis (42) we found preoperatively a grade 1 dislocation in 4 cases, a grade 2 dislocation in 6 cases, and 1 case of a grade 3 dislocation. We achieved complete reposition in all patients.

CE-angle : The CE-angle representing the coverage of the femoral head was preoperatively -3° (± 11.3°). It improved to 27.1 (± 5.3°) after the operation.

ACM-angle : The ACM-angle reflecting the development of the acetabular depth measured 45.4° preoperatively and 49.5° postoperatively. Therefore, a significant change in the ACM-angle could not be documented.

Subjective results : Even if some patients' subjective assessment could not be evaluated due to their mental condition, a significant improvement was reported by their relatives. The sitting balance was improved, and in all patients the preoperative level of ambulation was achieved. Also the problem of anal care was reduced. However, the period required to regain the preoperative status was significantly extended in comparison to non-CP-patients. The rehabilitation covered 8 to 14 months.

Complications : We did not experience any intraoperative complications or any cases of avascular necrosis of the femoral head (AVN). All hips remained stable at the time of follow-up, and redislocation did not occur. Concerning the triple osteotomy, 2 clinically asymptomatic nonunions of the ischium were found.

DISCUSSION

Despite divergent opinions in the literature, procedures for hip stabilization in CP-patients who are able to sit, stand or walk seem to be performed more frequently. However, complex operations including soft tissue release, and femoral and pelvic osteotomies are still regarded as controversial.

Surgery for spastic hip dislocation requires resolution of the pathologic muscle strain, and the secondary bony deformities of the proximal femur and the acetabulum must be corrected. On the femoral side, coxa valga and especially coxa antetorta are typical of this condition. Usually coxa valga is overestimated on plain xray due to the increased anteversion (4, 34, 41). Therefore the surgeon performing the intertrochanteric correction must achieve adequate derotation, because the amount of varisation suggested by the preoperative xray of the pelvis in AP plane is not necessary in most cases. This is of special importance with regard to the gluteal insufficiency which is a problem in many patients and may even be worsened by the varization. Concerning the acetabular deformity the situation is different from congenital hip dysplasia. All authors agree with a cranial acetabular defect, but concerning the dorsal or ventral position the opinions are controversial. Hoffer (19) described a dorsolateral direction of hip dislocation in CP patients. With regard to CT-scan investigations Guggenheim *et al.* (15) concluded that the acetabular defect is located in the ventral part. With 3-dimensional CT scans we found a more cranial and dorsal defect.

The decision as to the adequate operative procedure depends on the patient's age. A soft-tissue release in order to eliminate or modify the pathologic muscle strain should be performed as a preventive procedure possibly before the age of 5 and before hip dislocation occurs (22). As soon as secondary bony deformities develop, a soft-tissue procedure is not sufficient, and the need for osteotomy is unavoidable. Zapf and Gaudin (44), Hoffer *et al.* (18), and Boes *et al.* (6) recommended a derotation-varization osteotomy. According to Eilert and MacEwen (13) and Tylkowski *et al.* (43) the intertrochanteric correction is only successful before the age of 8 years. In their opinion there is no potential for recovering from acetabular dysplasia in older patients. Besides this aspect, the risk of revalgisation of the femoral neck is relatively high (21, 37). Therefore, the arguments in favor of a complex procedure including soft tissue

release, intertrochanteric osteotomy and reorientation of the acetabulum are quite reasonable.

The standard pelvic osteotomies like the Salter or Pemberton osteotomy are useful to correct the anterolateral defect of the acetabulum. Salter himself did not recommend his osteotomy for hip dislocation in CP-patients, which is caused by the increased muscle tone of the hip flexors and hip adductors due to spasticity. In spite of Salter's recommendation his pelvic osteotomy was performed frequently in CP-patients, and in many cases the results were not satisfactory (32). Shelf procedures were also used ; the outcome varied, but was mostly unsuccessful (7, 17, 40, 45). The use of Chiari osteotomies was also described in several publications (5, 27), but in practice intraoperative problems occurred during this osteotomy in the spastic hip joint. The dislocating hip joint in the spastic patient almost always presents with a superolateral subluxation or dislocation of the femoral head. The acetabulum is pulled out widely like a groove. A real secondary roof is rarely seen. In this anatomic situation a correct Chiari osteotomy is difficult to perform. Following the original description, the osteotomy must be done right above the attachment of the joint capsule. Due to the groove-like elongation of the acetabular roof in the subluxed or dislocated spastic hip joint, this attachment of the capsule is located very proximally, so that an original Chiari osteotomy with a cranial angle of about 20° is likely to be directed into the sacroiliac joint. In order to manage this problem some authors modified the osteotomy in such a way that they performed the osteotomy more distally, and some even placed additional allografts into the ventral and dorsal defect.

