SJIF Impact Factor: 6.711

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 9.
Issue: 10
Page N. 299-303
Year: 2025

Original Article

www.wjahr.com

EVALUATION OF PHYSICAL FINDING IN PATIENT WITH ROTATOR CUFF TEAR USING ULTRASOUND

Omar Abed Kassem*

M.B.Ch.B.-C.A.B.M.S. Orthopedic Department in Al-Salam General Hospital-Mosul-Iraq.

Article Received date: 18 August 2025 **Article Revised date:** 07 September 2025 **Article Accepted date:** 28 September 2025

***Corresponding Author: Omar Abed Kassem**

M.B.Ch.B.-C.A.B.M.S. Orthopedic Department in Al-Salam General Hospital-Mosul-Iraq.

DOI: https://doi.org/10.5281/zenodo.17275938

ABSTRACT

Background: A prevalent issue that can provide challenging diagnostic and treatment issues for the family doctor is shoulder discomfort. In the general population, it is the third most prevalent musculoskeletal complaint, and it makes about 5% of all musculoskeletal consultations with general practitioners. **Aim of the study:** To evaluate patients with symptoms of rotator cuff clinically and then by ultrasound, and evaluate the results of clinical examination in correlation to ultrasonographic finding. **Patients and methods:** From February 2011 to July 2013, a seventy patient was subjected to prospective comparative study in AL-Mosul teaching hospital, and of these seventy patients 58 of them found to have supraspinatus tear. **Results:** The results of clinical examination were compared to the results of ultra-sonographic examination. The history and physical examination show that the rotator cuff tear more common in male patients (68.5%), especially those under forty years of age (65.7%), with predilection to the dominant side (72.2%). It is more common in those with sedentary work like employees (86.5%), the history of trauma is present in (81.5%) of the patients. Our study found that 82.8% of patients had rotator cuff tears, as validated by ultrasound scanning. **Conclusion:** Unlike radiation, ultrasound is non-invasive, safe, and recognized to pose no risks. In a variety of age groups, rotator cuff tears mostly affect men over forty and more frequently impact the dominant side. Ultrasonography should be performed wherever possible to assist diagnosis and treatment of sore shoulders, although history and clinical examination are crucial in the diagnosis of rotator cuff injuries.

KEYWORDS: Physical Finding, Rotator Cuff Tear, Ultrasound.

INTRODUCTION

The shoulder joint consists of three bones and four joints: the clavicle, scapula, and glenoid. The humeral head is spheroidal, and the shoulder "socket" is a lateral projection of the scapula. The shoulder articulation includes four joints: glenohumeral, sternoclavicular, acromioclavicular, and scapulothorasic. The posterior capsule is the primary restraint. The shoulder is stabilized by both static and dynamic restraints, including the glenoid labrum, capsule, and rotator cuff muscles. Static restraints include the glenoid labrum, rotator interval, superior glenohumeral ligament, coracohumeral ligament, middle glenohumeral ligament, and inferior glenohumeral ligament complex. Dynamic restraints include joint concavity compression, increased capsular tension, and capsular stabilizers.[1]

Rotator cuff tears can be categorized into structural, vascular, vascular, and genetic factors. Structural factors include acromion type, degenerative spur, fracture of acromion, acromio-clavicular joint, coracoid, vascular etiology, trauma, instability, intrinsic rotator cuff degeneration, and genetic factors.[2]

The pathology of rotator cuff injuries might include partial tearing, bursitis, tendinitis, or a full tear in one of the tendons. There are three categories of factors that might contribute to the development of rotator cuff tears: extrinsic, traumatic, and intrinsic. Degenerative tears may result from intrinsic tendinopathy brought on by vascularity changes or aging-related metabolic changes. Tears may arise from irritation of the cuff caused by extrinsic sub-acromial impingement, which is caused by anomalies of the coraco-acromial arch restricting the supraspinatus outlet. Edema and bleeding, fibrosis and

tendinitis, bone spurs, and tendon ruptures are developmental phases of rotator cuff injuries. The rotator cuff's natural tendon is typically 10–12 mm thick.[3]

