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SM Journal of Clinical and Medical Imaging

Clinical Image

Modified 'Scarf' Technique for Detecting Partial Tears of Supraspinatus Tendon on Ultrasonography

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Article Information

Received date: Apr 30, 2018
Accepted date: May 02, 2018
Published date: May 03, 2018

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Keywords Scarf; Ultrasound; Tear

Abstract

We report a novel ultrasonography technique of demonstrating partial tears of supraspinatus tendon using modified scarf technique. Correct diagnosis of the partial tears assist in appropriate management of these injuries.

Introduction

Supraspinatus is one of the four rotator cuff muscles that originate from supraspinous fossa and has tendinous insertion into the most superior facet of greater tuberosity of humerus. Due to its anatomic location and relative avascularity, the supraspinatus tendon is prone to injuries [1]. These injuries are a common cause of shoulder pain and long disability [2].

Ultrasonography (USG) is reported to have sensitivity and specificity of 93 % and 94 % respectively for detecting partial-thickness tears of rotator cuff [3]; however it can be relatively difficult to demonstrate partial tears of supraspinatus tendon due to operator skills, quality of equipment and anatomic considerations.

We describe a novel technique for better demonstration of partial tear of supraspinatus tendon with ultrasound.

Modified Scarf Test Technique

Patient is made to sit erect with arm flexed at 45°, adduction of 15° and internal rotation, across the chest (Figure 1a). This position is slight modification to the scarf test which is an established way to assess acromio-clavicular (AC) joint pathologies e.g.; disruption [4]. Placing a 10-12 MHz linear probe (Philips iU22, Philips Medical Systems, DA Best, The Netherlands) over the supraspinatus in coronal oblique plane enables one to analyze it accurately (Figure's 1b&1c).

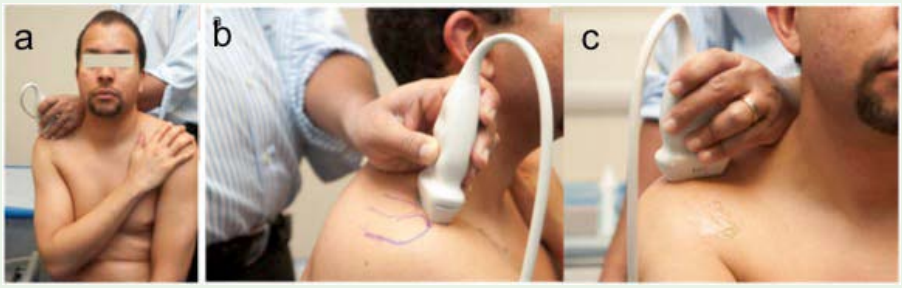

Figure 1: The position of arm in modified scarf technique. The position (lateral (b) and frontal (c) view of the probe in modified scarf technique.

Figure 2: Coronal oblique (a) and sagittal oblique (b) views of the shoulder showing supraspinatus (black star) and biceps (red star) which is more conspicuous on modified scarf technique (c).

Figure 3: Coronal oblique (a) and sagittal oblique (b) views of the shoulder showing supraspinatus (white star) which is more conspicuous on modified scarf technique (c).

Figure 4: Coronal oblique (a) and sagittal oblique (b) views of the shoulder showing supraspinatus (white star) which is more conspicuous on modified scarf technique (c).

We present a few cases (Figures 2,3 & 4) where the partial thickness tear of supraspinatus was more conspicuous using modified scarf technique.

Discussion

The natural history of tendon injury starts with degeneration and progresses to partial tears and if left untreated evolves into full thickness tears. The treatment is based on the clinical symptoms and degree of tear, which ranges from conservative to surgical repair for full thickness tears [5]. Partial tear of supraspinatus tendon poses a major diagnostic challenge on USG due to its anatomic in homogeneity [6]. Partial tears of supraspinatus are classified into articular surface, bursal surface or interstitial tears. Also, it is essential to differentiate a partial thickness tear from a full thickness tear to in planning management and appropriate surgical repair techniques [5].

USG plays an important role in management of these patients because it can reliably differentiate between an intact and torn rotator cuff [7]. Although USG is commonly used for diagnosing tears of supraspinatus, up to 20% of injuries can still be missed using conventional technique [8]. In conventional USG technique, supraspinatus is made accessible by extending the humerus and externally rotating the arm [9]. This position allows the visualization of the tendon insertion on greater tuberosity; however, it can be painful and difficult to achieve in patients due to acute symptoms.

In modified scarf position, the supraspinatus tendon is buckled and separated from the humeral articular surface making the tear, especially partial thickness articular surface tear more conspicuous. Obviously there is an inherent problem of anisotropy when visualizing the tendon especially supraspinatus. To minimize anisotropy artifact, the ultrasound beam should be perpendicular to the tendon. The anisotropy of normal supraspinatus tendon is diffuse unlike in cases of partial thickness articular surface tears where it is focal (Figure's 3&4).

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