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Case Report

Obturator internus muscle strains

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ABSTRACT

We report 2 cases of obturator internus muscle strains. The injuries occurred in young male athletes involved in kicking sports. Case 1 details an acute obturator internus muscle strain with associated adductor longus strain. Case 2 details an overuse injury of the bilateral obturator internus muscles. In each case, magnetic resonance imaging played a crucial role in accurate diagnosis.

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Introduction

Obturator internus muscle strains are extremely rare [1–3]. A small case series has described obturator internus muscle injury occurring alongside injury of other gluteal muscles after posterior hip dislocation secondary to trauma [4]. We describe 2 cases of obturator internus strain in high level young male athletes involved in kicking sports. The first occurred acutely and was associated with adductor longus strain, whereas the second was a repetitive strain injury of the obturator internus muscle and occurred bilaterally. To our knowledge, we describe the first reported incidence of bilateral obturator internus strain secondary to overuse.

Case report

Case 1

A 28-year-old male athlete presented to his physiotherapist with a 1-day history of left buttock pain. The pain was of sudden onset and occurred during a Gaelic football match when the patient bent to pick up a ball, while simultaneously twisting. On examination, the patient was tender over the left ischial tuberosity and the deep gluteal muscles. External rotation and extension at the hip were painful.

The patient was referred for magnetic resonance imaging (MRI) left femur with a suspected left common hamstring tendon avulsion.

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Table 1 – Grading of muscle strains.

Muscle strain: a partial or complete muscle tear	
Grade 1	Few muscle fibers are torn, no loss of function, and interstitial blood. MRI (T2) shows: <ul style="list-style-type: none"> • Feathery, interstitial increased signal in muscle • ± increased signal between muscles.
Grade 2	More muscle fibers are torn, some loss of strength, focal defect, and interstitial blood in muscle. MRI (T2) shows: <ul style="list-style-type: none"> • Feathery, interstitial increased signal in muscle • Increased signal between muscles • ± focal muscle defect • Tendon thinned, irregular, lax, and increased signal surrounding tendon.
Grade 3	Muscle completely torn, loss of strength, focal, and interstitial blood. MRI (T2) shows: <ul style="list-style-type: none"> • Feathery, interstitial increased signal in muscle • Complete muscle disruption with increased signal in gap between retracted segments • Increased signal between muscle fragments • Discontinuity of tendon within muscle.

While the MRI showed mild inflammatory changes at the left common hamstring tendon, there was no evidence of avulsion. MRI showed extensive intramuscular edema within the left obturator internus muscle with some internal partial thickness tearing of its fibers and extensive surrounding hemorrhage and soft tissue edema. These findings were consistent with grade 2 strain injury of the left obturator internus muscle (Table 1). There was also evidence of a grade 1 strain of the proximal left adductor longus muscle (Figs 1A and B).

The patient was managed with a period of targeted physical rehabilitation. He made a full return to sports 3 weeks later.

Case 2

A 17-year-old male athlete presented to the clinic of a sports and exercise medicine specialist complaining of a 6-week history of right groin pain (localized to the right pubic region). The onset of pain was while playing Gaelic football and it had followed a several months period of intensive training. The patient had been managed with an initial period of rest followed by rehabilitation. Return to training was complicated by an immediate recurrence of the pain.

Examination revealed a mild genu varus deformity, mild pes planus, and mild foot pronation. There was a mild to moderate tenderness at the tenoosseous attachment of the right adductor longus to the medial right pubic bone. Normal ranges of pain free hip joint movement were observed and the patient demonstrated excellent power and strength with resisted adduction and internal and external rotation.

MRI revealed extensive bilateral edema within the bilateral obturator internus muscles, more marked on the right. This was consistent with overuse or repetitive strain injury of the bilateral obturator internus muscles. MRI was also positive for mild osteitis pubis (Figs 2A and B).

The patient was diagnosed with a musculoskeletal overuse injury in the context of incomplete skeletal maturity and a recent skeletal growth spurt. He was treated conservatively with nonsteroidal anti-inflammatories, and advised to refrain from sporting activities for a period of 6-12 weeks. He was advised to modify and restrict his training, especially with respect to high agility maneuvers on return to sports. He made a full recovery.

Discussion

The obturator internus muscle originates inside the bony pelvis, where it is attached to the internal surface of the obturator membrane and surrounding bones. It leaves the pelvis through the lesser sciatic foramen and receives tendinous fibers from the superior and inferior Gemelli. These 3

