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Case Report

Thymoma metastatic to the epidural thoracic spine

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ABSTRACT

Background: Thymomas rarely metastasize to the spine. Here, we present a 69-year-old female diagnosed with stage IV thymoma, which subsequently developed a symptomatic epidural thoracic spinal lesion causing thoracic myelopathy.

Case Description: The patient initially presented with paraspinal rib pain, lower extremity weakness, and gait imbalance. The magnetic resonance revealed a T10 vertebral body lesion with epidural extension causing severe spinal cord compression. A T9–T10 hemilaminotomy for tumor resection was performed; this was followed by adjuvant chemotherapy and radiation. Gross total resection was achieved, and the final pathology was metastatic thymoma. Postoperatively, the patient significantly improved.

Conclusion: Metastatic thymomas to the thoracic spine are rare. For those presenting with epidural lesions causing myelopathy, surgical resection is beneficial and may be accompanied by adjunctive radiation and chemotherapy.

Keywords: Epidural, Hemilaminotomy, Myelopathy, Thoracic, Thymoma

INTRODUCTION

Thymoma accounts for approximately 0.2–1.5% of all adult malignancies (incidence of 0.13/100,000[2]). Most patients present between the ages of 40–60, and the number of males equals the number of females. These lesions can metastasize to the lymph nodes, liver, and other soft tissues, and rarely to the gastrointestinal system, bone, and kidneys.[8] The most important prognostic factor is the extent of surgical resection;[6] the benefit of adjuvant radiotherapy (RT) is less well defined. Here is a present case of a 69-year-old female with metastatic thymoma to the epidural thoracic spine whose myelopathy, following a T9–T10 hemilaminectomy markedly improved.

CASE PRESENTATION

A 69-year-old female patient diagnosed with stage IV thymoma in 2021 previously treated with chemotherapy and radiation presented with progressive worsening mid-back pain, gait imbalance, and lower extremity weakness. The initial magnetic resonance revealed a T10 vertebral body lesion with epidural extension causing spinal cord compression [Figure 1].

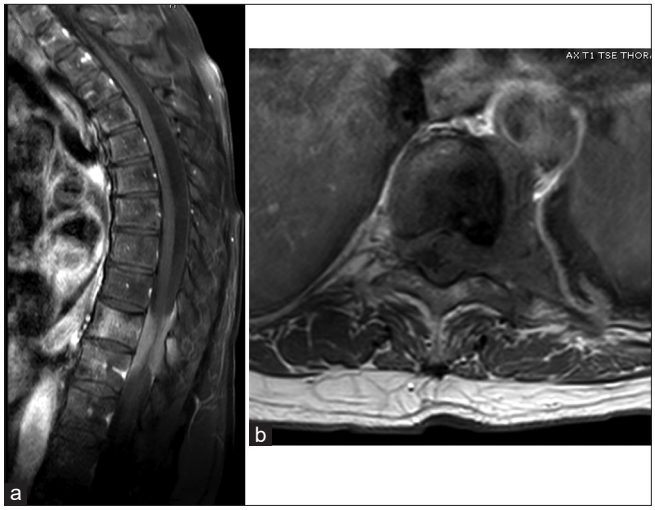

Figure 1: (a) Sagittal T1-weighted magnetic resonance imaging (MRI) with contrast demonstrating a homogeneously enhancing lesion in the T10 vertebral body with ventral and dorsal epidural extension causing severe spinal cord compression. (b) Axial T1-weighted MRI with contrast demonstrating a predominantly left-eccentric epidural lesion causing rightward displacement of the spinal cord. Of note the left T10 nerve root appears completely enveloped in the tumor.

In August 2022, the patient underwent T9 and T10 left hemilaminotomy for gross total tumor resection. At surgery, the firm tumor was densely adherent to the ligamentum flavum and underlying dura; it was dissected free while the left T10 nerve root, encased by the tumor, was sacrificed. A small durotomy was encountered near the axilla of the left T9 nerve root and was repaired primarily. The frozen pathology was consistent with metastatic thymoma. Postoperatively, the patient's myelopathy resolved within 6 postoperative months. Subsequent imaging revealed adequate decompression/removal of the epidural tumor [Figure 2]. She underwent adjuvant chemotherapy with carboplatin and etoposide (completed January 2023) and also received fractionated radiation (completed April 2023).

