Case Report

A Rare Case of Intramuscular Schwannoma of Dorsal Ramus Nerve: A Case Report

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ABSTRACT

Schwannoma is a benign, expansile neoplasm that originates from nerve sheaths. Intramuscular schwannoma is a rare tumor presenting as a slow-growing soft-tissue mass that may or may not has associated neurological symptoms. We present a rare case of intramuscular schwannoma of the dorsal ramus nerve in a 50-year-old female patient who presented with a single, firm, and well-defined swelling over the back region. On magnetic resonance imaging, a 54 mm × 23 mm × 20 mm, well-defined altered signal intensity lesion at the left posterior paraspinal region extending from the superior endplate of D12 to the inferior endplate of L1 vertebral bodies was noted which was suggestive of neurogenic tumor/ hemangioma. The swelling was excised and sent for histopathological examination (HPE). A diagnosis of intramuscular schwannoma was confirmed on HPE. Hence, all soft-tissue tumors should be sent for HPE for confirmation of the diagnosis and its further management.

Key words: Dorsal ramus nerve, Histopathological examination, Intramuscular schwannoma, Magnetic resonance imaging

Schwannoma is a benign, expansile neoplasm originating from the nerve sheaths which are composed of Schwann cells that insulate nerve fibers and enhance the propagation of nerve impulses [1]. It can occur anywhere in the body along the course of a nerve such as cranial nerves, spinal nerves, or peripheral nerves. Intramuscular schwannoma is a rare tumor presenting as a slow-growing soft-tissue mass that may or may not has associated neurological symptoms. Due to the low frequency of this type of tumor and lack of specific instrumental signs and symptoms, pre-surgical diagnosis is difficult [2]. We present a rare case of intramuscular schwannoma of the dorsal ramus nerve in a 50-year-old female patient.

CASE REPORT

A 50-year-old woman presented to the General Surgery outpatient department with the complaint of painless swelling over the left side of the back region for 7 months which was progressively increasing in size.

On examination, the patient was moderately built and well-nourished. No signs of icterus, cyanosis, pallor, clubbing, edema, or lymphadenopathy were present. The vitals were stable with a pulse rate of 78/min measured in the right radial artery, blood pressure of 128/80 mm-Hg measured in the right brachial artery, respiratory rate of 15/min, and SpO_2 of 99% on room air. On local examination, a single, oval, firm, well-defined swelling of 4 cm × 3 cm size was present in the middle part of the left-back region just lateral to the midline with limited mobility. No tenderness was present and the skin over the swelling was freely mobile. The neurovascular examination was normal.

Laboratory investigations were within normal limits with hemoglobin- 12.3 g/dl, white blood cells – 4.43 kU/L, platelet count – 246 kU/L, prothrombin time – 14.8 s, International Normalized Ratio – 1.08, activated partial thromboplastin time – 28.4 s, creatinine – 0.59 mg/dl, and serum glutamic-pyruvic transaminase – 15 U/L.

On ultrasonography, approximately 19 mm × 14 mm, mixed echogenic lesion with internal hypoechoic foci, and marked internal vascularity was noted in the intramuscular plane over the left paravertebral region. On magnetic resonance imaging (MRI), a 54 mm × 23 mm × 20 mm sized well-defined altered signal intensity lesion at the left posterior paraspinal region extending from superior endplate of D12 to inferior endplate of L1 vertebral bodies was noted. The lesion demonstrated inhomogeneously hyperintense signal intensity with central isointense signal intensity foci on T2 weighted and Short Tau Inversion Recovery images and isointense signal intensity to muscle on T1 weighted

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image which was suggestive of neurogenic tumor or hemangioma over infective pathology (Fig. 1).

Surgery was performed under general anesthesia. A vertical incision was kept over the left paravertebral region. Erector spinae muscle fibers were separated and the tumor was enucleated. The excised specimen was sent for Histopathological examination (HPE). Macroscopic examination showed a 3.5 cm × 2 cm × 1 cm sized soft tissue, well-encapsulated tumor which was yellowishwhite in appearance (Fig. 2).

Upon microscopic examination, the tumor was composed of Antoni A and Antoni B patterns. Antoni A pattern consisted of spindle cell stroma with a cell having a large, hyperchromatic vesicular nucleus with peripheral palisading and formation of Verocay bodies. Antoni B pattern consists of less cellular edematous stroma and many cystic areas. Hyalinized vessel walls were seen with areas of hemorrhage and inflammatory infiltrate. No evidence of malignancy was seen (Fig. 3). These features confirmed the diagnosis of schwannoma. There were no complications or any neurological deficit post-surgery. The patient was discharged on postoperative day 5 and further follow-up was uneventful.

DISCUSSION

Schwannoma/Neurilemmoma is a benign soft-tissue tumor arising from the peripheral nerve sheath (epineurium) derived from the Schwann cells. The prevalence of intramuscular schwannoma is 5% among all benign soft-tissue tumors [3]. Schwannoma can be classified according to its anatomical location. Specific subtypes include intermuscular, intramuscular, subcutaneous, and intraosseous schwannomas. The erector spinae muscles are dominated by the lumbar dorsal ramus nerve, which branches to form the spinae nerve. The dorsal ramus nerve runs dorsocaudally in the transverse domain and generally separates into the medial, intermediate, and lateral branches [4].

