Scapulothoracic Bursitis in a Patient with Rheumatoid Arthritis: Multimodality Imaging and Spontaneous Resolution

Ahmad Alnaggar*, Mohamed Khalil, Ahmed Almomen

Department of Radiology, Salmaniya Medical Complex, Bahrain, Manama

***Correspondence:** Ahmed Alnagger, Department of Radiology, Salmaniya Medical Complex, Bahrain, Manama

naggar2002us@yahoo.com

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AUTHORS' CONTRIBUTIONS

Ahmed Alnaggar: Physician responsible for the patient. Contact with the patient—article Review.
Mohamed Khalil: Data collection and literature review, writing the article.
Ahmed Almomen: Data collection and literature review, writing the article.

DISCLOSURES

None.

CONSENT

Yes

HUMAN AND ANIMAL RIGHTS

No experiment was carried out in this paper.

ABSTRACT

Scapulothoracic bursitis is an uncommon condition characterized by inflammation of the bursa located between the scapula and the thoracic wall. This disorder is frequently associated with repetitive shoulder movements or systemic inflammatory diseases. This report describes a 56-year-old woman with rheumatoid arthritis who presented with painless swelling in the left upper back. Imaging studies identified a well-defined, fluid-filled lesion beneath the latissimus dorsi and serratus anterior muscles. Ultrasound demonstrated an anechoic lesion without vascularity, and magnetic resonance imaging (MRI) confirmed a T1 hypointense and T2 hyperintense lesion with fine septations. The lesion resolved spontaneously without surgical intervention, possibly facilitated by ongoing anti-inflammatory therapy. This case emphasizes the need to consider scapulothoracic bursitis in the differential diagnosis of posterior chest wall masses and demonstrates the critical role of imaging in preventing unnecessary invasive procedures.

CASE REPORT

BACKGROUND

This case report presents a painless, atypical manifestation of scapulothoracic bursitis in a patient with rheumatoid arthritis, initially raising the suspicion of soft tissue malignancy. Multimodality imaging proved essential in establishing a non-invasive diagnosis and guiding conservative management. The case adds to the limited literature on this presentation and demonstrates the clinical value of imaging in differentiating benign from malignant processes.

CASE PRESENTATION

A 56-year-old woman presented to the rheumatology clinic for routine follow-up, reporting localized swelling in the left upper back below the scapula. Her medical history includes seropositive rheumatoid arthritis, bronchiectasis, bronchial asthma, valvular heart disease, and a previous tuberculosis infection at age 18. At the time of presentation, she was employed as a homemaker. Her medications included methotrexate, folic acid, fluticasone furoate/vilanterol, montelukast, bisoprolol, amlodipine, and spironolactone.

The initial clinical assessment suggested a possible soft tissue neoplasm, leading to a biopsy request. After the patient declined the procedure, ultrasound and magnetic resonance imaging (MRI) examinations were performed.

Management and follow-up

Based on the imaging findings, referral to thoracic surgery was made for further evaluation of treatment options. The patient did not attend the scheduled appointment. Three months later, a subsequent clinical episode required a computed tomography pulmonary angiography (CTPA), which demonstrated complete resolution of the previously identified scapulothoracic bursitis.

Imaging findings

Ultrasound revealed a well-defined, fluid-echoic lesion situated between the muscles and the underlying ribs in the left posterior chest wall. No calcifications, solid components, or internal vascularity were observed (Figure 1). Magnetic resonance imaging (MRI) demonstrated a well-defined lesion with fluid signal intensity, hypointense on T1-weighted images and hyperintense on T2-weighted images, measuring approximately 5.7 x 2.4 x 4.3 cm (oblique x transverse x craniocaudal), located along the left posterolateral chest wall beneath the latissimus dorsi and serratus anterior muscles. A few fine septations were present. No calcifications, fat or solid components, hemorrhage, or diffusion restriction were detected. The deep aspect of the lesion was in direct contact with the underlying ribs and intercostal muscles; however, no MRI features suggestive of invasion were identified (Figures 2,3).

