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Case Report

Clinical Outcome of Partial Spondylectomy and Adjuvant Therapy of a Metastatic Leiomyosarcoma to the Thoracic Spine: A Case Report

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Abstract

Background: Leiomyosarcoma (LMS) is a rare malignant tumor of smooth muscle origin, most commonly arising in the uterus. Spinal metastases from uterine LMS are extremely uncommon and represent diagnostic and therapeutic challenges. Due to its relative resistance to radiotherapy and chemotherapy, surgical management remains the cornerstone of treatment.
Case Report: A 42-year-old woman, with a history of uterine myomectomy 12 years earlier, presented with progressive thoracic back pain. Imaging [computed tomography (CT) and magnetic resonance imaging (MRI)] revealed a destructive extradural lesion at T5-T6. CT-guided biopsy confirmed LMS. She underwent partial spondylectomy with spinal stabilization, followed by postoperative adjuvant chemotherapy and radiotherapy. Serial follow-up with MRI, positron emission tomography (PET)-CT, and technetium-99m scintigraphy at 6, 12, and 24 months –and again at 7 years –showed no evidence of residual or recurrent tumor. She remained disease-free.
Conclusion: This case demonstrates that combined surgical cytoreduction and adjuvant therapy can achieve long-term disease control in patients with rare spinal metastases of uterine LMS. Reporting such extended follow-up cases provides valuable insights into treatment strategies and prognosis.

Keywords: Leiomyosarcoma; Spinal Neoplasms; Cytoreduction Surgical Procedures; Adjuvant Therapy; Neoplasm Metastasis; Thoracic Spine

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Background

Malignant transformation of uterine smooth muscle, termed leiomyosarcoma (LMS), is a rare malignancy, accounting for approximately 10-20 percent of soft-tissue sarcomas and with an incidence of 0.7 cases per 100000 persons per year (1-4). LMS most frequently originates in the uterus, followed by intra-abdominal viscera, the retroperitoneum, large blood vessels, and the soft tissues of extremities (3, 4). It primarily affects adults –especially women – and, although typically sporadic, can be associated with hereditary syndromes such as retinoblastoma and Li-Fraumeni (5).

LMS involving the bone is uncommon and may present as primary or metastatic disease. Primary bone LMS is exceedingly rare, and cases initially diagnosed as primary are often later reclassified as metastases. The most common sites include the distal femur, proximal tibia, and other long bones (6).

Diagnosis relies on imaging –such as plain radiography, computed tomography (CT), and magnetic resonance imaging (MRI) – though findings are often nonspecific. Histological confirmation via image-guided needle biopsy is preferred, with open incisional biopsy reserved for inconclusive cases (6). Complete surgical resection is the cornerstone of LMS treatment to minimize local recurrence and improve survival; when total resection is not feasible, adjuvant radiotherapy and/or chemotherapy is recommended. Regular postoperative surveillance is necessary to detect any recurrence promptly (2, 5-7).

This report discusses a 42-year-old woman with a history of uterine leiomyoma treated via hysterectomy, who presented 12 years later with thoracic back pain due to a solitary T5-T6 vertebral metastasis from uterine LMS. The case illustrates the diagnostic approach, partial spondylectomy with stabilization, and combined adjuvant therapies contributing to long-term disease-free survival.

Case Report

A 42-year-old woman (gravida 2, para 2, aborta 0) presented with a two-month history of progressively worsening, vague upper thoracic spine pain that was unresponsive to analgesics. She had undergone myomectomy for uterine leiomyoma 12 years earlier and had no prior neurological deficits. Physical and neurological examinations were unremarkable, with no motor weakness, sensory loss, or sphincter dysfunction.

Plain radiographs of the thoracic spine did not reveal any obvious osseous abnormalities (Figure 1).

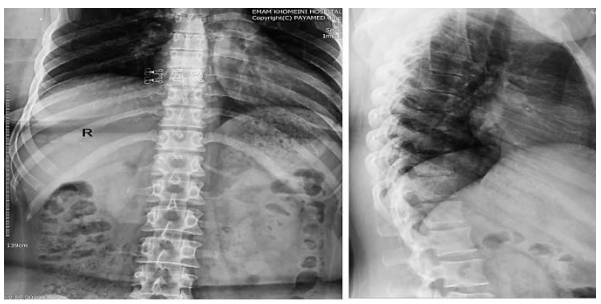

Figure 1. Preoperative anteroposterior (AP) and lateral X-rays showing no apparent osseous abnormalities

CT scan demonstrated destructive lytic lesions involving the T5-T6 vertebral bodies, left pedicles, spinous and transverse processes, adjacent ribs, spinal canal, neuroforamina, and paraspinal soft tissue (Figure 2).

