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Case Report

Innovating the surgical approach to a low grade fibromyxoid sarcoma of the subscapularis muscle

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ABSTRACT

We report a 47-year-old female with pulmonary emphysema and an incidental subscapularis intramuscular lesion (76×35×17 mm). Biopsy confirmed low-grade fibromyxoid sarcoma (LGFMS). Surgical excision was performed through a novel modified Judet approach with scapular osteotomy, ensuring complete resection while preserving function. The patient remains asymptomatic at 12 months, with full mobility and no recurrence. This case highlights the importance of including LGFMS in the differential diagnosis of shoulder tumors and demonstrates the utility of a modified Judet approach as a safe, effective option for rare intramuscular sarcomas.

Keywords: Fibromyxoid sarcoma, Surgical approach, Soft tissue tumor

INTRODUCTION

Intramuscular tumors arising within the subscapularis muscle represent a rare subset of soft tissue neoplasms, posing unique diagnostic and management challenges. The precise incidence remains unknown due to their rarity. Typically, patients present with nonspecific symptoms such as localized pain, swelling, or limited range of motion in the affected shoulder joint. Given the deep-seated nature of these tumors, they may often remain clinically silent until they reach a considerable size or impinge upon adjacent structures.[1]

Among intramuscular tumors, low-grade fibromyxoid sarcoma (LGFMS) stands out as a distinctive entity characterized by its indolent behavior and histological features, exhibiting alternating fibrous and myxoid areas, with uniform spindle cells arranged in a whorled or storiform pattern. Immunohistochemical staining, notably for MUC4 and MUC1, can aid in confirming the diagnosis.[2] Radiological modalities such as magnetic resonance imaging (MRI) play a crucial role in delineating the extent and characteristics of the tumor, aiding in surgical planning and prognostication.[1,3] These tumors tend to occur in young and middle-aged patients.[4] In literature, LGFMS presents a late recurrence and metastasis, with a prolonged clinical course.[4-8]

The management of intramuscular subscapularis tumors, including LGFMS requires a multidisciplinary approach. Surgical resection remains the cornerstone of treatment, aiming for complete excision with negative margins while preserving surrounding neurovascular structures and shoulder function, minimizing muscles section. Adjuvant therapies, including radiation therapy, may be considered in cases with high-risk features or inadequate surgical margins.[3-5]

The patient has been informed about the nature of the case report, including the use of their medical information and

imaging in a publication. They have provided written informed consent for the details of their case, including any identifiable information, to be published. The consent includes the understanding that their medical information will be anonymized to ensure privacy and confidentiality, while still providing valuable insights into the management and outcomes of their condition.

CASE REPORT

A 47-year-old female with a known history of pulmonary emphysema underwent a routine thoracic CT scan as part of her follow-up care, revealing an incidental finding of a well-defined intramuscular lesion located within the subscapularis muscle of her left shoulder. MRI revealed a 76×35×17 mm lesion with no aggressive features. It displayed a T2 hyperintense signal and varied contrast enhancement, with smooth margins (Figure 1).

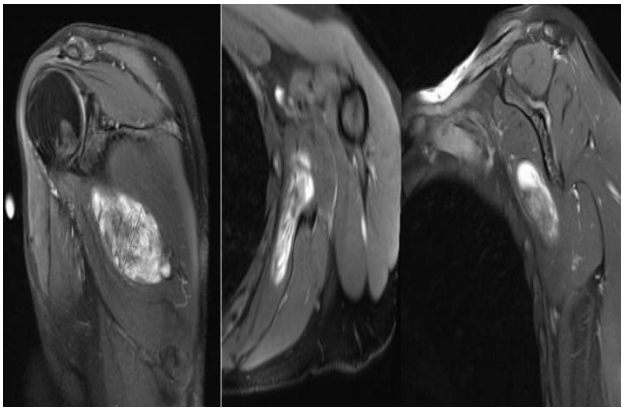

Figure 1: Coronal, axial and sagittal MRI planes of the lesion, respectively.

On clinical examination, the shoulder was normal except for a small, tender, elastic mass over the subscapularis.

