ROLE OF MRI IN ASSESSMENT OF ACROMIAL MORPHOLOGY IN ASSOCIATION WITH ROTATOR CUFF TEAR

Thesis

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Abstract

This study included 30 patients; 16 males and 14 females, 20-60 years age with mean range of 40. Cases were referred from the orthopaedic and outpatient department to the radiology department in Kasr Al-Aini for MRI shoulder Patient selection according to recent or chronic shoulder pain and Positive clinical tests. Specifically, patients presenting with non traumatic shoulder pain may benefit from early physical therapy and intervention if findings on MRI suggest impingement. Early intervention may prevent ultimate tears of the rotator cuff and could possibly reduce morbidity with aging .

Keywords:MRI- Acromion shapes-RCT-

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DEDICATION

I would like to dedicate this study to my family for their great help; continuous support and encouragement which were essential for the completeness of this work.

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ABBREVIATIONS

AHD	Acromiohumeral distance.
AI	Acromion index
AT	Acromion thickness.
LAA	Lateral acromial angle.
MRI	Magnetic resonance imaging
RCT	Rotator cuff tear
PD	Proton density.

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INTRODUCTION

The acromion is a posterior shoulder landmark, formed as a posterolateral extension of the scapular spine, superior to the glenoid. It articulates with the clavicle and is the origin of the deltoid and trapezius muscles ,Variation in the shape of the acromion can endorse variety of pathologies such as impingement syndrome and rotator cuff tear (RCT). ***(Mansur et al., 2013)***.

Rotator cuff disorder is one of the most common disorders of the shoulder. It is a common cause of chronic shoulder pain in adults. The specific etiology of a RCT has not been fully elucidated, but it has been considered to result from a combination of intrinsic and extrinsic factors. Intrinsic factors include degenerative changes, hypovascularity, and microstructural collagen fiber abnormalities. Recognized extrinsic factors include subacromial impingement, tensile overload and repetitive use. ***(Oh et al., 2010).*** .

The pathogenesis of RCT seems to be related to the morphology of the acromion which is usually assessed through the five commonly used parameters on standard plain radiographs including the acromial type, acromial slope, acromial tilt, lateral acromial angle and acromial index. ***(Balke et al., 2013)***.

However, with only a plain radiograph of the acromion in the supraspinatus outlet view, it is notoriously difficult to image the acromion and distinguish the hooked from the non-hooked acromion with anterior spurs. ***(Nho et al ., 2008)***

The magnetic resonance imaging (MRI) makes it possible to depict the shape of acromion in its longitudinal axis with better evaluation of the acromial morphological factors including the acromial shape, acromial thickness, acromio-humeral distance, and lateral acromial angle and acromial index. These factors are suggested to influence the status of the rotator cuff .***(Hirano et al .,2002)***.

The acromial shape can be classified into four types: type I (flat), type II (curved), type III (hooked) ***(Balk et al .,2013)*** and type IV(convex) ***(morag et al .,2006).***

AIM OF WORK

This study aimed to evaluate morphological characteristics of different acromial shapes in association with rotator cuff tears.

ANATOMY OF THE SHOULDER JOINT

The shoulder joint is a ball-and-socket synovial joint in which an elegant freedom of movement is allowed at some expense to its strength and stability.
The bones entering in its formation are the hemispherical head of the humerus (ball) linking to the shallow glenoid cavity of the scapula (socket). Some protection of the joint against displacement is afforded by its ligaments and by the tendons and muscles that surround it. The ligamentous protection supplied by the muscles and tendons effectively limits the degree of movement allowed by the joint. Additional protection superiorly supplied by the arch formed by the coracoid process, acromion, and coracoacromial ligament ***(Prescher, 2000).***

The clavicle connects the axial and appendicular skeletons of the upper extremity. Its sternal end is expanded and fits into the notch on the manubrium at the sternoclavicular joint. The lateral one-third is flat, and its sternal (lateral) end is expanded as it curves back to meet the scapula at the acromioclavicular joint. ***(Goldstein, 2004)***

The scapula consists of the scapular body, the scapular spine, the scapular neck, the acromion, the glenoid fossa, and the coracoid process. It has costal (anterior) and posterior surfaces with its anterior surface in contact with the thoracic cage (the scapulo-thoracic interface). From the upper part of the posterior surface, the spine of the scapula projects laterally, terminating into the acromion, which forms the lateral most tip of the shoulder. ***(Goldstein, 2004)***.

The lateral angle of the scapula is thick and strong, with an expanded large, shallow glenoid fossa, facing slightly forward and upwards, ready to receive the head of the humerus. Just medial to the glenoid fossa is the coracoid process as it projects upwards from the neck of the scapula. The coracoid process serves as an attachment site for several important ligaments and muscles ***(Goldstein, 2004)***.

The proximal humerus consists of the head, anatomic neck, and the greater and lesser tuberosities. The intertubercular or bicipital groove is located between the greater and lesser tuberosities along the anterior surface of the humerus ***(Stoller, et al, 1997).***

The head of the humerus is approximately one third of a sphere and it is about four times larger than the socket on the scapula. In anatomic position, it faces superiorly, medially, and posteriorly with the lesser tuberosity in front and the greater tuberosity pointing laterally ***(Goldstein, 2004)***
(figure 1, a-c).