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MRI Diagnosis of a Cervical Peripheral Nerve Sheath Tumor

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ABSTRACT

Peripheral nerve sheath tumors are uncommon soft-tissue neoplasms that may present as slowly enlarging cervical masses. A 44-year-old woman presented with a progressively enlarging neck mass evolving over one year and associated with electric shock-like pain on palpation. Physical examination revealed a well-circumscribed cervical lesion, while laboratory investigations were unremarkable and showed no evidence of inflammatory syndrome. Magnetic resonance imaging demonstrated a well-defined fusiform mass located within the intermuscular fat plane at the C5 level, measuring 28 × 12 × 16 mm. The lesion was hypointense on T1-weighted images, heterogeneously hyperintense on T2-weighted images, markedly hyperintense on STIR sequences, and exhibited intense homogeneous enhancement following gadolinium administration without restricted diffusion. No cervical lymphadenopathy, surrounding tissue infiltration, or aggressive imaging features were identified. The combination of a fusiform morphology, characteristic signal intensity, avid contrast enhancement, and associated neuropathic symptoms strongly suggested a benign peripheral nerve sheath tumor, most likely a schwannoma. This case highlights the pivotal role of MRI in the characterization of cervical soft-tissue masses and demonstrates how typical imaging findings, correlated with clinical presentation, can support a confident radiological diagnosis of a benign peripheral nerve sheath tumor and help distinguish it from other cervical lesions.

KEYWORDS :

Peripheral nerve sheath tumor; Magnetic resonance imaging; Cervical soft-tissue tumor.

MAIN ARTICLE

INTRODUCTION

Peripheral nerve sheath tumors (PNSTs) are uncommon soft-tissue neoplasms arising from the supporting structures of peripheral nerves. Schwannomas represent the most frequent benign subtype and are characterized by slow growth, well-defined margins, and an intimate relationship with the parent nerve. Approximately 25–45% of schwannomas occur in the head and neck region. Clinical presentation is often nonspecific, ranging from an asymptomatic mass to localized pain or paresthesia caused by nerve compression. Magnetic resonance imaging (MRI) is the modality of choice for lesion characterization and often allows a confident diagnosis by demonstrating characteristic morphological and signal features. Recognition of these imaging findings is essential to differentiate benign peripheral nerve sheath tumors from other cervical soft-tissue masses and to guide patient management (1,2).

CASE REPORT

A 44-year-old woman presented with a progressively enlarging cervical mass that had been evolving for approximately one year. The patient reported localized pain triggered by palpation, described as electric shock-like sensations radiating from the lesion. No constitutional symptoms, including fever, weight loss, or night sweats, were noted.

Physical examination revealed a small, well-circumscribed, mobile cervical mass. Palpation reproduced the characteristic neuropathic pain. Laboratory investigations were unremarkable, with no evidence of inflammatory syndrome.

Magnetic resonance imaging of the cervical region demonstrated a well-defined fusiform soft-tissue mass located within the intermuscular fat plane at the C5 level. The lesion measured 28 × 12 × 16 mm (craniocaudal × transverse × anteroposterior). It appeared homogeneously hypointense relative to muscle on T1-weighted images and heterogeneously hyperintense on T2-weighted sequences, with marked hyperintensity on STIR images. Diffusion-weighted imaging showed no evidence of restricted diffusion. Following gadolinium administration, the lesion demonstrated intense and homogeneous enhancement. No surrounding infiltration, bone involvement, or cervical lymphadenopathy was identified.

The combination of a well-circumscribed fusiform morphology, location along an intermuscular neurovascular plane, absence of aggressive imaging features, and associated electric shock-like pain strongly suggested a benign peripheral nerve sheath tumor, most

likely a schwannoma. Given the characteristic clinical and MRI findings, a presumptive radiological diagnosis was established.

DISCUSSION

Schwannomas are benign encapsulated neoplasms originating from Schwann cells of peripheral nerve sheaths. They usually occur between the third and sixth decades of life and affect men and women equally. The head and neck region is a common location, accounting for up to 45% of extracranial schwannomas. Patients typically present with a slowly enlarging mass, whereas neurological symptoms are less frequent and usually reflect direct nerve involvement. Electric shock-like pain elicited by palpation, as observed in the present case, is considered a valuable clinical clue suggesting a neurogenic origin (3,4).

MRI is considered the imaging modality of choice for evaluating peripheral nerve sheath tumors because of its superior soft-tissue contrast and its ability to demonstrate the relationship between the lesion and the parent nerve. Typical schwannomas appear as well-circumscribed fusiform masses, usually isointense or slightly hypointense on T1-weighted images and hyperintense on T2-weighted sequences. Variable internal heterogeneity may be encountered because of differences in cellularity and stromal composition. Strong enhancement after contrast administration is common and reflects the vascular nature of these tumors **(1).**

Several MRI signs have been described in peripheral nerve sheath tumors, including the entering and exiting nerve sign, the fascicular sign, the split-fat sign, and the target sign. Although not all of these findings were demonstrated in the present case, the lesion exhibited several highly suggestive characteristics, namely its fusiform configuration, sharp margins, benign behavior, and avid contrast enhancement. The absence of diffusion restriction further supported a benign process and argued against a highly cellular or malignant lesion (2,5).