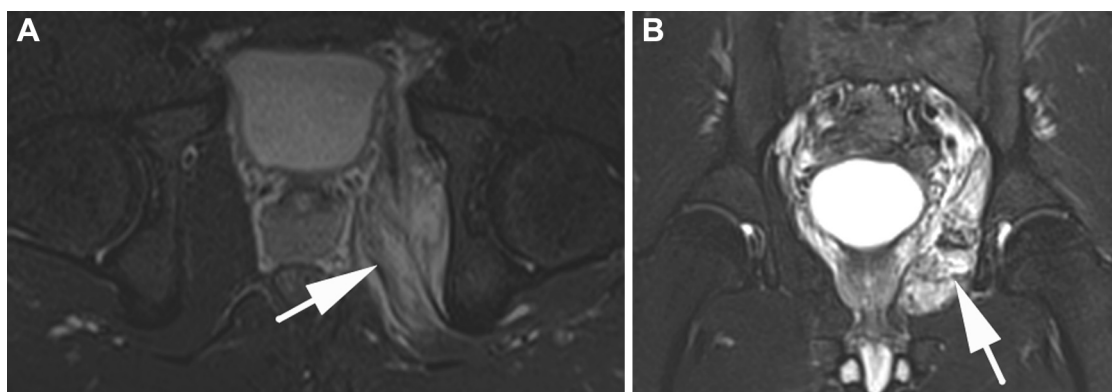


Fig. 1 – (A) (Case 1) Axial STIR image showing extensive intramuscular edema within the left obturator internus muscle with high-grade internal partial thickness tearing of its fibers (arrow). There is surrounding hemorrhage and soft tissue edema. (B) (Case 1) Coronal STIR image showing extensive intramuscular edema within the left obturator internus muscle with some internal partial thickness tearing of its fibers (arrow). There is surrounding hemorrhage and soft tissue edema. STIR, Short T1 Inversion Recovery.

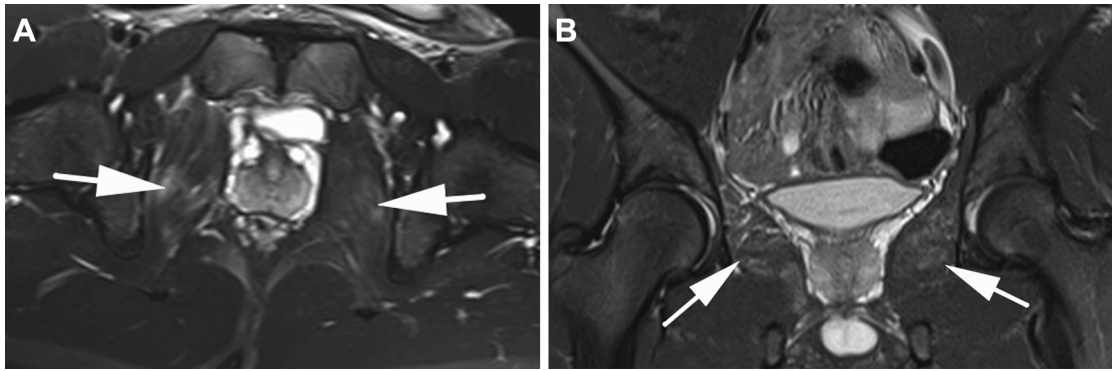


Fig. 2 – (A) (Case 2) Axial STIR image showing bilateral edema within the obturator internus muscles (arrows), more marked on the right. (B) (Case 2) Coronal STIR image showing bilateral edema within the obturator internus muscles (arrows), more marked on the right. STIR, Short T1 Inversion Recovery.

muscles form a functional unit the triceps coxae and insert onto the medial surface of the greater trochanter of the femur [5,6]. Obturator internus and the Gemelli together with obturator externus, piriformis, and quadratus femoris comprise the short lateral rotators of the thigh. These muscles externally rotate the thigh and have a role in abduction and adduction at the hip [6]. They are considered stabilizers of the thigh holding the femoral head in the acetabulum throughout ranges of motion and have been likened to the rotator cuff of the shoulder [7,8].

Injury of the obturator internus muscle is rare. It has been reported in young male athletes involved in kicking sports because of tackling, falling, and kicking. Patients have presented with buttock pain. There is a broad differential for acute gluteal pain in athletes, and this includes hamstring, gluteal, adductor and external rotator strains and avulsions, fracture, slipped capital femoral epiphysis, labral injuries, and lumbar radiculopathies [9]. History and clinical examination are helpful in narrowing the differential diagnosis; however, some pathologies, especially those involving the deep gluteal muscles can be difficult to distinguish clinically. MRI is helpful in establishing a diagnosis [1,2]. The important role of MRI is illustrated in case 1, where clinically the patient was suspected to have an avulsion injury of the common hamstring tendon insertion, but was instead found to have an obturator internus strain. Accurate diagnosis is important when formulating a rehabilitation program. Athletes with acute obturator internus strain appear to do well with a period of rest followed by physical rehabilitation [1].

Case 2 is unusual in that it is, to our knowledge, the first reported case of bilateral obturator internus strains. It is also the first reported case of long-term overuse injury of the obturator internus muscle. The patient initially complained of right groin pain, a common sporting injury. He was treated with a period of rest and rehabilitation but suffered an immediate recurrence of symptoms on return to full sporting activity. Clinically, the patient did not have any pain on resisted internal or external rotation at the

hip. He was mildly tender at the insertion of the right adductor longus tendon. On MRI, the patient was found to have bilateral obturator internus strains with mild traumatic osteitis pubis. This case again highlights the importance of MRI for accurate diagnosis. The patient was managed with a period of rest followed by targeted rehabilitation and activity modification, and made a successful return to sports.

Obturator internus muscle strains are rare. They respond well to rest and targeted rehabilitation programs. MRI plays a critical role in their diagnosis.

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