The sensitivity of sonography in detecting rotator cuff muscles pathologies in comparison to shoulder MRI

Thesis

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Presented by

Cherine Mamdouh Fayez Labib

(M.B.B.CH)

Supervised By

Ass. Prof. Dr. Waleed Mohamed Abd El Hamid Hetta

Assistant Professor of Radiology
Faculty of Medicine - Ain Shams University

Dr. Rasha Tolba Khattab

Lecturer of Radiology
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
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List of Abbreviations

AC	:	Acromioclavicular
ACJ	:	Acromioclavicular joint
CHL	:	Coracohumeral ligament
DM	:	Diabetes mellitus
GT	:	Greater tuberosity
IGHL	:	Inferior gleno humeral ligament
LHB	:	Long head of biceps
LT	:	Lesser tuberosity
MGHL	:	Middle gleno-humeral ligament
MRI	:	Magnetic Resonance Imaging
OA	:	Os acromiale
Sc	:	Subscapularis
SGHL	:	Superior gleno-humeral ligament
SS	:	Supraspinatus
SST	:	Supraspinatus tendon
Sub	:	Subscapularis
TE	:	Time to echo
Tr	:	Trapezius muscle
TR	:	Time to repetition
US	:	Ultrasonography
USG	:	Ultrasonography

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ABSTRACT

Background: Shoulder pain is a common and disabling complaint. Shoulder pain is responsible for approximately 16 % of all musculoskeletal disorders.

Objective: To compare the sensitivity of shoulder ultrasound in detecting rotator cuff muscles pathologies with unenhanced shoulder MRI.

Methods: A prospective comparative study, conducted in a private center in the period between june and november 2018

Results: Out of 52 patients undergoing ultrasound, 29 had supraspinatous tendinopathy, 9 had supraspinatous tendon partial thickness tear, 7 had supraspinatous complete thickness tear. When compared to MRI ultrasound had sensitivity and specificity of 90.6% and 75% for tendinopathy, 64.3% and 81.6% for partial thickness tear and 83.3% and 95.5% for full thickness tear respectively.

Conclusion: High resolution ultrasound is a good alternative to other radiological methods as MRI, for diagnosis of tendon and joints pathology

Keywords: MRI, rotator cuff muscles pathologies, ultrasound

Introduction

Shoulder pain is considered one of the very frequent and common complaints, it accounts for about 16% of musculoskeletal disorders ***(Stabler, 2006).*** 20% of the general population experience some sort of shoulder problems during their lifetime, of which 85% are rotator cuff related injuries. ***(Martinoli et al., 2003, Ostor et al., 2005, Naredo et al., 2002).*** Injuries in the rotator cuff muscles could be as simple as inflammations or up to complete tears.

Patient's age is an important factor in suspecting the shoulder's pathology. Impingement and tendinopathy, mild rotator cuff diseases, are common in patients of 40 years and younger. While adhesive capsulitis and glenohumeral osteoarthritis, advanced and chronic rotator cuff diseases, are seen more among patients of 40 years and older ***(Burbank et al., 2008)***.

The diagnosis and treatment plans of rotator cuff injuries are substantially improved through the use of medical imaging ***(Post et al., 1983)***. It can be the deciding factor of whether a patient would undergo surgery or would undergo conservative treatment. ***(Ruotolo and Nottage, 2002, Mantone et al., 2000).*** If the surgical option is decided, medical imaging can guide in choosing between arthroscopic or open approaches ***(Mantone et al., 2000, Gartsman et al., 1998).***

Now a days MRI is widely used as it has the advantages of giving excellent soft tissue details, tendon retraction and the extension of the tear. However, MRI has disadvantages; expensive, not easily available, its images show artifacts when adjacent metallic implant is existing and has contraindications such as claustrophobia ***(Dill, 2008).***

On the other hand, sonography is a less expensive alternative and much faster, offering a more robust dynamic examining capabilities such as; various arm positions and scanning planes. However, it has a steep learning curve, less sensitive for obese patients and difficult to perform for patients with restricted shoulder movement ***(Papatheodorou et al., 2006).***

Accordingly, Ultrasound is a more suitable primary diagnostic method when screening shoulder pain as it is much more affordable and faster. ***(Stabler, 2006)***. The accuracy of ultrasound in identifying rotator cuff tears has been studied several times. High accuracy was proven in the detecting of full thickness tears, less accuracy was noted in partial thickness tears ***(Dinnes et al., 2003).***

Aim of the Work

The aim of this study is to compare the sensitivity of shoulder ultrasound in detecting rotator cuff muscles pathologies with unenhanced shoulder MRI. Other benefits include identifying, retrospectively, the risk factors responsible for non articular causes of shoulder pain, thus the clinician can suggest ultrasound as a primary investigation to limit the use of the relatively more expensive MRI shoulder.