

Ischiofemoral Impingement Surgery Following Lumbar Spine and Sacroiliac Joint Fusion: A Case Report

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Abstract

Introduction: Ischiofemoral impingement is a cause of posterior hip pain and limitation in hip extension. The compensatory motion at the lumbar spine associated with limitation in hip mobility has been associated with low-back pain, and an increase of 30% in the load at L3-L4 and L4-L5 lumbar facet joint is reported in a cadaveric study involving simulated ischiofemoral impingement.

Case Presentation: A 66-year-old female developed low back pain associated with bilateral hip pain over a period of 12 years. The symptoms persisted despite 5 surgical interventions in the lumbar spine and sacroiliac joints. Impingement between the lesser trochanter and ischium, with limitation of hip extension, was identified on the physical examination and imaging studies. The patient underwent endoscopic partial resection of the lesser trochanter bilaterally. The Oswestry lumbar disability index improved from 56% before surgery to 14% at the 17-month follow-up. Impingement between the lesser trochanter and ischium should be considered in the differential diagnosis of low back pain.

Conclusion: Ischiofemoral impingement should be considered as a differential diagnosis for patients with unsuccessful lumbar spine surgery.

Keywords: Ischiofemoral impingement, Low back pain, Hip pain

Introduction

Ischiofemoral impingement (IFI) is a cause of posterior hip pain and limitation in hip extension [1–4]. IFI was first described in 1977 by Johnson [1] in a report of three patients with persistent hip pain after hip arthroplasty or proximal femoral osteotomy. Narrow ischiofemoral space related hip pain has also been reported in patients without a history of hip surgery [5]. IFI occurs more commonly in females [3, 6, 7] and at all ages, ranging from 11 to 77 [3, 8]. Bilateral hip involvement has been observed in 25–40% of cases [3, 6]. Although hip pain is a frequent symptom in patients with IFI, the association of low back pain in the presence of IFI was only recently described in 24 patients [7]. The present study reports a patient with chronic low back and bilateral hip pain who underwent multiple surgical interventions at the lumbar spine and sacroiliac joints without resolution of her symptoms. IFI was diagnosed, followed by the endoscopic treatment with partial resection of the lesser trochanter in both hips.

Case Report

A 66-year-old woman, retired nurse, presented after 12 years of low back pain associated with bilateral posterior hip pain, worse on the left hip. The symptoms were aggravated by sitting, standing, side-lying, and climbing stairs. Partial relief was achieved with ice, analgesics, and cortisone injections. The low back disability index was 56% [10], the modified Harris hip score (mHHS) was 49.5 on the left hip and 77 on the right hip.

The patient had been evaluated by multiple health professionals and underwent five previous surgical interventions to treat low back pain, including fusion from L4 to S1, left sacroiliac joint fusion, right sacroiliac joint fusion, implantation of pain neuromodulator, and revision of the pain modulator device. Unfortunately, the symptoms persisted following the lumbosacral surgical procedures.

On the physical examination, the patient was able to bend forward to 70°. The patient had no low back pain on lumbar hyperextension, although left side lumbar bending was painful. On gait exam, walking with long strides increased the symptoms in the lumbar spine and posterior hip. Arterial pulses, reflexes and sensory exam of both lower extremities were normal. The physical exam for intra-articular hip pathology was negative. On the lateral decubitus position, pain on palpation was noticed at the left and right greater trochanter. Recreation of posterior hip and low back pain, with pelvic and lumbar movement in adaptation to the limited hip extension, were observed by bringing the hip into passive extension with zero degrees of abduction and neutral rotation. Pain relief was obtained by extending the hip in abduction. Abductor weakness was detected by testing active abduction against resistance, rated as four out of five (able to overcome gravity and some resistance).