So far a double (Sutherland) (39) or triple osteotomy (Steel) (38) is only rarely recommended in the literature. However, different procedures for a pericapsular osteotomy of the acetabular roof in CP-patients are described in the literature. Mubarak *et al.* (26) used a modification of Albee's osteotomy (1), that was published in 1915. Another modification was described by Dega in 1974 (12). He established an improvement of the situation in the superolateral and posterior part of the acetabular roof which was more effective than the standard Salter or Pemberton osteotomy. With his technique Pemberton recommended not to extend the osteotomy into the ischial foramen. Nevertheless following this recommendation the desired correction of the dorsal defect is limited (19, 36, 40).

In our experience the complex procedure performed in our patients as described above allows us to correct the pathology of the soft tissue as well as the bony deformities. As documented by the postoperative xray findings all of the radiologic parameters were improved. The functional outcome and the clinical consequences for the patient are more important than the radiological results. The stability of the hip joint is a central parameter. Howard *et al.* (20) found a significant correlation between the stability of the hip and the ability to walk or bear weight. Also Sharrard *et al.* (35) reported a positive influence on the functional efficiency in patients with stable hip joints. Carstens *et al.* (8) agree with these findings.

Prevention of complications : To decrease the risk of femoral head necrosis caused by increased intraarticular pressure after repositioning, adequate shortening of the femur is recommended in addition to the release of the psoas and adductor muscles. For this purpose the femur needs to be shortened up to 2.5 cm. The bone wedge removed from the femur can be used for the triple osteotomy. At the time of psoas tenotomy, care must be taken to protect the medial femoral circumflex artery. The frequent risk of femoral fracture, also described by Samilson *et al.* (35) in 40 of their 274 patients with spastic subluxation of the hip joint, was not a problem in any of our patients. We also did not see a negative influence on the growth cartilage of the acetabular physis.

In summary we feel that our approach to the problem with the surgical technique described, which is a combined osteotomy for the redirection of the acetabulum and the proximal femur, adequately restores the anatomy in patients with cerebral palsy who are still able to walk. Our results justify our management, whereas long-term evaluation is needed to prove whether the results do stand the test of time.

