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Arthroscopic Assisted Soft Tissue Tumor Excision of Shoulder: A Rare Case Report

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Abstract

The shoulder girdle is a common site for primary and metastatic soft tissue tumor. Clinical presentation could range from asymptomatic, local tenderness to painful limited shoulder range of motion, mimicking impingement syndrome caused by degenerative change of rotator cuff tendinopathy and subacromial enthesophyte, especially when the tumor mass is large enough and within the subacromial space. Generally, open surgery for complete marginal excision is considered to be the standard management for these conditions. We report a case of a 47-year-old female with chronic shoulder pain caused by a benign fibrotic nodule measuring up to 5cm located withing the rotator cuff muscles mimicking impingement syndrome. Arthroscopic excision was performed via standard posterolateral and slightly enlarged lateral portals, with complete symptom resolution and no recurrence at six months. This highlight utility of arthroscopy for managing medium to large size, benign subacromial lesions.

Keywords: Shoulder girdle tumor; Arthroscopic tumor excision; Benign fibrotic nodule; Shoulder impingement syndrome

Introduction

Shoulder pain with limited range of motion is among one of the most common complaints in orthopedic clinic. Numerus etiologies are accounted for shoulder impingement syndrome, such as degenerative or inflammatory process of the rotator cuff tendon, while mass lesion in shoulder girdle is a less common cause and might not take into consideration initially. A few case reports had been published to describe such condition [1-5]. The histological finding ranging from lipoma, collagenous fibroma to aneurysmal bone cyst, and the size of the tumor are approximately 4-5cm in these cases. For the majority of the cases, though the tumor were confirmed benign in nature, open surgery with complete marginal excision was still the treatment of choice. To our best knowledge, only 1 article described removal of tumor lesion within subacromial space via arthroscopic approach [6]. Pagán Conesa A, et al. reported their achievement of arthroscopic marginal excision of a 32*25 *12 mm intramuscular lipoma. They suggested that arthroscopic approach could be confidentially accomplished with the tumor sized measuring 4cm or less. Herein, we presented a 5.5cm fibrous tumor causing chronic shoulder pain and impingement syndrome, discuss its diagnostic approach, radiographic and histologic findings, and finally surgical consideration and experience.

Case Presentation

A 47-year-old female with a medical history of chronic atopic dermatitis and benign follicular nodule presented to our clinic with the complaint of intermittent left shoulder pain for a proximally 1 year. She claimed that shoulder pain started after she took immunosuppressive medication of cyclosporine for the treatment of atopic dermatitis. She had no history of physical trauma, fever, chills, night sweats, or weight loss. She worked as a teacher and denied having alcohol abuse or smoking. No known cancer diagnoses were recorded throughout her family history. On examination, gross appearance showed mild protrusion over left acromial region that was tenderness to palpation. She had mild limited range of motion of her left shoulder joint (abduction: 110°, external rotation: 90°, internal rotation: 30°), tests for impingement were positive (Hawkin's test, Neer's test), while tests for rotator cuff tear were negative. No palpable mass lesions or lymph nodes were found.

The patient underwent sonography of the left shoulder and revealed a 1.8cm hypoechoic lesion in the insertion site of supraspinatus tendon. Magnetic resonance imaging (MRI) was subsequently arranged and a 3.4 x 5.2 x 1.8 cm intracapsular soft tissue mass was found on the floor of supraspinatous and infraspinatous muscles within the suprascapular notch and the supraspinous fossa region that was indistinguishable from the muscles and caused elevation of the supraspinatous muscle (Figure 1). A sono-guided core-needle biopsy was performed, and pathological examination of the specimen revealed degenerated and fibrotic lesion, which was considered inconclusive to the nature of the mass lesion. Bone scan was also arranged, and no marked tumor associated abnormal uptake was seen.

The patient underwent surgical resection of tumor mass via arthroscopic approach. Under general anesthesia, the patient was prepared and draped in beach chair position. Standard posterior, anterior and lateral portals were made, and identification of the tumor mass was achieved after adequate synovectomy. For optimal viewing and operating space, partial osteotomy of acromion and detachment of supraspinatus tendon was performed. The tumor mass was found on the undersurface (the articular side) of the rotator cuff. The soft-tissue mass, along with the surrounding tissue and part of the fascia of supraspinatus and infraspinatus muscles, was carefully dissected from the adjacent tissue (Figure 2). The resected mass was extracted cautiously through the slightly expanded posterior portal, measuring up to 9 x 3.8 x 1.2 cm in diameter (Figure 3). No rotator cuff repair procedure was required as the detachment of the insertion portion was minimal. The sample was later sent for pathological examination. Microscopically, the sections show pictures of a benign fibrotic nodule consisting of dense collagen fiber with proliferative fibroblasts. Immunohistochemistry showed equivocal staining for beta-catenin and low proliferative activity of Ki-67 marker, Masson's trichrome stain highlighting collagenous stroma, compatible with collagenous fibroma (Figure 4).