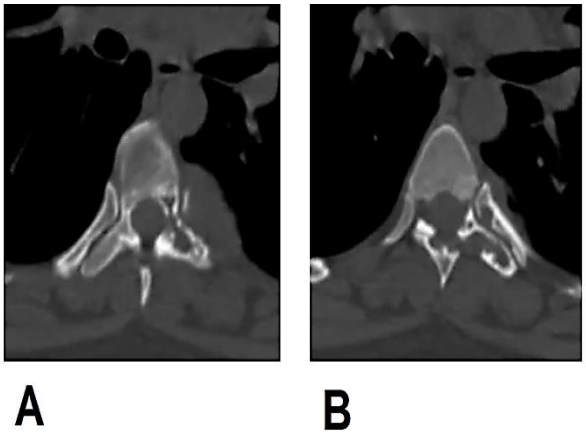

Figure 2. Computed tomography (CT)-scan showing destructive lytic bone lesions involving the vertebral body, left pedicle, spinous process, left transverse process, and adjacent rib

MRI revealed an infiltrative extradural mass extending from T5 to T6, approximately 8 × 4 × 5 cm in the left paravertebral region without vascular invasion. The lesion appeared hypointense on T1-weighted and hyperintense on T2-weighted images, completely occupying the spinal canal with compression of the spinal cord –classified as grade 3 epidural spinal cord compression (ESCC) (Figure 3).

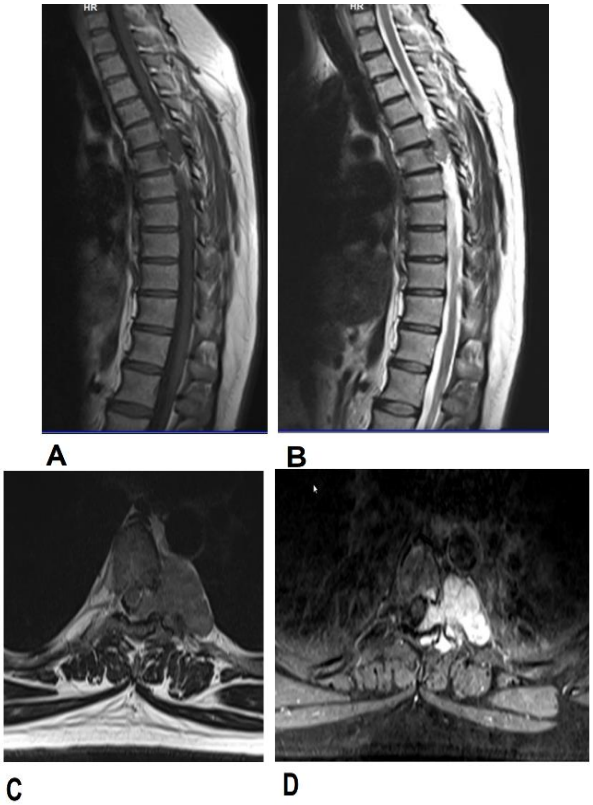

Figure 3. A-D) Magnetic resonance imaging (MRI) of the thoracic spine showing an infiltrative extradural soft tissue mass in the left paravertebral area without vascular involvement. The lesion has low signal intensity on T1-weighted images and high signal intensity on T2-weighted images

Bone scintigraphy showed increased uptake localized to the upper thoracic spine (Figure 4).

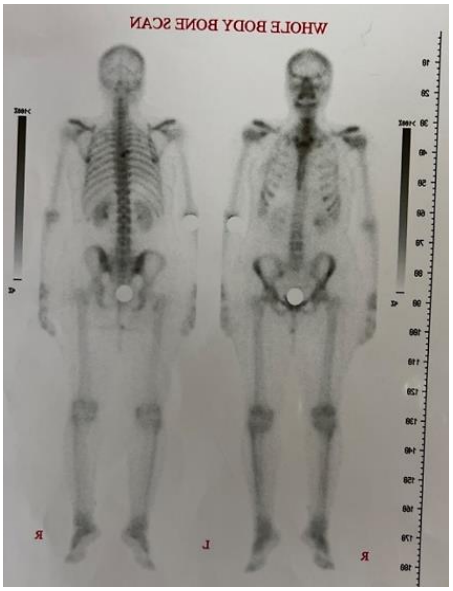

Figure 4. Whole body scan showing a localized area of increased density in the upper thoracic region. Computed tomography (CT)-guided biopsy was consistent with leiomyosarcoma (LMS).

