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CASE REPORT

Ganglion cyst arising from the transverse acetabular ligament (TAL): a rare cause of entrapment of the anterior branch of the obturator nerve. Case report and review of the literature

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Abstract
The transverse acetabular ligament is an unusual location for ganglion cysts. Only a few cases have been reported in the literature. They can be asymptomatic and represent an incidental finding or can cause an atypical pattern of hip joint/groin pain. We report a case of ganglion cyst arising from the TAL causing entrapment of the anterior branch of the obturator nerve with associated acute denervation of the abductor longus (AL), adductor brevis (AB), and gracilis muscles.

Keywords Obturator nerve entrapment · Anterior branch · Transverse acetabular ligament · Ganglion cyst

Introduction

Ganglion cysts (GC) are fluid-filled synovial lined lesions usually described in close association to the joint capsules, tendon sheaths, and ligaments. GC around the hip represent a relatively common finding [1, 2]. Those arising from the joint capsule have usually been reported as extending from the anterior aspect and causing compression on the femoral triangle. Both vascular compression syndromes on the femoral vein [3] and entrapment syndromes on the common femoral nerve [4] have been reported in the literature.

Two cases of symptomatic cysts arising from the transverse acetabular ligament (TAL) causing atypical groin pain not responding to conventional therapy have been described [5]. One case report of obturator nerve compression secondary to a large GC arising from the anterior joint capsule and with posterior extension has been reported in the literature [6, 7].

We report the first case of a GC arising from the TAL causing isolated entrapment of the anterior branch of the obturator nerve and consequent acute muscular denervation.

The obturator nerve arises from the L2, L3, and L4 rami of the lumbar plexus. It follows the iliopectineal line, then runs within the obturator canal and exits the pelvis through the obturator foramen [8]. Many different causes of obturator neuropathy have been described in the literature. These include iatrogenic (in particular related to hip replacement), traumatic, hematomas involving the psoas muscle, inguinal hernias, arterial aneurysms, neoplastic pathologies [9].

Case report

A 35-year-old man, farmer by occupation, presented with chief complaints of dull aching pain in the right buttock and groin for 5 months, which was aggravated by weight bearing, walking, and flexing the right hip. The symptoms had a right L4 distribution. There was no history of trauma, fever, or weight loss. He was neither diabetic nor hypertensive. On clinical examination, a mild to moderate degree of adduction weakness was demonstrated. X-ray of the lumbar spine and pelvis were negative. No significant abnormalities were detected on the MRI of the whole spine. MRI of the pelvis demonstrated a 3.5 × 1.8 × 1.8-cm multiloculated ganglion cyst arising from the TAL, extending anteromedially and causing marked compression on the obturator nerve. The

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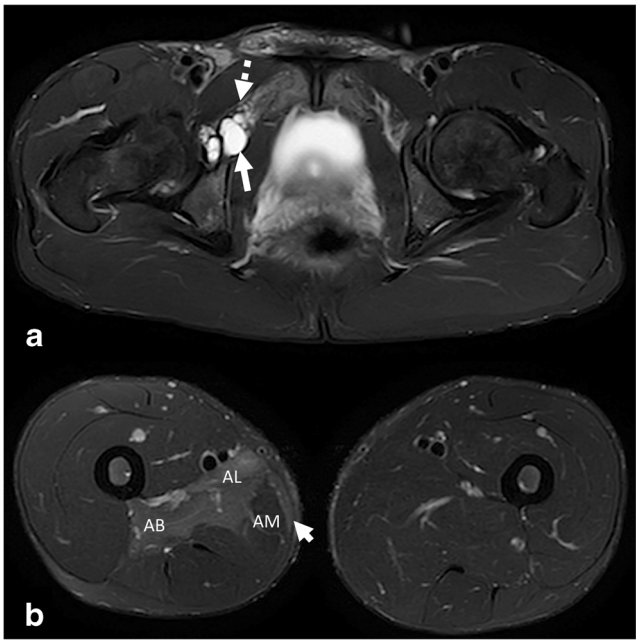

Fig. 1 Axial PD FS at the level of the inferior pubic ramus (**a**) and at the level of the upper thigh (**b**). Ganglion cyst arising from the transverse acetabular ligament (*arrow* in **a**) and encroaching on the anterior branch of the obturator nerve (*dotted arrow* in **a**). Muscle hyperintensity of the adductor longus (AL) and adductor brevis (AB) muscle and gracilis muscle (*arrow* in **b**) with sparing of the adductor magnus (AM)

