

Original Article



Ultrasonographic Findings of Periarthritis of Shoulder Joint in the Out Patients Department

Md Ibraheem¹, Md Ahsanul Hoque², Md Farhad Parvez³, ABM Zafar Sadeque⁴, Mohammed Emran⁵, Fatama Sharmin⁶

Abstract

Background: To detect periarticular lesions around the shoulder, musculoskeletal ultrasonography is very much useful. Recent improvements in Ultrasonographic technology have led to a higher sensitivity and accuracy of musculoskeletal sonography.

Objective: To present the distribution and representation of shoulder ultrasonographic (US) examination findings in patients with clinical diagnosis of shoulder periarthritis.

Materials and Methods: A cross sectional descriptive type of study at Single center setting conducted in OPD of department of Physical Medicine & Rehabilitation, BSMMU, Dhaka on thirty five patients with the clinical diagnosis of periarthritis of shoulder. Data was collected using an interview- administered questionnaire. All baseline investigations were done. Ultrasonogram was done by experienced Sonologists who were unaware about clinical data.

Results: The primary end point was reached in 85 percent of patient presented sonographic alteration suffering from periarthritis of shoulder. The structure most frequently involved was bicipital tendinitis (32%) and Supraspinatus tendinitis (28%). Sub acromial Bursitis (14%) and Acromioclavicular Osteoarthritis (11%) were also involved. About 15% individual presents no abnormalities. Different varieties of changes in the various structures had been detected.

Conclusion: Proper identification and assessment of the alteration of periarticular structure helps to approach for management and rehabilitation of Periarthritis of shoulder thus disability can be reduced.

Key words: Periarthritis, Shoulder, Ultrasonography.

Date received: 06.07.2022

Date accepted: 03.09.2022

DOI: <https://doi.org/10.3329/kyamcj.v13i3.63140>

KYAMC Journal. 2022; 13(03): 134-138.

Introduction

Periarthritis of the shoulder, an inflammatory disease of the shoulder joint, capsule and surrounding soft tissues characterized by shoulder pain and limited shoulder mobility. It occurs commonly and causes considerable pain, disability and time lost from work.¹ The prevalence of shoulder pain accompanied by disability in Bangladesh is approximately 7.3%.² The differential diagnosis includes several entities of similar clinical picture. Tendinitis and tears of the rotator cuff, biceps tendinitis, and subacromial-subdeltoid bursitis are the most common lesions found.³ While its aetiology is not clearly understood, numerous conditions, such as chronic strain of the shoulder, trauma and frequent exposure to cold or damp conditions, are recognized as possible causes.⁴

Occupation, posture, psychological stress and diabetes are considered the most important risk factors.⁵ The main clinical manifestations are soreness and progressive limitation of some

movements of the shoulder joint. When the condition involves the whole rotator cuff in older patients, resulting in total restriction of all movements of the joint, it is termed 'frozen shoulder' or 'adhesive capsulate'.⁶ The disorder involves not only the bursae or tendons but often all other structures of the shoulder joint, the more inclusive term, periarthritis, should be used.^{7,8}

High frequency ultrasonography (US) is an accurate non-invasive imaging technique for evaluating patients with painful shoulder.⁹ US is able to identify not the only image of the damage to cartilage and bone. But also to identify tendon pathology and synovial inflammation.¹⁰

Diagnostic Musculoskeletal ultrasound (MUS) can serve as an excellent imaging modality for the musculoskeletal clinician. The high sensitivity/specificity, non-invasiveness and low costs of this technique justify its routine utilization in clinical

1. Assistant Professor, Physical Medicine & Rehabilitation, East West Medical College, Dhaka, Bangladesh
2. Assistant Professor, Physical Medicine & Rehabilitation, Cox's Bazar Medical College, Bangladesh
3. Classified Specialist and Head of the Department of Physical Medicine, Combined Military Hospital (CMH), Chattogram, Bangladesh
4. Assistant Professor, Physical Medicine & Rehabilitation, Shahid Sheikh Abu Naser Specialized Hospital, Khulna, Bangladesh
5. Assistant Professor, Physical Medicine & Rehabilitation, Khwaja Yunus Ali Medical College, Enayetpur, Sirajganj, Bangladesh
6. Associate Professor (CC), Department of Radiology and Imaging, MH Samorita Hospital and Medical College, Dhaka, Bangladesh