Surgical Treatment

The patient underwent decompressive posterior laminectomy at T5-T6 with extensive tumor debulking, followed by posterior spinal stabilization with T3-T9 pedicle screw instrumentation. Postoperatively, her back pain improved significantly.

Histopathology

Microscopically, the resected mass consisted of spindle-shaped smooth muscle cells with high mitotic activity (Figure 5).

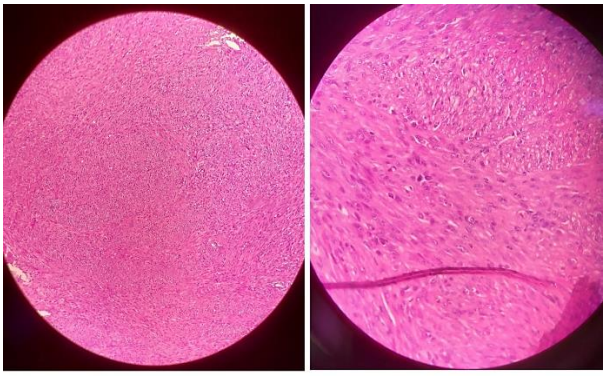

Figure 5. Microscopic examination of the resected tissue from computed tomography (CT)-guided biopsy

Adjuvant Therapy and Follow-up

Postoperatively, she received combined radiotherapy and chemotherapy (Figure 6). Serial follow-up imaging - including MRI at 6, 12, and 24 months, technetium-99m scintigraphy, and positron emission tomography (PET)-CT scans - demonstrated no residual or recurrent disease. A most recent evaluation at 5 years post-surgery with MRI and bone scintigraphy remained negative, and the patient remained symptom-free with no clinical or radiologic signs of local recurrence.

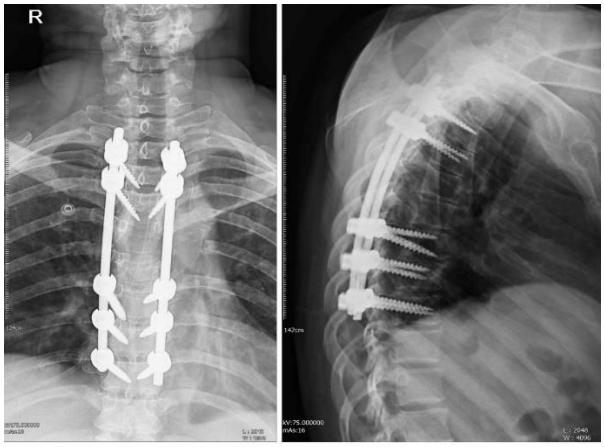

Figure 6. Post-operative X-ray [anteroposterior (AP) and lateral views]

Discussion

Uterine LMS is a rare tumor making up approximately 10-20 percent of soft-tissue sarcomas, most frequently metastasizing to the lungs, liver, kidneys, brain, and skin, whereas osseous –and especially spinal –metastases are rare (1-40).

Bone involvement can be primary or metastatic; primary bone LMS is extremely uncommon and often revised to metastatic upon further workup. Metastatic spinal LMS typically presents years after uterine surgery (e.g., myomectomy), as seen in our patient (3, 7, 40).

Spinal metastases usually affect one vertebral level, particularly in the thoracic region, and predominantly occur in women in early to mid-adulthood (17, 23). Reported intervals from primary tumor to metastasis average around 5 years, but our case showed a 12-year latency, emphasizing the potential for late recurrence.

Treatment-wise, LMS often shows resistance to radiotherapy and chemotherapy, making surgery essential. Even subtotal surgical resection combined with adjuvant therapies can yield durable results. For spinal LMS, retrospective data (n = 9) show a median survival of 46 months, while systematic analyses suggest medians up to 102 months (reviewed literature). Metastasectomy for bone LMS yields a pooled median survival of 59.6 months, although spinal cases have lower survival (~14.1 months) compared to other sites.

In our case, the patient underwent decompression and stabilization followed by combined adjuvant therapy, achieving 5-year disease-free status-consistent with local-control data from stereotactic body radiation therapy (SBRT) and metastasectomy studies (e.g., 76.4% 1-year control post-SBRT).

Conclusion

Metastases of uterine LMS to the spine are extremely rare. Surgical intervention –especially decompression and stabilization – is the mainstay of treatment and offers significant local control. In cases where complete resection is not feasible, palliative decompression combined with adjuvant radiotherapy and chemotherapy can result in effective tumor control and appreciable long-term survival, with reported median survival of 46 months and even exceeding 102 months in selected cohorts. This approach aligns with broader evidence showing improved outcomes through metastasectomy in various bone metastases, including sarcoma.

Conflict of Interest

The authors declare no conflict of interest in this study.

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