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Case Report

Think Multiple: Multilevel Paraspinal Schwannomas as a Rare Cause of Bilateral Low Back Pain - A Case Report

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Abstract

Schwannomas are typically solitary, slow-growing benign nerve sheath tumours, most often incidental findings on cross-sectional imaging. The presence of multiple, multilevel lesions is uncommon and carries distinct imaging and clinical implications compared with the solitary sporadic form. We report the case of a 64-year-old man with no significant past medical history, presenting with a several-month history of bilateral low back pain, more pronounced on the left side. Spinal MRI identified multiple small left-sided paraspinal masses at staged (multilevel) lumbar levels, arising from adjacent nerve roots and causing dilatation of the conus medullaris, with morphological and enhancement characteristics most suggestive of schwannomas. The left-sided predominance of these lesions was anatomically concordant with the laterality of the patient's pain. Further management was under multidisciplinary discussion at the time of writing.

This case illustrates the imaging characteristics of multilevel paraspinal schwannomas and highlights the importance of considering this rare entity, together with an underlying tumour predisposition syndrome, in the differential diagnosis of atypical or refractory low back pain.

Keywords: *Schwannoma; Paraspinal Mass; Multilevel; Low Back Pain; MRI*

Introduction

Schwannomas are benign, WHO grade I peripheral nerve sheath tumours arising from Schwann cells. They are most commonly solitary, slow-growing, and frequently discovered incidentally on imaging performed for unrelated indications [1,2]. While sporadic spinal schwannomas typically predominate at the cervical spine and the thoracolumbar junction, a lumbosacral topographic predominance (T12-L5) has been more specifically described in schwannomatosis, a rare tumour predisposition syndrome [1]. The presence of multiple, multilevel schwannomas on imaging — as opposed to a single lesion — is therefore a finding of note, even when incidental and asymptomatic, as it may warrant further consideration of an underlying predisposition syndrome such as schwannomatosis or neurofibromatosis type 2 (NF2) [1,2].

We report a case of multiple small left-sided paraspinal schwannomas at staged lumbar levels, discovered during the imaging work-up of bilateral, left-predominant low back pain, and describe their MRI characteristics.

Case Report

A 64-year-old man with no significant past medical history presented with a six-month history of bilateral low back pain, more pronounced on the left side, without radicular irradiation, sphincter disturbance, or associated constitutional symptoms.

Spinal MRI was performed as part of the aetiological work-up of the low back pain, comprising T1-weighted, T2 STIR sagittal, and 3D sequences before and after intravenous gadolinium administration.

At the cervical level, imaging showed straightening of the cervical spine with staged anterior and posterior marginal osteophytosis and staged uncovertebral joint arthrosis, without epidural disease, vertebral body height loss, bone marrow signal abnormality, disc abnormality, spinal cord signal abnormality, or craniocervical junction malformation.

At the dorsolumbar level, multiple small left-sided paraspinal masses were identified at staged lumbar levels, associated with an enlarged, dilated appearance of the conus medullaris. The lesions were isointense on T1-weighted images with a thin peripheral rim of fat at their margins (split-fat sign), markedly hyperintense on T2-weighted images, and showed intense enhancement following gadolinium administration.

The dorsolumbar spinal alignment, vertebral body heights, bone marrow signal, intervertebral discs, and subarachnoid spaces were otherwise unremarkable, and the conus medullaris was noted at the D12-L1 level. MRI findings were considered in favour of multiple small left-sided paraspinal masses at staged lumbar levels, appearing to arise from the adjacent nerve roots and responsible for dilatation of the conus medullaris, whose morphological and enhancement characteristics were considered most suggestive of schwannomas. The left-sided predominance of these lesions was noted to be anatomically concordant with the laterality of the patient's low back pain.

Clinical examination revealed no cutaneous stigmata of neurofibromatosis, such as café-au-lait macules or cutaneous and subcutaneous neurofibromas, and there was no personal or family history of neurofibromatosis. Cerebral and vestibular imaging and genetic testing for schwannomatosis-associated genes were not performed.

Further management of the paraspinal masses — including the respective roles of surveillance, percutaneous biopsy, and surgical excision — remained under multidisciplinary discussion, and clinical and radiological follow-up was ongoing, together with symptomatic management of the patient's low back pain.

