

# **Acute *obturator internus* muscle strain in a rugby player: a case report**

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*A 28-year-old male rugby player presented with severe onset of right hip pain when he fell awkward after a ruck during an international match. A rare case of an acute strain of the obturator internus muscle, a deep muscle of the hip joint, is reported, which resolved completely after a period of rest and intense active physical therapy.*

KEY WORDS: SPRAINS AND STRAINS - MUSCLES - ATHLETIC INJURIES - HIP.

Very little is reported in the literature on obturator internus muscle strain and rehabilitation.<sup>1</sup> Due to the location of the obturator muscles and the complex anatomy of the hip joint, clinical evaluation poses a challenge that requires expert knowledge.

Differential diagnosis includes a multitude of abnormalities, many of which are either unsuspected or difficult to diagnose without advanced imaging.<sup>2</sup>

The *obturator internus* muscle arises on the internal surface of the pubis rami and obturator membrane, attaches to the posterior bony margins of the obturator foramen, and exits the pelvic cavity through the smaller sciatic foramen. It is located partly within the lesser pelvis, and partly at the back of the hip-joint. It functions as a hip external rotator to abduct and externally rotate the thigh laterally away from the midline of the body, and steady the femoral head in the acetabulum.<sup>3</sup>

### **Case report**

This report describes a case of a 28-year-old frontline rugby player who presented with acute onset of right hip pain during an international match between South Africa and New Zealand in September 2013. He completed the match, but complained of pain in the right groin-, gluteal- and proximal hamstring areas.

The patient injured his hip when he fell awkward after being rucked and most likely abnormally burdened the *obturator internus* muscle with the rotation and flexion of his hip joint. The patient had no medical problems, took no medications, and had never had a previous injury to the hips.

No visible swelling or bruising was observed in the inguinal-, gluteal- or posterior thigh areas and neither were there pain on palpation of any of the muscles in these areas. The patient experienced pain on active abduction of his hip and also experienced pain on resistance of hip flexion on the affected side.

Magnetic resonance imaging (MRI) was performed on a 3 Tesla unit, two days after the initial injury. Large field of view examination of the pelvis, with body and posterior coils was obtained (Figures 1, 2).

The MRI scan demonstrated an acute injury of the internal obturator muscle on the right, with prominent muscle changes noted in the deep intrapelvic muscle bulk, with swelling, edema and a partial tear, but no complete disruption of the muscle. Slight edema was also present as the muscle exited the pelvis, with the distal muscle and tendon insertion intact.

The rest of the MRI examination was insignificant, with no further evidence of bone marrow oedema or fractures in the pelvic ring, and no further acute muscular injuries noted.

The patient had total rest for 7 days during which he received physiotherapy treatment consisting of local anti-inflammatory treatment of the affected area and symptomatic soft tissue treatment of stiff hip flexor-, adductor- and gluteal muscles.

The patient was pain free after 7 days with functional movement of the hip, adductors and gluteal areas. Light resistance training of the respective muscle groups was started after 7 days. He also started cycling and swimming, combined with upper body exercises in the gymnasium.

The player started with running and functional on field training after 10 days without any pain. After 14 days he returned to play. A follow-up MR scan 5 months after the injury showed complete healing of the muscle (Figure 3).

## **Discussion**

Obturator internus muscle strain in athletes is complex and rarely reported in the literature,<sup>1</sup> and as a result of the intricate anatomy of the pelvis, difficult to evaluate.<sup>2</sup> Groin injuries are most often reported in athletes who participate in sports that require twisting at the waist, sudden and sharp change of direction, and side-to-side stepping. Most commonly, strains occur during acute muscle contraction, in the event of kicking, pivoting or slipping, and the risk increases with acceleration and sprinting.<sup>4, 5</sup> The biomechanics of the pelvis typically involve angular motions in joints, including hip adduction and abduction, hip flexion and extension, knee flexion and extension, and knee internal and external rotation. Additional to this is pelvis rotation, the velocity of rotational motion, and the linear velocity of the pelvis.<sup>6</sup>

