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When a Benign Tumor Recurs: Transformation of a Lipoblastoma into a Myxoid Liposarcoma of the Thigh – The Pivotal Role of MRI and Surgery

Maazouz Lamiae[1]*, Bhallil Siham[1], Ziani Hamid[1], Nasri Siham[1], Skiker Imane[1]

[1]Radiology Resident, Department of Radiology, Mohammed VI University Hospital, Oujda, Morocco

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***Corresponding author:** Maazouz Lamiae
Radiology Resident, Department of Radiology, Mohammed VI University Hospital, Oujda, Morocco

Abstract | **Case Report**

Myxoid liposarcomas are rare malignant soft tissue tumors, representing a distinct entity due to their histological features and intermediate biological behavior. This report presents the case of a 31-year-old man who underwent surgery in 2020 for a lipoblastoma of the right thigh, which recurred as a histologically confirmed myxoid liposarcoma. MRI enabled precise characterization of the tumor. A carcinological excision with venous reconstruction and muscle coverage was performed. This case highlights the importance of MRI in the diagnosis of soft tissue tumors, the benefits of multidisciplinary management, and the necessity of prolonged follow-up after surgery.

Keywords: Myxoid liposarcoma, lipoblastoma, MRI, thigh, soft tissue tumor, oncologic surgery.

INTRODUCTION

Lipoblastoma is a rare benign soft tissue tumor that primarily occurs in children. In adults, this tumor is exceptional, and its transformation into liposarcoma has only been reported in extremely rare cases [1,2]. Myxoid liposarcoma is the second most common subtype of liposarcoma (accounting for 30% to 40% of cases), predominantly affecting young adults, with a preference for the lower limbs, particularly the deep muscular compartments [3].

The malignant transformation of a recurrent lipoblastoma into liposarcoma raises important diagnostic and therapeutic challenges. Magnetic resonance imaging (MRI) is the reference modality for evaluating soft tissue tumors [4]. We report here a case that has been documented radiologically, surgically, and histologically.

CLINICAL CASE

This is the case of a 31-year-old male with no significant medical history, who had undergone surgery in 2020 for a lipoblastoma (Figure 1) of the right thigh. Between 2021 and 2024, the patient reported a progressive, painless enlargement on the medial aspect of the right thigh, which prompted him to consult the trauma surgery department. On clinical examination, the mass measured 7 × 5 cm, was mobile, painless, and adherent to the skin, with no joint stiffness, no reduction in walking range, no limping, and no general health deterioration (Figure 2).

An MRI of the right thigh was performed using the following sequences: T1, T2, STIR, and T1 FATSAT before and after gadolinium contrast injection (Figure 3). The imaging revealed an intramuscular tumor process located within the vastus medialis muscle of the right thigh, with lobulated and well-defined contours. The lesion appeared hyperintense on both T1- and T2-weighted sequences, with no signal drop on fat-suppressed images. It demonstrated intermediate contrast enhancement and contained internal septations. Size: 94 × 82 × 112 mm (W × D × H).

The mass displaced the rectus femoris muscle laterally, abutted the vastus intermedius muscle superiorly and posteriorly, and was in close contact with the femoral vascular pedicle posteriorly—particularly the superficial femoral vein—with ill-defined margins. Anteriorly, the tumor invaded the subcutaneous tissue and overlying skin.

A second intramuscular mass was identified in the sartorius muscle. It exhibited heterogeneous signal characteristics, with a predominant fatty component

(hyperintense on T1 and T2, suppressed on FATSAT), a hemorrhagic component, and a tissue component showing post-contrast enhancement. This lesion measured 43 × 19 mm and extended over 71 mm, remaining confined to the sartorius muscle.

These MRI features were highly suggestive of a well-differentiated myxoid liposarcoma, characterized by lobular architecture, internal septations, and abundant myxoid stroma.

A thoraco-abdominopelvic CT scan revealed no evidence of metastatic spread.

Due to the suspicious nature of the recurrent tumor and the context of a prior lipoblastoma, a carcinologic resection was decided upon during a multidisciplinary team meeting. Surgery was performed under general anesthesia via an anteromedial approach to the right thigh.