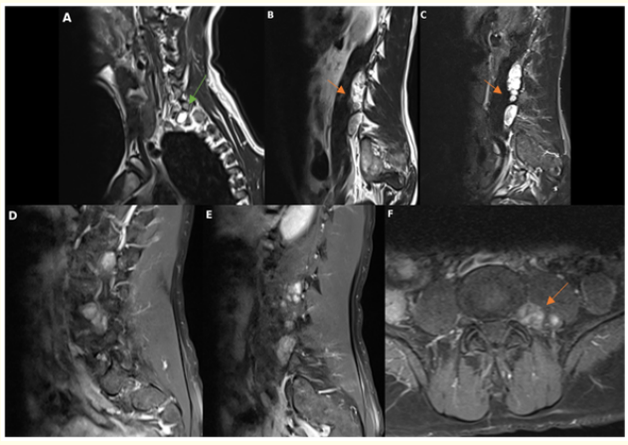

Figure 1: *Spinal MRI. (A) Sagittal image at the cervical level showing straightening of the cervical spine with staged marginal osteophytosis (Green arrow), (B) Sagittal T1-weighted image at the lumbar level showing multiple small left-sided paraspinal masses, isointense to muscle, with a thin peripheral rim of fat outlining the lesions (split-fat sign) (Orange arrow), (C) Sagittal T2-weighted image at the lumbar level showing the same lesions in marked hyperintensity (Orange arrow). (D) Sagittal fat-suppressed post-gadolinium T1-weighted image showing intense enhancement of the left-sided paraspinal lesions. (E) Sagittal fat-suppressed post-gadolinium T1-weighted image at a more caudal level showing multiple additional small enhancing lesions at staged levels. (F) Axial fat-suppressed post-gadolinium T1-weighted image showing a left-sided paraspinal enhancing lesion, with the split-fat sign visible at its margin, supporting its neurogenic origin (Orange arrow).*

Discussion

The discovery of paraspinal masses during the aetiological work-up of low back pain is not uncommon in radiological practice, and schwannomas are among the nerve sheath tumours to consider in this setting. The presence of multiple small lesions at staged lumbar levels, rather than a single lesion, distinguishes this case from the more typical solitary sporadic presentation [1].

Schwannomas classically demonstrate a target sign on T2-weighted sequences (peripheral hyperintensity with central hypointensity) and a split fat sign at their margins, distinguishing them from neurofibromas, which are typically centred on the nerve [3]. In the present case, all lesions were homogeneously hyperintense on T2-weighted images with intense homogeneous enhancement, and a split-fat sign was identified at their margins, supporting their neurogenic origin, without a clearly described target sign, an inconstant feature [3].

Multiple schwannomas should prompt consideration of an underlying predisposition syndrome. Schwannomatosis has a described predilection for the lower lumbosacral spine (T12-L5), consistent with the levels observed here, and frequently presents sporadically without a family history [1,2]. The absence of neurofibromatosis stigmata argues against NF1 but does not exclude NF2 or schwannomatosis [2]. Cerebral/vestibular imaging and genetic testing were not performed in this patient, a limitation for formally distinguishing between these entities [2,4].

Table 1 compares the present case with previously reported cases of multiple or multilevel spinal schwannomas [4-7], which share a lumbosacral predilection [1] but differ in presentation, ranging from incidental findings to cauda equina syndrome [8].

	Present case	**Li., *et al*. 2024 [5]**	**Chen., *et al*. 2024 [6]**	**Lee., *et al*. 2015 [4]**	**Ekhator and Rak 2023 [7]**
Age / Sex	64 / M	79 / F	37 / F	58 / M	68 / F
Levels/Location	Multiple staged lumbar levels (left paraspinal)	Lumbosacral canal + bilateral lower limbs	Conus/cauda equina, L1-S1	Spine + trunk (multiple)	L2-L5 (spinal cord compression)
Presentation	Bilateral low back pain, left-predominant	Not specified (multiple sites)	Stable over 2 years, minimal symptoms (constipation)	Severe neuropathic pain	Back pain, bilateral leg weakness
Cerebral/vestibular imaging	Not performed	Not specified	Performed (no vestibular schwannoma)	Performed (to exclude NF2)	Not specified
Genetic testing	Not performed	Not specified	Negative (SMARCB1/LZTR1)	Not specified	Not specified
Management	Under multidisciplinary discussion	Surgery/biopsy (pathology-confirmed)	Surgical resection (pathology-confirmed)	Staged surgery	Surgical resection

Table 1: *Comparison of the present case with previously reported cases of multiple or multilevel spinal schwannomas.*

Distinguishing sporadic multiple schwannomas from schwannomatosis and NF2 relies on cerebral/vestibular imaging, family history, and genetic testing for NF2, SMARCB1, or LZTR1 mutations [2,4], an evaluation not yet completed in this patient. The left-sided predominance of these lesions was anatomically concordant with the laterality of the patient's low back pain, supporting a possible contributory role of these lesions in the clinical presentation, although a causal relationship could not be firmly established in the absence of overt radicular symptoms or neurological deficit.

Conclusion

This case illustrates the discovery of multilevel paraspinal schwannomas during the imaging work-up of bilateral, left-predominant low back pain. Their lumbosacral distribution and multiplicity should prompt radiologists and clinicians to think of multiple schwannomas, and of an underlying tumour predisposition syndrome, in the differential diagnosis of atypical or refractory low back pain, and to recommend appropriate clinical correlation and further work-up where indicated.

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Conflict of Interest

None declared.

Consent

Written informed consent was obtained from the patient for publication of this case report and the accompanying images.

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