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World Journal of Surgery and Surgical Case Reports

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Vol: 2 & Iss: 1

Malignant Soft Tissue Tumors of The Extremities with Bone Metastasis

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Citation: Abdelnoor J. Malignant Soft Tissue Tumors of The Extremities with Bone Metastasis. *World J Surg Surgical Case Rep*, 2026;2(1):117-118.

Received: 20 February, 2026; **Accepted:** 10 March, 2026; **Published:** 12 March, 2026

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A B S T R A C T

Background: Soft Tissue Sarcomas (STS) are rare malignant tumors of mesenchymal origin, most frequently arising in the extremities. Pulmonary metastases predominate, but bone metastases, though less common, represent a clinically significant manifestation associated with pain, pathological fractures and reduced survival.

Methods: Narrative review of textbooks, guidelines and peer-reviewed studies focusing on malignant soft tissue tumors of the extremities with documented bone metastases.

Results: Twelve major tumor types were identified with reported skeletal dissemination, including synovial sarcoma, undifferentiated pleomorphic sarcoma, liposarcoma, leiomyosarcoma, rhabdomyosarcoma, extraskeletal Ewing sarcoma, clear cell sarcoma, angiosarcoma, malignant peripheral nerve sheath tumor, alveolar soft part sarcoma, fibrosarcoma and extraskeletal osteosarcoma.

Conclusion: Bone metastases, though less frequent than pulmonary spread, represent a critical clinical issue. Awareness of tumor subtypes prone to skeletal dissemination aids in surveillance and management. Early detection and multimodal treatment are essential to improve patient outcomes.

Keywords: Soft tissue sarcoma, Extremities, Bone metastasis, Synovial sarcoma, Rhabdomyosarcoma, Leiomyosarcoma

1. Introduction

Soft Tissue Sarcomas (STS) account for less than 1% of adult malignancies but encompass more than 50 histological subtypes[1]. The extremities are the most common site of origin. Metastatic spread typically involves the lungs; however, bone metastases, though less frequent, are clinically significant[2].Their incidence varies by histological subtype, with certain sarcomas demonstrating a higher predilection for skeletal dissemination[3].

2. Methods

A narrative literature review was performed using authoritative textbooks, clinical practice guidelines and peer-reviewed studies. Sources were selected to provide a comprehensive overview of malignant soft tissue tumors of the extremities with documented bone metastases.

3. Results

The following tumor types have been documented to metastasize to bone:

- Synovial sarcoma[4]
- Undifferentiated pleomorphic sarcoma (malignant fibrous histiocytoma)[5]
- Liposarcoma (pleomorphic and dedifferentiated subtypes)[6]
- Leiomyosarcoma[7]
- Rhabdomyosarcoma (alveolar subtype)[8]
- Extraskeletal Ewing sarcoma[9]
- Clear cell sarcoma[10]
- Angiosarcoma[11]
- Malignant Peripheral Nerve Sheath Tumor (MPNST)[12]
- Alveolar soft part sarcoma[3]
- Fibrosarcoma[2]
- Extraskeletal osteosarcoma[6]

4. Discussion

Bone metastases from STS are less frequent than pulmonary involvement but carry significant morbidity. The incidence ranges from 5% to 10% depending on subtype[3,4]. Clinical manifestations include pain, pathological fractures and spinal cord compression.

4.1. Diagnosis

MRI for local disease, CT/PET for systemic staging and biopsy for confirmation[5].

4.2. Management

- Surgery for stabilization or resection of isolated lesions.
- Radiotherapy for palliation and local control.
- Systemic therapy (chemotherapy, targeted agents) depending on histology[6,8].

4.3. Prognosis

Bone metastasis generally indicates advanced disease and poorer survival[7,8]. However, selected patients with limited skeletal involvement may benefit from aggressive local therapy[9].

Future directions include molecular profiling to identify predictors of skeletal dissemination and the development of novel targeted therapies.

5. Conclusion

Bone metastases in malignant soft tissue tumors of the extremities, though less common than pulmonary spread, represent a critical clinical issue. Awareness of tumor subtypes prone to skeletal dissemination aids in surveillance and management. Early detection and multimodal treatment are essential to improve patient outcomes.

6. References

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