

# Bilateral Gluteus Maximus Contracture in a Young Child: A Case Report and Review of Literature

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## Learning Point of the Article:

Post injection Gluteus maximus contracture can be diagnosed with a detailed history and examination, excision of fibrotic muscle, which is usually found between the Greater trochanter and Posterior superior iliac spine along with Z-plasty of Gluteus maximus muscle tendon can drastically improve functional outcome.

## Abstract

**Introduction:** Gluteus maximus contractures are uncommon in India. Only a few cases of this disease are reported in the Indian population. Common etiologies include congenital, post-injection, traumatic, and neuromuscular disorders. We report a case of bilateral isolated gluteus maximus muscle contracture due to repeated intramuscular injection.

**Case Report:** A 9-year-old male child from a village of North India presented to outpatient with difficulty in sitting cross-legged and squatting for the past 6–7 years. After clinical examination and relevant investigation, he was diagnosed as having bilateral isolated gluteus maximus contractures. He was treated with open release of contractures on both sides followed by physiotherapy. He was followed for 1 year and there was a significant improvement in his clinical symptoms and quality of life.

**Conclusion:** Gluteus maximus muscle contractures can easily be diagnosed on clinical examination. Patients present with characteristic clinical symptoms which should not be missed. Plain radiographs are usually normal. Magnetic resonance imaging findings typically show fibrotic bands and gluteal atrophy. Surgical release of contracture followed by gradual physiotherapy shows remarkable improvement in symptoms and quality of life for the patient.

**Keywords:** Gluteus maximus contracture, pediatric orthopedics, post-injection contracture.

## Introduction

Limitation of the movement of shoulder and knee joint following contractures of adjacent muscles has been frequently reported in literature [1, 2]. Limitation of hip joint movement due to gluteal muscle contracture (GMC) is relatively rare. Although GMC following repeated intramuscular injection is commonly reported in China and African countries, there are very few case reports of this entity in Indian subcontinent [3]. We report a case of isolated bilateral gluteus maximus contracture in a 9-year-old child.

## Case Report

A 9-year-old male child from a village of North India presented with complaints of inability to squat and sit cross-legged since the age of 2 years. The child had started walking at the age of 13 months before which he was able to crawl and sit on the floor. The mother (primary informant) also gives a history of febrile illness for which multiple injections were administered in both the buttocks following which the child gradually developed the disability. The parents initially noticed a mild limitation of hip motion which eventually progressed such extent that he has to left his school due to this disability and was having difficulty in

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## Author's Photo Gallery



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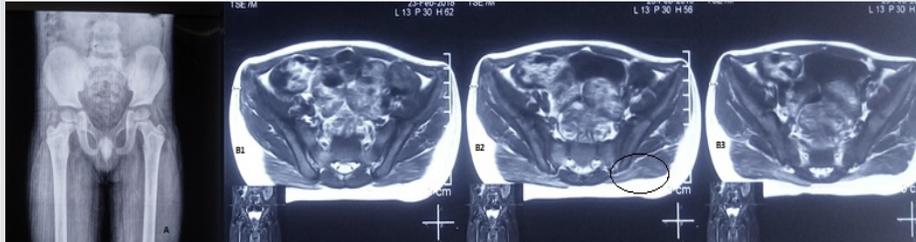
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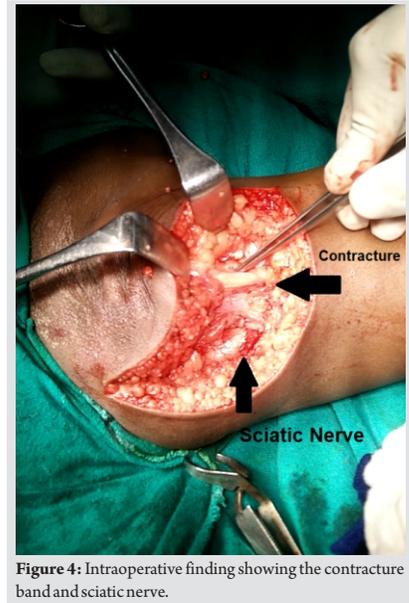
**Figure 1:** Pre-operative morbidity of the patient: (a) Inability to squat; (b) Restriction of flexion of both hips.



**Figure 2:** Pre-operative examination finding showing wasting and puckering in bilateral glutei.



**Figure 3:** Radiological investigations: (a) X-ray shows no abnormality. (b) Magnetic resonance imaging shows marked atrophy of bilateral glutei (left > right) with low-intensity band within upper and middle 1/3rd of belly of the left gluteus maximus (encircled in b3).



**Figure 4:** Intraoperative finding showing the contracture band and sciatic nerve.

maintain his personal hygiene (Video 1). The parents had not sought care for the child initially and he was being managed conservatively with physiotherapy, but the child was not showing any improvement (Fig. 1a). There was no significant pre-, peri-, or post-natal history. The child has no other significant history of previous illness apart from that febrile episode. He has no history of previous surgery or history of any long-term intake of medications. On examination, there was puckering in bilateral glutei muscle. There was atrophy and flattening of both glutei with left significantly more wasted than right (Fig. 2). Hip flexion was only 0–40° on both sides. Apart of flexion adduction and internal rotation was also restricted on both sides (Fig. 1b). There was no significant abnormality noted on plain radiograph (Fig. 3a). Magnetic resonance imaging (MRI) showed marked atrophy of bilateral glutei (left > right) with low-intensity band within upper and middle 1/3rd of belly of the left gluteus maximus. Mild medial retraction of distal body of the tendons of gluteus maximus was also noted (Fig. 3b). After thorough evaluation, a diagnosis of bilateral gluteus maximus muscle contracture was made and he was planned for open release of contracture. Open release of contracture was done in two separate settings at an interval of 1 week. The left side was operated before the right side. On the left side, we released the gluteal muscle from the iliac crest, but it