Further review of the patient's record shows that the lesion was present in a high-resolution CT scan of the chest. (Figure 4). This study was conducted 5 months prior to her presentation to the clinic.

The CTPA done three months after her episode shows a complete resolution of the lesion (Figure 5).

DISCUSSION

Aetiology and demographics

Scapulothoracic bursitis results from repetitive motion between the scapula and the thoracic wall. Reported etiologies include mechanical stress, trauma, structural or anatomical abnormalities, systemic inflammatory diseases, and post-surgical changes. The condition is more prevalent among individuals engaged in repetitive overhead activities [1,2]. In the present case, rheumatoid arthritis and occupational activities as a homemaker were considered potential contributing factors, although it was not established whether her domestic activities involved repetitive shoulder movement. Trauma and anatomical abnormalities were excluded as risk factors.

Clinical and imaging findings

Scapulothoracic bursitis typically presents with pain and localized swelling that intensifies with physical activity. It is frequently identified as a well-defined cystic lesion between the serratus anterior muscle and the thoracic wall. The enlarged bursa may be mistaken for a soft tissue tumor, occasionally resulting in unnecessary surgical intervention [3]. In this case, the patient lacked typical symptoms, which contributed to the initial suspicion of an underlying neoplastic process.

Three imaging modalities were used to assess the mass. Initially, an ultrasound was performed. Although ultrasound can serve as an initial diagnostic tool for inflamed bursae, it is primarily used to guide therapeutic procedures. The literature on ultrasound for diagnosing subscapular bursitis remains limited [4].

Magnetic resonance imaging (MRI) is the most effective modality for identifying and characterizing soft tissue masses. Subscapular bursitis appears hypointense on T1-weighted images, hyperintense on T2-weighted images, and demonstrates rim enhancement with contrast. In this case, contrast was not administered due to patient preference. Computed tomography (CT) scans are effective but may not correlate with clinical symptoms, particularly in the absence of skeletal abnormalities such as osteochondromas or scapulothoracic incongruity. Routine CT scans are not recommended unless bone or cartilage lesions affecting scapulothoracic joint alignment are suspected [1]. CT can be used to monitor treatment response after initial MRI characterization.

Treatment and prognosis

Two primary treatment pathways exist for scapulothoracic bursitis. The most common is conservative management, which includes nonsteroidal anti-inflammatory drugs, physiotherapy, and local steroid injections. Surgical intervention involves complete excision of the lesion and its wall, using techniques such as partial scapulectomy, arthroscopy, or resection through the superomedial angle. Surgery is reserved for cases unresponsive to conservative therapy. In this case, the patient did not require surgical intervention, as the condition resolved spontaneously, possibly due to ongoing anti-inflammatory therapy [1,2,5].

Differential diagnosis

The differential diagnosis for posterior chest wall lesions includes both benign and malignant entities. These differentials include elastofibroma dorsi, abscesses, lipomas, and hematomas. Elastofibroma dorsi often mimics bursitis due to its deep scapular location and characteristic. On ultrasound, it shows alternating hypo-echoic bands within an echogenic background, while on CT, it typically demonstrates a heterogeneous mass with ill-defined margins and no capsule. As for MRI, it reveals a heterogeneous lesion with linear fatty streaks [6,7].

Soft tissue abscesses appear as hypoechoic, heterogeneous, avascular collections with a vascularized rim, surrounding hyperemia, debris motion, and sometimes gas or calcifications on ultrasound. On CT, it presents as a low-attenuation collection with an irregular enhancing wall, septa, gas, or classification, accompanied by surrounding edema. MRI findings of abscesses include T1 low/intermediate and T2 high signal, rim enhancement, and the penumbra sign (T1 hyperintense rim) [8].

Lipomas are encapsulated lesions that mimic the signal of subcutaneous fat on all MRI sequences. On ultrasound, they present as well-circumscribed, oval, echogenic masses that lack posterior acoustic enhancement. Larger lipomas may demonstrate delicate linear striations running parallel to the skin surface. When located deeper, lipomas are usually iso- to hyperechoic relative to adjacent muscle and can show posterior

acoustic enhancement. On non-contrast CT, lipomas appear generally as well-defined and lucent [9,10].

