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CASE REPORT

Serendipitous Discovery of a Benign Obturator Nerve Schwannoma

Case report with a brief clinical review

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abstract: Schwannomas are typically benign tumours of the peripheral nerves. However, they seldom arise from the obturator nerve. We report a case of an uncommon swelling (2.5 × 3.5 cm) in a 65-year-old male cadaver, found during a routine dissection session for first Bachelor of Medicine and Surgery students in the Department of Anatomy, Kasturba Medical College, Manipal, India, in 2019. It was seen originating from the left obturator nerve in the pelvis at the level of the sacral promontory. Histopathological investigation revealed a schwannoma. The hypocellular tumour was arranged in a sweeping fascicle pattern with patches of myxoid degeneration. Obturator schwannomas, though rare, can exist in cadavers, as seen in the present case. Hence, it should be considered as a differential diagnosis for clinical cases of pelvic masses and eliminated only after thorough radiological examination. Knowledge about the existence of such schwannomas is therefore essential.

Keywords: Schwannoma; Obturator Nerves; Neurilemmoma; Nerve Sheath Neoplasms; Case Report; India.

The obturator nerve originates from the ventral rami of the second, third and fourth lumbar nerve. The nerve runs down into the pelvis along the medial border of the psoas major muscle. It enters the anterior compartment of the thigh through the obturator foramen to supply the muscles of the medial compartment of the thigh. Further, it distributes articular branches to the hip, knee joints and sensory innervation to the medial side of the thigh.[1]

A schwannoma is a benign, encapsulated, non-invasive tumour of Schwann cells, that rarely undergoes malignant transformation. There is no gender predilection and it presents commonly between the ages of 20–50 years.[2] Schwannomas are rare tumours that can develop at any site in the body and are most commonly found in the head and neck region. They are rarely located in the lower extremities where they can mimic compression neuropathies.[3] In the current literature, there have been approximately 60 retroperitoneal schwannomas recorded and among them, only about 20 are in the pelvis.[4] Schwannomas are usually solitary tumours extending from 1–3 cm in diameter.[5] Here, an incidental finding of an obturator nerve schwannoma in a 65-year-old male cadaver during a routine undergraduate dissection session and its histological findings are reported.

Case Report

In the present case, during a routine undergraduate dissection, a mass on the course of the obturator nerve was discovered in a 65-year-old male cadaver the Department of Anatomy, Kasturba Medical College, Manipal, India, in 2019. The fusiform swelling was on the left obturator nerve, located extraperitoneally in the pelvis, at the level of the sacral promontory. On the contralateral side, however, the obturator nerve was observed to be typical with no visible abnormality. On examination, the mass was 2.5 cm in length, encapsulated and had a hard consistency. The breadth of the swelling at the midpoint of the mass was 3.5 cm. However, the obturator nerve breadth was measured as 1 cm below as well as above the swelling. On gross examination, the swelling was identified as a peripheral nerve sheath tumour [Figure 1].

The mass was excised, histologically processed and stained with haematoxylin and eosin. On microscopic examination of the specimen, all three layers of the peripheral nerve (perineurium, epineurium and endoneurium) could be identified. A proliferation of spindle cells with a fascicular architectural configuration and areas of loosely cellular corresponding to Antoni B patterns of arrangement were observed. The hypocellular tumour was arranged in a sweeping fascicle form with patches of myxoid degeneration. Tumour cells showed elongated buckled nuclei with no mitotic figures. The tumour was determined to be a schwannoma. The obturator nerve on the right side was also excised and histologically processed. It showed features of a typical nerve [Figure 2].

Discussion

Schwannomas, also known as neurilemmomas, are classified under the peripheral nerve sheath tumours

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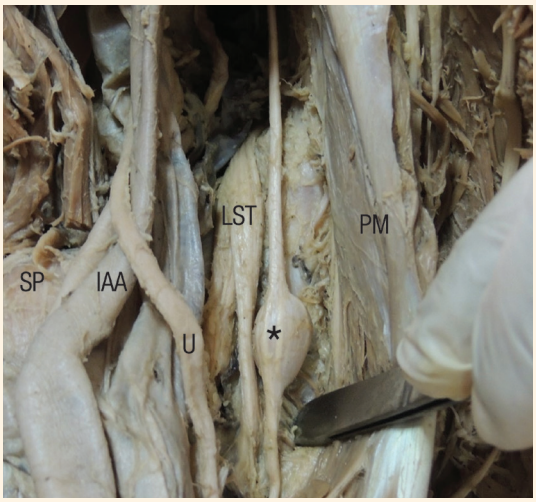

