Use of SPECT-CT with $^{99m}$Tc-MDP Bone Scintigraphy to Diagnose Symptomatic Os Acromiale

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Introduction:

In this report, we present a male who was a football player with shoulder pain secondary to a symptomatic os acromiale. We will demonstrate the findings on bone scan with limited SPECT/CT that diagnosed this important clinical abnormality.

Case report

An 18-year-old male American football player presented with persistent left shoulder pain and the inability to abduct his arm beyond 45 degrees for the past 6 months. Plain film was unremarkable and MRI did not reveal a rotator cuff tear. 99mTc-MDP bone scintigraphy was performed using 24.26 mCi on a dual-head camera fitted with high-resolution, low-energy collimators. Blood pool images were obtained shortly after injection, and delayed static images were obtained approximately 3 hours after the initial injection. The images revealed asymmetric increased activity near the left acromion process on the early blood pool and delayed static images. SPECT/CT was performed for further anatomic localization with the field of view restricted to the shoulders. The images demonstrated incomplete fusion of both acromion processes which could be age related in this patient. However, the ossification center in the left apophysis occurred at the meso-acromion rather than at the pre-acromion (as on the right side), and was associated with more activity (figure 1) indicating ongoing osteoblastic activity likely from incomplete fusion. This finding was consistent with painful os acromiale.

Discussion

Os Acromiale is an anatomic variant caused by the failure of the anterior acromial apophysis to fuse to the acromion process. Instead it is joined to the scapular spine by fibrocartilaginous tissue rather than ossified bone (1). Os acromiale is typically an incidental finding that is present in about 8% of the population (1, 2). It is rare for os acromiale to be symptomatic, but it has been implicated in shoulder impingement syndromes mimicking rotator cuff injuries (3). There are multiple cases that described painful os acromiale and were diagnosed with plain radiographs (4). However, this is the first time to our knowledge that painful os acromiale has been described on bone scintigraphy with SPECT/CT.

Following failure of conservative treatment including physical therapy, nonsteroidal anti-inflammatory agents, and sub-acromial corticosteroid, these patients usually undergo surgical intervention (5). Our patient failed conservative management and was subsequently referred for surgical resection of the incompletely fused ossification center to relieve his pain.

Conclusion:

Os Acromiale is an anatomic variant that in rare cases can cause pain. MDP bone scintigraphy with SPECT/CT can play an important role in diagnosing this clinical entity.
References:


Figure 1. Top row shows the static bone scan and blood pool images, middle row images shows the fused SPECT/CT images, bottom row shows the attenuation correction CT. The arrows are placed at the ossification centers of the apophyses, which is at the meso-acromion on the left (white arrow) rather than at the pre-acromion on the right (black arrow). The right apophysis is nearly fused and has less activity than the unfused aphophysis of the left acromion.