The patient recovered uneventfully after the operation. She was followed at our clinic at 1-month, 2-month and 6-month post-operatively and her shoulder pain relieved mostly. A follow-up MRI was obtained in the sixth month after surgery. No evidence of recurrence was found. The patient was complying to shoulder rehabilitation protocol until full recovery was achieved.

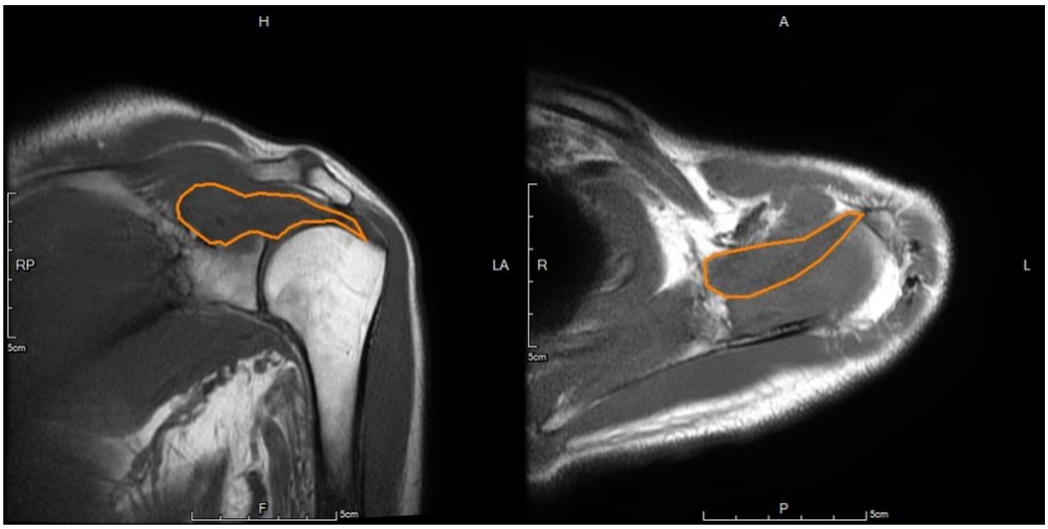

Figure 1: Pre-operative MRI shows mass lesion about the supraspinatus and infraspinatus region.