REFERENCES

1. Albee F. H. The bone graft wedge. Its use in the treatment of relapsing, acquired, and congenital dislocation of the hip. N. Y. Med. J., 1915, 102, 433-435.
2. Baird R. A., Sutherland D. H., HcDade W. C. One-stage reconstruction of the hip in the older child with spastic subluxation or dislocation. Annual Meeting of the American Academy for Cerebral Palsy and Developmental Medicine, Atlanta, Georgia, Oct. 6, 1977.
3. Baker L. D., Dolelin R., Basset F. H. Pathological changes in the hip in cerebral palsy : incidence, pathogenesis, and treatment. A preliminary report. J. Bone Joint Surg., 1962, 44-A, 1331-1342.
4. Baumann J. U., Feinstein R. Die Hüfte bei cerebraler Bewegungsstörung — 10-Jahres-Resultate der Derotations-Varisations-Osteotomie bei cerebralen Bewegungsstörungen. Orthopädie, 1979, 8, 91-92.
5. Bleck E. E. The hip in cerebral palsy. Orthop. Clin. North Am., 1980, 11, 79-104.
6. Bos C. F. A., Rozing P. M., Verbout A. J. Surgery for hip dislocation in cerebral palsy. Acta Orthop. Scand., 1987, 58, 638-640.
7. Carr C., Gage J. R. The fate of the nonoperated hip in cerebral palsy, J. Pediat. Orthop., 1987, 7, 262-267.
8. Carstens C., Niethard F. U., Schwinning M. Die operative Behandlung der Hüftluxation bei Patienten mit infantiler Zerebralparese. Z. Orthop., 1992, 130, 419-425.
9. Castle M. E., Schneider C. Proximal femoral resection-interposition arthroplasty. J. Bone Joint Surg., 1978, 60-A, 1051-1054.
10. Cooke P. H., Cole W. G., Carey R. P. L. Dislocation of the hip in cerebral palsy. J. Bone Joint Surg., 1989, 71-B, 441-446.
11. Cooperman D. R., Bartucci E., Dietrieck E., Millar E. A. Hip dislocation in spastic cerebral palsy : long-term consequences. J. Ped. Orthop., 1987, 7, 268-276.
12. Dega W. Osteotomia trans-iliakalna w leczeniu wrodzonej dysplazij biodra. Chir. Narz. Ruchu. Ortop. Polska, 1974, 39, 601-613.
13. Eilert R. E., MacEwen G. D. Varus derotational osteotomy of the femur in cerebral palsy. Clin. Orthop., 1977, 125, 168-172.
14. Feldkamp H., Treppenhauer M. Erfolgsaussichten operativer Hüfteingriffe bei schwerbehinderten Kindern mit Zerebralparese. Z. Orthop., 1985, 123, 189-192.
15. Gugenheim J. J., Gerson L. P., Sadler C., Tullos H. S. Pathologic morphology of the acetabulum in paralytic and congenital hip instability. J. Ped. Orthop., 1982, 2, 397-400.
16. Heimkes B., Hien N., Stotz S. Die spastische Hüftluxation — Prophylaxe und Therapie. Orthop. Prax., 1986, 505-510.
17. Hill L. M., Bassett F. H., Banker L. D. Correction of adduction, flexion and internal rotation deformities of the hip in cerebral palsy. Devel. Med. Child. Neurol., 1966, 8, 406-416.
18. Hoffer M. M., Stein G. A., Koffmann H., Prietto M. Femoral varus-derotation osteotomy in spastic cerebral palsy. J. Bone Joint Surg., 1985, 67-A, 1229-1235.
19. Hoffer M. M. Current Concepts Review — Management of the hip in cerebral palsy. J. Bone Joint Surg., 1986, 68-A, 629-631.
20. Howard C. B., McKibben B., Williams L. A., Mackie I. Factors affecting the incidence of hip dislocation in cerebral palsy. J. Bone Joint Surg., 1985, 67-B, 530-532.
21. Jani L., Warner H. Die Wiederaufrichtung des Schenkelhalses nach der Drehvarisierungsosteotomie. Arch. Orthop. Unfall Chir., 1969, 66, 49-56.
22. Kalen V., Bleck E. E. Prevention of spastic paralytic dislocation of the hip. Dev. Med. Child. Neurol., 1985, 27, 17-24.
21. Lee E. H., Carroll N. C. Hip stability and ambulatory status in myelomeningocele. J. Ped. Orthop., 1985, 5, 522-527.
22. Lonstein J. E., Beck K. Hip dislocation and subluxation in cerebral palsy. J. Ped. Orthop., 1986, 6, 521-526.
23. Manjarris J. F., Mubarak S. J. Avascular necrosis of the femoral heads following bilateral iliopsoas and adductor releases via the medial approach to the hip. J. Ped. Orthop., 1984, 4, 109-110.
24. Mathews S. S., Jones M. H., Sperling S. C. Hip derangement seen in cerebral palsied children. Am. J. Phys. Med., 1953, 32, 213-221.
25. Moreau H., Drummond D. S., Rogala E., Ashworth A., Porter T. Natural history of the dislocated hip in spastic cerebral palsy. Devel. Med. Child. Neurol., 1979, 21, 749-753.
26. Mubarak S. J., Valencia F. G., Wenger D. R. One-stage correction of the spastic dislocated hip. J. Bone Joint Surg., 1992, 74-A, 1347-1352.
27. Osterkamp J., Caillouette J. T., Hoffer M. M. Chiari osteotomy in cerebral palsy. J. Ped. Orthop., 1988, 8, 274-277.
28. Pritchett J. W. The untreated unstable hip in severe cerebral palsy. Clin. Orthop., 1983, 173, 169-172.
29. Rang M., Douglas G., Bennet G. C., Koreska J. Seating for children with cerebral palsy. J. Ped. Orthop., 1981, 1, 279-287.
30. Rang M. Cerebral Palsy. In : Morissy R. T. (ed.) : Lovell and Winter's Pediatric Orthopaedics. J. B. Lippincott, Philadelphia 1990, pp. 465-506.
31. Salter R. B. Innominate osteotomy in the treatment of congenital dislocation and subluxation of the hip. J. Bone Joint Surg., 1961, 43-B, 518-539.
32. Salter R. B., Dubos J. P. The first fifteen years' personal experience with innominate osteotomy in the treatment of congenital dislocation and subluxation of the hip. Clin. Orthop., 1974, 98, 72-103.
33. Samilson R. L., Tsou P., Green W. M. Dislocation and