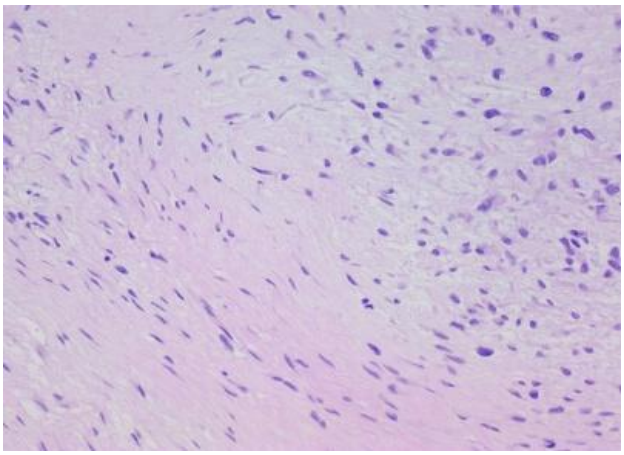

Figure 2: (HE 200×) The neoplastic cells are spindled, with mildly hyperchromatic nuclei, arranged in short fascicles.

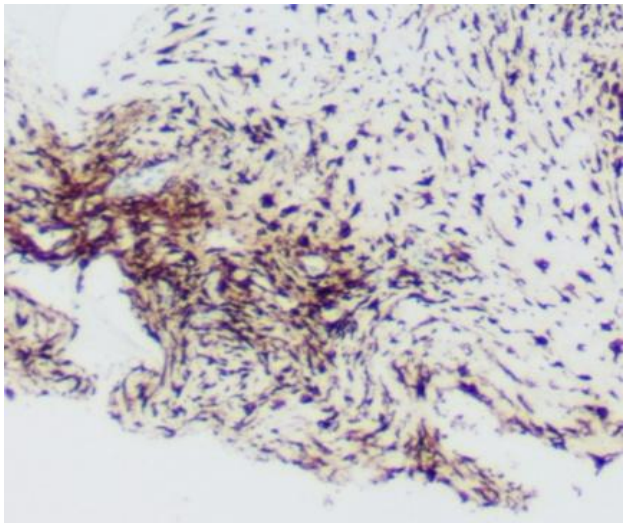

Figure 3: Immunohistochemical staining demonstrated strong cytoplasmic MUC4 expression, supporting the diagnosis of low-grade fibromyxoid sarcoma.

The biopsy specimen revealed a low-grade fibromyxoid sarcoma with high expression of MUC4 (Figure 2 and 3). Surgical excision was recommended following multidisciplinary discussion.

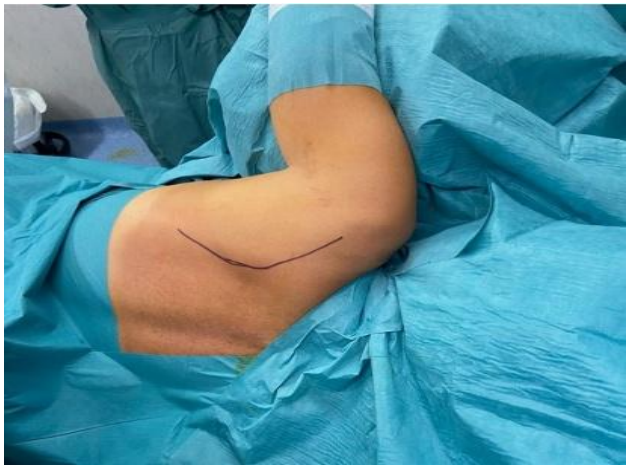

Figure 4: Patient positioned in the lateral decubitus, with demonstration of the incision used.

A modified Judet approach was chosen to access the tumor while preserving surrounding neurovascular structures, and minimizing muscular and articular morbidity. The incision was made along the medial border of the scapula, extending from the inferior angle to the coracoid process (Figure 4).

To adequately access the tumor, an osteotomy of the scapula was performed approximately 2 cm inferiorly to the spine, allowing excellent exposure of the subscapularis muscle without intersecting the tumor.

Careful dissection was carried out to isolate the tumor from surrounding structures while preserving neurovascular integrity. A wide tumor resection was performed, involving almost the entire subscapularis muscle up to the thoracic wall (Figure 5).

