Iliopsoas Transfer in the Management of Established Dislocation and Refractory Progressive Subluxation of the Hip in Cerebral Palsy

W. J. W. Sharrard and J. Burke

Orthopaedic Department, Children's Hospital, Sheffield, England

Summary. The authors have reviewed 25 hips in 23 patients with cerebral palsy in which iliopsoas transfer had been performed for established dislocation or refractory progressive subluxation of the hip. The iliopsoas tendon was transferred either posteriorly or anteriorly, depending upon the degree of flexion of the hip. An adductor release was performed in all cases and an open reduction when necessary. A painfree stable joint was produced except for one hip in which the iliopsoas tendon had become detached because of sepsis. The loss of flexor power at the hip due to the transfer is thought to be a small price to pay for the relief of pain and spasm and the increase in function.

Résumen. Les auteurs ont effectué la révision de 25 hanches chez 23 malades atteints de paralysie cérébrale, qui ont bénéficié d'une transplantation du psoas pour luxation ou subluxation progressive de la hanche. Le tendon du psoas a été transféré par voie postéro-externe ou antéro-externe selon le degré de flexum irreductible de la hanche. La ténosynovite des adducteurs a été pratiquée dans tous les cas ainsi qu'une réduction sanglante lorsqu'elle a été jugée nécessaire. On a ainsi obtenu une articulation stable et indolore au sein d'un cas où le tendon du psoas s'est désinséré à la suite d'une infection. La perte de force des fléchisseurs de la hanche résultant de la transplantation est de peu d'importance en regard du soulagement de la douleur et de la spasticité et de l'amélioration de la fonction.

Key words: Hip, Dislocation, Subluxation, Cerebral palsy

Dislocation of the hip in cerebral palsy, as in other paralytic dislocations, develops when strong and spastic hip adductors and flexors are opposed by weaker abductors and extensors. Progressive subluxation leading to dislocation occurs most commonly between the ages of 5 and 7 years in spastic quadriplegia or diplegia and very rarely in hemiplegia. In 98% of patients with subluxation, early and adequate adductor release, with or without neurectomy of the anterior branch of the obturator nerve, and sometimes combined with lengthening of the iliopsoas tendon, is sufficient to reduce the hip and prevent recurrence of the subluxation. In a small percentage of patients these measures may fail and subluxation will progress and lead to dislocation. The purpose of this paper is to report the results of iliopsoas transfer in patients with established dislocation or refractory progressive subluxation of the hip in cerebral palsy.

Material

Twenty-three patients were available for review in whom 25 hips had been treated by iliopsoas transfer in Sheffield during the 12 year period between 1966–1978. There were 13 females and 10 males, the age at operation being from 3 years to 31 years. The mean follow-up was for 4.5 years with a minimum of 18 months and a maximum of 12 years. All of the patients had spastic quadriplegia and four also had athetosis.

Fourteen patients had scoliosis, nine of them showing a windswept deformity with one hip in the adducted position and the other hip abducted.

Group I. Established Dislocation

There were 15 hips with established dislocation in 14 patients. In 5 hips there had been no previous surgery. The other patients had undergone repeated operations including adductor release, obtura-
neurectomy and iliopsoas elongation. One patient had had a Chiari osteotomy, one a Salter osteotomy and one a varus and derotation femoral osteotomy.

**Surgical Management**

All patients underwent an adductor release and in 7 hips an open reduction was also necessary. If there was an excess of 30° of fixed flexion with the hip reduced, a postero-lateral iliopsoas transfer was performed [6], otherwise the iliopsoas was transferred antero-laterally [2]. There were 8 anterior and 7 posterior transfers in this group. If there was an excess of anteverision in an older child, a varus derotation osteotomy of the femur was performed 2 weeks later. This was necessary in 4 patients. In another a Salter osteotomy was performed to obtain a concentric reduction. In a further patient a Chiari innominate osteotomy was performed, followed by a Charnley arthroplasty 12 weeks later for severe degenerative changes noted at the first operation. All patients were immobilised in a plaster of Paris spica for 6 weeks and then treated by intensive physiotherapy appropriate to their potential ability for walking.

**Results**

At follow-up all the hips were clinically reduced, stable and pain-free, except for one hip which dislocated on adduction but remained in joint when nursed in abduction. This severely affected child with windswept limbs and scoliosis, had developed wound sepsis with discharge of a silk suture, and it is thought that the iliopsoas tendon had retracted from its fixation to the greater trochanter. Radiographic examination showed subluxation of the two joints with 30° or more of the head of the femur exposed, one after an antero-lateral transfer and the other following a postero-lateral transfer. Both were recorded as having 80° of anteverision at operation and should have received derotation varus osteotomies of the femur.

**Illustrative Case Reports**

D. H. A 3-year old girl with spastic quadriplegia presented with a painful, dislocated hip with generalised spasms. She had previously had an adductor and flexor release. A radiograph showed the hip to be dislocated (Fig. 1). An adductor release was performed with closed reduction of the hip and a postero-lateral transfer of the iliopsoas. At follow-up 3 years after operation the hip was reduced, stable and pain free, although the other hip showed evidence of progression of subluxation (Fig. 2).

J. S. A 14-year old girl with spastic quadriplegia had developed increasing generalised spasms with deterioration in the use of her lower limbs and upper limbs. She had been treated with a brain "pacemaker" in North America with no improvement in her spasms. A radiograph of the pelvis showed established dislocation of the left hip with flattening of the femoral head due to pressure of the overlying hip capsule and abductors (Fig. 3). After adductor release, open reduction, capsulorrhaphy, postero-lateral iliopsoas transfer and varus derota-

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**Fig. 1.** D. H. Established dislocation of the right hip with dysplasia of acetabulum

**Fig. 2.** D. H. Concentric reduction of the right hip three years after adductor release, closed reduction of the hip and postero-lateral iliopsoas transfer