Primary cervical intradural extramedullary malignant melanoma: a case report

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Case presentation

A 47-year-old Chinese man presented with a 6-month history of neck pain, numbness and weakness in the left limb. In January 2019, he was admitted to the Department of Spine Surgery at our institution. His medical and family histories were unremarkable, with no prior interventions.

Neurological examination revealed deficits involving three levels of the left upper limb. Magnetic resonance imaging (MRI) revealed an extramedullary lesion at the C2-C3 level (Fig 1a to c). Following ophthalmological and dermatological assessments (including oral mucosa, external genitalia, and anus), a primary intradural extramedullary malignant melanoma (MM) was suspected. Surgical intervention was indicated to improve neurological function.

Although the tumour was in the left anterior cervical cord, its position posterior to the C2-C3 vertebral body and spindle-shaped appearance made anterior surgery less favourable, as resection of the vertebral body to access the tumour and reconstruction following removal would increase surgical trauma and risk. After discussing the risks and benefits with the patient and his family, informed consent was obtained prior to surgery.

The patient underwent posterior surgery under general anaesthesia with neuroelectrophysiological monitoring. A C2-C4 laminectomy was performed to expose the tumour, which was located on the left anterior side of the cord. The lesion was compressing and adherent to the spinal cord and dura. Using a nerve retractor and with stable intraoperative neuromonitoring, the tumour was carefully dissected and completely excised (Fig 1d to f). The dura was sutured and the laminae were re-implanted using titanium mini-plates. A drainage tube was placed, and the incision was carefully sutured.

Postoperative cervical MRI confirmed complete tumour resection (Fig 2a to c). Histopathological examination (Fig 2d to f) confirmed MM with positive staining for HMB-45 (+), S-100 (+), and a Ki-67 index of 5%.

The patient underwent postoperative rehabilitation and reported good neurological recovery at the 5-year follow-up, with minimal assistance required for certain left upper limb movements. Given the favourable outcome, the patient declined adjuvant radiochemotherapy as recommended by our team. He continues to lead a relatively active and independent life.

Discussion

Malignant melanoma of the spinal region is rare and may present as either a primary or metastatic lesion, with primary cases being exceptionally uncommon.[1] Primary spinal MM most frequently affects the middle and lower thoracic spine, with rare involvement of the cervical region.[2] This is the first case of primary intradural extramedullary MM treated in our department in recent decades. Despite the tumour being located in the upper cervical region, satisfactory clinical outcomes were achieved.

Although MRI is the recommended and effective preoperative imaging modality to diagnose spinal MM, distinguishing it from other pigmented central nervous system tumours, such as leptomeningeal melanoma or melanocytoma,[3] can be challenging. A definitive diagnosis relies on histopathological confirmation. Immunohistochemical staining using antimelanoma markers such as HMB-45 and S-100 can help confirm the diagnosis.[2] In our case, positive staining for both HMB-45 and S-100 was conclusively confirmed. There are currently no established guidelines for the treatment of spinal MM, but complete surgical removal is typically recommended.[4] In our case, the chief surgeon carefully removed the tumour starting on the left side and gradually accessed the anterior spinal cord. Complete resection was successfully achieved without damage to the spinal cord or nerve roots. It has been reported that patients may achieve better outcomes and prognosis with postoperative adjuvant radiotherapy and chemotherapy.[5] In our