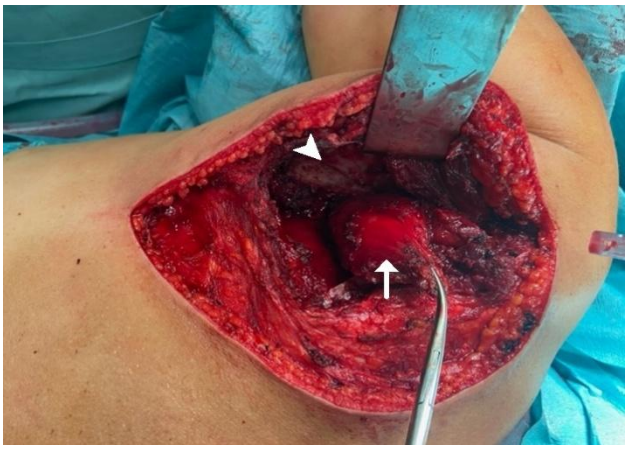

Figure 5: Dissection of the intra-subscapularis tumor after scapular osteotomy (arrow-isolated tumor; arrowhead -scapular bone after osteotomy).

Following tumor resection, the scapular osteotomy fixation was achieved using transosseous sutures. The wound was meticulously closed in layers, and a drain was placed to prevent seroma formation.

Postoperatively, the patient recovered uneventfully with no immediate complications. Histopathological report confirmed the diagnosis and clear margins (the closest was 2 mm free margin).

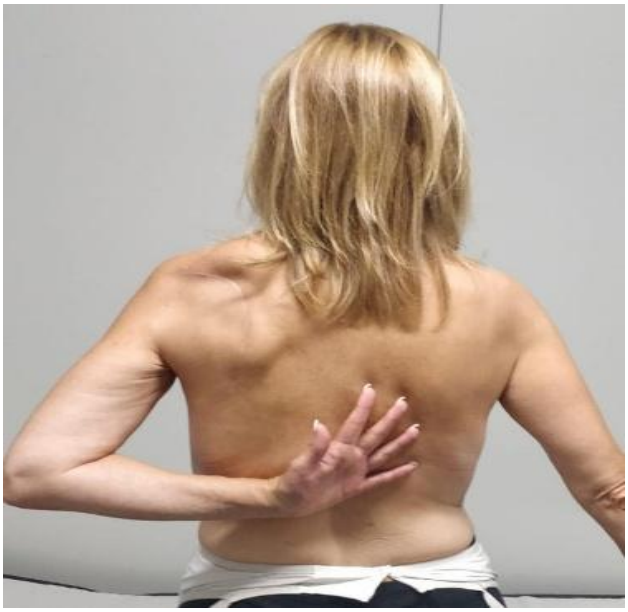

Figure 6: Follow-up (function and scar).

Postoperative imaging demonstrated satisfactory alignment of the scapular osteotomy with bone consolidation. At the 12 months follow-up, the patient was found to have fully recovered shoulder mobility (Figure 6) and was asymptomatic. There are no signs of local recurrence, and the patient remains under follow-up.

DISCUSSION

Subscapularis tumors present a diagnostic and therapeutic challenge due to their rare occurrence and deep-seated location within the shoulder, where standard anterior or posterior approaches offer restricted access to the subscapular plane.[5]

Histologically, LGFMS exhibits a characteristic fibrous and myxoid matrix, along with uniform spindle cells arranged in a whorled or storiform pattern. Immunohistochemical staining for markers such as MUC4 and MUC1 is often utilized to confirm the diagnosis.[2]

The management of subscapularis tumors, particularly LGFMS, requires a multidisciplinary approach. Surgical resection remains the cornerstone of treatment. The choice of approach is a key factor in achieving complete excision with negative margins while preserving surrounding neurovascular structures and shoulder function.[3]

Despite its low-grade histology, LGFMS carries the potential for late local recurrence and distant metastasis, underscoring the importance of vigilant long-term follow-up.

After years or decades, they often recur locally and/or metastasize, usually to the lungs and pleura. Evans was the first to report LGFMS in 1987, and initially he reported that 7 out of 12 patients developed distant metastasis, with a follow-up ranging from 5.5 to 50 years.[7-9]

Zhang et al identified 19 LGFMS cases with two or more local recurrences based on their literature review. From their review, the median age of the patients was 26 years (range, 6-53 years), median tumor size (maximum diameter) was 10 cm (known in 10 cases), and ranged from 3.5 to 15 cm.[4] Among 19 patients, 13 were men, with a male-to-female ratio of 2.17:1. All patients were initially treated surgically, and only 3 had data on surgical margin status, all of which were positive. The median time of first recurrence was 3 years while the median time from illness onset to death was 28 years. Five patients had metastases, including lung (n=5), bone (n=1) and chest wall (n=1). Characteristics of dedifferentiated sarcoma were observed in 2 recurrent tumors and features of sclerosing epithelioid fibrosarcoma was observed in one case.[4] Furthermore, they report a case with multiple recurrences, emphasizing that LGFMS can exhibit highly invasive biological behavior. These findings underscore the importance of achieving negative margins during the initial surgery.[5,7,10]

