loss, and additional antibodies directed towards the acetylcholine receptor are found in association with CASPR2 antibodies, serum hyponatremia and delusions, as well as myoclonus, are more common in the presence of LGI1 antibodies. The sole presence of LGI1 antibodies in our patient, as with patients described previously, was not associated with malignancy and had a better outcome.

Peripheral nerve involvement as part of the clinical manifestation of Morvan's syndrome is not uncommon, ranging from 46% of patients with both CASPR2 and LGI1 antibodies to 100% of patients with only LGI1 antibodies [5]. However, in all preceding patients the neuropathic features consisted mainly of sensory symptoms, and no previously described patient showed extensive motor nerve involvement as described here, to our knowledge.

Fever has been reported to be part of the autonomic nervous system instability that characterizes the syndrome [5], but there are no reports of it as the sole manifestation of the syndrome, neither at presentation or at the time of a relapse.

4. Conclusion

In our patient, the combination of GBS-like and classic Morvan's syndrome symptoms at presentation, as well as the episodes of fever during follow-up, are atypical and may suggest the presence of an additional antibody against a yet unknown antigen.

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Conflicts of Interest/Disclosures

The authors declare that they have no financial or other conflicts of interest in relation to this research and its publication.

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References

[1] Liguori R, Vincent A, Clover L, et al. Morvan's syndrome: peripheral and central nervous system and cardiac involvement with antibodies to voltage-gated potassium channels. Brain 2001;124:2417–26.
[2] Lee W, Day TJ, Williams DR. Clinical, laboratory and electrophysiological features of Morvan's fibrillary chorea. J Clin Neurosci 2013;20:1246–9.
[3] Lee EK, Maselli RA, Ellis WG, et al. Morvan's fibrillary chorea: a paraneoplastic manifestation of thymoma. J Neurol Neurosurg Psychiatry 1998;65:857–62.
[4] Díaz-Manera J, Rojas-García R, Gallardo E, et al. Antibodies to AChR, MuSK and VGKC in a patient with myasthenia gravis and Morvan's syndrome. Nat Clin Pract Neurol 2007;3:405–10.
[5] Irani SR, Pettingill P, Kleopa KA, et al. Morvan syndrome: clinical and serological observations in 29 cases. Ann Neurol 2012;72:241–55.

Four cases of spinal epidural angiolipoma

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ABSTRACT

Spinal angiolipomas are uncommon benign tumours composed of mature fatty tissue and abnormal vascular elements, most commonly found within the posterior spinal epidural space. Most tumours are located within the mid-thoracic spine; in contrast thoracolumbar junction and purely lumbar angiolipomas are rare. We report a case series of four spinal angiolipomas, including a thoracolumbar junction and a purely lumbar tumour.

1. Introduction

Spinal angiolipomas are uncommon benign tumours composed of mature fatty tissue and abnormal vascular elements, most commonly found within the posterior spinal epidural space [1,2]. Most tumours are located within the mid-thoracic spine; in contrast thoracolumbar junction and purely lumbar angiolipomas are rare [3–5]. We report a case series of four spinal angiolipomas, including a thoracolumbar junction and a purely lumbar tumour.

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2. Case reports

2.1. Patient 1

A 58-year-old woman with a past history of gastric stapling for obesity and type 2 diabetes on oral hypoglycaemic therapy, presented with a 5 year history of a burning and sore sensation within bilateral hands and shoulders with associated mid-thoracic back pain. She denied any history of lower limb sensory change or weakness, or any bowel or bladder dysfunction. Other than bilateral lower limb hyper-reflexia, the remainder of her neurological examination was unremarkable; in particular there was normal lower limb tone and sensation, and down-going plantar reflexes.

MRI showed an enhancing fat containing extradural mass dorsal to the theca and cord that extended from T2 to T6 (Fig. 1). She