There are three types of rotator cuff tendon tears: partial thickness tears, full thickness tears, and full thickness tears, which involve the tendons completely separating from the bone. In contrast to full thickness tears, which are through-and-through rips that may cause reduced shoulder mobility and function, partial thickness tears frequently manifest as the fraying of an intact tendon.[4]

Ultrasound is a useful tool for diagnosing rotator cuff pathology caused by subacromial impingement. It can be classified into three stages: simple acute tendinitis, chronic tendinitis, and rupture of rotator cuff. The examination involves static and dynamic sonography, with dynamic sonography being particularly useful for visualizing abnormal tendon glide and locating the exact site and etiology of the condition. Stage 1 tendinitis is characterized by edema and tendon inflammation, while stage 2 is characterized by degeneration of the involved tendon. Stage 3 or cuff rupture is characterized by extreme variability of anatomical and sonographic features. Advantages of ultrasound include its non-invasive nature, safety, dynamic examination, real-time results, practical examination, quickness, pathology demonstration, and identifying changes in biceps tendon and deltoid muscle. However, it has limitations, including a learning curve and reduced sensitivity in obese patients and those with restricted shoulder movement.[5] The symptoms of rotator cuff tendon tears include discomfort during overhead motion activities and frequent nighttime awakenings. Even with the arm at the side, a chronic tear may result in continuous discomfort and a progressive loss of strength. The shoulder muscles will atrophy if the rupture is significant, and the active range of motion is restricted. Manual muscle testing reveals limited shoulder abduction and weakness.[2,4]

As clinically required, a physical examination includes palpation, ROM testing, motor strength testing, inspection, and special shoulder tests in addition to methodically exposing the entire shoulder. Patient observation during the history part of the evaluation is the first step in the inspection process. The larger tuberosity and subacromial bursa are frequently the sites of tenderness, and the biceps tendon can be felt anteriorly in the bicipital groove.[6]

The scapula plane, which is about 30 degrees ahead of the coronal plane, has the highest overall elevation when range of motion is assessed. During active shoulder elevation, patients with rotator cuff injuries often have increased ST motion and decreased GH motion. To isolate the relevant muscles separately, strength testing is done. The ideal posture for isolating the supraspinatus muscle is with the arm in the scapular plane, the shoulder fully internally rotated, and the elbow extended. The severity of the tear is assessed using specialized tests such the Jobs test, Neer impingement sign and impingement test, Hawkins-Kennedy test, and Job apprehension test.[7]

PATIENT AND METHODS

Seventy individuals were the focus of a prospective comparison research at Al-Kindy Teaching Hospital between February 20011 and July 2013, and 58 of these patients had supraspinatus tears.

Clinical finding

History including the name, age, sex, occupation, pain severity, the presence of night pain, limitation of movement and history of trauma.

Physical finding

- Inspection to detect atrophy, swelling, or other visible abnormalities.
- Palpation to detect tenderness, crepitus.
- ROM evaluates total active and passive ROM in all plains and we concerned with painful arc (60-120 degree) of active abduction.
- Strength testing.
- Special test concentrated on

Painful arc, JOBs test.

Any patient with suggestive history(shoulder pain, night pain, difficulties in overhead activities) and have one or more of the following findings(muscle atrophy, painful arc, jobs test positive) sent for ultrasound examination to detect the presence of supraspinatus tear.

Ultrasound

Every subject was checked utilizing a 7.5 MHZ linear phased array transducer and commercially accessible ultrasound equipment. Scand was performed on the longitudinal and transverse planes from the rotator cuff, subacromial-subdeltoid bursa, and biceptal tendon groove, as well as the transverse plane from the posterior glenohumeral recesses and glenoid labrum. Comparative images of the opposing shoulder were acquired for each patient in order to compare ultrasonography results and make it easier to identify any slight anomalies.

