Case Series

Pyomyositis involving the scapular muscles: A case series

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Abstract

Pyomyositis or tropical pyomyositis is an uncommon infection of skeletal muscle that may be primary or secondary. Primary type has bacterial aetiology, and *Staphylococcus aureus* is associated in most cases. The diagnosis requires high index of suspicion and careful assessment of radiological investigations. Diagnosis often requires magnetic resonance imaging (MRI) for better delineation of the disease process, associated site involvement and exclusion of related conditions. Evacuation of pus coupled with appropriate antibiotic therapy is the mainstay and curative in most cases. Caution, however, is required due to increased morbidity, protracted course of recovery and mortality in few cases. The association with comorbidities including immunocompromised status compounds the problem. We describe our experience with this condition in a series of five cases (four male and one female) with diverse involvement of scapular muscle. All cases had primary pyomyositis except one case secondary to shoulder joint tuberculosis. Right side was involved in three and left in two cases. Infraspinatus was commonly involved, and one case had extensive involvement around scapula. All cases were managed by one or multiple aspiration, except one managed with open surgical drainage. The outcome was good in all cases with no recurrence or complication noted in their respective follow-up. Primary care centres may play important role in the early diagnosis of this condition with clinical evaluation and judicious use of imaging. Cases with severe involvement or those requiring advanced procedures may be referred to higher centres as per the requirement. Most of the times, timely diagnosis, antibiotic therapy and drainage of the pus is required and may also be performed in the primary care level through a standard protocol.

Keywords: Bacterial infection, infection, muscle abscess, pyomyositis tropicans, scapular muscle, tropical pyomyositis

Introduction

Pyomyositis is an uncommon and focal infection involving a skeletal muscle, and the *Staphylococcus aureus* has been found to be mostly associated, but cases may have other bacterial or polymicrobial aetiology.[1] Streptococcal are next common organism, and gram negative or other aerobic bacteria have also been described to be involved. The disease results from a deep bacterial collection and proliferation within the involved muscle, leading to subsequent pyogenic abscess formation and related clinical feature. Due to its common prevalence in the tropical countries, pyomyositis is also called 'tropical pyomyositis' or 'pyomyositis tropicans'. The disease, however, is not exclusive to the tropical regions.[1,2] The prevalence in temperate climate is frequently reported, and there is a surge in cases in the settings of conditions like associated immunocompromised status, malignancy or seropositivity to human immunodeficiency viral infection (HIV) to name a few.[3] Trauma, by providing a hypervascular bed and increased iron flow to involved muscle, can favour development of pyomyositis and is also associated in most, if not all, cases.[4] Muscles around scapula are uncommon sites for the pyomyositis, and their occurrence is limited to

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anecdotal reports or small series in the medical literature. We present our experience of dealing with a few cases of pyomyositis involving the muscles around the scapula. Many of the cases were seen in primary care centre first and duly referred for further treatment at our centre. Knowledge of the clinical involvement of scapular muscle as uncommon site of pyomyositis is important for the appropriate diagnosis. Our series underlines the importance of clinical suspicion and judicious examination at the primary care facility for early diagnosis and appropriate referral when necessary.

Case Series

Key relevant details of each case in our series of five cases (4 males, 1 female) are described below.

Case 1

A 23-year-old male patient presented to us with an acute pain and swelling in his right scapular region for the last five days [Figure 1a]. There was no history of trauma or other systemic disorders. On clinical examination, tenderness and raised localised temperature was noted along with swelling below the scapular spine [Figure 1b]. The ipsilateral shoulder joint had no problem and normal range of motion. The investigations were unremarkable except raised neutrophils and total leukocyte count suggesting an infective process. The MRI revealed extensive muscle oedema below the scapular spine [Figure 1c]. There was encapsulated abscess pocket within infraspinatus muscle [Figure 1d]. The aspiration of the swelling was performed to evacuate purulent material followed by empirical antibiotics. The culture was positive for *Staphylococcus aureus* sensitive to cephalosporins. Ceftriaxone and amikacin were given intravenously for two weeks followed by oral four-week course. There was marked clinical improvement coupled with normal counts in second month, and no recurrence of the condition was noted in the follow up of six months.

