ANTERIOR SOFT-TISSUE RELEASE OF THE HIP IN JUVENILE CHRONIC ARTHRITIS

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We report the results of anterior soft-tissue release of the hip for fixed flexion deformity in 17 patients (31 hips) with juvenile chronic arthritis. The mean age at operation was 8 years 6 months. All the patients were reviewed at one and three years and 11 (21 hips) were available for review at five years.

The results were good as regards early pain relief and improved mobility. At one year, the average fixed flexion deformity was reduced from 35° to 9.5°, and at three years it was 18°. This degree of improvement was maintained in the hips followed for five years.

At 5 to 12 years' follow-up (mean 6.7) seven patients (14 hips) have required no further surgery and have maintained an acceptable range of motion. We discuss the influence of surgery on radiographic changes and on femoral neck anteverision.

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In patients with juvenile chronic arthritis, involvement of the hip is the most important factor affecting mobility and independence (Isdale 1970; Ansell 1978). Initially, synovial hypertrophy and effusion cause pain and secondary muscle spasm. Later, fibrosis and periarticular contractures produce fixed flexion and adduction deformity, as joint destruction continues in the presence of active disease.

Total hip replacement has been shown to improve overall mobility and pain (Halley and Charnley 1975; Bisla, Inglis and Ranawat 1976; Colville and Raunio 1979; Arden 1983; Ruddlesdin et al 1986; Witt, Swann and Ansell 1991), but the high rate of loosening recently reported (Witt et al 1991) is of serious concern. This implies that early in the natural history of the disease, once conservative treatment has failed, other surgical options should be considered if they can delay the requirement for total joint replacement.

Few studies with sufficient numbers and follow-up have reported the results of soft-tissue release of the hip in juvenile chronic arthritis, and none has been prospective. Mogensen et al (1983) found that the range of motion was only temporarily improved: flexion contractures had relapsed to the preoperative level after an average follow-up of 48 months, but psosas tenotomies had not been performed. Swann and Ansell (1986) reported the results of psosas and adductor tenotomies; they found that improvement in flexion contracture was maintained after follow-up for three years.

The aim of our prospective study was to assess the value of a more extensive soft-tissue release. This was similar to that described by Souther (1914) for hip contractures in poliomyelitis. Its use has not been reported for fixed flexion deformity in juvenile chronic arthritis.

PATIENTS AND METHODS

From 1981 to 1987 we treated 31 hips in 17 patients with juvenile chronic arthritis for fixed flexion deformity by anterior soft-tissue release. There were 11 girls and 6 boys; their mean age at the onset of disease was 4 years 2 months (18 months to 9 years). The hip had been clinically involved in the disease for an average of 6 years 5 months (3 to 10 years) and the mean age at operation was 8 years 6 months (5 to 11 years).

The disease was systemic in onset in eight patients, polyarticular and seronegative in four, polyarticular and seropositive in three, and pauciarticular and seronegative in two. All patients were reviewed clinically and radiographically one year and three years postoperatively. Of these, 21 hips in 11 patients were reviewed after five years. Two patients (3 hips) had been lost to follow-up, one (2 hips) had died, and three (5 hips) had required total hip replacements.

We considered only active flexion in our assessment of the range of motion. Each patient was examined in a supine position, using Thomas's test to determine the degree of flexion contracture. Active flexion from that position, with gentle passive assistance, was measured with a goniometer.

Indications. We considered that soft-tissue release was
indicated for patients with severe pain and fixed deformity which had not responded to anti-inflammatory medication, physiotherapy and splinting.

In a typical case, internal rotation and adduction affected both hips, and the fixed flexion of the hips had led to secondary flexion deformity of the knees and increased lumbar lordosis. The adducted and internally rotated position of the hip tends to produce genu valgum and external tibial torsion. Even if only one hip is involved by the disease, the contralateral hip may develop a secondary flexion and adduction contracture or the abduction contracture which produces the so-called ‘windswept’ appearance. An additional indication for surgery in the presence of severe deformity of the hip was to prevent or reduce secondary changes in neighbouring joints.

Technique of operation. The incision starts over the iliac crest and extends to the anterolateral thigh. Skin flaps are reflected and the lateral cutaneous nerve of the thigh is identified and retracted medially. The iliac apophysis is then split longitudinally and the muscles are stripped from both surfaces of the ilium. Rector femoris is released from the anterior hip capsule and the anterior inferior iliac spine. Psoas is identified and divided. The capsule of the hip is incised along the line of the anterior margin of the acetabulum. The hip is not dislocated, but careful rotation of the leg makes it possible to remove most of the synovium. Bone is then removed from the anterior iliac crest to allow the split parts of the apophysis to be sutured together over the reduced iliac crest without tension. In the nine patients (17 hips) with adduction contractures, adductor release was performed through a separate medial incision.