RESULTS

Patients with age distribution less than 40 years represented 65.7%, patient with age from 40-60 years represented 18.6%, while patient with age more than 60 years represented 15.7%. Of these 70 patients included in our study there were 48 males (68.5%), and 22 females (31.5%). Patient with heavy work were 22 (31.5%), while those with light work were 48(68.5%), as shown in table (1).

Table 1: Distribution of the studied sample according to socio-demographic parameters.

Socio-demographic parameters		No,	%
Age (years)	Less than 40	46	65.7
	40-60	13	18.5
	More than 60	11	15.7
Sex	Males	48	68.6
	Females	22	31.4
Work	Heavy work	22	31.4
	Light work	48	68.6

Of the patients included, 51 (72.8%) had the dominant side impacted, and 19 (27.2%) had the non-dominant side affected. According to table (2), 57 patients (81.5%) have a history of trauma, while 13 patients (18.5%) do not.

Table 2: Distribution of the studied sample according to disease related parameters.

Disease related parameters		No,	%
Side affected	Dominant	51	72.8
	Non- dominant	19	27.2
History of trauma	Present	57	81.5
	Absent	13	18.5

Four patients (5.8%) did not have a history of night discomfort, whereas 66 patients (94.2%) did. Furthermore, just two patients (2.9%) denied having any movement limitations, whereas 68 patients (97.1%) reported having some kind of movement limitation, particularly in flexion abduction and internal rotation. 18 patients (25.7%) had shoulder muscle atrophy, and 54 patients (77.1%) had painful arcs. According to table (3), 58 patients (82.8%) had good results from the Jobs test.

Table (3): Distribution of the studied sample according to clinical examination.

Clinical examination		No,	%
Night pain	Present	66	94.2
	Absent	4	5.8
Limitation of movement	limitation of movement		97.1
	No limitation of movement		2.9
Physical examination	shoulder m atrophy		25.7
	painful arc		77.1
	jobs test		82.8

As noticed in figure (1), 58 patients (82.8%) with clinical symptoms had a supraspinatus tear verified by ultrasound testing, while 12 patients (17.2%) with clinical symptoms had a negative result.

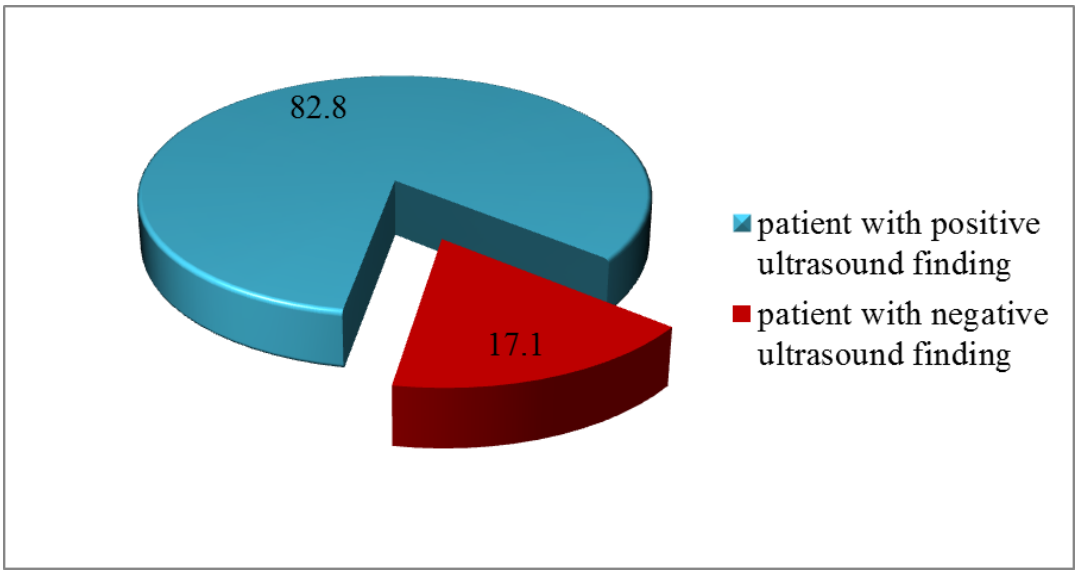

Figure 1: Ultrasound findings.

