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Case Report

# Unveiling the enigma of myxoid liposarcoma: Diagnostic challenges and multidisciplinary triumphs in limb-salvage surgery ☆

*Ikhwan Nasir, MD*[a], *Boon Tat Yeap, MD, MMed*[a,b], *Thai Hau Koo, MD*[c], *Aaron Gerarde Paul, MD, MMed*[d], *Mohd Hazeman Zakaria, MD, MMed*[e,*]

[a] *Department of Anaesthesiology and Intensive Care, Hospital Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia*
[b] *Department of Medical Education, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia*
[c] *Department of Internal Medicine, Hospital Pakar Universiti Sains Malaysia, School of Medical Sciences, Kubang Kerian, Kelantan, Malaysia*
[d] *Department of Orthopaedics, Hospital Queen Elizabeth, Kota Kinabalu, Sabah, Malaysia*
[e] *Department of Radiology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia*

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ABSTRACT

Liposarcoma is a rare soft-tissue sarcoma accounting for about 5% of adult cases; myxoid liposarcoma is the second most common subtype and typically arises in the lower extremities (especially the thigh). We report the case of a 48-year-old woman who presented with a rapidly enlarging, painful mass in the left thigh over 1 year, which was confirmed to be a myxoid liposarcoma on histopathological examination. The patient underwent wide local excision of the tumor with clear margins; she had an uncomplicated postoperative course and remained disease-free at 6 months of follow-up. This case highlights the importance of thorough imaging evaluation and biopsy for accurate diagnosis of soft-tissue masses, as well as the need for complete surgical resection and diligent long-term surveillance in myxoid liposarcoma.



## Introduction

Liposarcoma, a rare and heterogeneous soft-tissue sarcoma, accounts for approximately 5% of all sarcomas in adults [1,2]. Among its subtypes, myxoid liposarcoma is the second most common and predominantly arises in the lower extremities, particularly the thigh. These adipocytic tumors often present diagnostic challenges due to complex imaging features, necessitating histopathological confirmation for definitive

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* Corresponding author.
E-mail address: hazeman@upm.edu.my (M.H. Zakaria).

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management. We present a case of a middle-aged woman diagnosed with myxoid liposarcoma of the left thigh, and we discuss the epidemiology, diagnosis, therapeutic management, and follow-up considerations for this condition.

## Case presentation

A 48-year-old woman (BMI: 22.5 kg/m$^2$) presented to our institution in 2024 with a 1-year history of progressive, unilateral swelling of her left thigh. She noted that the mass was initially about 3 cm in diameter and gradually enlarged to approximately 10 cm over the last 2 months, accompanied by intermittent dull aching pain around the area. Two weeks before presentation, the pain worsened, prompting her to seek treatment. She had no significant past medical or surgical history and no family history of malignancy. There were no constitutional symptoms such as weight loss, fever, or anorexia. She also denied any history of trauma to the limbs. On physical examination, an approximately 13 × 7 cm firm mass was palpable in the medial aspect of the anterior compartment of the left thigh; the mass was mobile in the longitudinal plane and the overlying skin was intact (Fig. 1). Neurologic and vascular examinations of the limb were unremarkable.

Laboratory investigations were within normal limits. For example, her hemoglobin was 13.8 g/dL (reference range 12.0–15.5), white blood cell counts 7.6 × 10^9/L (4–11 × 10^9/L), and C-reactive protein 1.2 mg/L (normal <5). These results indicated no evidence of infection or significant systemic inflammation. Given the large size of the thigh mass, imaging studies were obtained for further evaluation. A bedside ultrasound demonstrated a heterogeneous solid mass with internal vascularity on Doppler imaging. Subsequent magnetic resonance imaging (MRI) of the left thigh revealed a well-circumscribed intramuscular tumor within the vastus medialis, measuring approximately 7.3 × 6.9 × 14.4 cm, with internal septations (Fig. 2). The lesion showed heterogeneous signal characteristics: predominantly hypointense on T1-weighted images and heterogeneously hyperintense on T2-weighted images, with incomplete fat suppression on fat-saturated sequences, suggesting the presence of a fat component. The mass exhibited heterogeneous enhancement on postcontrast MRI sequences. No obvious bone involvement or extension into subcutaneous tissue was noted on imaging. To obtain a preoperative tissue diagnosis, an ultrasound-guided Tru-Cut biopsy was performed; histopathology of the core sample demonstrated a lipogenic tumor in an abundant myxoid stroma, consistent with a myxoid liposarcoma. A metastatic workup was also conducted prior to definitive treatment. Contrast-enhanced computed tomography (CT) of the chest, abdomen, and pelvis showed no evidence of distant metastases.