Intraoperative exploration revealed a well-defined, exo-fascial mass adherent to the subcutaneous tissue, located near the great saphenous vein, without deep muscular invasion. A monobloc resection of the tumor with macroscopically clear margins was achieved. The tumor measured 7.2 × 5.1 × 4.3 cm (Figure 4). Due to macroscopic involvement of the venous wall, a partial resection of the great saphenous vein was necessary, followed by autologous venous bypass using a healthy segment of the same vein (Figure 5). This reconstruction was performed in collaboration with the vascular surgery team.

The cutaneous and subcutaneous tissue defect was covered using a transposed lumbomuscular flap, performed by the plastic surgery team (Figure 6). The procedure was completed without major intraoperative complications. Postoperative recovery was uneventful, with satisfactory wound healing (Figure 7) and progressive return to walking by postoperative day 5, with no vascular or neurological complications. Close clinical and radiological follow-up was initiated.

Histological analysis confirmed the diagnosis. Macroscopically, the surgical specimen revealed a well-encapsulated mass of mixed consistency, measuring 7.2 × 5.1 × 4.3 cm, with a lobulated, white-grayish, gelatinous cut surface suggestive of a myxoid component. Histological examination (H&E staining) showed a malignant mesenchymal tumor proliferation arranged in lobules separated by thin fibrous septa. The stroma was rich in basophilic myxoid substance with abundant vascularization (Figure 8).

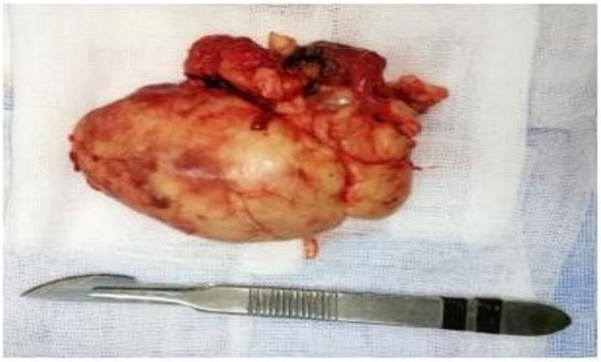

Figure 1: Surgical specimen of the initially resected lipoblastoma.

Figure 2: Clinical image showing the mass located on the anteromedial aspect of the right thigh.

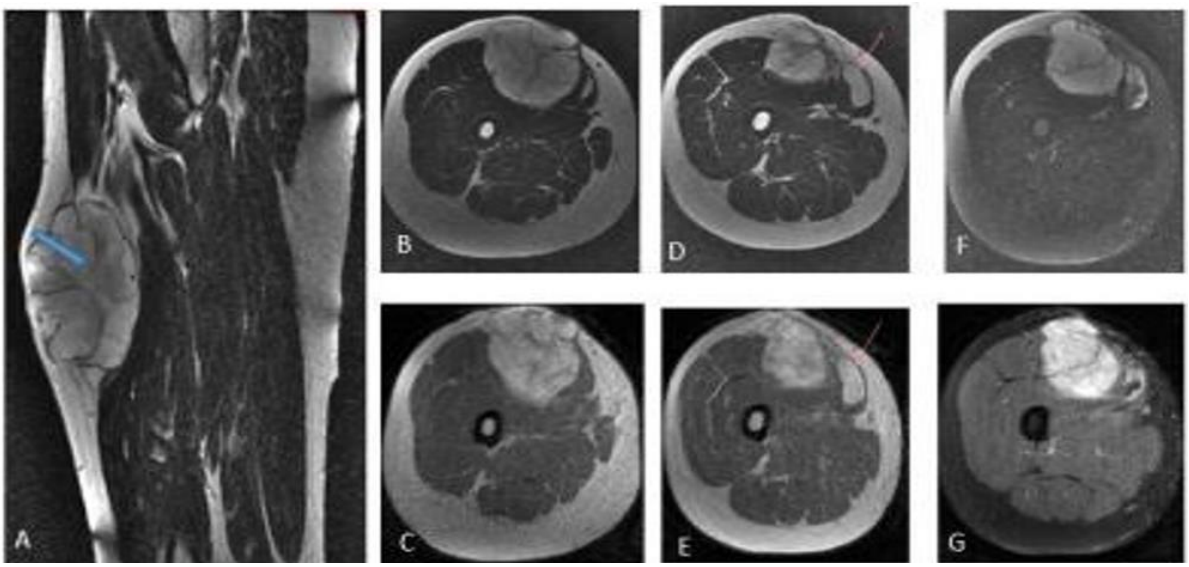

Figure 3: MRI of the right thigh: sagittal T2-weighted (A), axial T2-weighted (B, D), axial T1-weighted (C, E), axial T2 fat-saturated (F), and axial contrast-enhanced T1 fat-saturated sequences (G).