Figure 1: Showing schwannoma (*) in the retroperitoneal area of the pelvis originating from the left obturator nerve in a 65-year-old male cadaver in the Department of Anatomy, Kasturba Medical College, Manipal, India, in December 2019.
LST = lumbosacral trunk; U = ureter; PM = psoas major; SP = sacral promontory; IAA = internal iliac artery.

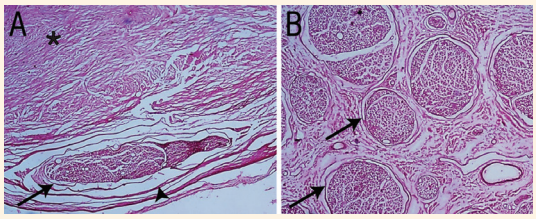

Figure 2: A: Histology of schwannoma using haematoxylin and eosin (H&E) staining at ×40 magnification in a 65-year-old male cadaver showing a flattened nerve fascicle in the periphery (arrow). In addition, it shows the capsule with the three layers (epineurium, perineurium and endoneurium) enclosing the tumour (arrowhead) and fascicle pattern with patches of mixed degeneration (asterisk). **B:** Histology of normal obturator nerve of the right-side using H&E staining at ×40 magnification showing the bundles of nerve fascicles enclosed in the perineurium (arrows).

(PNSTs) and arise from Schwann cells of the outer nerve sheath, i.e. the epineurium.[2] They are rare tumours that can develop at any site in the body. Only 13% of PNSTs arise in the trunk; approximately 3% are retroperitoneal and the incidence of retroperitoneal location of a schwannoma is 0.5–5%.[4] Schwannomas are benign, well-circumscribed lesions with 30–40 years being the peak age at diagnosis. The World Health Organization classifies schwannomas as grade 1 tumours that are generally benign and whose malignant transformation is extremely rare.[6] They may be present with neurological manifestations such as pain in the limbs, paraesthesia and motor weakness due to compression of the adjacent structures or may be found incidentally as asymptomatic masses.[7] The low incidence is due to the fact that there are no specific signs and symptoms as the tumours develop in the broad area of the retroperitoneum.[8] The clinical manifestations are produced only after the tumours have grown to a substantial size; hence, there is a long latency period. The tumours, when large enough, cause pressure symptoms through compression or displacement of adjacent structures.[9] As the tumours are deep-seated in the retroperitoneum, often on ultrasound they are erroneously seen as gynaecological tumours, only to be proven wrong during surgery.[10,11] Therefore, as confirmed in most of the clinical cases after surgery and definitive histopathological examination, presurgical diagnosis is very challenging.[12,13] The computed tomography (CT) and magnetic resonance imaging (MRI) narrow the diagnosis but are not able to assess it as imaging features are not specific to any type of tumour.[4] Laparoscopic resection is the treatment of choice with favourable post-operative recovery.[14]

Benign peripheral nerve sheath tumours are classified into two main groups: neurofibromas and schwannomas. The distinction of schwannomas from neurofibromas is of importance to surgeons as schwannomas can be easily enucleated using laparoscopic surgery while preserving nerve contiguity. However, neurofibromas are intraneural; hence, resection without nerve deficits is difficult.[15] The characteristic of a peripheral nerve sheath tumour is the identification of a nerve that is proximal and distal to the mass. However, this may be difficult to visualise as the nerve itself may be compressed or distorted by the tumour.[16]

Histologically, schwannomas can be differentiated from other peripheral nerve tumours by the presence of capsule and fascicular growth patterns, increase in nuclear size and large nuclear hyperchromasia.[9] Areas of elongated cells that are densely packed, arranged in fascicles and showing an Antoni type A pattern may be seen, forming Verocay bodies when they are prominent. Cells are less compact and prone to cystic degeneration in the Antoni type B pattern.[4] Large schwannomas generally go through progressive degenerating alterations, comprising of cyst formation and hyalinisation of vessels. Benign schwannomas have large expanses of eosinophilic atypical round cells, whereas their epithelioid appearance is seen when they undergo malignant transformation.[17] In the current case, histopathology showed a distinct capsule with an Antoni B pattern of fascicular cells. Degenerative changes were not observed.[18]