Given the enlarging, painful nature of the thigh mass and the biopsy results, the patient was counseled to undergo wide surgical excision of the tumor. Informed consent was obtained (including consent for publication of this case). The operation was performed under regional anesthesia (spinal subarachnoid block with 13.5 mg of heavy bupivacaine 0.5% and 15 mcg of fentanyl), with the patient in a supine position and standard intraoperative monitoring. A wide excision of

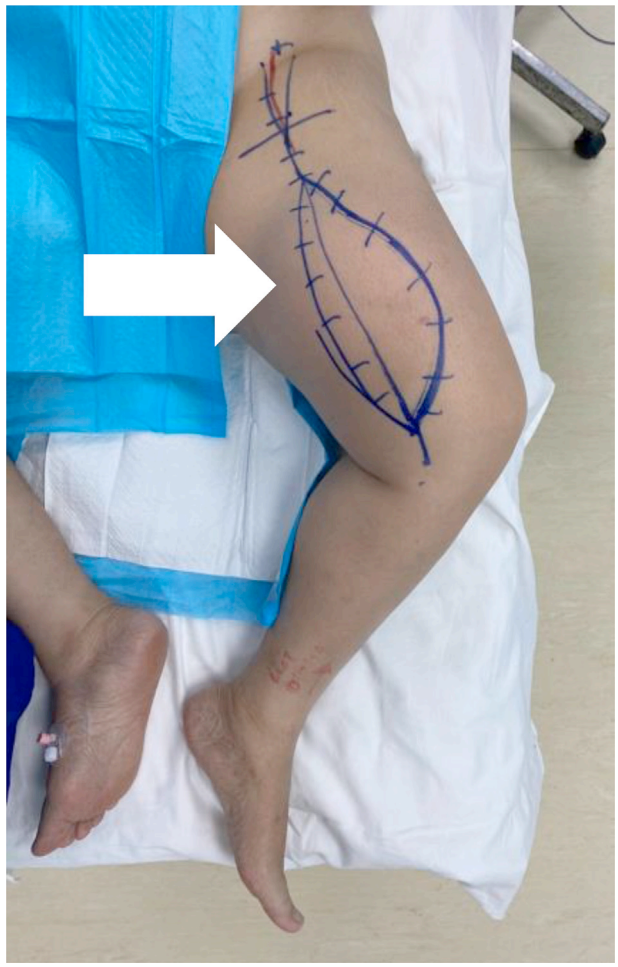

**Fig. 1 – Clinical photograph of the patient's left thigh in a supine position, illustrating the visible bulge of the tumor on the medial anterior aspect (white arrow).**

the left vastus medialis muscle and tumor was carried out by the orthopedic oncology team. An anteromedial approach was used (Fig. 3), beginning just medial to the femoral vessels and extending distally to the medial epicondyle of the femur. The entire vastus medialis muscle and part of the underlying vastus intermedius were resected en bloc with the tumor, aiming for clear margins. A vacuum drain was placed in the resection bed and was removed on the fifth postoperative day once drainage had ceased and the wound had epithelialized.

Histopathological examination of the resected specimen confirmed a myxoid liposarcoma, characterized by a well-circumscribed but unencapsulated mass composed of abundant myxoid matrix with scattered mature adipocytes. Necrosis was minimal and surgical margins were microscopically negative (R0 resection). The patient's postoperative recovery was uneventful, and she was ambulated with support during rehabilitation.