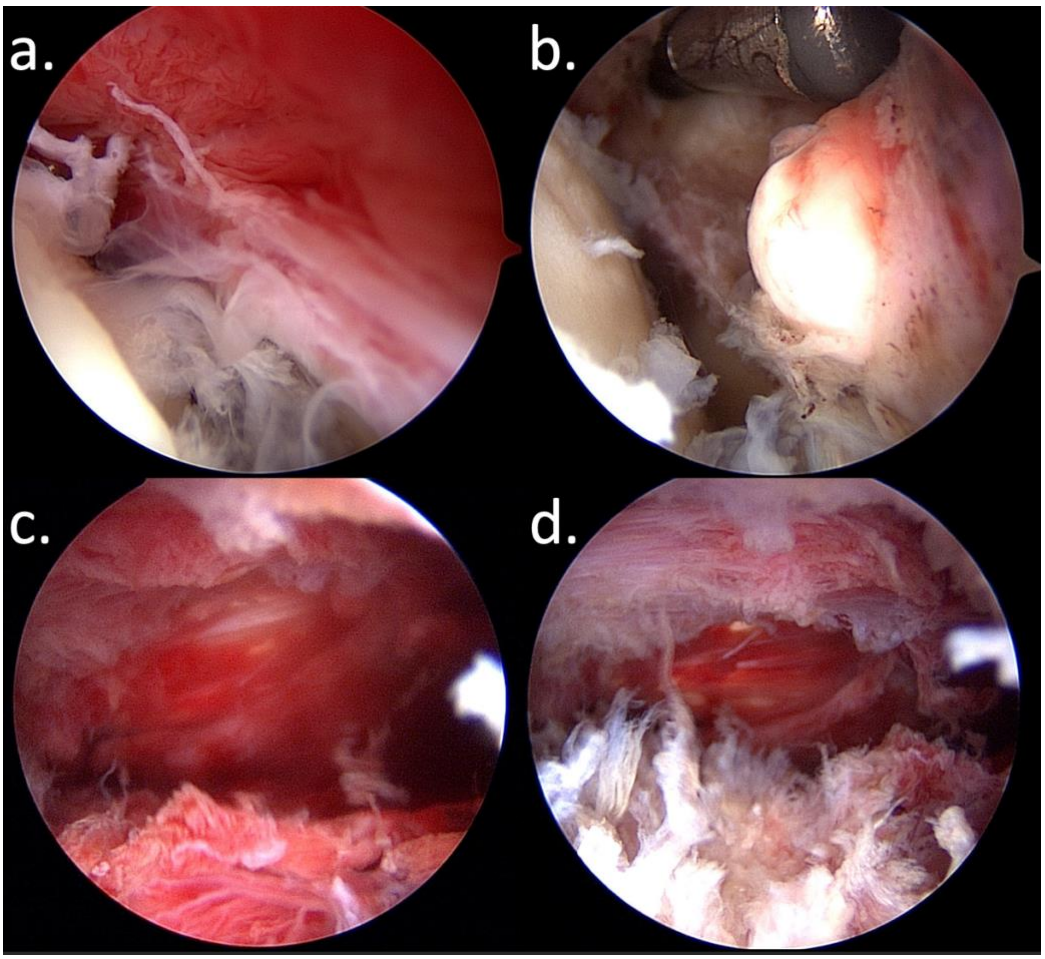

Figure 2: Intra-operative image of arthroscopic tumor removal: (a) the soft tissue tumor was found on the undersurface of the rotator cuff; (b) the tumor was carefully dissected from the surrounding tissue; (c) and (d) after the removal of the tumor.

Figure 3: Gross view of the soft tissue tumor.

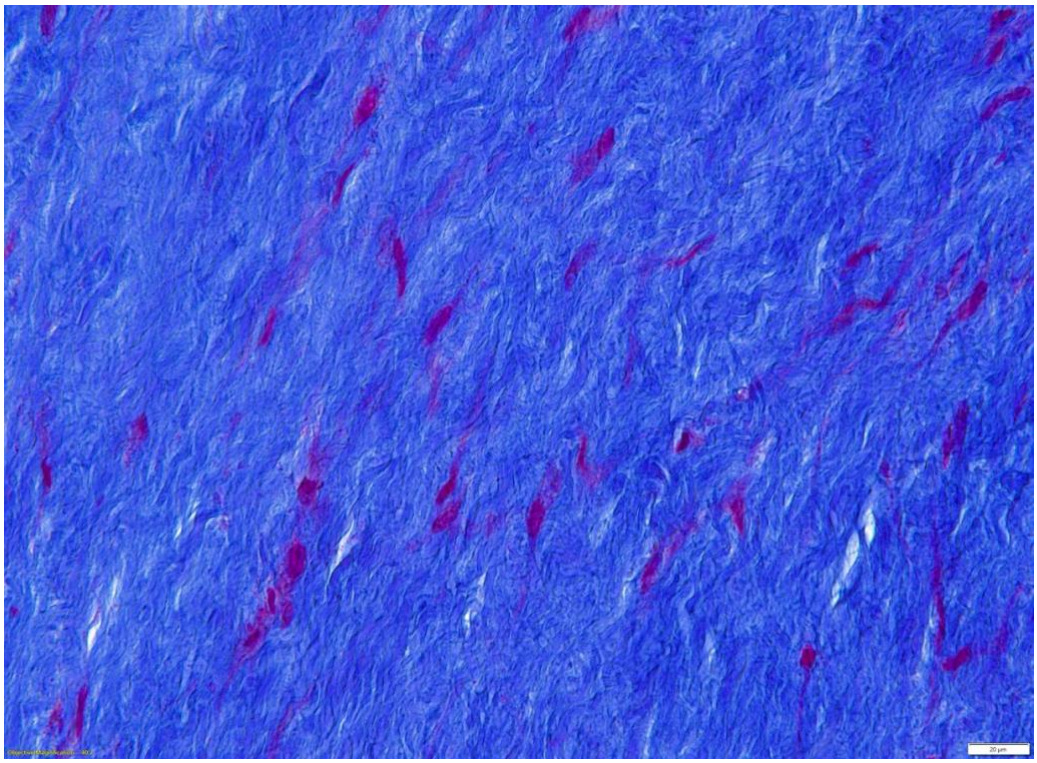

Figure 4: The histochemical stain of Masson's trichrome stain highlighting collagenous stroma in scarlet blue.