Hematomas exhibit variable imaging features depending on the age of the blood throughout all imaging modalities. On ultrasound, it presents as avascular, echogenic masses with variable internal echoes in the first month, gradually transforming into smaller, more anechoic collections over time. On CT scans, hematomas generally appear as nonenhancing, heterogeneous masses with attenuation similar to muscle, and their density decreases as the blood products liquefy. MRI signal characteristics depend on the hematoma's stage: subacute hematomas often show a high T1 signal that remains bright on fat-saturated sequences due to the presence of methemoglobin, while chronic hematomas may develop a hemosiderin rim, best visualized on gradient-echo sequences. After contrast administration, a peripheral rim of enhancement is typically observed; however, any nodular or mass-like enhancement should prompt suspicion of an underlying hemorrhagic tumor [9,11].

CONCLUSION

Scapulothoracic bursitis is an uncommon diagnosis that may present with atypical symptoms, complicating the diagnostic process. The absence of classic signs such as redness, tenderness, or trauma may lead to consideration of alternative diagnoses, including neoplastic processes. This case illustrates the crucial role of imaging modalities, particularly ultrasound and MRI, in accurately identifying and characterizing lesions, thereby reducing the need for unnecessary invasive diagnostic procedures.

TEACHING POINT

Scapulothoracic bursitis appears as a well-defined, fluid-filled mass between the scapula and thoracic wall. On MRI, it shows low signal on T1-weighted images and high signal on T2-weighted images. Recognizing these imaging features is essential for distinguishing scapulothoracic bursitis from soft tissue tumors and for avoiding unnecessary invasive procedures.

QUESTIONS

Question 1: Which imaging modality is most appropriate for the diagnosis and characterization of scapulothoracic bursitis?

1. Ultrasound
2. Plain radiography
3. Magnetic resonance imaging (applies)
4. Positron emission tomography
5. Fluoroscopy

Explanation:

MRI provides superior soft tissue contrast and is the preferred imaging modality for assessing scapulothoracic bursitis [see Clinical & Imaging Findings section].

Question 2: Which of the following clinical findings is least characteristic of scapulothoracic bursitis?

1. Localized swelling
2. Pain during shoulder movement
3. Crepitus on scapular motion
4. Fever (applies)
5. Tenderness over the lesion

Explanation: Fever is not associated with scapulothoracic bursitis and should prompt consideration of alternative diagnoses, such as infection [see Etiology & Demographics section].

Question 3: On MRI, scapulothoracic bursitis typically demonstrates which of the following imaging features?

1. Hypointense signal on T1-weighted images (applies)
2. Hyperintense signal on T2-weighted images (applies)
3. Peripheral rim enhancement after contrast administration (applies)
4. Diffusion restriction
5. Internal calcifications

Explanation: MRI findings in scapulothoracic bursitis commonly include T1 hypointensity, T2 hyperintensity, and rim enhancement if contrast is administered. Diffusion restriction and calcifications are uncommon [see Clinical & Imaging Findings section].

Question 4: Which of the following are recognized risk factors for developing scapulothoracic bursitis?

1. Rheumatoid arthritis (applies)
2. Repetitive overhead shoulder movements (applies)
3. Direct trauma to the shoulder girdle (applies)
4. Diabetes mellitus
5. Anatomical abnormalities of the scapulothoracic articulation (applies)

Explanation: Repetitive motion, trauma, rheumatoid arthritis, and structural abnormalities of the scapulothoracic joint are established risk factors for bursitis. Diabetes mellitus is not a recognized risk factor [see Etiology & Demographics section].

Question 5: What is the recommended initial management strategy for scapulothoracic bursitis in most cases?

1. Surgical excision of the bursa
2. Conservative therapy with nonsteroidal anti-inflammatory drugs and physiotherapy (applies)
3. Systemic antibiotic therapy
4. Radiotherapy
5. Image-guided corticosteroid injection (applies)

Explanation: Most cases respond well to conservative management with nonsteroidal anti-inflammatory drugs, physiotherapy, and local corticosteroid injections if needed. Surgical intervention is reserved for refractory cases [see Treatment & Prognosis section].