At her 6-month postoperative follow-up, surveillance imaging was performed. MRI of the left thigh (surgical site) showed no evidence of local recurrence, and a CT scan of the chest was clear of any metastatic disease. Clinically, she had regained full function of the left leg and was able

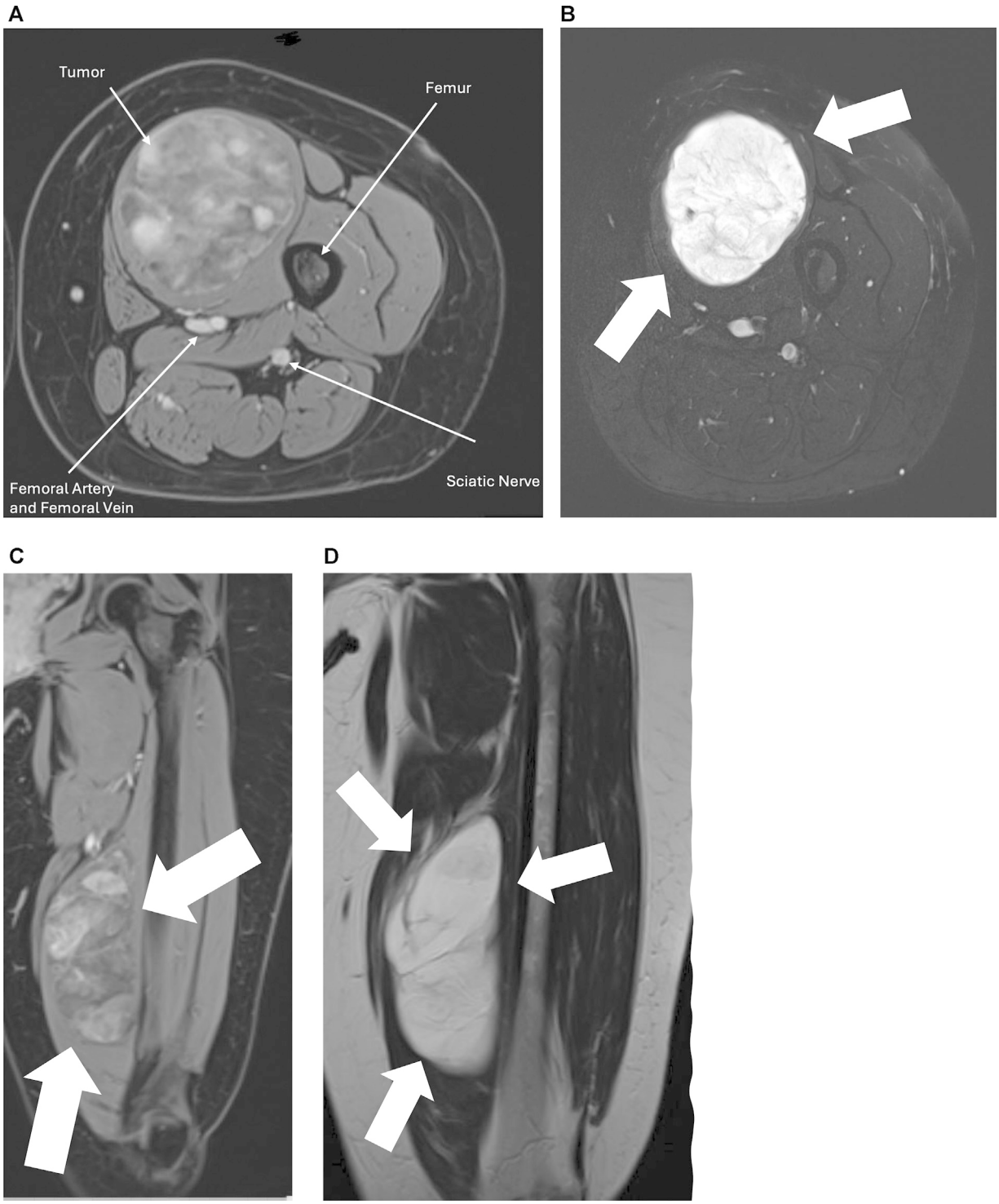


**Fig. 2 – Magnetic resonance imaging of the left thigh at mid-thigh level. (A) Axial T1-weighted MR image with gadolinium (postcontrast), labeled to show the tumor, femur, femoral vessels, and sciatic nerve. (B) Axial T2-weighted MR image of the thigh. (C) Sagittal T1-weighted MR image with gadolinium (postcontrast). (D) Sagittal T2-weighted MR image. The intramuscular mass (white arrows) in the vastus medialis measures approximately 7.3 x 6.9 x 14.4 cm and contains internal septations. It exhibits heterogeneous signal intensities—predominantly hypointense on T1WI, hyperintense on T2WI with incomplete fat suppression on Short Tau Inversion Recovery (STIR)—and shows irregular enhancement on the postcontrast images. No blooming artifact is present on gradient-echo sequences (GRE). The tumor does not invade the subcutaneous tissue, and the surrounding muscles and adjacent femur appear normal. No abnormal signal intensities within the left vastus medialis muscle (surrounding this mass).**

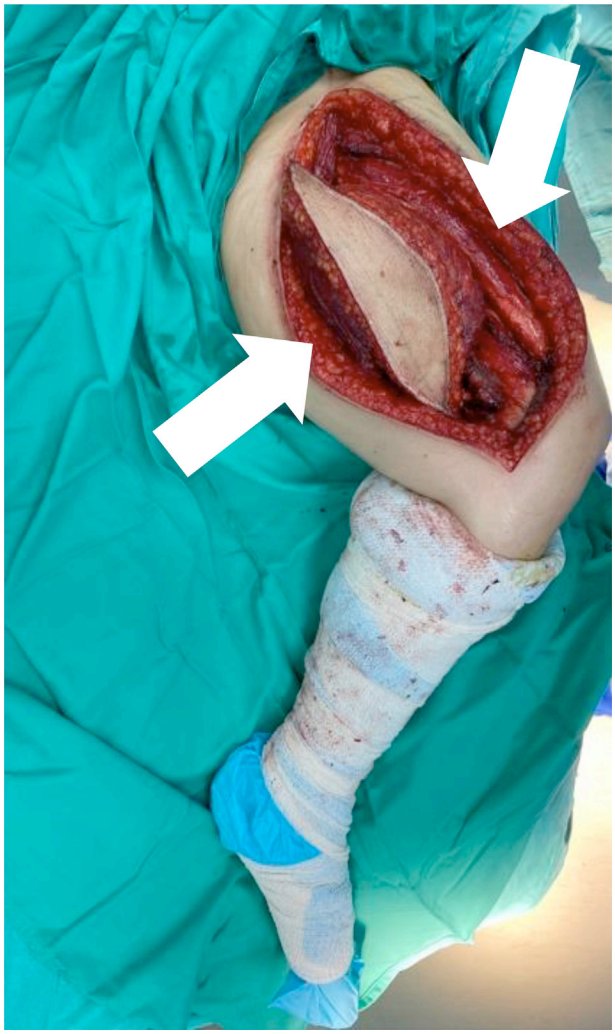

**Fig. 3 – Intraoperative photograph showing the resection bed in the left thigh after complete excision of the tumor with clear margins. The white arrows indicate the surgical cavity where the tumor was removed.**

to perform activities of daily living without difficulty. The patient continues to be followed in the orthopedic oncology clinic at 6-month intervals with imaging surveillance—MRI of the thigh for local recurrence and CT of the chest for distant metastasis—given the high risk of recurrence and metastasis associated with liposarcomas.

## Discussion

Myxoid liposarcoma is a malignant soft-tissue tumor of adipocytic origin. It most commonly occurs in adults between 30 and 50 years of age, with a slight male predominance [3]. Clinically, it often presents as a deep-seated, gradually enlarging mass in the thigh or popliteal region, and it may remain asymptomatic until it becomes large enough to cause a mass effect on surrounding structures [4]. In our case, the patient was female and in her late 40s, which, while slightly less common than in males, is within the known demographic range for this tumor.