The radiographies demonstrated instrumentation and arthrodesis from L4 to S1, bilateral sacroiliac joint fusion implants, and an implanted neuromodulator at the lumbar spine (Fig. 1a). Acetabular overcoverage with medialization of the femoral head, enlargement of

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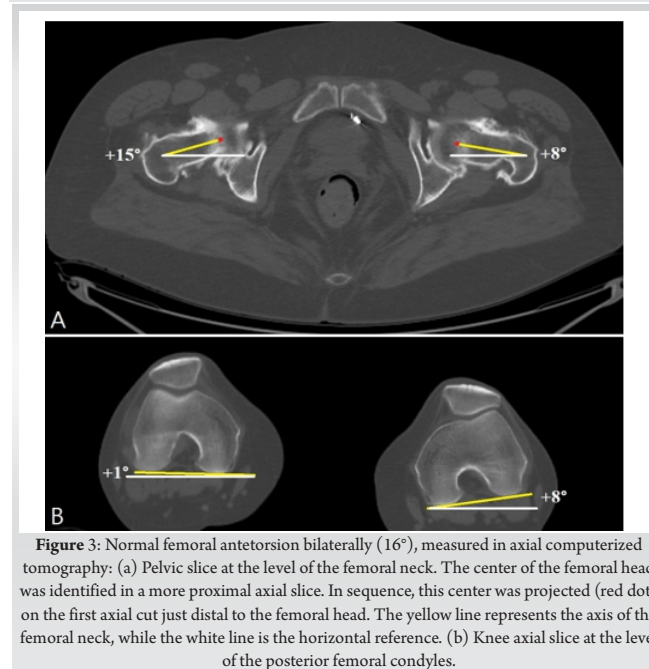
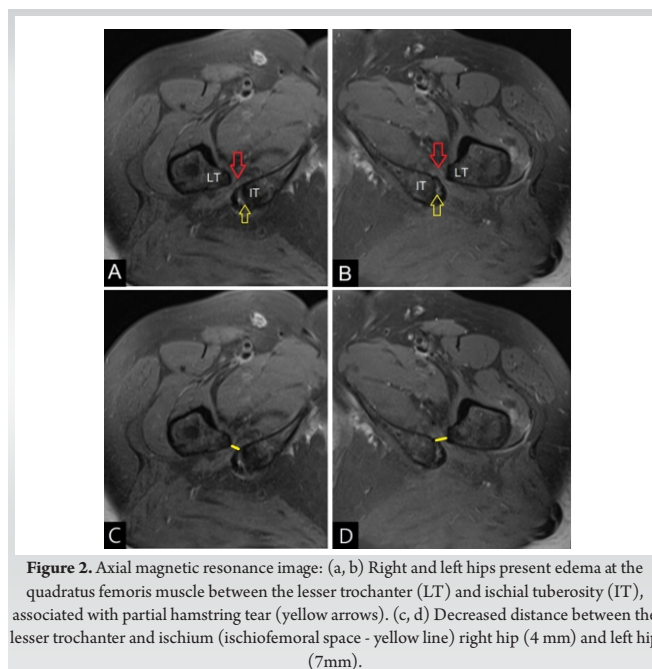
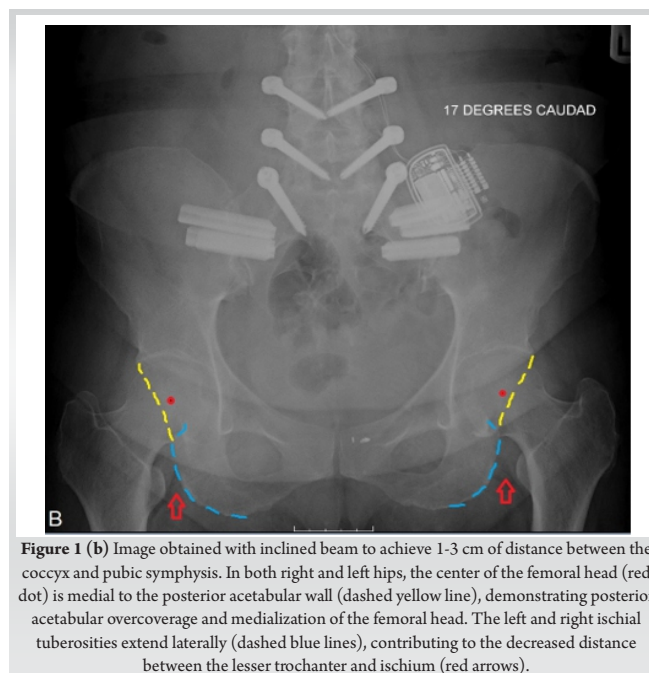
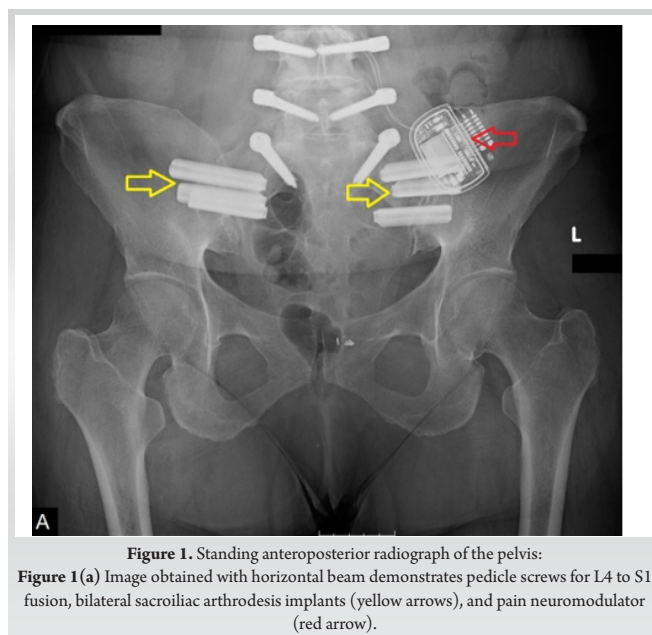
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the ischial tuberosities, and decreased distance between the lesser trochanters and ischium were also noted (Fig. 1b).