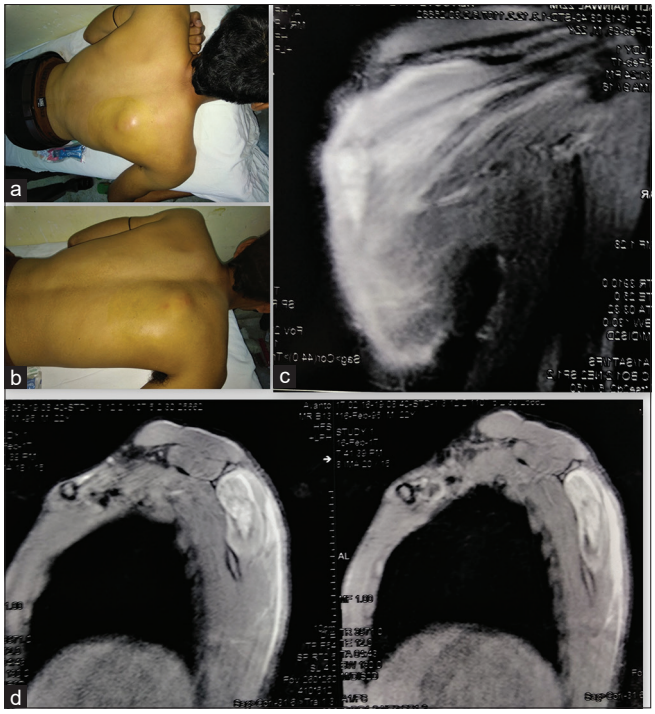

Figure 1: The clinical image showing a tense swelling over the left scapular region (a) painted before the aspiration (b) The MRI images showing infraspinatus muscle edema along its muscle fibres and collection over medial scapular border (c) An encapsulated and localised collection within the infraspinatus muscle can be appreciated in sagittal views (d)

Case 2

A 50-year-old male patient presented with an atraumatic, painful and boggy swelling for the last two weeks in the left scapular region [Figure 2a]. The patient had associated diabetic mellitus and was on oral hypoglycaemic treatment. There was pain, tenderness and fluctuant swelling noted involving a widespread area over the left scapula. The radiographs showed normal underlying bone and shoulder joint [Figure 2b] and increased soft tissue swelling around scapula. MRI showed collection over infraspinatus and latissimus dorsi muscle [Figure 2c]. Serial four aspirations were performed and culture-specific cephalosporins for *Staphylococcus aureus* was started to result in gradual recovery in the next two weeks [Figure 2d]. The antibiotic in oral forms was continued for another six weeks. No recurrence was noted in the follow-up of 5 months. Strict and supervised control of sugar level by medicine team was ensured throughout the treatment period.

Case 3

A 42-year-old male patient presented with a chronic swelling over right scapular region [Figure 3a] especially on the medial

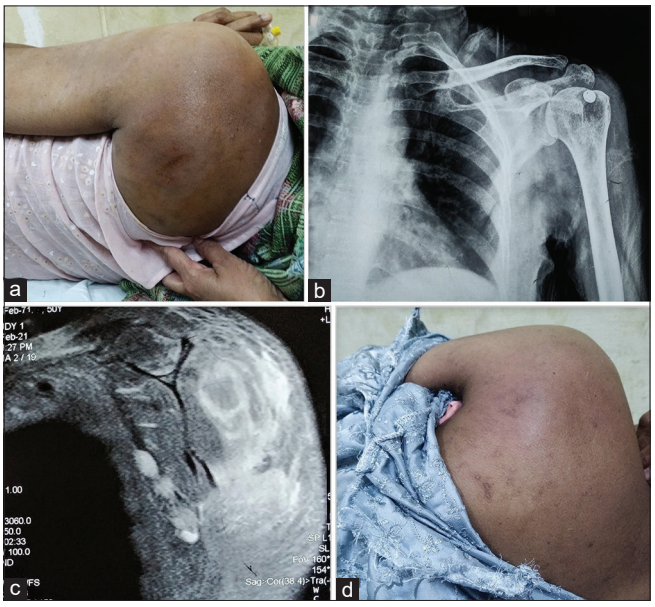

Figure 2: The clinical image showing a large boggy swelling involving the left scapular region (a) with radiograph showing no bony abnormality (b). MRI image showing extensive edema and collection in the infraspinatus muscle extending also below the scapula (c). The decreased swelling noted in the follow-up following few aspirations (d)

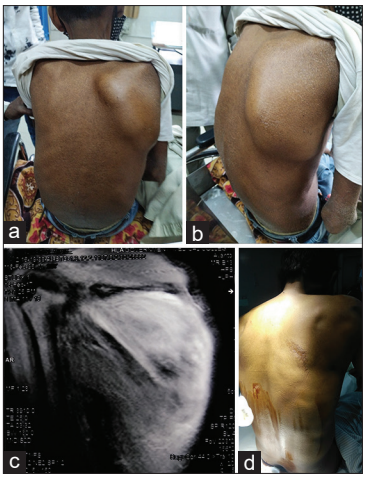

Figure 3: The clinical image showing scapular region swelling (a) more pronounced over medial border and below the scapula (b). MRI image showing corresponding scapular infraspinatus muscle involvement (c). The wound developed later as a result of prolonged sinus formation healed by secondary intention (d)

aspect of the scapula [Figure 3b]. MRI revealed scapular muscle collection and oedema involving the infraspinatus and medial scapular border [Figure 3c]. Two aspirations were performed leading to clinical relief, but recurrence was noted and a stab incision over lower scapula was given to facilitate drainage and local curettage. The wound healed following multiple dressings, but patient was lost to the follow-up after three months. Later, he developed a sinus for which dressings and debridement were performed by a local practitioner leading to gradual healing of the wound by secondary intention [Figure 3d]. There was no recurrence noted in the follow-up of six months.

