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General Surgery

SOFT TISSUE LIPOSARCOMA OF THE LOWER THIGH: CLINICAL CHALLENGES AND APPROACH

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ABSTRACT Soft tissue sarcomas (STS) are rare malignant tumors originating from mesenchymal tissues. This report presents a case of a 45-year-old female diagnosed with well-differentiated liposarcoma (WDLPS) in the right lower thigh. The case highlights diagnostic challenges, imaging findings, histopathological confirmation, surgical intervention and follow-up strategies.

KEYWORDS : Well-differentiated liposarcoma, soft tissue sarcoma, lower thigh, MRI, surgical excision, surveillance

INTRODUCTION

Soft tissue sarcomas (STS) represent a rare group of malignancies, with liposarcoma being one of the most common histological subtypes in adults. Among its variants, well-differentiated liposarcoma (WDLPS) accounts for a significant proportion, particularly affecting the extremities. WDLPS also referred to as atypical lipomatous tumor (ALT) when located in the extremities, typically exhibits indolent behavior, low metastatic potential, but a high rate of local recurrence if not adequately excised. The lower thigh is a common anatomical site due to the abundance of adipose and connective tissue.

This case report presents a patient with WDLPS of the lower thigh, emphasizing the importance of precise diagnosis, appropriate surgical management, and vigilant follow-up in optimizing outcomes.

Case Summary

A 45-year-old married woman from Moradabad, Uttar Pradesh, presented with a painless swelling in the lower aspect of her right thigh that had been progressively increasing in size over the past year. Initially 3×3 cm² in size, the swelling had undergone a rapid increase in volume during the last two months, reaching 10×14 cm². This growth was associated with a dull, continuous ache over the same period. There was no history of trauma, weight loss, appetite changes, skin changes, limb weakness or systemic symptoms such as cough or hemoptysis. She had no significant medical, surgical, or family history.

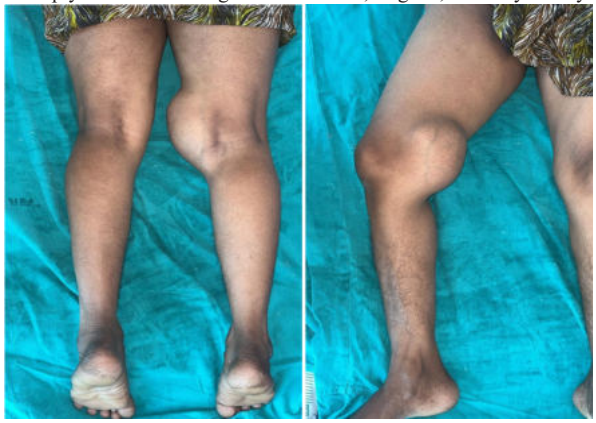

Fig 1. Clinical image showing a well-defined swelling over the lower medial right thigh.

On examination the right lower limb revealed a single, well-defined, firm swelling of 10×14 cm² located in the medial and lower thigh, extending from 12 cm proximal to 2 cm distal to the tibial tuberosity, partially overlying the knee joint. The swelling was non-tender, non-fluctuant, not compressible, not pulsatile, and mobile in all directions. The overlying skin appeared healthy, with a few prominent veins, and there was no evidence of scarring, sinuses, or skin tethering. No neurovascular deficits were detected. No inguinal lymphadenopathy was noted. Bilateral limb lengths and mid-thigh circumferences were equal, with no gait disturbances or joint movement restrictions. The neurological and vascular examinations of the lower limbs were within normal limits. Based on clinical presentation and examination, a provisional diagnosis of soft tissue sarcoma of the lower right thigh was made. The staging was consistent with Stage IB (T3 N0 M0 G1) soft tissue sarcoma. Further diagnostic evaluation, including imaging and biopsy, confirmed the diagnosis of well-differentiated liposarcoma (WDLPS), a low-grade malignancy with minimal metastatic potential. MRI revealed a well-defined, lobulated soft tissue lesion in the poster medial lower right thigh, measuring 8 × 8.4 × 13 cm. It appeared T1 isointense, T2 hyper intense, with fat content, diffusion restriction, and heterogeneous enhancement. The lesion abutted adjacent muscles and bones without infiltration, suggesting a likely soft tissue liposarcoma.

Fig 2. Post operative wound bed after STSG coverage.

The patient underwent wide local excision of the tumor with the goal of achieving oncologically safe margins. Due to the size and location of the lesion—overlying the medial knee and lower thigh—primary closure was not feasible without compromising limb function or causing excessive tension on the surgical site. Hence, after successful

tumor resection, coverage was achieved using a split-thickness skin graft (STSG), harvested from the contra lateral thigh. The postoperative course was uneventful. Graft take was satisfactory, and the patient began physiotherapy for joint mobility preservation soon after wound healing.