- **Intra-muscular tumor located in the anterior compartment of the right thigh, well-defined with lobulated margins, hyperintense on T1 (C) and markedly hyperintense on T2 (A, B), without signal drop on fat-saturated sequences (F), showing intense enhancement post-gadolinium (G), with visible internal septa (blue arrow).**
- **Second intramuscular mass within the sartorius muscle (pink arrow), with heterogeneous signal: a predominant fatty component (hyperintense on T1 and T2), suppressed on fat-saturated sequences, a second hemorrhagic component, and a third enhancing component post-contrast.**

Figure 4: Radical en bloc resection of the tumor mass with macroscopically clear margins.

Figure 5: Repair of macroscopic parietal venous invasion using a graft from the contralateral great saphenous vein, preserved in warm heparinized saline, followed by an autologous venous bypass.

Figure 6: Creation of a lumbomuscular flap to reconstruct the cutaneous and subcutaneous tissue defect.

Figure 7: Postoperative course showing progression toward satisfactory wound healing.

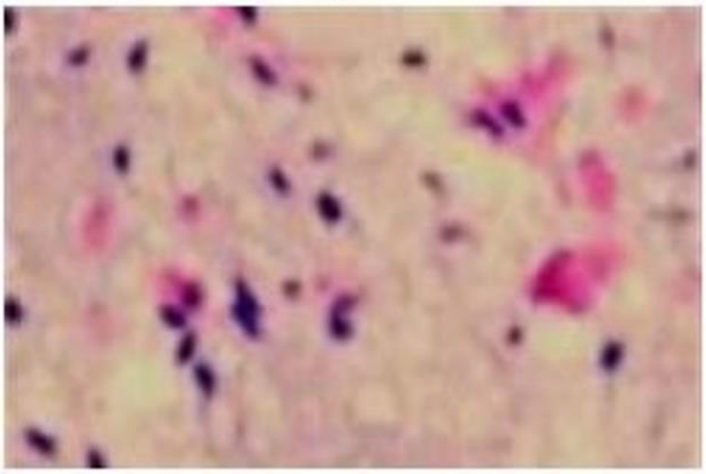

Figure 8: Histological image (H&E stain) showing a malignant mesenchymal tumor proliferation arranged in lobules separated by thin fibrous septa, with a stroma rich in basophilic myxoid material.

DISCUSSION

Malignant transformation of a lipoblastoma is exceedingly rare in the literature [1,2]. This case demonstrates that a lesion initially considered benign can recur as a malignant sarcoma. MRI played a pivotal role in this scenario by enabling detailed characterization of the lesion. It strongly suggested a myxoid liposarcoma based on well-established imaging criteria, including abundant myxoid stroma, internal septations, intense contrast enhancement, and a lobulated architecture [4,5].

MRI also provided critical information on the tumor's relationship to vascular structures, which was essential for appropriate surgical planning. Furthermore, MRI remains the imaging modality of choice for postoperative surveillance due to the potential risk of local recurrence or metastatic spread [4,7].

The standard treatment for liposarcomas is wide surgical excision with negative margins (R0 resection), which ensures effective local control and reduces the likelihood of recurrence [6,8]. In our case, involvement

of the great saphenous vein required vascular reconstruction, while the soft tissue defect necessitated coverage with a musculocutaneous flap.

This case underscores the importance of a rigorous multidisciplinary approach. Collaboration among trauma surgeons, vascular and plastic surgeons, radiologists, and pathologists was critical to achieving a radical, functional, and safe treatment outcome [7,8].

CONCLUSION

This rare clinical case highlights the potential malignant transformation of a lipoblastoma into a myxoid liposarcoma, emphasizing the importance of:

- MRI in initial diagnosis, surgical planning, and follow-up;
- Wide carcinological resection with clear margins;
- Vascular and soft tissue reconstruction when invasion is present;
- A coordinated multidisciplinary approach;
- Prolonged follow-up, even for tumors initially diagnosed as benign.

This report calls for heightened vigilance in the face of any recurrence of a soft tissue fat-containing tumor, especially in adults, and reinforces that the benign nature of an initial lesion does not rule out the possibility of malignant progression [2,6].

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