DISCUSSION

Khandelwal *et al*. demonstrated that thymic carcinoma had the fastest rate of metastasis with a median of 3.6 months [Reference Summary Table].[5] Because thymomas metastasize to lymph nodes at relatively low rates (1.0% in tumors <2 cm), staging using the traditional World Health Organization Tumor Node Metastasis (TNM) staging system[4] can be difficult. Magnetic resonance imaging and fluorodeoxyglucose-positron emission tomography can facilitate the diagnosis of metabolically active lesions.[7] Adequate surgical decompression is critical in appropriate cases. Histopathological evaluation of the lesion remains the gold standard for diagnosis. Immunohistochemistry, typically

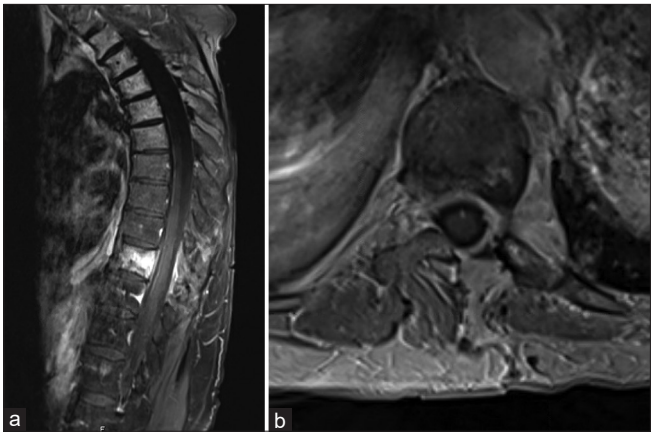

Figure 2: (a) Four-month postoperative sagittal T1-weighted magnetic resonance imaging (MRI) with contrast demonstrating good spinal cord decompression with removal of epidural tumor components. Residual enhancement is seen throughout the T10 vertebral body which was not pursued during surgery. (b) Postoperative axial T1-weighted MRI with contrast showing the hemilaminectomy defect and a well-decompressed spinal cord with normal positioning in the spinal canal.

demonstrating a mixed lymphocyte-epithelial phenotype, is essential for confirming thymoma.[1] Adjuvant chemotherapy and radiation may be warranted. Haniuda *et al*. reported decreased recurrence rates in patients undergoing adjuvant RT.[3]

CONCLUSION

The successful surgical management of metastatic thymomas, consisting of gross total excision, carries the best prognosis for achieving optimal outcomes. Additional postoperative adjuvant chemotherapy and radiation treatments may be utilized.

Declaration of patient consent

Patient's consent not required as patient's identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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REFERENCE SUMMARY TABLE

Author	Year	Article type	Results	Key points
den Bakker *et al*.	2014	REV	• 5 thymoma subtypes (A, AB, B1, B2, B3) – spindled or epithelioid neoplastic cells • Variable amounts of immature T-cells. • Staining for CK, p63, EMA, and CD20: differentiates thymoma from thymic hyperplasia versus nonHodgkin lymphoma.	• mixed lymphocyte and epithelioid phenotypes are crucial in the diagnosis of thymoma.
Haniuda *et al*.	1996	RC	• Macroscopic pleural adherence: 36.4% of nonirradiated patients had a recurrence, and no irradiated patients had a recurrence • Microscopic pleural invasion: RT did not change the recurrence rate.	• Adjuvant RT decreases rates of local thoracic thymoma recurrence postop.
Khandelwal *et al*.	2016	RC	• Metastasis/recurrence after surgery in 31% of patients • Younger patients – more likely to have recurrence • Thymic carcinoma – shortest time to recurrence or metastasis postoperatively.	• Thymic carcinomas are most likely to metastasize with the shortest time to recurrence.
Regnard *et al*.	1996	RC	• 10- and 15-year survival rates for biopsy-proven thymoma were 67% and 55%, respectively • Multivariate analysis: the extent of resection sole prognostic factor • Masaoka's clinical staging and histologic classification were not significant/nonprognostic.	• Extent of surgical resection – most important prognostic factor.
Vladislav *et al*.	2012	CS	• The average time of diagnosis from the primary tumor to metastasis was 3.6 years • Metastatic tumors closely resemble primary tumor • Extrathoracic metastatic sites include lymph nodes, liver, soft tissue, skeletal muscle; rarely bone, kidneys, and abdominal wall.	• Thymic carcinoma and type B tumors are most likely to metastasize.

REV: Review, RC: Retrospective cohort, CS: Case series, Postop: Postoperatively, RT: Radiotherapy