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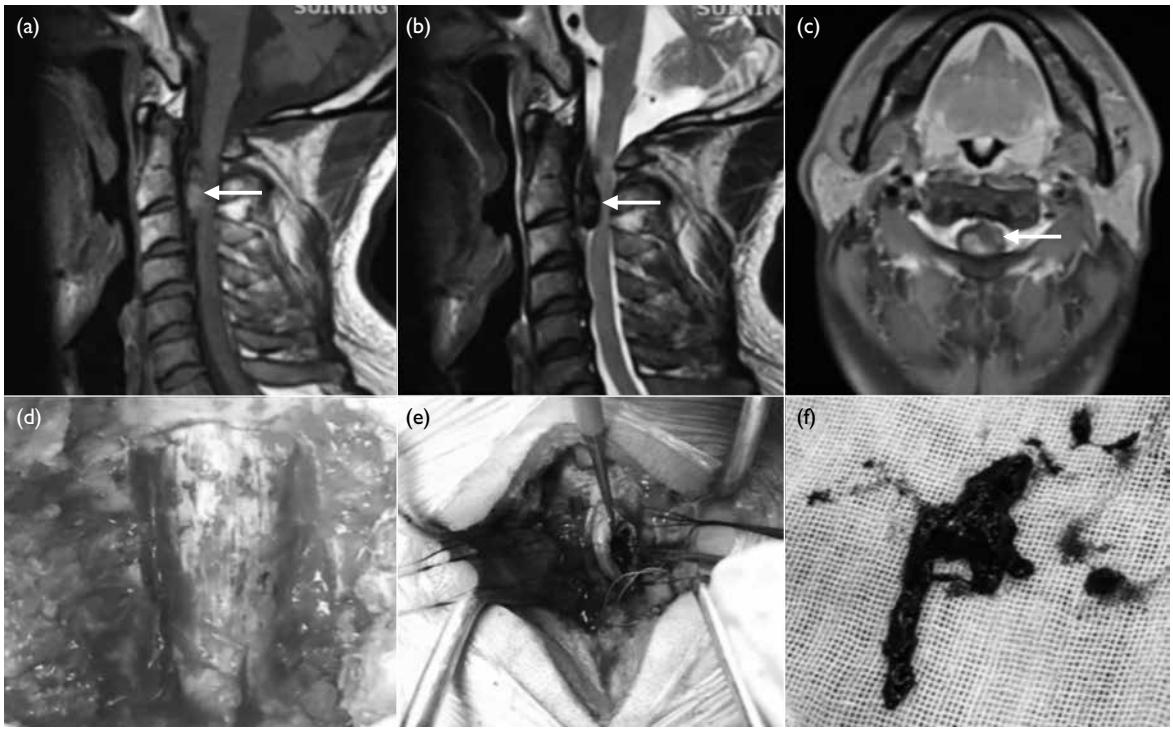

FIG 1. Cervical magnetic resonance imaging showing a tumour at the C2-C3 level (arrows) with a hyperintense signal on T1-weighted imaging (a), and a predominantly hypointense signal on T2-weighted imaging (b: sagittal; c: axial). Intraoperative images showing grey-black dura (d), black tumour exposed after dural incision (e), and tumour post-removal (f)