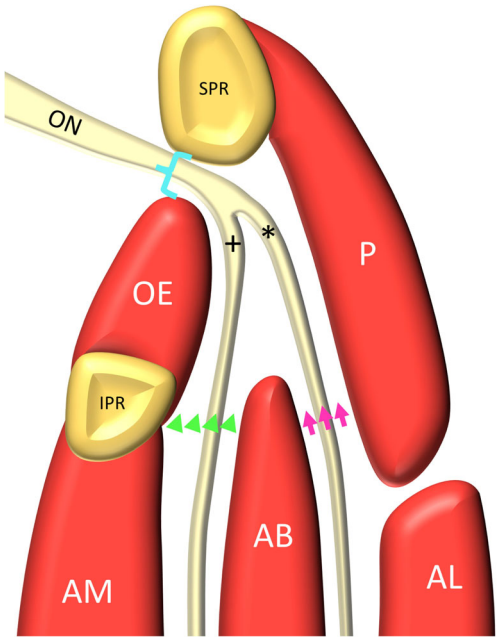

Fig. 3 Diagram showing the three critical zones of entrapment for the obturator nerve. The obturator canal (*blue braces*) site of entrapment of the common obturator nerve (ON), the intermuscular interval between the pectineus (P) and the obturator externus (OE) muscles and between the adductor longus (AL) and adductor brevis (AB) (*pink arrows*) site of entrapment of the anterior branch (*) and the intervals between the obturator externus (OE) and adductor magnus (AM) and the adductor brevis (AB) (*green arrowheads*) site of entrapment of the posterior branch (+). Superior pubic ramus (SPR) and inferior pubic ramus (IPR) are also indicated

acetabular labrum was unremarkable, excluding the possibility of a paralabral cyst. There was isolated hyperintensity, probably related to edema of the adductor longus and brevis and gracilis muscles without fatty infiltration (Fig. 1). CT-guided aspiration was performed (Fig. 2) with complete resolution of the symptoms demonstrated at the subsequent clinical examination.

Discussion

The obturator nerve has two branches. The anterior descends anterior to the adductor brevis sending motor branches to the AL, AB, and gracilis. The posterior branch runs posterior to the AB and gives motor innervation to the adductor magnus and obturator externus [8]. The pattern of muscle denervation in our case is isolated to AL, AB, and gracilis muscles, which correspond to entrapment of the anterior branch. The absence of fatty infiltration indicates a relatively short clinical history [10]. The GC is encroaching and compressing only the anterior branch at its origin when the nerve exits the obturator canal and enters the thigh. The adductor magnus and obturator externus muscles present normal morphology and signal intensity indicative of sparing of the posterior branch.

Several different critical sites for obturator nerve pathology have been described.

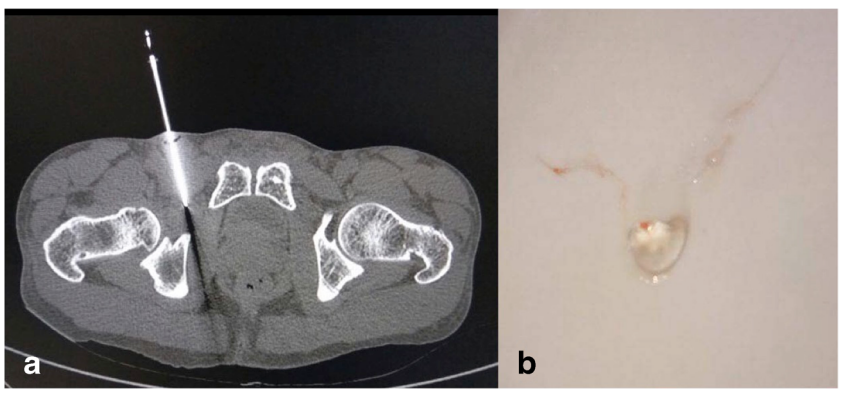

Fig. 2 CT-guided aspiration of the ganglion cyst (**a**). Gelatinous material was aspirated (**b**)

- Within the true pelvis: fractures, trauma, hematoma (anticoagulation), retroperitoneal masses, tumors, and pregnancy
- In the obturator tunnel, trauma of the nerve is usually iatrogenic (complications from orthopedic and gynecologic surgery)
- At the obturator foramen, the nerve is restricted by the fascia of the adductor brevis muscle, which is particularly thick at this level. This in combination with the medial circumflex femoral artery and vein represents a common site of chronic entrapment in athletes [11].