Case 4

A 50-year-old female patient presented with left side scapular swelling extending into the lateral chest wall and posterior axilla. The radiographs were unremarkable [Figure 4a], and MRI revealed a widespread collection over the scapular muscle extending into lateral chest wall and posterior upper arm [Figure 4b]. Open drainage was carried out in this case over posterior swelling and axilla region over maximum fluctuation clinically. The drainage and subsequent dressings led to clinical improvement in the next two weeks. The wound healed well with no recurrence or any complication noted in the follow-up of five months [Figure 4c].

Case 5

A 43-year-old male patient presented with a right-side scapular muscle swelling, pain and restricted shoulder movement for the last four months. The treatment was taken for shoulder stiffness in the form of pain medicine and physiotherapy considering it a case of frozen shoulder at the previous centre. MRI revealed supra and infraspinatus and teres minor muscle abscess [Figure 5a]. There was concomitant ipsilateral shoulder joint articular oedema and deceased joint space suggesting an infective arthropathy. There was also a cold abscess presenting as a localised swelling in the right mid-arm over biceps

Figure 4: The radiograph showing normal osteoarticular status (a) and MRI images showing lower scapula collection extending into lateral chest wall and axilla (b). The healed incision given over the prominent area of swelling with no recurrence of the disease (c)

muscle [Figure 5b]. The MRI of the arm delineated well-defined abscess within the biceps muscle [Figure 5c]. Biceps swelling was aspirated, and Mycobacterium tuberculosis was identified on GeneExpert [Figure 5d]. Four drug ATT (antitubercular treatment) was started leading to gradual clinical healing and change of drugs to two-drug course after four months. ATT was continued for eighteen months, and no complication and recurrence were noted.

Discussion

The pyomyositis of the muscles around scapula is an uncommon disorder, and there are few reports or series available in the medical literature. There have been reports of isolated pyomyositis of muscles around scapula like subscapularis.[5] This was reported to be caused by Panton–Valentine leucocidin (PVL) positive *Staphylococcus aureus*. It was advocated that the septic arthritis of the adjacent shoulder joint should be excluded in all such cases. Occasionally more than one muscles like subscapularis and infraspinatus muscle involvement is also reported.[6] One of our cases had an associated shoulder joint involvement, and the pyomyositis may have resulted from the shoulder joint tuberculosis. Similar other adjacent joints like acromioclavicular joint can also have septic arthritis along with pyomyositis like in one reported case with supraspinatus pyomyositis.[7]

Early identification and drainage lead to good outcome. Contrast enhanced MRI shows peripheral rim enhancement without the central enhancement, highly suggestive of pyomyositis and resultant collection.[8] The MRI also excluded underlying bony or

periosteal changes or neoplastic lesion. All our cases underwent MRI for better delineation of the diseases process. Emergent surgical evacuation, lavage and debridement are the mainstay along with appropriate antibiotic therapy for a good outcome.[9] Cultures for bacterial, fungal, tubercular and cytology are advocated and were performed by us. The cases chose aspiration over the surgical drainage in all but one case. Fortunately, serial aspirations and supervised treatment led to uncomplicated healing, but the treatment should be individualised as per the clinical condition and other features. The disease in developing nations and delayed diagnosis or inappropriate treatment can be fatal. There is 1-20% mortality rate reported in some centres.[10]

Diabetes, an epidemic, can be a potential culprit for developing pyomyositis that may have multiple site involvement.[11] The