A computed tomography (CT) of the lumbar spine demonstrated L4-S1 fusion without central or foraminal stenosis. The magnetic resonance (MRI) of the pelvis showed edema and fatty infiltration in the quadratus femoris muscle bilaterally, with decreased ischiofemoral space (Fig. 2). The ischiofemoral space was determined in a MRI obtained with the lower limbs positioning observed in a standing position, considering the distances between the knees, ankles, and the lower limb rotation. A partial tear of the gluteus minimus was observed in both hips. Normal femoral antetorsion (16°) in the right and left hips was observed in the controlled CT study (Fig. 3). Intra-articular CT-guided injection with anesthetic provided no symptom relief.

Conservative treatment was not successful, including abductor

strengthening, patient education to walk with short strides at normal speed, or to abduct the hips when walking faster. Surgery was indicated in both hips to address the IFI. Partial resection of the lesser trochanter was performed in the left hip, followed by the right hip four months later. The patient was positioned supine on a traction table, with 20° of contralateral tilt, and the lesser trochanter was partially resected endoscopically through a posterolateral approach [4]. The lesser trochanter was reached through a window in the quadratus femoris muscle (Fig. 4), between the medial femoral circumflex artery and first perforating branch of the profunda femoris artery. Post-operative rehabilitation included weight bearing as tolerated, six weeks. The patient was instructed to avoid active hip flexion for six weeks, utilizing her upper limbs to passively flex the hip.

Improvement in low back and hip pain was observed after surgery. The

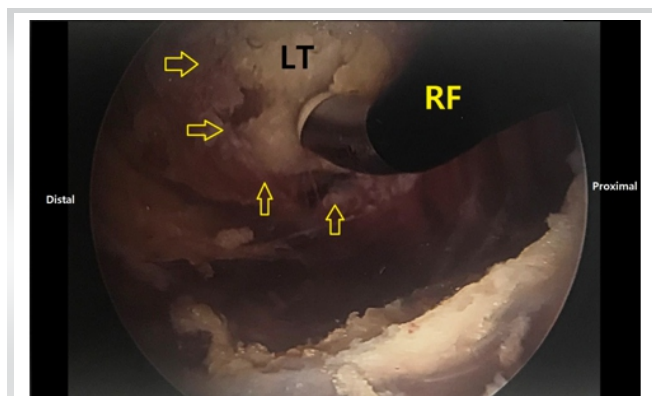


Figure 4: Endoscopic partial resection of the lesser trochanter (LT) in the left hip. The LT is reached through a small window created in the quadratus femoris muscle (yellow arrows)



Figure 5: Post-operative radiographs following partial resection of the lesser trochanter.

Figure 5 (a) Anteroposterior pelvis radiograph. The yellow arrows indicate the topography of the resected lesser trochanters.

