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Idiopathic Contracture of the Gluteus Maximus Muscle in Children

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Summary. Restriction of motion of the hip caused by contracture of the gluteus maximus is not uncommon. Twenty-seven children with this disorder were reviewed between 1975 and 1983. The clinical manifestations are very characteristic. All patients underwent surgical release of the fibrotic contracture tissue of the gluteus maximus with good results. The etiology of the disorder remains unknown. It is likely that the primary cause might be congenital in origin and that some predisposing condition exists. In addition, intramuscular injection might play an important role.

In recent years, it has become clear that restriction of motion of the hip caused by fibrosis of the gluteus maximus muscle is not uncommon. However, there have been few reports in the literature of contracture affecting the gluteus maximus. During the 8-year period from 1975 to 1983, 27 consecutive patients with contracture of the gluteus maximus were treated in Ji Shui Tan Hospital. The purpose of this paper is to review this series of patients and to discuss the etiology and surgical treatment of this condition.

This series consisted of 15 boys and 12 girls whose ages ranged from 3 to 14 years at the time of operation (median range – 7–10 years, mean – 8.5 years). Two patients were sisters. All of the patients had symmetrical involvement bilaterally without known causes. Four patients with abduction contracture of the hip were not included: two with the condition secondary to poliomyelitis with iliotibial band contracture; one in whom the condition occurred secondary to soft-tissue infection in the left buttock; and one with congenital dislocation of the hip in whom the condition occurred postoperatively. One patient with cerebral palsy with tightness of both heel cords was misdiagnosed and was also excluded.

Because the condition was thought to be uncommon, the majority of patients were misdiagnosed for many years as having rickets, gluteal muscle adhesion, coxa valga, or even discoid meniscus.

Clinical Features

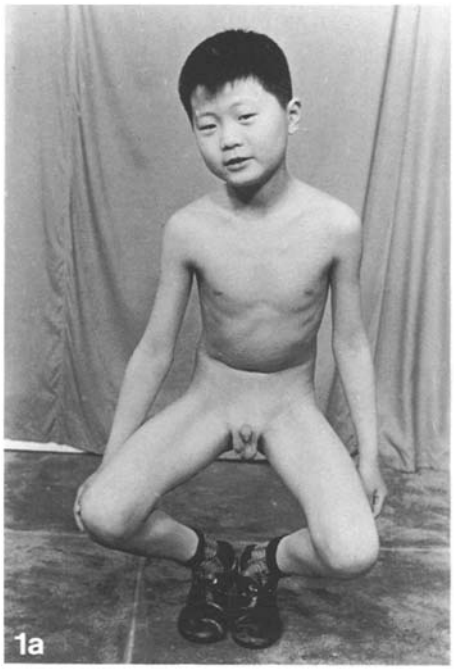
Most of the patients had a history of repeated infection treated with intramuscular injection of various drugs (mainly antibiotics and antipyretics) in the buttock area. On occasion, parents or teachers noted that the child had to open his or her legs widely before squatting down and had to repeat the same action while standing (Fig. 1a). They could not run fast and became fatigued easily. The onset was insidious and without fever, swelling, or pain.

On examination, the child often had an abnormal gait, with the lower limb kept in an attitude of external rotation (toeing out). The manifestation of the condition was symmetrical. There was a typical restriction of motion, such that the affected hip could not be flexed or extended in the usual sagittal plane (between 30° and 90°) with the hip in neutral position. Adduction was limited or absent. Squatting was possible only in a frog-leg position. There was a deeply depressed skin groove over the buttock running along the anteroinferior portion of the gluteus maximus to the greater trochanter, in which a hard, cordlike mass was palpable (Fig. 1b). The gluteal muscle was atrophic.

There were no radiographic findings, except for a slightly increased femoral neck-shaft angle with an apparent reduction of the CE angle.

Treatment

All of the patients underwent surgical treatment. With the patient under spinal anesthesia and lying on his or her side, the surgical field was draped in the usual manner with the leg free. With the hip flexed, a posterolateral incision along the skin



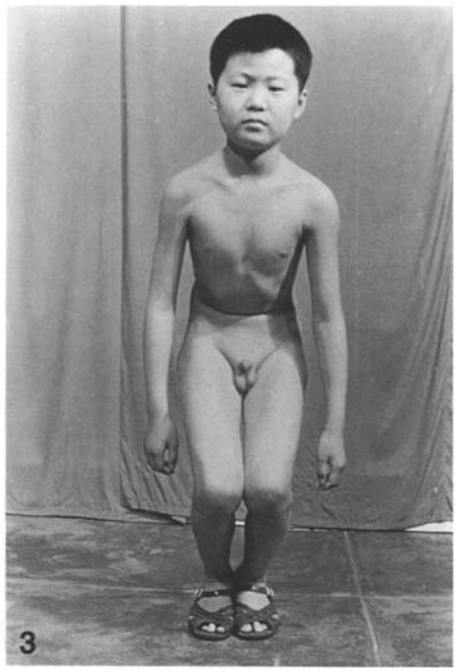
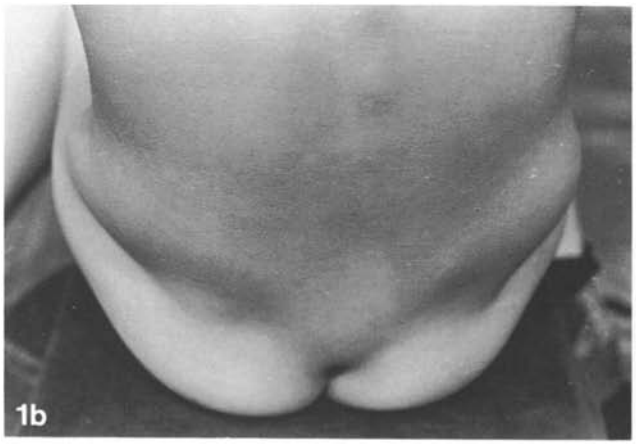
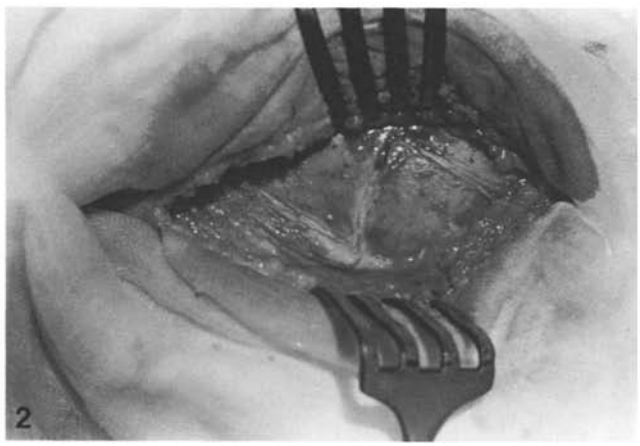