DISCUSSION

The incidence of rotator cuff tears is known to increase with age, and many of them don't hurt or show any symptoms. Sports injuries and trauma are fewer common causes of rotator cuff injury than age-related deterioration. For the assessment of sore shoulders in the 1960s, there were only simple films available. A variety of diagnostic techniques, including arthrography, sonography, arthroscopy, and magnetic resonance imaging (MRI), have been developed in recent years to evaluate the diagnosis of shoulder problems, particularly rotator cuff tears.

In this study, we attempted to assess the clinical status of a patient who had a suspected rotator cuff tear as well as the outcome of an ultrasonographic test that helped identify the tear. Out of the 70 patients who complained of shoulder discomfort in our research, 62.2% had a supraspinatus tear, which was consistent with the findings of the Stevenson and Trojian study.[8] The patients' average age of 50 years was in line with findings by Zhao et al.[9] and Veado et al.[10], which demonstrated that rotator cuff degeneration was a significant contributing factor to rotator cuff disease.

In terms of sex, of the 70 patients with rotator cuff tears in our study, 48 (68.6%) were men and 22 (31.4%) were women. This was consistent with the findings of Khan et al.[11] and Alshammari et al.[12]; this was likely due to the fact that the men engaged in more demanding exercise.

The findings of Abechain et al.[13] are consistent with the fact that 51 patients (72.8%) had a rotator cuff tear on the dominant side, while 19 patients (27.2%) had a tear on the non-dominant side. This is clearly because the dominant side is overused in activities that may make it more prone to rotator cuff pathology and trauma.

The current investigation indicated that 57 patients (81%) had a history of trauma, which is consistent with the findings of the Stevenson and Trojian study.[8]

In accordance with the findings of the Stevenson and Trojian research[8], it was discovered that muscle atrophy appeared in 18 patients (25.7%) while it was absent in 52 patients (74.3%) and that night discomfort appeared in 66 patients (94.2%) while it was missing in only 4 patients (5.8%). It was discovered that 16 individuals (22.9%) did not have painful arc syndrome, while 54 patients (77.1%) did. 58 patients (82.8%) had positive Jobs test results, whereas 12 patients (17.2%) had negative results. These results were consistent with the findings of Caliş et al.[14] and Akram et al.[15] as well.

Rotator cuff tears have been assessed with ultrasound, with differing levels of sensitivity and specificity. This discrepancy might be caused by differences in operator expertise. The US has the advantages of quickness, noninvasiveness, and comparatively low cost. Twelve patients (17.2%) in our investigation had negative results, but 58 patients (82.8%) had clinical symptoms; these findings were consistent with those of Okoroha et al.[16] and Aminzadeh et al.[17]

CONCLUSION

Rotator cuff tears affect the dominant side in a variety of age groups, mostly in men over forty and more frequently in men. Ultrasound is non-invasive, safe, and recognized to pose no risks, unlike radiation. • Ultrasonography should be utilized wherever possible to assist diagnosis and treatment of sore shoulders, although history and clinical examination are crucial in the diagnosis of rotator cuff injuries.

Recommendation

Patient with clinical symptoms of rotator cuff tear with negative ultrasound result requires further evaluation by MRI.