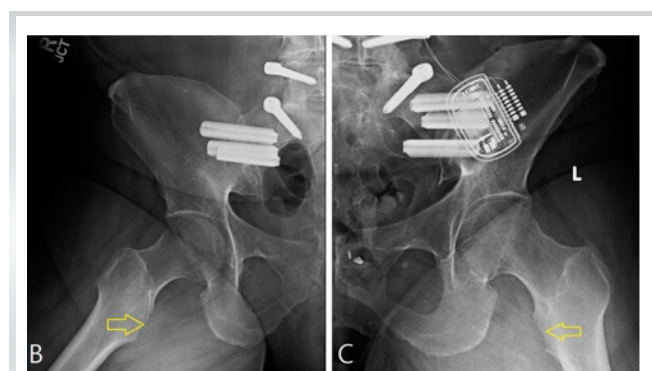


Figure 5 (b): Six-month post-operative lateral radiograph of the right hip. (c) Twelve-month post-operative lateral radiograph of the left hip.

mHHS of the left hip improved from 49.5 before surgery to 95.7 at 17 months after surgery. The mHHS of the right hip improved from 77 before surgery to 100 at 12 months after surgery. The Oswestry disability index improved from 56% before the hip surgeries to 14% at 17 months after the left hip surgery. Although a partial detachment of the iliopsoas tendon had to be performed in both hips to resect the lesser trochanter, the patient did not complain of flexor weakness. No heterotopic ossification was observed in radiographies performed at six and 12 months after surgery (Fig. 5).

Discussion

The case presented in this manuscript illustrates the association between low back pain and limitation in hip extension provoked by impingement between the lesser trochanter and ischium. The improvement in low back pain following the surgical treatment for IFI observed in our patient is explained by the restoration of hip extension, which is fundamental for activities requiring an upright erect posture.

The MRI findings of decreased ischiofemoral space and edema in the quadratus femoris muscle were utilized for the diagnosis in our patient. However, the MRI is a static exam and the distance between the lesser trochanter and the ischium is variable along the gait cycle, decreasing in the terminal stance of the single support phase in comparison to the double support phase [11]. Therefore, active and passive physical examination testing was essential for the diagnosis of IFI, by allowing the dynamic testing of the relationship between the lesser trochanter and ischium, with simultaneous assessment of the pelvis and lumbar accommodation secondary to limited hip extension.

In addition to the osseous clearance provided by the partial resection of the lesser trochanter, the partial release of the iliopsoas insertion at the lesser trochanter may also have contributed for increasing hip extension. Post-operatively, our patient was instructed to avoid active hip flexion for 6 months following lesser trochanter resection, as to avoid detachment of the remaining insertion of the iliacus muscle inserted anteriorly. The patient did not complain of hip flexion weakness in the post-operative period. Exercises for abductor strengthening were also recommended, as the ischiofemoral space dynamically decreases in individuals with abductor weakness [12].

Additional osseous causes of limitation in hip extension can occur concomitantly to IFI and should be considered in the diagnosis of patients with hip and low back pain [13, 14]. Femoral torsion abnormalities, posterior acetabular overcoverage, or posterior cam deformity can limit hip extension through the premature coupling between the acetabulum and femur [13, 14]. The lower extremity biomechanical axis should also be considered in patients with hip and low back pain, as knee valgus and foot deformities may lead to a decreased ischiofemoral space.

In summary, IFI needs to be considered in the differential diagnosis for patients with hip and low back pain. Our case demonstrates the overlooked diagnosis of IFI as the mechanism behind low back pain. Here, the persistence of low back pain despite multiple surgical interventions was corrected by addressing bilateral ischiofemoral impingement. Further investigations are necessary to estimate the prevalence of IFI in patients with chronic low back pain, especially in individuals without improvement following surgery at the lumbar spine.

Conclusion

Awareness of ischiofemoral impingement and knowledge of its clinical presentation as not only hip pain, but also back pain, will facilitate care of patients with chronic idiopathic low back pain. In this case, the persistence of low back pain despite multiple surgical interventions was corrected by addressing bilateral ischiofemoral impingement. The significant improvement in our patient highlights the importance of considering IFI in patients with back pain in association with hip pain.

Clinical Message

When patients note ongoing low back pain following multiple corrective surgeries, one should consider the presence of ischiofemoral impingement in the presence or absence of hip pain, and note the successful management with lesser trochanteric resection and iliopsoas tenotomy.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his/her consent for his/her images and other clinical information to be reported in the Journal. The patient understands that his/her name and initials will not be published, and due efforts will be made to conceal his/her identity, but anonymity cannot be guaranteed.

Conflict of Interest: None, **Source of Support:** None

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