The symptom frequencies reported among patients with benign schwannoma are 5–52% for tenderness, 20% for radicular pain, 60–96% for the Tinel sign, and 7.6–82% for motor weakness [5]. Intramuscular schwannomas are situated within the muscle tissues. They typically present as a slow-growing mass. There is usually a long interval between the onset of clinical symptoms and treatment. The patients rarely present with neurological symptoms (i.e. tingling, numbness, and motor or sensory loss), and the mass is usually non-tender, firm in consistency, and non-transilluminant. Tinel's sign is not classically elicited in patients with intramuscular schwannomas, as the tumor, which is deeply located, usually arises from the small motor nerve branches within the substance of muscles. Specific motor weakness due to motor branch involvement is also uncommon [6,7]. In the present case, there was no radicular pain, tenderness, or motor weakness.

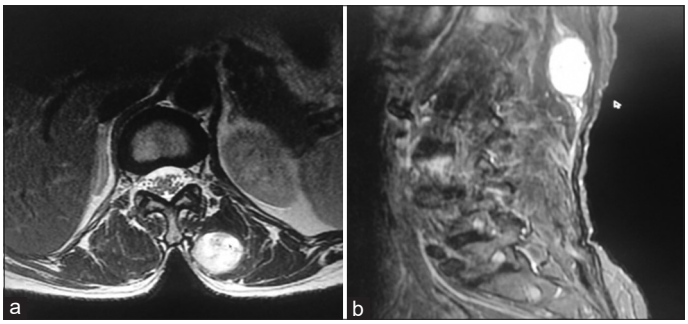

Figure 1: (a and b) T2w MRI images showing well-defined inhomogeneously hyperintense lesion on axial and sagittal sections

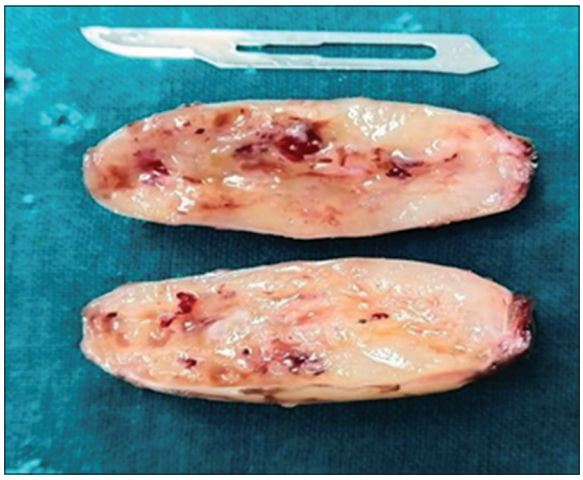

Figure 2: Cut section of excised specimen reveals yellowish-white areas with hemorrhagic spots

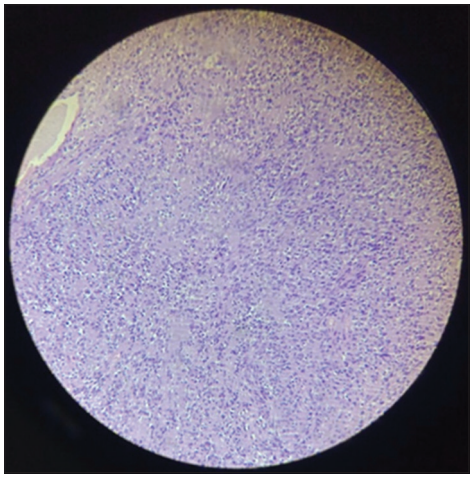

Figure 3: Microscopic appearance of Schwannoma showing Antoni A and Antoni B pattern with verocay bodies

Table 1: Review of the literature of dorsal ramus nerve tumor

Study	Age	Sex	Site	Preoperative diagnosis	Surgery	Postoperative diagnosis
Kim *et al.*[8]	62 years	Female	L2-L4	Metastasis/Sarcoma/Peripheral nerve sheath tumor	Excision of the tumor	Schwannoma
Shah *et al.*[9]	45 years	Male	D9-D11	Schwannoma	Excision of the tumor	Schwannoma
Present case	50 years	Female	D12-L1	Neurgonic tumor/Hemangioma	Excision of tumor	Schwannoma

The differential diagnosis consists of hemangioma, neurogenic tumor, and lipoma.

MRI has proven useful in the preoperative diagnosis of intramuscular schwannoma [6]. The histological hallmark of a schwannoma is the pattern of alternating Antoni A and B areas, as demonstrated in the present case. When examined by immunohistochemistry, schwannomas typically show diffuse, strong expression of S-100 protein and abundant pericellular collagen type IV.

Enucleation is a standard surgical procedure for schwannomas. However, certain schwannomas are not easily enucleated and enucleation may result in iatrogenic nerve injury, even with atraumatic procedures [1]. To the best of our knowledge, two cases of dorsal ramus nerve schwannoma have been reported previously (Table 1) [8,9].

CONCLUSION

Intramuscular schwannoma is a rare entity. Despite being rare, it should be considered as one of the differential diagnoses of a firm, well-defined, non-tender swelling in the paravertebral region. Since the preoperative diagnosis is difficult, all soft-tissue tumors should be sent for HPE for confirmation of the diagnosis and its further management.

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