Impingement at these levels causes generalized denervation of the adductor compartment [6, 7,].

A topographical anatomical study outlined three critical zones of entrapment for the obturator nerve. Critical zones are anatomical areas that may represent a potential source of nerve entrapment including canals, intervals, rings, and foramina.

The obturator canal (common obturator nerve), the intermuscular interval between the pectineus and the obturator externus muscles and between the adductor longus and adductor brevis (anterior branch) and the intervals between the obturator externus and adductor magnus and the adductor brevis (posterior branch) (Fig. 3) [12].

Isolated entrapment syndrome of the posterior division of the obturator nerve is a known entity that has been described [13]. To our knowledge, entrapment of anterior branch syndrome represents a novel finding. The pattern of denervation on MRI is very specific. When isolated denervation of the AB and AL muscles is recognized with sparing of the AM findings are diagnostic. The first-line therapy is a CT-guided aspiration and steroid injection in order to sclerotize the cyst and achieve a complete resolution of the nerve compression syndrome. In case of recurrence or absence of a response after radiological treatment, surgery would be necessary.

Compliance with ethical standards

Conflict of interest None.

References

1. Yukata K. Cystic lesion around the hip joint. World J Orthop. 2015;6:688. https://doi.org/10.5312/wjo.v6.i9.688.
2. Neto N, Nunnes P. Spectrum of MRI features of ganglion and synovial cysts. Insights Imaging. 2016;7:179–86. https://doi.org/10.1007/s13244-016-0463-z.
3. Sun W-Y, Jang L-C, Park J-W, Choi J-W. Unilateral leg swelling caused by a ganglion cyst on the hip joint. J Korean Surg Soc. 2009;76:333–5.
4. Kalacı A, Dogramaci Y, Sevinç TT, Yanat AN. Femoral nerve compression secondary to a ganglion cyst arising from a hip joint: a case report and review of the literature. J Med Case Rep. 2009;3:33. https://doi.org/10.1186/1752-1947-3-33.
5. Botchu R, Esler CN, Lloyd DM, Rennie WJ. Ganglia arising from the transverse acetabular ligament: a report of two cases. J Orthop Surg. 2013;21:380–2. https://doi.org/10.1177/230949901302100324.
6. Schwabegger AH, Shafighi M, Gurunluoglu R. An unusual case of thigh adductor weakness: obturator nerve ganglion. J Neurol Neurosurg Psychiatry. 2004;75:775. https://doi.org/10.1136/jnnp.2003.021030.
7. Stuplich M, Hottinger AF, Stoupis C, Sturzenegger M. Combined femoral and obturator neuropathy caused by synovial cyst of the hip. Muscle Nerve. 2005;32:552–4. https://doi.org/10.1002/mus.20364.
8. Petchprapa CN, Rosenberg ZS, Sconfienza LM, Cavalcanti CFA, La Rocca Vieira R, Zember JS. MR imaging of entrapment neuropathies of the lower extremity. RadioGraphics. 2010;30:983–1000. https://doi.org/10.1148/rg.304095135.
9. Kim DH, Murovic JA, Tiel RL, Kline DG. Intrapelvic and thigh-level femoral nerve lesions: management and outcomes in 119 surgically treated cases. J Neurosurg. 2004;100:989–96. https://doi.org/10.3171/jns.2004.100.6.0989.
10. Scalf RE, Wenger DE, Frick MA, Mandrekar JN, Adkins MC. MRI findings of 26 patients with Parsonage–Turner syndrome. Am J Roentgenol. 2007;189:251. https://doi.org/10.2214/AJR.06.1136.
11. Bradshaw C, McCrory P, Bell S, Brukner P. Obturator nerve entrapment: a cause of groin pain in athletes. Am J Sports Med. 1997;25:402–8. https://doi.org/10.1177/036354659702500322.
12. Peri G. The 'critical zones' of entrapment of the nerves of the lower limb. Surg Radiol Anat. 1991;13:139–43. https://doi.org/10.1007/BF01623889.
13. Kumka M. Critical sites of entrapment of the posterior division of the obturator nerve: anatomical considerations. J Can Chiropr Assoc. 2010;54:33–42.