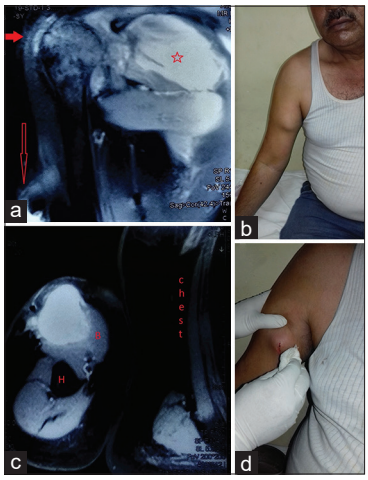

Figure 5: The MRI image showing collection within the scapular muscle (infraspinatus, denoted by star) and teres minor below (a) Associated shoulder joint infective arthritis with periarticular edema (denoted by short arrow) and joint destruction is also noted. The clinical image showing associated nodular swelling over ipsilateral biceps muscle in the mid-arm region (b) The MRI showed corresponding localised swelling in the mid-arm (denoted by long arrow) suggestive of a collection within the biceps muscle (c) The collection is probably a cold abscess within the biceps brachii muscle (denoted by B, humerus is H). The biceps swelling was aspirated for further investigations (d)

presence of fever, swelling in the setting of uncontrolled sugar level should raise suspicion to rule out infective foci. One of our cases had diabetes mellitus and strict sugar control supplemented the recovery. The scapula abscess requires high index of suspicion and often extensile approaches to drain the abscess is required it involves a wide area. A report of a single posterolateral incision to drain a multiloculated abscess involving anterior and posterior aspect of scapula and the axillary area is reported.[12] In one of our cases with widespread abscess extending upto the upper chest wall was managed by open method. Immunocompromised cases with HIV are vulnerable to this infection. Atypical organisms like pneumococcal bacteria have also been reported as causative organism in one such case with supra and infraspinatus involvement along with ipsilateral biceps and coracobrachialis muscle.[13] Tubercular pyomyositis, on the other hand, is uncommon entity but has been reported to have increased in incidence over the years due to migratory population and immunocompromised conditions.[14] Although primary tubercular pyomyositis is rare, one of our cases had pyomyositis with scapula muscle infiltration secondary to ipsilateral shoulder joint infection. Caution should be exercised as some tubercular infection my mimic pyogenic infection at times with elevated counts and other features.[15] Correct bacterial or mycobacterial diagnosis is thus of paramount importance as the treatment is different. Relevant details of few reported cases have been described in the tabulated form [Table 1]. True identification of the organism may be difficult by culture negativity and previous empiric antibiotic use. Therefore, judicious use of antibiotics, only after ascertaining the diagnosis and causative organism, is important. In obese people, extra care is warranted especially following any blunt muscle trauma and subsequent swelling and fever to exclude pyomyositis.[16] Our series describes the occurrence of pyomyositis in the cold, hilly region. The pyomyositis is otherwise described to be prevalent in warmer, tropical climate. Apart from it, involvement of uncommon scapular region is important for educational purpose, more so for primary care physicians. As most of the cases of pyomyositis are dealt with primary care facilities, knowledge of uncommon presentation shall help misdiagnosis and appropriate referral. In

Table 1: The key characteristics of a few previously reported cases with pyomyositis affecting muscles around scapula

Authors	Complaint	Age/ Gender	Organism isolated	Location	Treatment	Special features
Jagernauth *et al.* 2018	Progressive acute shoulder pain	38/F	Staph. aureus	R subscapularis	Shoulder arthroscopy followed by Open drainage	History of cutaneous abscess in the past
Yoneda *et al.* 2003	Fever, swelling, pain	40/M	Staph. aureus	L infraspinatus and R subscapularis	Open dissection and drainage	Poorly controlled DM, dental caries, periodontitis, HBsAg positive
Chatterjee *et al.* 2007	Pain, swelling	41/M	Strep. Pneumoniae	R Supraspinatus, infraspinatus, biceps, coracobrachialis	Pigtail catheter under CT guidance, penicillin	HIV positive, not taking ART for 3 years
Khaw *et al.* 2019	Acute swelling, pain shoulder region and axilla	13/F	Staph. aureus	R Extensive anterior and posterior aspect of scapula and axilla	Postero-lateral incision and drainage	History of pulling of upper extremity, multi-loculated abscess
Corey *et al.* 2015	Pain, swelling shoulder region, fever	42/F	Staph. aureus	L Supraspinatus, deltoid muscle along with AC joint septic arthritis	Open drainage	Overweight, hypertension, psoriasis

M=Male, F=Female, L=Left, R=Right, Staph.=Staphylococcus, CT=Computerised tomography, Strep.=Streptococcus, AC=Acromio-clavicular, DM=Diabetes mellitus, HIV=Human immunodeficiency virus, ART=Anti-retroviral treatment

addition to it, we believe that antibiotic therapy following early diagnosis can lead to uneventful outcome in most cases with very few requiring occasional incision and drainage. One case of tubercular involvement highlights exclusion of this common endemic condition in selected cases. Apart from it, cases with widespread involvement, those requiring advanced imaging like MRI or those with severe abscess formation can be promptly referred for appropriate management to avoid complications.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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