

Focal Myositis of the Deltoid Muscle: The Role of Magnetic Resonance Imaging for Diagnosis

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Learning Point of the Article:

A high index of suspicion and appropriate timely investigations will aid to diagnose focal myositis of deltoid, which is a rare cause of shoulder pain.

Abstract

Introduction: Focal myositis is a rare condition first described by Heffner et al., in 1977, as a self-limiting condition of unknown aetiology. It presents as an inflammatory pseudo tumour in skeletal muscle and can present diagnostic difficulty, being commonly mistaken for tissue of vascular, inflammatory, or neoplastic origin. Diagnosis is traditionally confirmed by muscle biopsy. We present a case where magnetic resonance imaging (MRI) was used to confirm the diagnosis without need for biopsy.

Case Presentation: A 19-year-old female presented with a two-year history of intermittent swelling of the deltoid associated with pain and tenderness to palpation. There was no history of trauma or systemic illness. She was symptomatic with pain, swelling, and tenderness over the left deltoid with no restriction in range of movement of the shoulder or neck. Plain radiographs were normal and MRI magnetic resonance imaging showed diffuse oedematous signal changes on the proton density weighted sequence within the deltoid muscle and no plexiform neurofibroma. Nerve conduction and electromyography studies were within normal limits excluding an axillary nerve lesion. The patient underwent extensive screening for connective tissue disorders and creatine kinase and lactate dehydrogenase levels were within limits. The patient underwent neuromuscular specialist review confirming that this appeared to be a rare case of focal myositis in the deltoid. The serial MRI scans confirmed resolution of the condition.

Conclusion: Focal myositis of the deltoid is a rare cause of shoulder pain. We have shown that sequential MRI scanning can obviate the need for muscle biopsy, which has historically been required for diagnostic confirmation. The MRI appearance on the proton density weighted sequence showed diffuse oedematous signal changes and no plexiform neurofibroma within the deltoid and is a description that has not been previously used for this rare diagnosis.

Keywords: Focal, myositis, deltoid, diagnosis.

Introduction

Focal myositis is a rare, self-limiting condition of unknown aetiology. Heffner et al., first described it, in 1977 [1]. It is much less common than systemic myositis and presents as pseudo tumour of inflammatory nature in skeletal muscle [2]. It typically presents with local symptoms linked to the inflammation or pressure effects of the mass on surrounding structures. Focal myositis is rare in the upper limb and even less common in the deltoid with only two traumatic cases having been previously

reported. These were both following intramuscular injections for influenza immunization injection [3] and anabolic steroids [4].

The diagnosis of focal myositis is difficult and it is commonly mistaken for tissue of vascular, inflammatory, or neoplastic origin [5]. The most common misdiagnosis is of soft-tissue sarcoma [6]. Traditionally, the diagnosis was confirmed by muscle biopsy [5, 97]. Specific histological features for this condition include myopathic, focal neurogenic, fibrosis, and inflammatory changes.

Author's Photo Gallery



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Figure 1: A Coronal slice of a proton density weighted magnetic resonance imaging sequence showing diffuse oedematous signal changes within the deltoid muscle and no plexiform neurofibroma.

We present a case of atraumatic focal myositis of the deltoid and the use of magnetic resonance imaging (MRI) to diagnose without the need for biopsy.

Case Presentation

A 19-year-old female presented with a history of intermittent swelling of the deltoid for two years duration, which was associated with pain and tenderness. She had in total of four episodes over this time period, each lasting roughly two months. She did not report any trauma to that region and she was not known to have any systemic illness. There was no past medical or family history of significance and she was not on any regular medications. At the time of presentation, her main concern was pain around the deltoid region, which was associated with swelling and tenderness. On clinical examination of the shoulder and neck, she did not have any restriction in range of movements. Neurological and vascular examination was unremarkable.

