



## A 44-year-old woman with right hip pain

Fernanda Babler<sup>1</sup> · Gunjan Malhotra<sup>1</sup> · Samer Soussahn<sup>1</sup> · Steven B. Soliman<sup>1</sup>

Received: 2 March 2023 / Revised: 4 May 2023 / Accepted: 1 June 2023 / Published online: 7 June 2023  
© The Author(s), under exclusive licence to International Skeletal Society (ISS) 2023

### Discussion

The obturator internus muscle arises from the posterior surface of the obturator foramen. It then makes an acute angle, passing through the lesser sciatic foramen, and curving around the posterior aspect of the ischium and the hip joint capsule. The obturator internus tendon then receives tendinous fiber contributions from the superior and inferior gemelli, forming a functional unit, the triceps coxae, which inserts on the medial aspect of the greater trochanter. This functions primarily as a hip external rotator [1, 2]. The obturator internus bursa which is normally nondistended and non-visualized is located between the tendon and posterior ischium, and reduces frictional stress, facilitating smooth motion over that ridge [1–3].

Obturator internus bursitis (OIB) is rare with only a few case reports in the literature and paucity in the literature regarding this entity [1–7]. In fact, injury in general of the obturator internus is rare [2]. Patients with OIB can present with hip, groin, gluteal, and low back pain, although symptoms and localization can be clinically vague [1–7]. Furthermore, given the tendon and bursa's proximity to the sciatic nerve (Fig. 1), symptoms may mimic sciatic pain [7]. Given that the clinical findings are vague, rendering an accurate diagnosis difficult, imaging is typically obtained. The diagnosis is often found incidentally on MRI while evaluating for more common causes of hip and low back pathology [1–8]. Causes include strain, overuse, contusions, and tendinopathy [3]. One proposed mechanism of injury is that the tendon experiences significant frictional stress as it passes along the

posterior ischium during lateral rotation of the hip [6]. As in our case, treatment is usually successful with non-steroidal anti-inflammatory oral medications and physical therapy [2, 3, 6]. In recalcitrant cases, an ultrasound-guided bursal steroid injection can be performed. This can be performed using a 22-gauge spinal needle, inserted using an in-plane technique, with the transducer in the transverse/short-axis orientation (long-axis to the obturator internus tendon), and injecting from a lateral to medial approach [3, 6]. CT-guided and surgical drainages have also been reported, but only in the cases of associated infections [9, 10].

In the case of OIB, the MR imaging features are characteristic, allowing an accurate diagnosis (Fig. 1). The inflamed bursa is distended with hyperintense T2, hypointense T1 fluid signal, and sometimes with associated hypointense debris [1]. The curved orientation of the fluid in the bursa, along the tendon and posterior ischium, is likened to the appearance of a boomerang or termed “boomerang-shaped,” when imaged in the axial plane [1] (Fig. 1a).

Differential diagnoses on MRI include obturator internus tendinosis, obturator internus intramuscular abscess, and obturator internus infectious bursitis [6, 8–10]. Tendinosis can occur concomitantly and will present as thickening and heterogenous signal within the tendon, with or without an associated OIB [6, 8]. In the case of obturator internus intramuscular abscess, the muscle will appear enlarged and swollen, and with an associated rim-enhancing intramuscular fluid collection on post-contrast T1-weighted fat-suppressed images. This could be in association with obturator internus infectious bursitis which can be differentiated from non-infectious bursitis, since the former demonstrates thicker and irregular rim enhancement and variable internal heterogenous enhancement on post-contrast T1-weighted fat-suppressed images [9, 10].

OIB is a rare finding, infrequently considered, and easily overlooked. Knowledge of this entity and its distinct MRI features is important in order to identify this rare cause of hip, groin, gluteal, and low back pain.

All procedures performed in studies involving human participants were in accordance with the ethical standards

Answer.

Obturator internus bursitis.

The case presentation can be found at <https://doi.org/10.1007/s00256-023-04381-w>.

✉ Steven B. Soliman  
ssoliman@med.umich.edu

<sup>1</sup> Division of Musculoskeletal Radiology, Department of Radiology, University of Michigan, Ann Arbor, MI, USA

of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from the subject described in this report. Institutional review board protocol review was exempt per our institutional review board policies for this type of manuscript and since these examinations were clinically indicated. Our study complied with the Health Insurance Portability and Accountability Act.

## Conflict of interest

The authors declare no competing interests.

## References

- Hwang JY, Lee SW, Kim JO. MR imaging features of obturator internus bursa of the hip. *Korean J Radiol.* 2008;9(4):375–8.
- Byrne C, Alkhatat A, O'Neill P, Eustace S, Kavanagh E. Obturator internus muscle strains. *Radiol Case Rep.* 2016;12(1):130–2.
- Smith J, Wisniewski SJ, Wempe MK, Landry BW, Sellon JL. Sonographically guided obturator internus injections: techniques and validation. *J Ultrasound Med.* 2012;31(10):1597–608.
- Swezey RL. Obturator internus bursitis: a common factor in low back pain. *Orthopedics.* 1993;16:783–5.
- Sadigale O, Tiwari A, Ramanathan M, Choudhury H, Wadia F, Bagaria V. Obturator internus bursitis mimicking groin pain in a football player: a case report. *J Orthop Case Rep.* 2022;12(2):106–11.
- Chen B, Rispoli L, Stitik T, Leong M. Successful treatment of gluteal pain from obturator internus tendinitis and bursitis with ultrasound-guided injection. *Am J Phys Med Rehabil.* 2017;96(10):e181–4.
- Murata Y, Ogata S, Ikeda Y, Yamagata M. An unusual cause of sciatic pain as a result of the dynamic motion of the obturator internus muscle. *Spine J.* 2009;9:e16–8.
- Rohde RS, Ziran BH. Obturator internus tendinitis as a source of chronic hip pain. *Orthopedics.* 2003;26:425–6.
- Viani RM, Bromberg K, Bradley JS. Obturator internus muscle abscess in children: report of seven cases and review. *Clin Infect Dis.* 1999;28:117–22.
- Birkbeck D, Watson JT. Obturator internus pyomyositis. A case report. *Clin Orthop Relat Res.* 1995;316:221–6.

**Publisher's note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.