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.4 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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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. 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.

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. 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. In the current case, histopathology showed a distinct capsule with an Antoni B pattern of fascicular cells. Degenerative changes were not observed.

Obturator nerve schwannomas should be considered a differential diagnosis when dealing with cases the diagnosis but are not able to assess it as imaging features are not specific to any type of tumour. Laparoscopic resection is the treatment of choice with favourable post-operative recovery.

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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. 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.

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Obturator nerve schwannomas should be considered a differential diagnosis when dealing with cases
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. Literature cites schwannoma cases misdiagnosed as lymph node metastasis and ovarian malignancies before surgery. Most of the cases of obturator schwannomas that have been reported in the literature were diagnosed postoperatively, only after laparoscopic resection and pathological examination. 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. 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.

### 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 |
|-------------------------------|----------------|---------------------|-----------------|---------------------------------------------------------------|
| Dh Furia et al. (2018) | One case | Dysuria and strangury | CT – well circumscribed mass | Pelvic schwannoma |
| Chopra et al. (2017) | One case | Left pelvic pain of unknown origin | CT – multi-loculated cystic mass on lateral pelvic wall | Obturator schwannoma |
| Gleason et al. (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. (2015) | One case | Lymph node metastasis of rectal cancer | CT and MRI – 15-mm tumour | Benign obturator nerve schwannoma |
| Coskun et al. (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. (2016) | One case | Left lower abdominal pain | CT and MRI – a mass of 30 mm | Benign obturator nerve schwannoma |
| Okuyama et al. (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. (2013) | One case | Anal pain | CT and MRI – prominent cystic degeneration and calcification. | Pelvic schwannoma |
| Ningshu et al. (2012) | Six cases | 3 incidental, 3 vague pelvic pain | One case preoperatively diagnosed | Pelvic schwannoma |
| Aubert et al. (2000) | One case | Urological manifestations | CT – mass in paravesical position | Pelvic schwannoma |
| Scotto et al. (1998) | One case | Not specified | No | Obturator schwannoma |
| Hunter et al. (1988) | Two cases | Asymptomatic | No | Retroperitoneal schwannoma |

CT = computed tomography; MRI = magnetic resonance imaging.

### 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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