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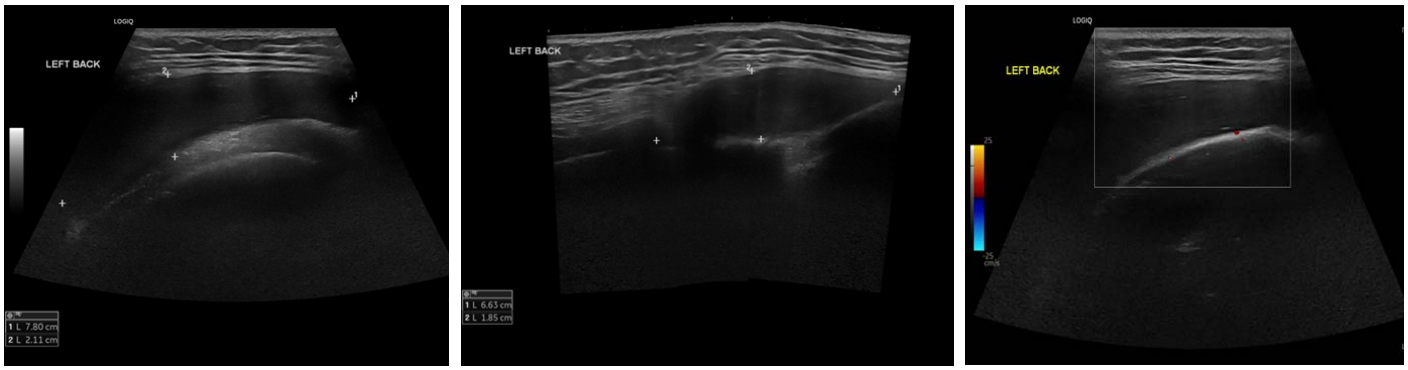
FIGURES



a b c

Figure 1: Ultrasonographic imaging shows an anechoic lesion (a,b). Image (c) shows no vascular flow to the lesion

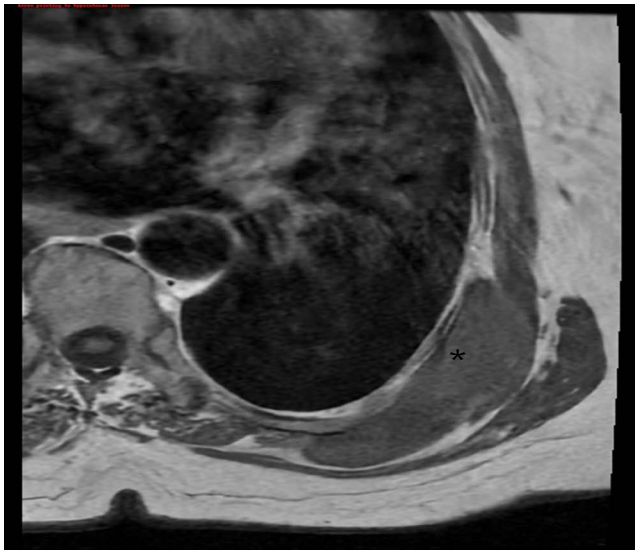


Figure 2: T1 axial view shows a left-sided hypointense lesion beneath the latissimus dorsi marked by the asterisk.

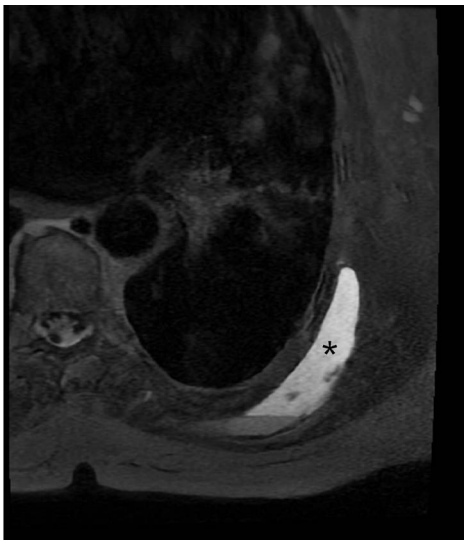


Figure 3: The asterisk marks the same lesion on T2-weighted imaging, in which it appears hyperintense.