Corresponding author: Md Ibraheem, Assistant Professor, Physical Medicine & Rehabilitation, East West Medical College, Dhaka, Bangladesh. **Cell Phone:** +8801760597339, **Email:** dribraheem82@gmail.com

rheumatological practice.¹¹ The structures most commonly imaged with diagnostic musculoskeletal ultrasound; include tendon, muscle, nerve, joint, and some osseous pathology.¹² It has also become a valuable tool in the daily clinical practice of Physical medicine and Rehabilitation Specialists; the musculoskeletal ultrasound probe replaces the terms with the physician's stethoscope.¹³ Although it has been applied to the musculoskeletal system since the 1970s, more recent developments in real-time sonography and the use of

high-resolution transducers have enabled high-quality images of soft tissues to be achieved.^{14,15}

The most frequent Ultrasonography finding of shoulder joint was effusion in the long head of the biceps tendon (Figure 1). Subscapularis muscle was the most frequently involved among the rotator cuff tendons. Tendon tear was also common among non-painful shoulders.¹⁶⁻¹⁸

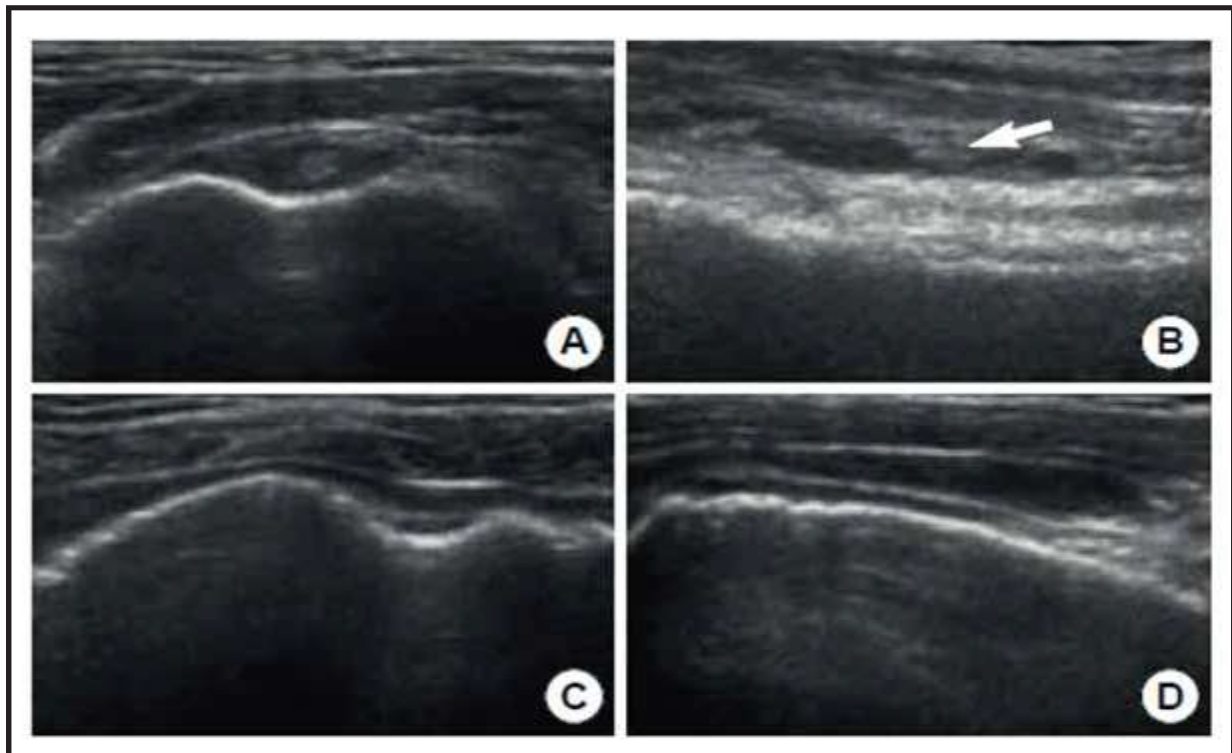


Figure 1: USG findings of biceps abnormalities. Biceps effusion with pannus (arrow) in biceps tendon sheath. (A,B), Biceps tendon rupture with empty sheath (C,D). Transverse view (A, C). Longitudinal view (C, D)