subluxation of the hip in cerebral palsy. J. Bone Joint Surg., 1972, 54-A, 863-873.
34. Sauser D. D., Hewes R. C., Root L. Hip changes in spastic cerebral palsy. Am. J. Radiol., 1986, 146, 1219-1222.
35. Sharrard W. J. W., Allen J. M. H., Heaney S. H., Prendivill G. R. G. Surgical prophylaxis of subluxation and dislocation of the hip in cerebral palsy. J. Bone Joint Surg., 1975, 57-B, 160-166.
36. Sherk H. H., Pasquariello P. D., Doherty J. Hip dislocation in cerebral palsy : Selection for treatment. Dev. Med. Child. Neurol., 1983, 25, 738-746.
37. Steeger D., Wunderlich T. Zur Problematik der Korreketurosteotomie am Hüftgelenk spastisch behinderter Kinder. Z. Orthop., 1982, 120, 221-225.
38. Steel H. H. Triple osteotomy of the innominate bone. J. Bone Joint Surg., 1973, 55-A, 343-346.
39. Sutherland D. H., Greenfield R. Double innominate osteotomy. J. Bone Joint Surg., 1973, 59-A, 1082-1091.
40. Tachdjian M. O., Minear W. L. Hip dislocation in cerebral palsy. J. Bone Joint Surg., 1956, 38-A, 1358-1364.
41. Thom B. Die Antetorsion des koxalen Femurendes bei der infantilen Zerebralparese. Verh. Dtsch. Orthop. Ges., 1961, 49, 166-177.
42. Tönnis D. Die angeborene Hüftdysplasie und Hüftluxation im Kindes- und Erwachsenenalter. Springer, Berlin-Heidelberg-New York-Tokyo, 1984, pp. 312-321.
43. Tylkowski C. M., Rosenthal R. K., Simon S. R. Proximal femoral osteotomy in cerebral palsy. Clin. Orthop., 1980, 151, 183-192.
44. Zapfe E., Gaudin B. P. Indikation und Komplikation der Dreh-Varisations-Osteotomie bei Zerebralparesen. Orthop. Prax., 1980, 118, 291-293.
45. Zuckerman J. D., Staheli L. T., McLaughlin J. F. Acetabular augmentation for progressive hip subluxation in cerebral palsy. J. Ped. Orthop., 1984, 4, 436-442.

SAMENVATTING

J. JEROSCH, S. SENST, I. HOFFSTETTER. Gecombineerde femur- en bekkenosteotomie bij patiënten met infantiele cerebraal parese met heupluxatie, maar steeds ambulant.