Regular clinical and imaging surveillance is paramount to monitor for disease recurrence or progression, facilitating timely intervention if necessary.[4]

Given the location and malignant nature of the reported tumor, along with the risk of late distant metastases (primarily to the lungs and pleura) and the patient's relatively young age, our multidisciplinary team convened and determined that surgery was the most appropriate treatment option.

In this case, the tumor's deep position beneath the scapula required an approach capable of providing safe circumferential access without compromising shoulder stability or neurovascular integrity. The modified Judet approach with scapular osteotomy offered an extensible and direct corridor to the ventral scapular surface, enabling wide resection through a controlled dissection plane while preserving the scapular body, rotator cuff, and glenohumeral capsule. Compared with traditional anterior or posterior approaches, which often limit visualization and working space on the deep subscapular plane, this technique minimizes soft-tissue detachment, reduces traction on neurovascular structures, and facilitates oncologically sound margins with low morbidity.[4] As such, it represents a valuable surgical option for selected deep intramuscular tumors of the shoulder girdle where standard exposures are insufficient.[4,5]

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REFERENCES

1. Mohamed M, Fisher C, Thway K. Low-grade fibromyxoid sarcoma: clinical, morphologic and genetic features. J Bone Joint Surg Am. 2023;81:20-8.
2. Fu H, Liu Y, Xu L, Chang Y, Zhou L, Zhang W, et al. MUC4 expression distinguishes SWI/SNF-mutant renal medullary carcinomas from other renal carcinomas. Mod Pathol. 2021;34(3):646-53.
3. Andritsos D, Rizkalla J, Mital M. Low-grade fibromyxoid sarcoma: clinical presentation, treatment, and prognosis. Am J Case Rep. 2018;19:736-41.
4. Zhang X, Qiu Y, Zhang J, Chen Z, Yang Q, Huang W, et al. An elderly low-grade fibromyxoid sarcoma patient with early postoperative recurrences and metastases: a case report and literature review. Front Med. 2024;11:1172746.
5. Tsuchiya T, Seki Y, Yamamoto K. Local recurrence of low-grade fibromyxoid sarcoma with MUC4 expression after marginal excision: a case report and literature review. BMC Musculoskelet Disord. 2021;22(1):98.
6. Houdek MT, Wilke BK, Barlow JD. Management of scapular tumors. Orthop Clin North Am. 2023;54(1):101-8.
7. Evans HL. Low-grade fibromyxoid sarcoma: a report of two metastasizing neoplasms having a deceptively benign appearance. Am J Clin Pathol. 1987;88:615-22.
8. Evans HL. Low-grade fibromyxoid sarcoma: a report of 12 cases. Am J Surg Pathol. 1993;17:595-600.
9. Folpe AL, Lane KL, Paull G, Weiss SW. Low-grade fibromyxoid sarcoma and hyalinizing spindle cell tumor with giant rosettes: a clinicopathologic study of 73 cases supporting their identity and assessing the impact of high-grade areas. Am J Surg Pathol. 2000;24:1353-60.
10. Evans HL. Low-grade fibromyxoid sarcoma: a clinicopathologic study of 33 cases with long-term follow-up. Am J Surg Pathol. 2011;35:1450-62.
11. Ugai K, Kizaki T, Morimoto K, Sashikata T. A case of low-grade fibromyxoid sarcoma of the thigh. Pathol Int. 1994;44:793-9.
12. Griffin AM, Shaheen M, Bell RS, Wunder JS, Ferguson PC. Oncologic and functional outcome of scapular chondrosarcoma. Ann Surg Oncol. 2008;15:2250-6.
13. Mayil Vahanan N, Mohanlal P, Bose JC, Gangadharan R, Karthisundar V. The functional and oncological results after scapulectomy for scapular tumours: 2-16 year results. Int Orthop. 2007;31:831-6.
14. Bartoníček J, Říha M, Tuček M. Osteochondroma of scapular body-trans-scapular technique of resection: a case report. J Shoulder Elbow Surg. 2018;27(11):1.

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