Diagnostic ultrasonograms estimated to be less expensive than MRI.¹⁷ Additionally, Ultra sonogram is more patient friendly as claustrophobia, which may occur with MRI scanners. When compared to MRI, patients with shoulder pain prefer diagnostic Ultrasonography.¹⁹⁻²² MRI scanning benefits to examine a large area but may detect several “abnormalities” that may not be clinically related to the patient’s complaints. Diagnostic Ultrasonography also can examine large areas with extended field of view (FOV) imaging; however the clinician can interact with the patient who can then direct the examination toward the symptomatic area. In this way, the clinician can focus the examination to the most relevant area.¹²

Ultrasonogram also has the advantage of being a dynamic study. For example, the subjected part can be imaged in real time, observing for pathologic movement in muscles, tendon, bursa or joints. With diagnostic ultrasonogram, the patient simultaneously provides feedback and vital information to the examiner during the dynamic examination that may reveal tendon sublimation, joint sublimation, or ligamentous

incompetence.²³⁻²⁵

This study is intended to present the distribution and representation of shoulder ultrasonographic (US) examination findings in patients with clinical diagnosis of shoulder periarthritis. This study will give significant information about assessment of sonographic disease pattern among the patients with periarthritis of shoulder joint. This effort will help to target key patient populations at risk by quantifying the extent of the problem, and by facilitating for appropriate interventions at an appropriate time.

Materials and Methods

This cross sectional descriptive study was carried out in the Department of Physical Medicine and Rehabilitation (PMR), Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh from July 2012 to June 2013. A total of 35 adult patients clinically diagnosed periarthritis of shoulder joint were selected purposively irrespective of sex.

Criteria for inclusion were patients aged ≥ 20 years and ≤ 60 years of both sexes except evidence of malignancy, patient with fracture or suspected fracture, contact with TB patient. After taking the formal consent of the patient, details history was taken and a preset date form filled up for every patient. Past history of illness and any systemic disease was inquired cautiously. Clinical examination was done accordingly. Base line investigation was done e.g. CBC, ESR and Hb%, RBS, Serum creatinine, Urine for R/M/E, serum uric acid, X-ray shoulder joint A/P view was also done. All reports were properly recorded in the data sheet. Ultrasonography of the shoulder joint was done by the well Trained Sonologists. Outcome variables were Ultrasonographic findings regarding tendon, bursa, capsule, bony contour and muscle and demographic variables. Data cleaning validation and analysis performed using the SPSS (Statistical package for social sciences) -package program (version-20.0) for Windows.

Results

The current study included 35 patients and Mean age was 48.54 years, range 28-70. Most number of patients (21, 60%) were of 40 to 60 years of age group. 9 (25.7%) of the respondents were below 40 years, 5 patients (14.3%) were aged over 60 years. It also showed that 19 (54%) of the total respondents were female and 16 (46%) were male. It also observed that female patients were more frequent in below 40 years and 40 to 60 years of age group. Among the 5 patients aging more than 60 years, only 1 was female. It also showed that more than half (51%) of the respondents were service holders, 37% were house wives and the rest were retired and businessmen. In this study 21 of the 35 respondents (60%) had shoulder pain for less than 6 months, 10 had pain for 6 months to 1 year and 4 patients had pain for more than 1 year; mean symptom duration 9.0643 months, range 0.5-96 months.

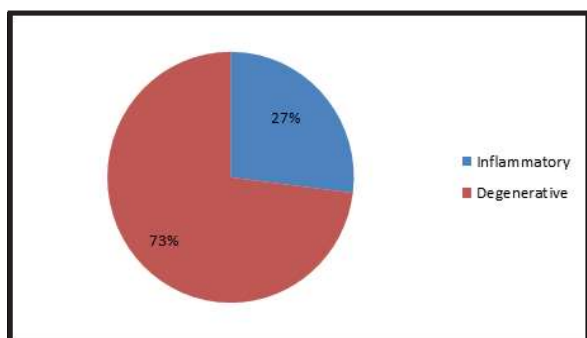


Figure 2: Distribution of nature of pain.