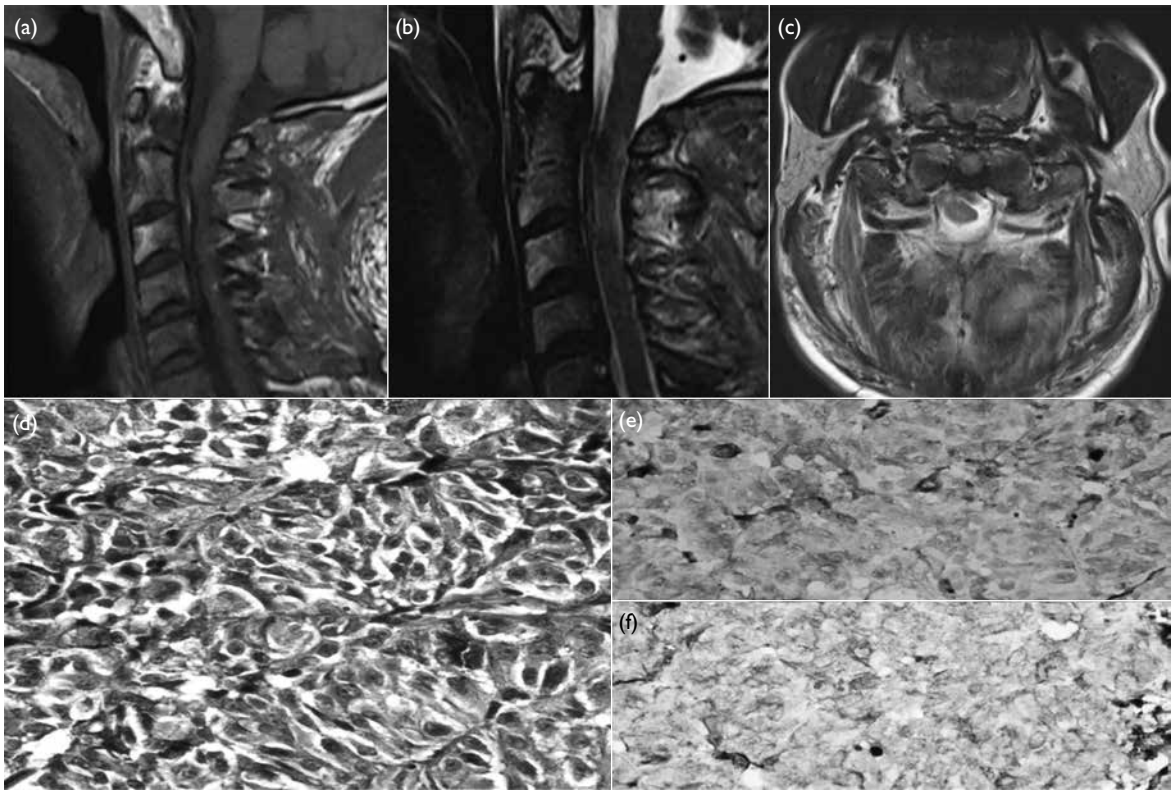

FIG 2. Postoperative cervical magnetic resonance imaging demonstrating complete tumour removal on T1-weighted (a), T2-weighted (b), and axial (c) images. Histopathological views at original magnification (×400) show melanoma cells with brown-black pigmentation on haematoxylin-eosin staining (d), strong positivity for S-100 (e), and diffuse strong cytoplasmic positivity for HMB-45 (f)

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case, the patient was enjoying a relatively good life at the 5-year follow-up without adjuvant therapy, indicating the importance of complete resection and consistent with the literature. However, the importance of radiotherapy or chemotherapy should not be ruled out as further follow-up is necessary to assess the final prognosis. Our team still recommends that postoperative radiotherapy or chemotherapy be routinely performed to improve patient outcomes.

Our research team reports a rare case of primary intradural extramedullary MM at the C2-C3 level with successful surgery. First, complete tumour resection is crucial for improving patient prognosis and survival, emphasising the need for careful consideration during treatment planning. Second, proper handling of the anatomical relationship between the tumour and the spinal cord or nerve roots is essential to remove the tumour as completely as possible while minimising neurological injury. Third, although our patient declined adjuvant therapy and achieved a favourable outcome at the 5-year follow-up, we continue to recommend routine postoperative radiotherapy or chemotherapy to improve prognosis. A key limitation of this case is the absence of radiological imaging at final follow-up, as the patient declined hospital visits due to perceived symptom improvement, which limits our ability to definitively exclude indolent recurrence. Our case provides valuable clinical insights, and long-term follow-up remains essential for monitoring outcomes.

Author contributions

Concept or design: L Tang, Y Chen.
Acquisition of data: L Tang, H Liu, M Wang, Y Zhou.
Analysis or interpretation of data: L Tang, Y Chen, J He, M Chen.
Drafting of the manuscript: L Tang, H Liu.
Critical revision of the manuscript for important intellectual content: Y Chen, J Zheng, F Wang.
All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Ethics approval

The study was approved by Suining Central Hospital's Ethics Committee for Biomedical Research Involving Human Beings, China (Ref No.: KYLLMC20240019). Written informed consent was obtained from the patient for the publication of this case report.

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