Obturator nerve schwannomas should be considered a differential diagnosis when dealing with cases

Table 1: Cases of pelvic retroperitoneal schwannoma in the current literature

Author and year of publication	Number of cases	Presenting complaint	Radio diagnosis	Laparoscopic resection and postoperative pathological diagnosis
Di Furia *et al.*[20] (2018)	One case	Dysuria and strangury	CT – well circumscribed mass	Pelvic schwannoma
Chopra *et al.*[13] (2017)	One case	Left pelvic pain of unknown origin	CT – multi-loculated cystic mass on lateral pelvic wall	Obturator schwannoma
Gleason *et al.*[11] (2017)	One case	Pelvic pain diagnosed as ovarian malignancy	MRI – 2.6 × 2.1 × 2.7 cm mass adjacent to the left pelvic sidewall	Benign obturator nerve schwannoma
Yamada *et al.*[23] (2015)	One case	Lymph node metastasis of rectal cancer	CT and MRI – 15-mm tumour	Benign obturator nerve schwannoma
Coskun *et al.*[21] (2016)	One case	Initially diagnosed as pelvic metastasis of right kidney mass	CT – a well demarcated left iliac mass of 30*29 cm	Benign obturator nerve schwannoma
Takahashi *et al.*[24] (2016)	One case	Left lower abdominal pain	CT and MRI – a mass of 30 mm	Benign obturator nerve schwannoma
Okuyama *et al.*[22] (2014)	One case	Diagnosed as a mesenteric tumour	CT and MRI – heterogeneous tumour, 5 cm in diameter, in the pelvic cavity	Pelvic schwannoma
Takaaki *et al.*[25] (2013)	One case	Anal pain	CT and MRI – prominent cystic degeneration and calcification.	Pelvic schwannoma
Ningshu *et al.*[14] (2012)	Six cases	3 incidental, 3 vague pelvic pain	One case preoperatively diagnosed	Pelvic schwannoma
Aubert *et al.*[19] (2000)	One case	Urological manifestations	CT – mass in paravesical position	Pelvic schwannoma
Scotto *et al.*[10] (1998)	One case	Not specified	No	Obturator schwannoma
Hunter *et al.*[12] (1988)	Two cases	Asymptomatic	No	Retroperitoneal schwannoma

CT = computed tomography; MRI = magnetic resonance imaging.

of a pelvic mass. As the obturator nerve is in close proximity to vital pelvic structures, the symptoms arising from these growing masses usually mimic gynaecological or urological tumours.[19,20] Literature cites schwannoma cases misdiagnosed as lymph node metastasis and ovarian malignancies before surgery.[21–23] Most of the cases of obturator schwannomas that have been reported in the literature were diagnosed postoperatively, only after laparoscopic resection and pathological examination [Table 1].[10,13]

However, a case reported by Takahashi *et al.* diagnosed the obturator nerve tumour preoperatively, as the CT and MRI showed clear continuity with the obturator nerve.[24] Being in an anatomically complex and surgically inaccessible site with surrounding vital structures, pelvic tumour enucleation necessitates familiarity and knowledge of the pelvic retroperitoneal anatomy to avoid damage to the adjacent vascular and urinary structures.[25]

Conclusion

There is a varied range of benign and malignant tumours in the pelvic retroperitoneum. The patients commonly present with vague pain at a very late stage when the tumour is large. CTs and MRIs help significantly in diagnosis; however, the imaging features are non-specific and diagnosis is confirmed only by postoperative histopathology. This report concludes that obturator schwannomas, though very rare, can occur in unusual locations, as seen in this cadaveric dissection. Hence, it should be considered as a differential diagnosis for cases of pelvic masses and should be ruled out only after careful investigation.

AUTHORS' CONTRIBUTION

SS contributed to the concept and design of the report. NA and AS contributed in the acquisition and compilation of data. DN contributed with data analysis and interpretation. SP contributed with the

critical review of the manuscript. NPB contributed to the preparation and drafting of the manuscript. All authors approved the final version of this manuscript.

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