From a diagnostic standpoint, imaging plays a vital role in the evaluation of soft-tissue masses. Ultrasound is a useful first-line modality as it is noninvasive and can differentiate solid from cystic lesions at the bedside. In this patient, ultrasound helped confirm the mass was solid and vascular. Magnetic resonance imaging is the gold-standard for further characterization of soft-tissue sarcomas, as it provides excellent contrast resolution for different tissue components [5]. Myxoid liposarcomas typically appear as heterogeneous masses on MRI with mixed solid and fatty areas – they often contain lipomatous components that are hyperintense on T1-weighted images and myxoid (water-rich) areas that are hyperintense on T2-weighted images [5]. Our patient's MRI reflected these features, showing a predominantly intramuscular tumor with internal septations and mixed signal intensities corresponding to fat and myxoid tissue. Notably, areas of the tumor were not suppressed on fat-saturated sequences, indicating macroscopic fat, which is a characteristic finding in liposarcomas. Definitive diagnosis, however, requires histopathological confirmation [2–5]. In this case, a core needle biopsy provided a diagnosis of myxoid liposarcoma, guiding our treatment planning.

Wide surgical excision with negative margins remains the mainstay of treatment for myxoid liposarcoma [5,6]. Complete resection of the tumor with a microscopically negative margin (R0 resection) is associated with better local control and long-term survival [5,6]. In our patient, an en bloc resection of the tumor along with the involved muscle was achieved, and histopathology confirmed clear margins. Achieving local control is critical, as positive margins (R1 or R2 resection) significantly increase the risk of local recurrence and may necessitate re-operation or adjuvant therapy. In general, myxoid liposarcoma is considered more radiosensitive and chemosensitive than many other soft-tissue sarcoma subtypes [7]. Adjuvant radiation therapy can be utilized to improve local control, particularly for large (>10 cm) or deep tumors, or when surgical margins are close/positive [6,7]. Some guidelines advocate for preoperative radiotherapy in cases of very large or deep tumors to potentially reduce tumor size and facilitate resection [6,7]. In our case, the tumor was indeed large and deep; however, primary resection was elected after multidisciplinary discussion since the mass was resectable and the patient was keen to proceed directly to surgery. Postoperatively, our patient's margins were clear and the decision was made to observe without immediate adjuvant radiotherapy, given the absence of residual disease.

The role of chemotherapy in myxoid liposarcoma remains somewhat debated [6–9]. Myxoid/round cell liposarcomas (particularly those with a high-grade round cell component) have shown greater sensitivity to systemic chemotherapy compared to other liposarcoma subtypes [6–9]. In fact, myxoid liposarcoma is regarded as one of the more chemoresponsive soft-tissue sarcomas [6–8]. Anthracycline-based regimens (such as doxorubicin with or without ifosfamide) are the standard first-line chemotherapies for advanced or metastatic disease, and myxoid liposarcomas have demonstrated response rates around 40% to these treatments [9]. This chemosensitivity is significantly higher than that of

well-differentiated or dedifferentiated liposarcomas, for example, and informs the consideration of neoadjuvant or adjuvant chemotherapy in certain cases (e.g. high-grade tumors or those with metastatic spread) [7–9]. In our patient's case, the disease was localized and of intermediate grade (no significant round cell component noted), so chemotherapy was not administered. However, should she develop metastatic disease or if a high-grade component had been present, an anthracycline-based chemotherapy regimen could be considered as part of a multidisciplinary treatment approach.

Long-term follow-up is essential in patients with myxoid liposarcoma. The median survival time was 190 months for patients who underwent surgery alone and 90 months for those who underwent surgery and adjuvant treatment, as the tumor size of patients who received adjuvant treatment was relatively more significant [8]. While local recurrence rates for myxoid liposarcoma are relatively lower than for some other sarcoma subtypes (especially if wide negative margins are achieved), these tumors have a notable propensity for distant metastasis. Approximately 30%-60% of patients will develop metastases, with the lungs being the most common site [1]. Myxoid liposarcoma also tends to metastasize to unusual locations like extrapulmonary fat, skeletal tissue, or the spine, particularly in cases with a high-grade round cell component [10]. Tumors with a round cell component greater than 5% are considered high-grade myxoid liposarcoma and are associated with a significantly higher risk of metastasis and death [11]. In our case, no metastases were detected at presentation or in early follow-up.