## **Conclusions**

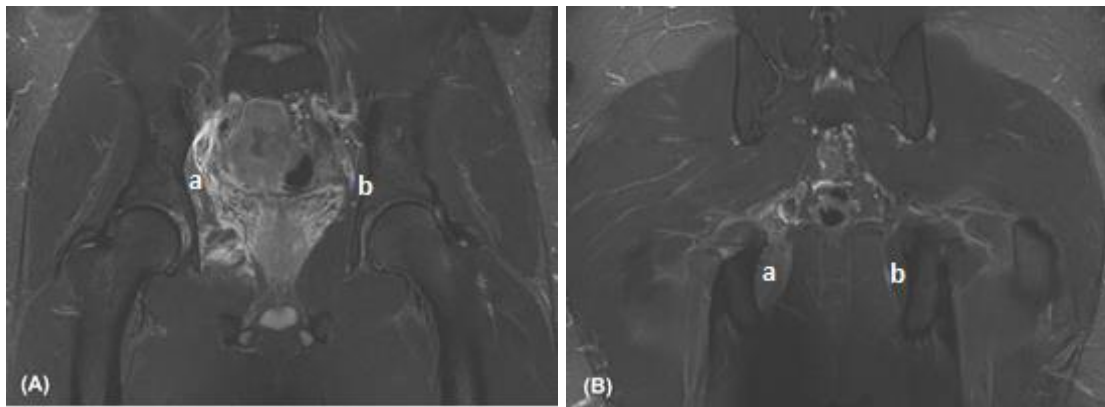
The diverse diagnosis of hip injuries in athletes should include strain of the hip external rotators, including the obturator internus muscle.<sup>7</sup> Early confirmation of diagnosis by MRI is regarded as the investigation of choice ruling out any bone abnormalities.<sup>2, 4</sup> The location of the muscle makes physiotherapy and symptomatic treatment difficult, and therefore may require extensive rehabilitation time. In this case intensive remedial treatment of an acute obturator internus muscle strain has resulted in complete recovery and return to play within a short period of time after injury.

## References

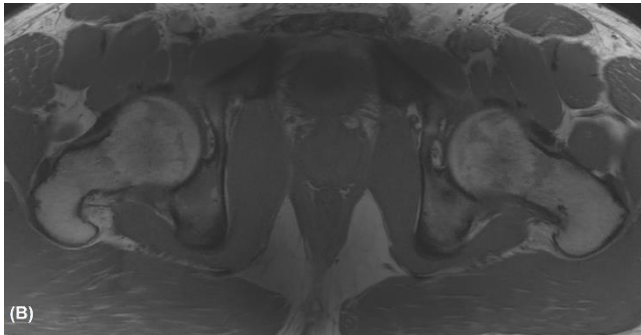
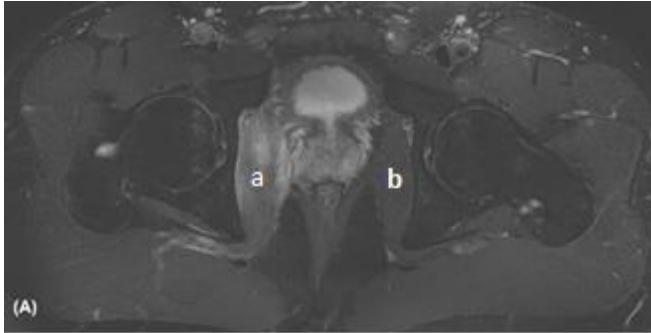
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*Conflicts of interest.*—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

**FIGURES:**

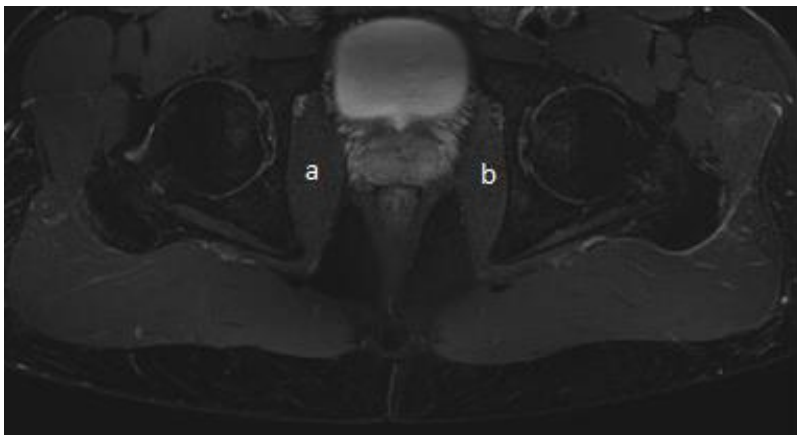


**Figure 1 (A & B):** STIR coronal MR image of the pelvis. Internal obturator muscle injury indicated on the right (a), and normal appearance (b) on the left.



**Figure 2:** (A) T2 FS axial MR image of the pelvis. The Internal obturator muscle shows injury on the right (a) and normal on the left (b). (B) T1 axial MR image of the pelvis.

[FS = Fat Saturated]



**Figure 3:** T2 FS axial MR image of the pelvis 5 months after the injury. Normal appearance of the right (a) and left (b) internal obturator muscle.