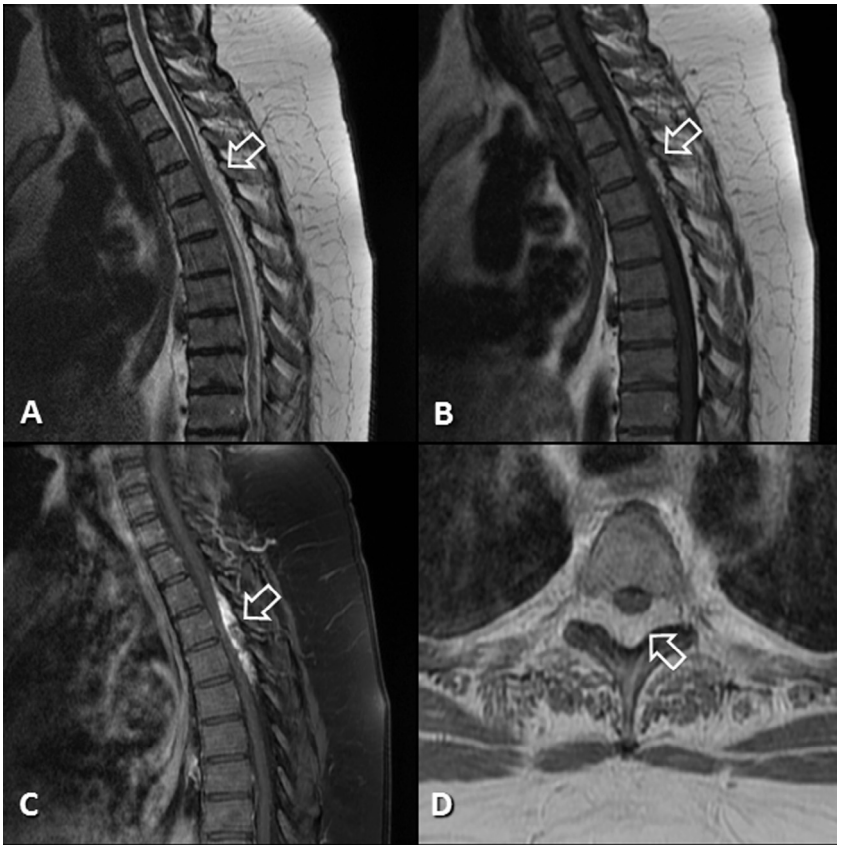

Fig. 1. Patient 1. Sagittal T2-weighted (A), sagittal T1-weighted (B), sagittal fat saturated T1-weighted post-contrast (C) and axial T1-weighted post-contrast MRI at the T5/6 level show an enhancing fat containing extradural mass dorsal to the theca and cord that extends from T2 to T6. It anteriorly displaces and moderately compresses the spinal cord, however cord signal is normal. The mass is T2 hyperintense, heterogeneous on T1-weighted imaging with areas of intrinsic high T1 signal that appear to saturate on the fat saturated post-contrast sequence and shows vivid contrast enhancement. The mass extends into bilateral neural foramen at both the T4/5 and T5/6 levels. No bone involvement or destruction.

underwent a T2 to T6 laminectomy which revealed a large, highly vascular, infiltrative tumour extending from T2 to T6. The tumour extended out laterally into the lateral recesses and neural foramina. The tumour was dissected away from the theca and laterally was freed from the adjacent nerve roots. A complete macroscopic resection was performed, with the epidural fat at T2 just superior to the upper border of the tumour noted to be normal.

She had an unremarkable post-operative recovery, and had no neurological disability at 2 month review.

2.2. Patient 2

A 42-year-old woman with no significant past medical history, presented with a 4 month history of bilateral lower limb, left greater than right, progressive numbness and weakness. This was on a background of intermittent thoracic back pain for 5 years. No bladder or bowel dysfunction was reported. On examination, she had 4/5 power in ankle dorsiflexion bilaterally and had hyper-reflexic ankle jerks. She demonstrated reduced sensation to light touch bilaterally in the L4 to S1 dermatomes.

MRI showed an enhancing mass admixed with areas of fat signal within the posterior epidural space extending from T11 to L2 that compressed the lower cord and conus medullaris (Fig. 2). She underwent a T11 to L2 laminectomy which revealed an extensive dorsally located tumour. The tumour was predominantly extradural although a small component had also invaded into the intradural extramedullary space through the posterior theca. The tumour was dissected away from the dura, with the region of involved dura opened and the smaller intradural component resected. The tumour had extended onto the back of the conus medullaris, however there were no adhesions to the spinal cord. A complete macroscopic resection including the intradural component of the tumour was achieved.

The patient had an uncomplicated post-operative course with a normal lower limb neurological examination other than persisting but stable 4/5 power in ankle dorsiflexion bilaterally. Follow up MRI scans up to 5 years demonstrated no tumour recurrence and the patient has remained well with no residual disability.

2.3. Patient 3

A 39-year-old man with no significant past medical history presented with a 2 year history of progressive ascending numbness that initially began in his right foot. At presentation, the numbness was bilateral and had progressed to his high thoracic region. He also reported an 18 month history of progressive leg weakness and difficulty with balance, as well as erectile dysfunction. No impairment of bladder or bowel function was reported. On examination he had a spastic gait, bilateral lower limb hyper-reflexia and positive Babinski sign bilaterally. There was 4/5 power throughout his lower limbs and a T4 sensory level to both temperature and vibration sensation was identified.

MRI showed an enhancing, partially fat containing, extradural mass that extended dorsal to the theca from T3 to T6 (Fig. 3). He underwent a T3 to T7 laminectomy which demonstrated an extensive highly vascular extradural tumour extending from T3 to T7