The differential diagnosis of a small enhancing cervical soft-tissue mass includes reactive or metastatic lymphadenopathy, paraganglioma, peripheral nerve sheath tumors, vascular malformations, and soft-tissue sarcomas. The absence of cervical lymphadenopathy, the intermuscular location, the fusiform morphology, and the characteristic neuropathic pain favored a neurogenic tumor. Likewise, the lack of infiltrative margins, surrounding tissue invasion, or diffusion restriction argued against malignancy (5,6).

CONCLUSION

A well-circumscribed fusiform cervical mass demonstrating T1 hypointensity, T2/STIR hyperintensity, intense homogeneous enhancement, and absence of diffusion restriction should raise strong suspicion for a benign peripheral nerve sheath tumor. When associated

with neuropathic symptoms such as electric shock-like pain, MRI can provide a highly suggestive diagnosis of schwannoma and accurately characterize the lesion while excluding aggressive features.

FIGURES:

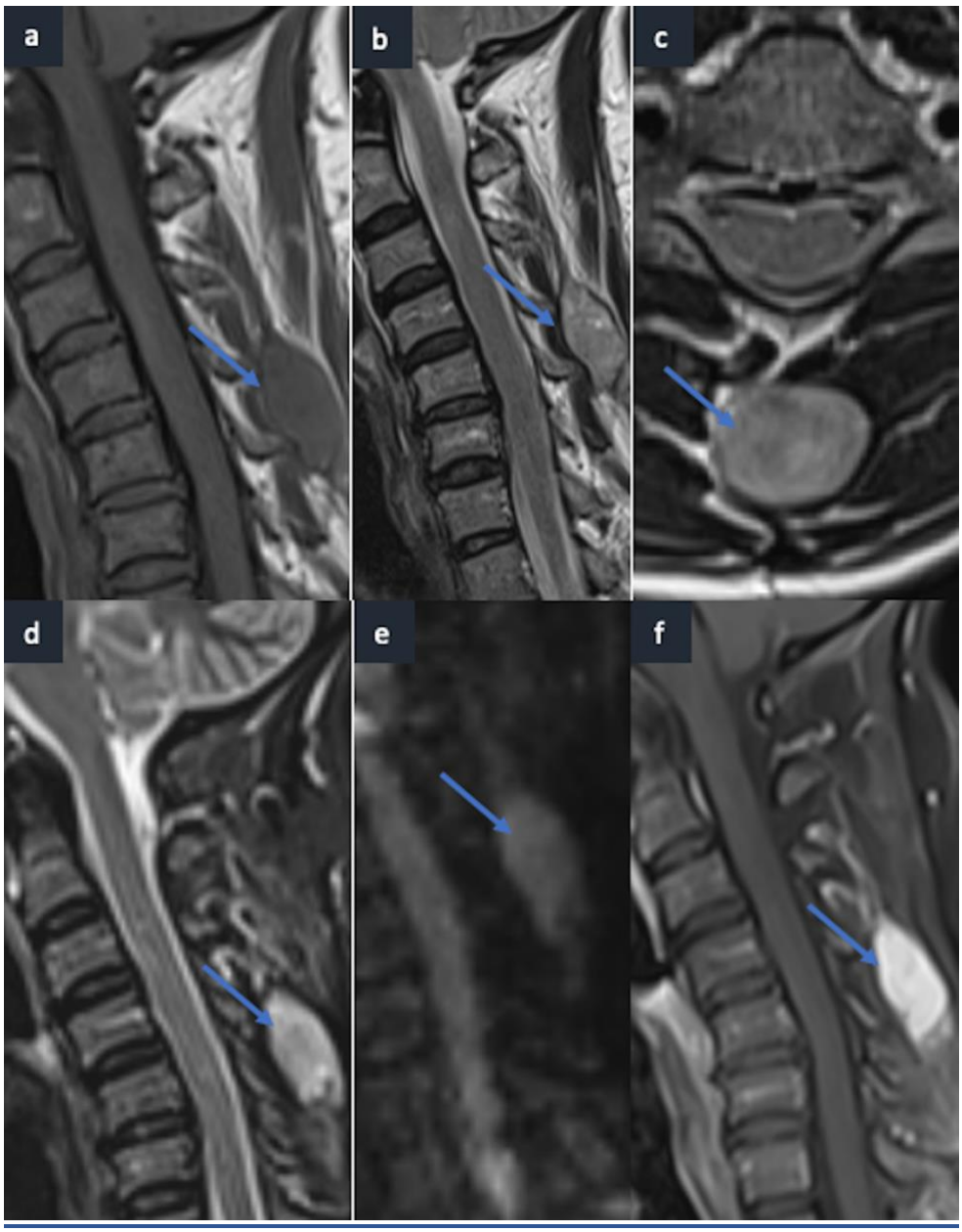

Figure 1: Magnetic resonance imaging of the cervical region demonstrating a well-circumscribed cervical soft-tissue mass (blue arrow) with homogeneous low-to-intermediate signal intensity relative to muscle on sagittal T1-weighted image (a). The lesion appears markedly hyperintense with mild internal heterogeneity on sagittal T2-weighted image (b), axial T2-weighted image (c), and sagittal STIR image (d). Diffusion-weighted imaging (e) shows no diffusion restriction. Post-contrast sagittal T1-weighted image (f) demonstrates intense and relatively homogeneous enhancement of the lesion.

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The authors declare that they have no conflicts of interest.

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