Result shows that the patients gave positive family history of various diseases like 11% of the patients gave positive family history of Diabetes Mellitus (DM), 17% (6 of the 35 patients) had positive family history of hypertension, 3% of the respondents had positive family history of heart disease and only 1 of the respondents gave positive family history of asthma. The present study reveals that more than half of the respondents (18, 51.2%) had no associated condition, 8 of the patients had diabetes, 5 had hypertension, 2 had both diabetes

and hypertension and only one person had asthma and one other had hepatitis. It also shows that 31% of the respondents had a positive history of trauma. Almost two-thirds (73%) of the patients were found to have pain in shoulder due to degenerative change, 27% had pain due to inflammatory change (Figure 2).

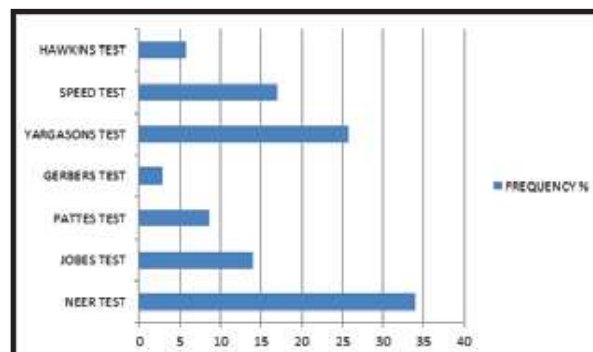


Figure 3: shows special tests for shoulder joint physical examination had various frequencies.

Variable amount of disability problems found on shoulder joint on movement, 5 of the patients had problem in abduction, 4 had problem while combing, 8 patients had disability problem reaching upper back. 3 patients had problem both in combing and abduction, 1 patient had problem in combing and reach at upper back. 2 had problem in abduction and reach at upper back. More than one-fourth of the patients (9, 25.7%) had disability problem in all these activities, and 3 had problem in none. All were elicited by different clinical tests (Figure 3).

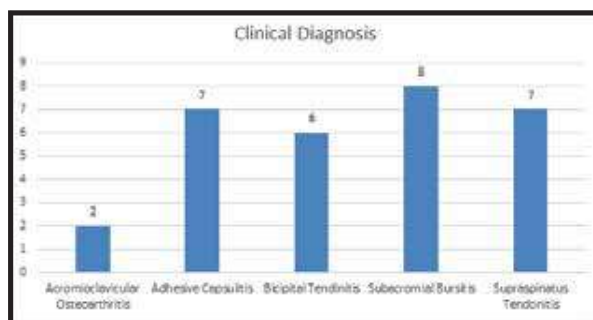


Figure 4: Bar graph showing clinical diagnosis of the respondents

Figure 4 shows the distribution of clinical diagnosis of the patients. 2 (5%) patients were diagnosed as suffering from acromioclavicular osteoarthritis, 7 (20%) had Adhesive capsulitis, 6 (17%) had bicipital tendinitis, 8 (23%) had subacromial bursitis and 7 (20%) had supraspinatus tendonitis.

Table I shows the frequency of involved structure in periathritis of shoulder joint that can be assessed by Ultrasonogram. According to the study 31% (n=11) of patients had Bicipital tendinitis, 28% (n=10) had supraspinatus tendonitis, 14% (n=5) had sub acromial bursitis, 8% (n=3) had capsulitis, 11% (n=4) shows Acromioclavicular Osteoarthritis and 2% (n=1) had sub scapular tendonitis. There was significant

number of Normal USG study that was 14 % (n=5).

Table 1: Ultrasonographic findings in periathritis of Shoulder Joint.