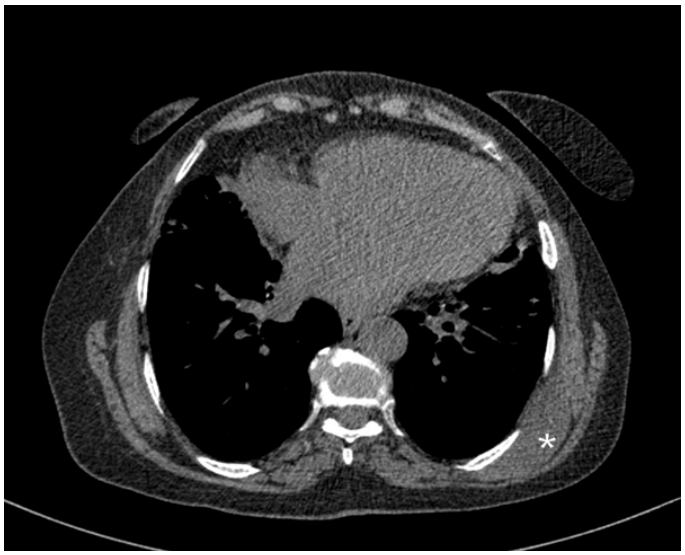


Figure 4: The lesion's appearance on an axial cut of a CT study.

Figure 5: Shows an axial view of a CTPA scan with complete resolution of the lesion.

Table 1: Summary Table

Feature	Details
Etiology	Repetitive motion, trauma, rheumatoid arthritis
Incidence	precise incidence unknown
Gender ratio	No clear gender predilection
Age predilection	Adults
Risk factors	Repetitive shoulder use, systemic inflammatory conditions
Treatment	NSAIDs, physical therapy, surgical excision in refractory cases
Prognosis	Good with conservative treatment
Imaging findings	Hypoechoic lesion (US), T1 hypointense/T2 hyperintense (MRI)

Table 2: Differential Diagnoses of Scapulothoracic Bursitis

Diagnosis	**Ultrasound (US) Findings**	**MRI Findings**	**CT Findings**
Elastifibroma dorsi	Alternating linear or curvilinear hypoechoic bands with an echogenic background	Ill defined, heterogeneous soft tissue lesion with interlaced fat streaks	Non-encapsulated lenticular—shaped heterogenous mass with indistinct borders
Abscess	Hypoechoic, heterogenous, avascular center and a vascular rim	T1 hypointense, T2 hyperintense, peripheral rim enhancement	Low attenuation with irregular wall enhancement and surroudning edema
Hematoma	In early stages, its an avascular, echogenic mass with variable internal echoes. In later stages, it becomes smaller and more anechoic.	In the subacute phase it has a high T1 signal that remains bright on fat-saturated sequences. Later it develops a hemosiderin rim that's best seen on gradient echo-sequences.	Non-enhancing, heterogeneous mass with attenuation similar to muscle. Its density decreases gradually as blood products liquefy.
Lipoma	Homogeneous hyperechoic or isoechoic to fat	Isointense to fat on all sequences, suppression on fat-sat T1.	Radiolucent or fat density lesion

KEYWORDS

Scapulothoracic bursitis; Posterior chest wall swelling; shoulder; Soft tissue mass; Rheumatoid arthritis

ABBREVIATIONS

US = ULTRA SOUND
MRI = MAGNETIC RESONANCE IMAGING
CT = COMPUTED TOMOGRAPHY
CTPA = COMPUTED TOMOGRAPHY PULMONARY ANGIOGRAPHY
HRCT = HIGH-RESOLUTION COMPUTED TOMOGRAPHY
NSAIDS=NONSTEROIDALANTI-INFLAMMATORY DRUGS

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