Discussion

Potential causes for shoulder impingement syndrome include rotator cuff tendinopathy or tear, adhesive capsulitis, subacromial impingement, glenohumeral instability, degenerative joint disease, biceps tendinitis and a wide range of differential diagnosis, while mechanical impingement by mass lesion is much less common and could be easily overlooked on the list of differential diagnosis. According to the reported tumor-related impingement syndrome cases [1-5], symptoms might include insidious onset of pain and impingement due to slow-growing nature of the tumor, pain independent from movement and had poor response to conservative treatment, poorly localized pain and night pain mimicking rotator cuff tear. In our case, she had chronic discrete shoulder pain not related to trauma, impingement provoking tests were positive, while signs of weakness and tests for cuff tear were negative. Generally, a thorough history taking and physical examination might give some hints, and proper image studies would usually warrant a correct diagnosis.

The shoulder girdle is one of the frequent locations for primary and metastatic bone and soft tissue tumors. According to Cleeman E et al., benign tumors (72%) were more common than malignant tumors (28%) in their study collecting 194 cases of shoulder girdle tumors [7]. Among benign soft tissue tumor, lipoma account for 42% of all cases in one study, while malignant mesenchymal tumor represented 33% of all primary malignant soft tissue tumor [8]. The MRI signal of our case shows intermediate signal on T1WI, predominantly intermediate to low signal with focal peripheral high signal on fat-sat T2WI, and no obvious enhancement on post-gadolinium images. The differential diagnosis should include pseu-dosarcomatous lesion (nodular fasciitis, fibromatosis, fibroma), giant cell tumor or other synovial origin mass. The possibility of sarcoma should also be considered [9]. MRI features of malignant soft tissue tumor include large size (>3cm), ill-defined margin, inhomogeneity on all pulse sequences, rapid or pe-ripheral enhancement of contrast medium, extension beyond certain compartment or invasion of adjacent structure [10,11].

The standard approach to establish a histopathological diagnosis of a suspicious soft tissue mass is by percutaneous core needle biopsy [12]. The biopsy tract along with the entry skin area should be re-moved at the time of definitive surgery to minimize the risk of tumor seeding. Owing to the low possibil-ity of malignancy according to pre-operative studies and huge deep-seated nature of the lesion that might lead to great destruction to the surrounding structure if it was to be removed by an open approach, an arthroscopic-assisted approach was chosen alternatively for removal of the tumor mass. Arthroscopic approach has the advantage of less invasiveness, blood-free arthroscopic view for easier identification of mass lesion and much simpler access to the subacromial space. In contrast, deltoid detachment and even acromial osteotomy might be necessary via open surgical approach. However, residual tumor mass that might increase the risk of recurrence is a concern for arthroscopic resection. Besides, it would be trou-blesome once the previous-deem benign lesion turns out to be malignant in final pathologic report and pose great risk of tumor seeding via arthroscopic approach.

We believe that this case demonstrates a feasible and effective strategy for managing a relatively large tumor, exceeding the previously reported size limitation of 4 cm [6], as long as the tumor is benign in nature. Arthroscopic approach is particularly suitable for cases with lesions within or underneath the rotator cuff. Even when partial excision of tissue around the tendon insertion is necessary, rotator cuff repair can still be performed arthroscopically during the same procedure. Follow-up MRI obtained six months postoperatively confirmed complete excision of the tumor with no evidence of local recurrence.

However, a key limitation of this case report is the relatively short follow-up period, which may not be sufficient to assess the long-term recurrence risk, especially for indolent or slow-growing tumors. Fur-thermore, although such cases are inherently rare, additional clinical cases are required to validate the ef-ficacy of this approach and to develop proficiency in arthroscopic techniques for tumor excision.

In conclusion, subacromial tumor mass is an unusual cause of impingement syndrome and mimic common etiology of shoulder pain. The accurate diagnosis and management necessitate a multidiscipli-nary approach involving clinical evaluation, advanced imaging, and often, a preoperative biopsy. Arthro-scopic resection is a reasonable choice for benign and relatively large (up to 5cm) subacromial lesion in selected cases.

Conclusion

Benign subacromial tumors, though rare, should be considered in the differential diagnosis of im-pingement-like shoulder pain. Arthroscopic excision is a minimally invasive, effective alternative to open surgery for selected medium-to-large benign lesions. This case demonstrates the potential for arthrosco-py to achieve both diagnostic clarity and therapeutic success in the management of subacromial soft tis-sue tumors.

Acknowledgements

Informed Consent Statement

I confirm that informed written consent was obtained from the individuals described in this paper, or their legal guardians, for the use of their clinical information and images in this publication.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board (or Ethics Committee) of Tri-service general hospital, National Defense Medical Center (IRB No. A202415155 approved on Oct. 24, 2024).

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