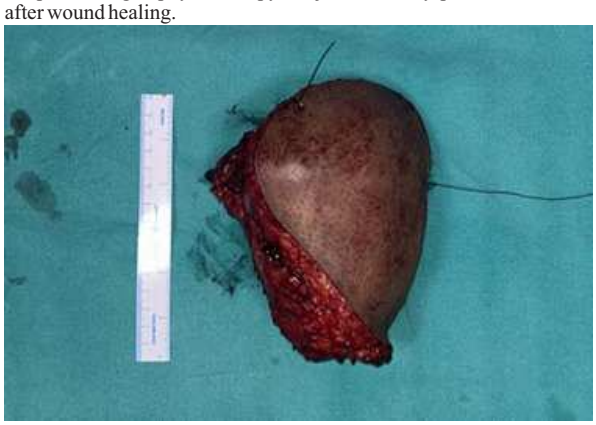

Fig 3. Respected specimen of soft tissue sarcoma of right lower thigh.

DISCUSSION

WDLPS is a type of soft tissue sarcoma known for its slow progression and low metastatic potential, but with a tendency for significant local recurrence. It is made up of mature fat cells interspersed with atypical stromal cells and fibrous bands. While its histological features may resemble benign lipomas, WDLPS behaves more aggressively in terms of growth and differentiation into higher-grade sarcoma (dedifferentiation) increases its metastatic risk. The mainstay of treatment is wide local excision with clear margins, as chemotherapy and radiotherapy have limited roles in its standard management. (1)

Clinically, WDLPS often presents as a gradually enlarging, painless lump. Due to its similarity to benign lipomas, early stages are frequently misdiagnosed or inadequately managed. (2) Any soft tissue mass that is more than 5 cm in diameter, located deep to the fascia, or growing in size should prompt further evaluation. Delay in diagnosis may result in more complicated surgery and increased risk of recurrence. MRI is the preferred imaging technique, offering precise delineation of the tumor. Typical MRI findings include a large, fatty mass with thickened internal septa, nodular components, or non-fatty areas that suggest atypia. Use of contrast may reveal subtle enhancement of fibrous tissue or suspicious regions within the mass, guiding biopsy. Histologically, WDLPS comprises adipocytes that appear mature but contain areas of nuclear atypia and abnormal stromal cells. It lacks the cellular activity and pleomorphism typical of higher-grade sarcomas. Immunohistochemical testing is essential for accurate diagnosis, particularly the detection of MDM2 and CDK4 amplification—genetic changes found in WDLPS that help distinguish it from benign lipomas. These markers are linked to gene amplification at chromosome 12q13-15. (3)

Surgical excision with a margin of healthy tissue is the definitive treatment. In most extremity cases, limb-sparing surgery is feasible and effective. The success of surgery depends heavily on achieving clear margins, as recurrence is strongly associated with incomplete resection. In the discussed case, wide excision was performed successfully without compromising vital structures. Radiation therapy has a limited role in WDLPS but may be considered when surgical margins are inadequate or in recurrent cases. Chemotherapy is generally not recommended due to the tumor's low grade and poor responsiveness to systemic treatments. Postoperative monitoring is crucial because WDLPS has a recurrence rate of up to 30%, (4) particularly in cases with close or positive margins. Regular follow-up using physical exams and MRI every six months for the first few years is recommended. (5) Chest imaging is generally not needed unless dedifferentiation occurs. A key challenge lies in differentiating WDLPS from benign lipomas before surgery. Misdiagnosis can lead to incomplete removal and more complex recurrences. Therefore, large or deep fatty tumors should always be evaluated in specialized centers. With proper surgical management and long-term surveillance, WDLPS has an excellent prognosis, with a five-year disease-specific survival rate exceeding 90%. Outcomes are especially favorable in extremity tumors compared to those in retroperitoneal or deep-seated locations.

CONCLUSION

This case highlights the need for timely evaluation of any enlarging soft tissue mass, particularly in the limbs. Although well-differentiated liposarcoma is a low-grade tumor, it carries a considerable risk of local recurrence. Accurate diagnosis—supported by imaging and confirmation of MDM2/CDK4 amplification—is key to differentiating it from benign lipomas. Wide local excision remains the primary treatment, and when closure is not possible, split-thickness skin grafting (STSG) offers effective coverage while preserving function. Consistent follow-up is essential to monitor for recurrence. With coordinated multidisciplinary care, outcomes are generally favorable, especially in extremity-based tumors.

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