Involved Structure	Number of Findings (N)	Percentage (%)
Bicipital Tendinitis	11	31
Supraspinatus Tendinitis	10	28
Subacromial Bursitis	5	14
Capsulitis	3	8
Acromio Clavicular OA	4	11
Subscapularis Tendinitis	1	2
Normal USG	5	14

Discussion

Periarthritis of the shoulder is a very common rheumatological condition. In most patient it results from periarticular lesion involving the Rotator cuff, the Biceps tendon and the sub acromial- sub deltooid bursa. In this study 35 adult patients aged 20 to 60 clinically diagnosed Periarthritis of shoulder joint were selected purposively. Ultrasonography of the affected joint was done by the experienced sonologist who were blind about the clinical diagnosis. The differential diagnosis comprises several essences of similar clinical picture. Ultrasonogram investigation includes the biceps, the supraspinatus, infraspinatus, and subscapularis tendons; the subacromial-subdeltoid bursa; and the glenohumeral and acromioclavicular joints to assess their usual involvement. We observed that most number of patients 60% are of 40 to 60 years of age group. It also shows that 19 (54%) of the total respondents were female and 16 (46%) were male. It also shows that more than half (51%) of the respondents were service holders, In this study 21 of the 35 respondents (60%) had shoulder pain for less than 6 months. Almost two-third (73%) of the patients were found to have pain in shoulder due to degenerative change, 27% had pain due to inflammatory change.

The present study reveals that more than half of the respondents (18, 51.2%) had no associated condition and 31% of the respondents had a positive history of trauma.

In this study 34% of the respondents had positive Neer test, 14% of the respondents had positive Jobe's test, 9% of the respondents were found positive for Patte's test, only one of the respondents was found to have positive Gerber's test, 26% of the respondents had positive Yargasson's test, 6 out of the 35 respondents had a (17%) positive Speed's test and 6% of the respondents had positive Hawkins test. Although the Speed's test was positive in 42.2% cases in a study conducted by Iagnocco A et al.¹⁶ In this study it was observed that among the clinical diagnosis of the patients, 2 (5%) patients were diagnosed as suffering from acromioclavicular osteoarthritis, 7 (20%) had adhesive capsulitis, 6 (17%) had bicipital tendinitis, 8 (23%) had subacromial bursitis and 7 (20%) had

supraspinatus tendonitis which corresponds with the findings of a study conducted by E Naredo et al.²⁶

It also shows the diagnosis of the patients based on ultra-sonogram report, 85 % (30) were positive and 15% (5) were negative upon ultrasonographic examination. According to USG, 5 of the patients had no structural involvement, 10 had inflammation of the supraspinatus tendon, 5 had inflammation of the subacromial bursa, 11 patients had inflammation of the bicipital tendon, 3 had inflammation of the joint (adhesive) capsule and 4 had osteoarthritic change of the acromioclavicular joint. Pope DP et al and Naredo E et al found similar positive ultrasonogram findings but their was significant variation in representation of structural involvement in this study.^{26,27} Although Iagnocco A et al also found sonographic alternation in total of 94.1% of patient on their study.¹⁶

It was a single centred study, sample size was not reflecting the whole country scenario and it was a purposive non-random sampling method.

Conclusion

The sonography is a valuable method for the assessment of shoulder pathology. The availability of Musculoskeletal Ultrasonogram in Physiatric practice offers the possibility of establishing a more accurate diagnosis and rehabilitation of the painful shoulder and therefore improving the treatment of this common problem. The availability, non-invasiveness and low costs of sonography justify its routine utilisation for the assessment of painful shoulder in clinical practice.

Acknowledgement

We sincerely acknowledge our hounrable teacher Professor Dr. M Moyeenuzzaman, Ex Chairman, Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University, Dhaka.

References

1. Abate M, Schiavone C, Salini V. Sonographic evaluation of the shoulder in asymptomatic elderly subject with diabetes. BMC Musculoskeletal disorder. 2010; 11:278.
2. Barbara H, Rosanna T. Oxaprozin versus diclofenac in NSAID-refractory periarthritis pain of the shoulder. Current Medical Research & Opinion. 2004;20(8): 1279 –1290.
3. Bartolozzi A, Andreychik D, Ahmad S. Determinants of outcome in the treatment of rotator cuff disease. ClinOrthop 1994;308:90–97.
4. Breidiah WH, Newman JS, Taljanovic MS. Power Doppler Sonography in the assessment of musculo-skeletal fluid collections. Am J Roentgenol 1996; 166:1443-1446.
5. Buckle P. Upper limb disorders and work: the importance of physical and psychosocial factors. J Psychosom Res 1997; 43:17-25.