Fig. 1a, b. Preoperative photographs of a 10-year-old boy who had had some trouble with squatting, noticed by his teacher 2 years prior to admission. **a** Note the abnormal squatting position with both knees widely open. **b** Note the depressed skin groove on the buttock of both hips

Fig. 2. Intraoperative photograph shows the "Z" incision for releasing the contracture tissue

Fig. 3. Postoperatively, the patient is able to squat normally with the knees close together





groove was made. Occasionally, the skin adhered to the gluteal aponeurosis, which was then exposed distally at this attachment to the iliotibial band. Grossly, the pathological changes were located at the anteroinferior part of the gluteus maximus and posterior to the tensor fasciae latae. The fibrotic tissue became thickened for about 1 cm and formed a contracture band, which prevented hip adduction. A soft-tissue release was performed by complete division of the contracture tissue; that is, an incision was made parallel to the iliotibial band below the trochanter and then crossed its tip horizontally and continued proximally along the anterior part of the gluteus maximus (Fig. 2). The scar tissue, including the fibrosed part of the gluteus maximus, was completely incised. Care was taken to avoid injury to the sciatic nerve. The gluteus medius and minimus were virtually spared involvement. Before wound closure, it was verified that all contracture tissues had been released.

Neither immobilization nor traction was needed postoperatively. Active and passive motion was encouraged. The patient was able to get out of bed and begin exercising the day after surgery. One month later, most of the patients had returned to normal activity.

The micropathological examination showed proliferation and scarring changes in the collagen and muscular tissue. There was no evidence of inflammation.

Results

The follow-up period varied from 3 months to 9 years, with an average of 2.5 years. Correction of the hip contracture was apparent in the majority of patients (Fig. 3). Only two patients complained of somewhat restricted motion in the operated hips.

In this series there were no deaths, infections, gluteal muscle weakness, or secondary sciatic nerve injury. One patient developed a hematoma postoperatively.

Discussion

The gluteus maximus muscle can be divided into two portions, a superficial one and a deep one. The fibrotic changes in this series involved mainly the anteroinferior part of the superficial portion that terminates in the iliotibial band. In addition to being a powerful extensor and rotator of the thigh, the anterior part of the gluteus maximus is an abductor when the thigh is flexed. Thus, the contracture force of the fibrosed muscle pulls the iliotibial band backward and upward, with resultant restriction of hip motion and resultant deformity. Based on this, I propose the term "idiopathic contracture of the gluteus maximus" to differentiate this condition from that occurring secondary to definite causes such as poliomyelitis or infection.

At our institution, we have no experience with conservative treatment. All of the patients received surgical treatment with satisfactory results. The operation has proved to be simple, safe, and effective. The key procedure is the division of all contracture tissue along the anteroinferior portion of the gluteus maximus. Hang [1] reported that in half of his patients the involvement was deep, extending to the external rotators and the posterior part of the capsule of the hip. None of the patients in our series had such a serious involvement, except for one patient with multiple contracture of the hamstring, sacrospinalis, and the gluteus maximus, such that lengthening of both hamstrings was necessary.

The etiology of this condition remains mysterious [2, 4, 6]. Muscular dysplasia of congenital origin has been postulated, and a lesion similar to congenital torticollis has been suggested. On the other hand, Shen [5] reported four pairs of siblings in his series, and we also had two patients who were sisters. This may be suggestive of a genetic cause for this condition. None of these patients, however, was seen with the condition at birth. Intramuscular injection as a cause of this condition is widely supported [3]. However, most children who have multiple intramuscular injections in the buttock area do not develop this condition.

Thus, it is likely that some as yet unspecified predisposing condition exists. Intramuscular injections might then play a certain etiological role.

Whether this contracture of the gluteus maximus will recur is not known, because follow-up periods in our series have been too short to allow such a prediction. Only one patient complained of regression 2.5 years after surgery, but no evidence of recurrence was found upon examination.

The prognosis without treatment appears to be unfavorable. In this series, a 4-year-old girl who had surgery on her right hip complained of pain, fatigue, and weakness in the untreated left hip 6 years later. She was satisfied with the operation on the right hip and requested surgical treatment for the left.

Finally, a 7-year-old girl, followed up 6 years after surgery, was asymptomatic and had normal activity. The radiograph of both hips, however, showed that the neck-shaft angle of the femur had continued to increase. Whether or not this radiographic change represents an abnormal phenomenon must await long-term observation of additional patients.

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