REFERENCES

1 Barnechea Rey A. Anatomy and Kinematics of the Shoulder Joint, 2021; 111-113. doi:10.1007/978-3-030-81549-3_10.
2 Pandey V, Jaap Willems W. Rotator cuff tear: A detailed update. Asia Pac J Sports Med Arthrosc Rehabil Technol, 2015; 2(1): 1-14. Published 2015 Feb 11. doi:10.1016/j.asmart.2014.11.003
3 May T, Garmel GM. Rotator Cuff Injury. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih. gov/books/NBK547664/
4 Matthewson G, Beach CJ, Nelson AA, et al. Partial Thickness Rotator Cuff Tears: Current Concepts. Adv Orthop, 2015; 2015: 458786. doi:10.1155/2015/458786
5 Zheng F, Wang H, Gong H, Fan H, Zhang K, Du L. Role of Ultrasound in the Detection of Rotator-Cuff Syndrome: An Observational Study. Med Sci Monit, 2019; 25: 5856-5863. doi:10.12659/MSM.915547
6 Yang S, Kim TU, Kim DH, Chang MC. Understanding the physical examination of the shoulder: a narrative review. Ann Palliat Med, 2021; 10(2): 2293-2303. doi: 10.21037/apm-20-1808
7 Giovannetti de Sanctis E, Ciolli G, Mocini F, Cerciello S, Maccauro G, Franceschi F. Evaluation of the range of motion of scapulothoracic, acromioclavicular and sternoclavicular joints: State of the art. Shoulder Elbow, 2023; 15(2): 132-139. doi:10.1177/17585732221090226
8 Stevenson JH, Trojian T. Evaluation of shoulder pain. J Fam Pract, 2002 Jul; 51(7): 605-11. PMID: 12160496.
9 Zhao J, Luo M, Pan J, Liang G, Feng W, Zeng L, et al. Risk factors affecting rotator cuff retear after arthroscopic repair: A meta-analysis and systematic review. Journal of Shoulder and Elbow Surgery, 2021; 30(11): 2660-2670. https://doi.org/10.1016/j.jse.2021.05.010
10 Veado MA de C, Prata EF, Gomes DC. Rotator cuff injury in patients over the age of 65 years:

evaluation of function, integrity and strength. Rev bras ortop, 2015May; 50(3): 318–23. doi.org/10.1016/j.rboe.2015.06.004

11 Khan S, Hameed N, Mazar S, Hashmi IA, Rafi MS, Shah MI, et al. Persistent Shoulder Pain After Anterior Cervical Discectomy and Fusion (ACDF): Another Dual Pathology. Cureus, March 05, 2021; 13(3): e13709. DOI 10.7759/cureus.13709.

12 Alshammari QT, Alshammari AR, Alyahyawi AR, Alhmshe AS, Alshammari AS, Alshammari MF, et al. MRI Assessment of Rotator Cuff Tear in Patients with Shoulder Pain. Pharmacophore, 2023; 14(2): 19-25. https://doi.org/10.51847/q4TEobTCIz

13 Abechain JJK, Godinho GG, Matsunaga FT, Netto NA, Daou JP, Tamaoki MJS. Functional outcomes of traumatic and non-traumatic rotator cuff tears after arthroscopic repair. World J Orthop, 2017; 8(8): 631-637. Published, 2017 Aug 18. doi:10.5312/wjo.v8.i8.631

14 Caliş M, Akgün K, Birtane M, Karacan I, Caliş H, Tüzün F. Diagnostic values of clinical diagnostic tests in subacromial impingement syndrome. Ann Rheum Dis, 2000; 59(1): 44-47. doi:10.1136/ard.59.1.44

15 Akram M, Gillani SFH, Farooqi FM, Awais SM. Acromion Types and Role of Corticosteroid with Shoulder Impingement Syndrome. Journal of the College of Physicians and Surgeons Pakistan, 2016; 26(12): 980-983.

16 Okoroha KR, Fidai MS, Tramer JS, Davis KD, Kolowich PA. Diagnostic accuracy of ultrasound for rotator cuff tears. Ultrasonography, 2019; 38(3): 215-220. doi:10.14366/usg.18058

17 Aminzadeh B, Najafi S, Moradi A, Abbasi B, Farrokh D, Emadzadeh M. Evaluation of Diagnostic Precision of Ultrasound for Rotator Cuff Disorders in Patients with Shoulder Pain. Arch Bone Jt Surg, 2020; 8(6): 689-695. doi:10.22038/abjs.2020.42894.2166