In een retrospektieve studie werden de resultaten van 11 patiënten met een heupluxatie bij bekende infantiele cerebraal parese geëvalueerd. De patiënten werden alle geopereerd met het doel het heupgewricht te stabiliseren. Er werd een proximale femurosteotomie (varisatie en derotatie) als ook een bekkenosteotomie (triple osteotomie) doorgevoerd. De gemiddelde leeftijd van de patiënten was 14,4 ± 3,7 jaren. 7 patiënten waren vrouwelijk en 4 mannelijk. Alle 11 heupgewrichten konden met succes gestabiliseerd worden ; bij alle patiënten kon de heup gereponeerd worden. Pre-operatief konden vier van de 11 patiënten zonder en zeven slechts met hulpmiddelen lopen. Postoperatief verschlechterde de statomotorische functie bij geen enkele patiënt en een geringe verbetering kon bij 3 patiënten bereikt worden. De passieve abductie nam significant toe van 20° preoperatief naar 42° postoperatief. De flexie in het heupgewricht nam gering af van 101° naar 92°. De endorotatie nam significant af van 51° naar 37°. Exorotatie nam toe van 27° naar 41°. De CCD-hoek nam significant af van 138,9° naar 118,7°. De migratie index volgens Reimers verbeterde significant. De index was 50,2% preoperatief en 24,2% postoperatief. Preoperatief was de CE-hoek slechts -3° (± 11,3°) . Postoperatief bedroeg deze waarde 27,1° (± 5,3°). De ACM-hoek veranderde van 45,4° naar 49,5°. Het evenwicht tijdens het zitten kon bij alle patiënten verbeterd worden. Ook het probleem van de anale hygiëne kon worden verbeterd. Echter de tijdsduur van herstel, het bereiken van de preoperatieve status was significant langer in vergelijking met patiënten die geen infantiele cerebraal parese hebben. De revalidatie duurt tussen 8 en 14 maanden. Samenvattend denken wij dat de beschreven gecombineerde ingreep bij deze patiëntenpopulatie het beste de anatomie hersteld. Onze resultaten rechtvaardigen deze ingreep en de lange termijn resultaten zullen moeten bewijzen of deze ingreep de tand des tijds doorstaat.

RÉSUMÉ

J. JEROSCH, S. SENST, I. HOFFSTETTER. Réorientation combinée du fémur et du cotyle chez des infirmes moteurs cérébraux présentant une luxation de hanche encore capables de marcher.

Les auteurs ont évalué rétrospectivement les résultats obtenus chez 16 patients insuffisants moteurs cérébraux présentant une luxation de hanche, qui étaient encore capables de marcher. Ils avaient été traités chirurgicalement par ostéotomie du fémur proximal (varisation et dérotation) et ostéotomie acétabulaire (triple ostéotomie) pour stabiliser leur hanche. L'âge moyen était de 14,4 ± 3,7 années. Il y avait 7 filles et 4 garçons. Les 11 hanches ont toutes été correctement stabilisées. L'amplitude d'abduction passive a été significativement augmentée, passant de 20° en préopératoire à 42° en postopératoire. L'amplitude de la flexion a été légèrement réduite, de 101° à 92°. La rotation interne a

également été réduite, passant de 51° à 37° tandis que la rotation externe a été augmentée, passant de 27° à 41°. En préopératoire, les patients étaient tous capables de marcher, sans support pour 4 d'entre eux, avec support pour les 7 autres. La capacité d'ambulation a été légèrement améliorée chez 3 patients. L'angle CCD a été réduit significativement, passant de 138,9° en préopératoire à 118,7° en postopératoire. L'indice de migration selon Reimers s'est amélioré de façon significative, passant de 50,2% en préopératoire à 24,2% en postopératoire. Avant l'opération, on notait dans 4 cas une luxation de degré 1, dans 6 cas une luxation de degré 2 et dans un cas une luxation de degré 3. Une reposition complète a été obtenue chez tous les patients. En préopératoire, l'angle CE était de -3° (± 11,3°) et il a pu être porté à 27,1° (± 5,3°). L'angle ACM était de 45,4° en préopératoire et 49,5° en postopératoire. L'équilibre en position assise a été amélioré chez tous les patients. Les problèmes d'hygiène périnéale ont été améliorés. Cependant, le temps nécessaire pour recouvrer l'état préopératoire a été allongé par rapport à des patients non IMC. Il faut s'attendre à une période de revalidation de 8 à 14 mois. En résumé, nous pensons que la technique présentée, qui combine une ostéotomie de réorientation de l'acétabulum et du fémur proximal, restaure au mieux l'anatomie chez ce type de patient. Les résultats obtenus semblent justifier cette attitude ; il reste à montrer par une évaluation à long terme si les résultats résistent à l'épreuve du temps.