did not improve the range of motion of hip joint, then we cut the gluteus maximus tendon and fibrotic band near greater trochanter, after cutting the tendon, we were able to flex the hip joint to >90°. On the right side, we did not attempt to release gluteus muscle from the iliac crest as we found it to be ineffective. Only the tendon and fibrotic band were released following which an improvement in flexion noted intraoperatively. Sciatic nerve was identified and protected in both procedures (Fig. 4). Post-operative period was uneventful and there was no complication related to wound healing. Gradual passive physiotherapy and range of motion exercise were started 2–3 days after surgery. After 1 year of follow-up, the child had good range of motion. He was able to squat and sit cross-legged. Hip extension was possible in both hips. There was hypertrophic scar formation on both sides, for which he was advised treatment, but the parents refused for treatment (Fig. 5) (Video 2).

**Discussion**

Gluteus maximus contractures restricting hip joint movement are a relatively rare entity. Common etiology that can lead to GMC includes poliomyelitis, history of abscesses in buttocks, idiopathic GMC, and repeated intramuscular injection. A few case reports of idiopathic gluteus maximus contracture are reported in India [3, 4, 5]. GMC can easily be diagnosed by clinical examination. Attitude of abduction and external rotation with a limited flexion and adduction are pathognomonic [3]. Patients are unable to bring their knees together when they squat and crouch [1]. Ober sign is also positive when there is a contracture of iliotibial band and/or tensor fascia lata [2]. “Reverse Ober’s sign” is pathognomonic of gluteus maximus contracture. Each patient was found to have



**Figure 5:** Post-operative follow-up at 1 year: (a) Hypertrophic scar at surgical site; (b, c) improved flexion in both hips; (d, e) extension of both hips possible; (f) child is able to sit cross-legged.



full hip adduction when the hip was extended but a hip abduction contracture when the hip was flexed. This finding of increasing abduction as an extended/adducted hip is flexed to 90 degrees is described as a positive "reverse Ober test." After surgical treatment, all hips could adduct to neutral from full extension to full flexion." [6]. Out-toeing gait, flattened and cone-shaped buttock, apparent leg length discrepancy, pelvic obliquity, and compensatory lumbar scoliosis are also reported findings [2, 4, 7]. The role of plain radiograph is to rule out other pathologies. Plain radiography shows minimal or no abnormality in early stages. In late stages, an iliac hyperdense line running parallel to the sacroiliac joint in anteroposterior view can be seen, but in our patients, there was no such radiological finding. MRI is the modality of choice. Common findings include atrophy of gluteus maximus in the presence of fibrotic bands appearing as a low-intensity signal in all the sequences. In advanced cases, medial retraction of the distal muscle belly and tendon of gluteus maximus along with the external rotation of the proximal femur and posteromedial retraction of iliotibial tract occurs [1, 8]. Contracture of glutei muscle following repeated intramuscular injection is known entity in China and African countries. Direct trauma to muscle due to repeated injection as well as certain chemicals and drugs as benzyl alcohol and quinine has been reported to cause fibrosis of the affected muscle. Even a single intramuscular injection given by mistake in segmental vessel of gluteal muscle can lead to contracture of a particular segment of gluteus maximus muscle [6, 9, 10]. Non-operative management with massage, physiotherapy, shortwave diathermy, and active and passive stretching exercises is reported to be effective in 38–39% of patients [11]. Operative interventions include an open release, endoscopic release, and minimally invasive method. Conventional open release can be used in all cases of GMC, especially in severe cases as it allows adequate exposure for release of the fibrotic bands. A sequential release based on the muscle groups involved from superficial to deep is done till

all signs of the contracture are resolved intraoperatively. Z-plasty of the contracture has also been advocated [12, 13, 14, 15]. Open release also provides with the flexibility of the shape of incision, clear exposure less tissue damage, low recurrence, and high safety [13]. Acute hematoma, neurovascular injury, wound infection, wound dehiscence, hypertrophic scar, and a Trendelenburg gait are complications related to open release. Post-operative hematoma is a common complication which is prevented by positioning the patient in lateral position and ice packs which allows adequate compression and positional drainage [13]. Rehabilitation is started once drain is removed or when post-operative pain subsides and consists of active and passive flexion of knee and hip without crossing their legs, walking straight, and crouching with closed knees. Vigorous exercises are avoided till wound is fully healed to prevent any hematoma formation.

### Conclusion

Acquired GMC is relatively rare in the Indian subcontinent but commonly found in China and Africa. A thorough history and clinical examination is all that is required to obtain a diagnosis of GMC. MRI is the imaging modality of choice for confirmation of diagnosis. Open release of contracture followed by gradual exercises can drastically improve function. A timely diagnosis and surgical treatment can significantly improve quality of life.

### Clinical Message

Gluteus maximus contractures are relatively rare in the Indian subcontinent. They are usually associated with injections to the gluteal region and manifest with difficulty sitting cross-legged and squatting. A detailed history and examination is usually adequate to reach a diagnosis. Many treatment options are being used to treat the contractures, a simple open release of the contracture significantly improves the range of motion in the hip as well as the quality of life of the patients.

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**Conflict of Interest:** Nil

**Source of Support:** Nil

**Consent:** The authors confirm that Informed consent of the patient is taken for publication of this case report

#### How to Cite this Article

Sinha S, Gupta S, Kanojia RK. Bilateral Gluteus Maximus Contracture in a Young Child: A Case Report and Review of Literature. *Journal of Orthopaedic Case Reports* 2019 Mar-Apr; 9(2): 60-63.