Nevertheless, vigilant surveillance was instituted given the tumor's metastatic potential. Current sarcoma surveillance guidelines recommend periodic imaging of both the primary site and the lungs for up to 10 years post-treatment. In practice, MRI is advised for the local site (to detect any soft-tissue recurrence), and chest imaging (typically CT scans) is used to monitor for pulmonary metastases [12]. Consistent with these recommendations, our patient's follow-up schedule includes alternating MRI of the thigh and CT of the chest every 6 months. Early detection of recurrence or metastasis allows for timely intervention, which can be crucial for long-term survival.

## Conclusion

In managing myxoid liposarcoma of the extremity, a wide local resection with clear margins is necessary but not sufficient on its own. Optimal care is achieved through a multidisciplinary approach, often involving surgeons, radiologists, pathologists, and oncologists, to improve long-term outcomes. Careful preoperative evaluation with MRI is critical for surgical planning to ensure adequate margins. Postsurgical surveillance with periodic imaging—for example, MRI of the primary site and CT of the chest—is key to early detection of local recurrence or distant metastasis and prompt intervention. This case underlines the importance of combining thorough diagnostic workup, effective surgical management, and vigilant follow-up to achieve favorable results in patients with myxoid liposarcoma.

## Data availability

Data not available/The data that has been used is confidential.

## Patient consent

Written informed consent was obtained from the patient for the publication of this case report.

## REFERENCES


[1] . WHO classification of tumours soft tissue and bone tumours. Lyon (France): International Agency for Research on Cancer; 2020. p. 3.

[2] Kransdorf MJ. Malignant soft-tissue tumors in a large referral population: distribution of diagnoses by age, sex, and location. AJR Am J Roentgenol 1995;164:129–34. doi:10.2214/ajr.164.1.7998525.

[3] Catalano O, Varelli C, Sbordone C, Corvino A, De Rosa D, Vallone G, et al. A bump: what to do next? Ultrasound imaging of superficial soft-tissue palpable lesions. J Ultrasound 2020;23:287–300. doi:10.1007/s40477-019-00415-z.

[4] Buehler D, Marburger TB, Billings SD. Primary subcutaneous myxoid liposarcoma: a clinicopathologic review of three cases with molecular confirmation and discussion of the differential diagnosis. J Cutan Pathol 2014;41:907–15. doi:10.1111/cup.12428.

[5] Sundaram M, Baran G, Merenda G, McDonald DJ. Myxoid liposarcoma: magnetic resonance imaging appearances with clinical and histological correlation. Skelet Radiol 1990;19:359–62. doi:10.1007/BF00193091.

[6] Tfayli Y, Baydoun A, Naja AS, Saghieh S. Management of myxoid liposarcoma of the extremity. Oncol Lett 2021;22:596. doi:10.3892/ol.2021.12857.

[7] Moreau LC, Turcotte R, Ferguson P, Wunder J, Clarkson P, Masri B, et al. Myxoid\round cell liposarcoma (MRCLS) revisited: an analysis of 418 primarily managed cases. Ann Surg Oncol 2012;19:1081–8. doi:10.1245/s10434-011-2127-z.

[8] Zheng K, Yu XC, Xu M, Yang Y. Surgical outcomes and prognostic factors of myxoid liposarcoma in extremities: a retrospective study. Orthop Surg 2019;11:1020–8. doi:10.1111/os.12566.

[9] Nassif EF, Keung EZ, Thirasastr P, Somaiah N. Myxoid liposarcomas: systemic treatment options. Curr Treat Options Oncol 2023;24(4):274–91. doi:10.1007/s11864-023-01057-4.

[10] Schwab JH, Boland PJ, Antonescu C, Bilsky MH, Healey JH. Spinal metastases from myxoid liposarcoma warrant screening with magnetic resonance imaging. Cancer 2007;110:1815–22. doi:10.1002/cncr.22992.

[11] Haniball J, Sumathi VP, Kindblom LG, Abudu A, Carter SR, Tillman RM, et al. Prognostic factors and metastatic patterns in primary myxoid/round-cell liposarcoma. Sarcoma 2011;2011:538085. doi:10.1155/2011/538085.

[12] Hussein M, Gupta H, Ahuja A, Thaker S. Imaging recommendations for soft-tissue sarcomas: model guidelines from diagnosis to post-treatment follow-up. Clin Radiol 2024;79(12):881–91. doi:10.1016/j.crad.2024.08.023.