6. Cagliero E, Apruzzese W, Perlmutter GS, et al. Musculoskeletal disorders of the hand and shoulder in patients with diabetes mellitus. *Am J Med* 20; 112:487-490.
7. Chipchase LS, O'Connor DA, Costi JJ, et al. Shoulder impingement syndrome: preoperative health status. *J Shoulder Elbow Surg* 2000; 9:12-15.
8. Cooperberg PL, Tsang I, Truelove L et al. Gray scale ultrasound in the evaluation of rheumatoid arthritis of the knee. *Radiology* 1978;126:759-763.
9. Donald I. Sonar-the story of an experiment. *Ultrasound Med Biol* 1974; 1:109-117.
10. G A W Bruyn et al. Reliability of ultrasonography in detecting shoulder disease in patients with rheumatoid arthritis. *Ann Rheum Dis* 2009; 68:357-361.
11. Gerber C, Krushell RJ. Isolated rupture of the tendon of the subscapularis muscle. Clinical features in 16 cases. *J Bone Joint Surg [Br]*1991;73:389-394.
12. Hangiandreou NJ. AAPM/RSNA physics tutorial for residents. Topics in US: B-mode US: basic concepts and new technology. *Radio graphics* 2003; 23(4):1019-1033.
13. Haq SA, Darmawan J, Islam MN, et al . Prevalence of rheumatic diseases and associated outcomes in rural and urban communities in Bangladesh: a COPCORD study. *J Rheumatol* 2005;32(2):351.
14. Hawkins RJ, Kennedy JC. Impingement syndrome in athletes. *Am J Sports Med* 1980;8:151-158.
15. Hyun A K, Su H K, Young-II S. Ultrasonographic findings of the shoulder in patients with rheumatoid arthritis and comparison with physical examination. *J Korean Medical Science*. 2007; 22:660-666.
16. Iagnocco A, Coari G, Leone A, Valesini G. Source Sonographic study of painful shoulder. *Clinical & Experimental Rheumatology*. 2003; 21(3): 355-358.
17. Jacobson JA. Ultrasound in sports medicine. *Rad Clin NA* 2002; 40(2):363-386.
18. Jobe FW, Jobe CM. Painful athletic injuries of the shoulder. *ClinOrthop* 1983;173:117-124
19. Kim HA, Kim SH, Seo YI The role of ultrasonography in evaluation of pathomorphological changes in humeroscapular periartthritis. 2010;132(9-10):293-297.
20. L. Solomon, D. Warwick, S. Nayagam. Apleys system of orthopaedics and fractures. 9th edition. London: Hodder Arnold; 2010.
21. Leroux JL, Thomas E, Bonnel F, Blotman F. Diagnostic value of clinical tests for shoulder impingement syndrome. *Rev Rhum (Engl Ed)*1995;62:423-428.
22. Middleton WD, Payne WT, Teefey SA, Hildebolt CF, Rubin DA, Yamaguchi K. Sonography and MRI of the shoulder: comparison of patient satisfaction. *AJR* 2004; 183(5):1449-1452.
23. Neer CS, Welsh RP. The shoulder in sports. *OrthopClin North Am* 1977; 8:583-591
24. Ozçakar L, Tok F, De Muynck M, Vanderstraeten G. Musculoskeletal ultrasonography in Physical and rehabilitation medicine. *J Rehabilitation Medicine*. 2012 Apr; 44(4):310-318.
25. Paul H L, Scott P, Advances and utility of diagnostic ultrasound in musculoskeletal medicine. *Current Rev Musculoskeletal Med* .2008, 1:24-31.
26. Naredo E, Aquado P, De Miquel E, Uson J, Mayordomo L, Gijon - banos J, Martin Mola E. Painful shoulder: comparison of physical examination and ultrasonographic findings. *Annals of the Rheumatic Disease*. 2002 February; 61(2): 132-136.
27. Pope DP, Croft PR, Pritchard CM, et al. Prevalence of shoulder pain in the community: the influence of case-definition. *Ann Rheum Dis* 1997; 56:308-312.