She was initially investigated with plain radiographs and this did not show any obvious pathology. Therefore, further investigation with MRI magnetic resonance imaging was requested of the left shoulder. The MRI scan showed signal changes within the deltoid muscle consistent with diffuse oedema on the proton density weighted sequence and there was no evidence of plexiform neurofibroma (Fig. 1). She underwent nerve conduction and electromyography studies and the results were within normal limits in particular excluded an axillary nerve lesion, with axillary nerve M-wave amplitude of 14.1 and terminal latency of 3.3 with normal motor action potentials seen within the deltoid. This confirmed the absence of an

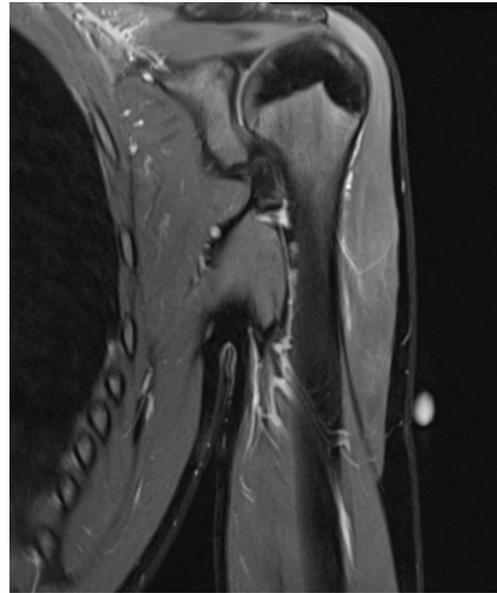


Figure 2: A sequential coronal magnetic resonance imaging slice following resolution of symptoms showing a reduction in the observed level of edema within the deltoid.

axillary nerve lesion. There was an initial elevation in erythrocyte sedimentation rate (ESR) (26 – 73 mm/h) and C reactive protein (CRP) of 12, however, they returned to normal parameters when her symptoms abated. The patient was screened thoroughly to rule out connective tissue disorders with antinuclear, antineutrophil cytoplasmic antibodies, ANCA and extractable nuclear antigen (ENA) antibody panels, as well as diabetes. Blood investigations for creatine kinase and lactate dehydrogenase levels taken during the acute phase were within limits. A sequential MRI scan was performed upon resolution of symptoms showing a reduction in the observed level of oedema within the deltoid (Figure Fig. 2). A specialist opinion from the neuromuscular unit was obtained and they confirmed that the appearances are consistent with focal myositis in the deltoid.

Discussion

Focal myositis is a rare condition, it can occur at any age and affects both male and female equally. Focal myositis usually affects single group of muscle; however, there are reports of focal myositis affecting more than one muscle group [1]. Focal myositis can affect any skeletal muscle in the body but is more common within the lower limbs. Auerbach et al., showed of the 115 rare cases of focal myositis in their study, only one patient had it of the deltoid muscle [8]. Intramuscular injection has been implicated in two other cases of deltoid myositis [3, 4]. Focal myositis has also been reported as a paraneoplastic feature of haemopathies and haematologic conditions [9].

MRI plays a key role in the diagnosis of focal myositis. It typically shows an enlargement of the muscle affected with a

circumscribed mass. Gaeta et al., reported MRI findings of focal myositis in 8ight patients. Six of those patients showed homogeneous and two of them showed inhomogeneous hyperintensity on fast-STIR sequence images. Three of their patients underwent dynamic contrast-enhanced MRI examination showing slow progressive enhancement, which is typical of benign soft-tissue lesions [10].

Diagnosis of focal myositis can be challenging, leading to delay in diagnosis [7]. Careful consideration of focal symptoms should be assessed clinically and with electro-neuro-myography. Blood investigations for inflammatory markers are helpful to rule out systemic pathology. MRI is one of the key diagnostic tools, which can be supplemented with contrast enhancement. However, in case of unusual clinical or MRI findings, muscle biopsy should be considered to confirm the diagnosis [11].

Most of the literatures available on focal myositis are reported in the lower limbs, only a handful of reports are there in the upper limb mainly in the biceps brachii. We believe that our case is the first presentation of atraumatic focal myositis of the deltoid. Focal myositis arising from deltoid muscle can present

atypically and should be considered as one of the rare causes of shoulder pain in differential diagnosis.

Conclusion

To the best of our knowledge, this is the first report in the literature to describe the MRI findings of focal myositis of the deltoid in acute and refractory stages. We have shown that sequential MRI scanning can be used to confirm the diagnosis of focal myositis; however, in resistant myositis, one should consider muscle biopsy to confirm the diagnosis. The Authors highlight sequential MRI could potentially obviate the need for muscle biopsy.

Clinical Message

Focal myositis of the deltoid should be considered in the differential diagnosis as a rare cause of shoulder pain. High index of suspicion and appropriate investigations will aid to early diagnosis.

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

Conflict of interest: Nil **Source of support:** None

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