The postoperative care is extremely important; it begins in the recovery room. Active assisted exercises start on the day of the operation and between sessions of physiotherapy both legs are held in abduction by skin traction. Prone lying is encouraged after two days. After suture removal at ten days, hydrotherapy is started, and followed by mobilisation on dry land. Night traction is continued at home for several months.

RESULTS

Pain and mobility. All our patients had early relief of pain. Before operation, eight patients were unable to walk because of hip disease and six had to use walking aids. All were able to walk when they were discharged from hospital, although nine patients required walking aids. The improvement in gait was usually maintained during medium-term review.

Range of movement. Figure 1 shows the mean range of motion in the hips related to the time interval after surgery. The average range of hip flexion before operation was from 35° (20 to 70) to 85° (60 to 100). At one year the average range was from 9.5° (0 to 25) to 87.5° (50 to 110). At three years this was 18° (0 to 40) to 81° (60 to 110). At five years only 11 patients (21 hips) were available for review; these showed an average range of hip flexion from 15° (0 to 30) to 89° (30 to 100).

Longer-term follow-up. One patient has died. Three patients (5 hips) required total hip replacement at an average of 6.3 years after soft-tissue release. Seven patients (14 hips) have not yet required any further surgery after an average of 6.7 years, and the range of motion in this group was from 11° (0 to 30) to 87° (60 to 100).

Radiology. Five patients showed some apparent radiographic improvement after soft-tissue release. There was an increase in joint space, clearer definition of the femoral head and acetabulum and reduction in general osteoporosis (Fig. 2), but more often there was evidence of continuing joint deterioration. The radiographic changes due to alterations in disease activity could not be distinguished from those due to the effects of surgery.

In a previous study of 14 of our patients (28 hips), CT of the proximal and distal femur had shown no correlation between femoral neck anteversion and the degree of fixed flexion deformity (Stirrat et al 1988). Follow-up scans of seven of these patients (14 hips) at 7 to 36 months after soft-tissue release showed no improvement in femoral neck anteversion.

DISCUSSION

Control of hip disease is very important for maintaining the mobility and independence of children with juvenile chronic arthritis. Where conservative measures have failed, soft-tissue release may produce considerable benefit by decompressing the joint and releasing joint contractures.

Jakubowski and Ruszczynska (1967) reported the results of soft-tissue release in 32 patients aged from 6 to 18 years. Nine of these were at the hip, but details of the operations and follow-up were not given and therefore the effect of the individual operations was not considered. Cranberry (1977) had successful results in 10 of 15 hip flexion releases and 5 of 10 adductor releases, but again no details were given. Mogensen et al (1983) reported
Flexion contracture of 26° before surgery was reduced to 9° at one year and this improvement was maintained in the 46 hips reviewed after three years.

Most of our patients had severe flexion contractures: 66% had 30° or more and the mean was 35°. This was the reason for our use of a more extensive release procedure. The addition of subtotal synovectomy had an uncertain effect but has been reported to be successful for pain relief if not range of motion (Albright, Albright and Ogden 1975; Mogensen et al 1982), probably because of decompression of the joint (Wingstrand et al 1985; Rydholm et al 1986). Such decompression is also produced by release of tight surrounding structures, particularly the iliopsoas tendon (Soto-Hall, Johnson and Johnson 1964), and may account for the good pain relief reported by Swann and Ansell (1986) who did not perform synovectomies.

Some of our patients showed radiographic improvement after surgery but this was probably related to changes in disease activity rather than to the operation itself. Swann and Ansell (1986) found similar improvement in half of their patients. The changes are presumably due to reversal of disuse osteoporosis and improved nutrition of articular cartilage from better joint congruity and function (Ekholm and Norbäck 1951; Salter and Field 1960).

In patients with juvenile chronic arthritis the valgus and antverted appearance of the femoral neck may be caused by soft-tissue contracture (Swann and Ansell 1986), muscle spasm and regional growth disturbances (Blane, Ragsdale and Hensinger 1987), or the persistence of the normal valgus angle of early childhood (Isdale 1970). The antverted seen in cerebral palsy and spastic hemiplegia is thought to be caused by abnormal muscle action (Staheli, Duncan and Schaefer 1968; Fabry, MacEwen and Shands 1973). If this was the only factor involved in juvenile chronic arthritis we would expect femoral antversion to correlate with flexion contracture; but this was not confirmed by Stirrat et al (1988), and we found no change in femoral neck antversion after soft-tissue release. Fabry et al (1973) reported similar findings in congenital dislocation of the hip. More severe growth defects affecting the proximal femoral capital epiphysis almost certainly play a role (Ansell and Bywaters 1956). It seems that, depending on the age of onset of disease at the hip, both abnormal muscle forces and growth disturbance are involved in failure of normal remodelling of the proximal femur.

We found that anterior soft-tissue release gave a satisfactory improvement in symptoms and range of motion. It is particularly indicated in children with a definite fixed flexion deformity.

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REFERENCES


