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COMPARISION BETWEEN ULTRASONOGRAPHY AND ARTHROSCOPIC FINDINGS OF ROTATOR CUFF TEAR

Orthopaedics

Dr. Shakti Kishore* Senior. Resident Department of Orthopaedics, PMCH Patna.*Corresponding Author

Dr. Priya Ranjan Senior. Resident Department of Orthopaedics, PMCH Patna.

Dr. Vijay Kumar Professor &HOD Department of orthopaedics, PMCH Patna.

ABSTRACT

Rotator cuff muscles pathology is a common cause of shoulder pain in population of all age groups especially adult and elderly people and among sports person. Radiography findings are almost normal and MR imaging being costly. USG is one of the best and cheapest modality in diagnosing this common injury. In this paper author has compared the USG findings which is operator dependent procedure with direct visualisation during arthroscopy to observe the outcome

KEYWORDS

USG ultrasonogyaphy rotator Cuff, Arthropathy, Bursa, Supraspinatous, Subscapularis, MR imaging, Echogenecity.

INTRODUCTION:

Rotator cuff disease encompasses a wide range of pathology from minimal bursa or articular side irritation and tendonitis to severe degenerative rotator cuff arthropathy. Rotator cuff pathology affects adults of all ages and other shoulder afflications must be ruled out by careful history and physical examination. The most sensitive clinical findings are impingement and the arc of pain sign. Radiographic findings are usually normal in the acute setting, although the active abduction view may show decreased acromiohumeral distance. In more chronic cases, an outlet view may show decreased opacity and decreased size of the supraspinatus muscle due to atrophy. In late cases, the humeral head may become subluxated superiorly, and secondary degenerative arthritis of the glenohumeral joint may ensue. Ultrasonography (USG), with over 90% sensitivity and specificity, can help confirm the diagnosis in clinically equivocal cases. USG can also reveal the presence of other abnormalities that may mimic rotator cuff tear at clinical examination, including tendinosis, calcifictendinitis, subacromial subdeltoid bursitis, greater tuberosity fracture, and adhesive capsulitis.

Crass et all[1] and Middleton et[2] all in 1984 were the first to describe ultrasonographic (USG) evaluation for rotator cuff tears, and USG has proved to be as accurate as magnetic resonance (MR) imaging in the detection of supraspinatus tendon tears. In a recent study comparing USG with MR imaging and using arthroscopy as the standard of reference, Teefey et al[3] demonstrated an overall accuracy of 87% for both modalities in correctly identifying partial and full thickness rotator cuff tears as well as the absence of such tears. We review the clinical, ultrasonographic and arthroscopic evaluation of rotator cuff tears with an emphasis on arthroscopic technique and the interpretation of arthroscopic findings. We also discuss and illustrate a variety of conditions that can mimic rotator cuff tears clinically, including supraspinatus subdeltoid bursits, greaters tuberosity fracture, and adhesive capsulitis.

MATERIALS AND METHODS:

Since January 2016,46 patients were selected who underwent arthroscopic diagnosis and further treatment if required. This was a retrospective and prospective study and data was collected from different centres.

Inclusion Criteria was adult patient with proved rotator cuff tear by USG.

Exclusion Criteria was children, patient with other shoulder pathology, patient with other comorbidities that interferes with surgery.

Preoperative MR Imaging was not done. No follow up was required for this study. Large and full thickness tear of rotator cuff was repaired arthroscopically or by mini open techniques. Partial tear was treated depending upon the circumstances and surgeon preferences.

Major criteria in USG for full thickness tear: Non visualization of cuff may be associated with nacked tuberosity or double arc sign, Focal non visulisationin in two planes, Discontinuity confirmed with stress test, Focal abnormal echogenicityt, may be associated with partial thickness tear.

Minor Criteria In USG For Cuff Tear:

Fluid along the biceps tendon sheath and in the subdeltoid bursa, concave subdeltoid bursal contour, Irregularity of the greater tuberosity, Compressibility.

Partial thickness tear can be diagnosed either as distinct hypoechoic or mixed hyper- and hypoechoic defect visualized in two planes at the deep articular side of the cuff, or minimal flattening of the bursal side of the cuff, Partial tears can be classified as bursal surface, intrasubstance, or articular surface tears.

RESULTS

Rotationcuff injury is more common in male and on right side. 69.6% of were of age group 41 to 60 years. Supraspinatious tendon is most commonly involved rotator cuff tear.

DISCUSSION

Shoulder arthroscopy enables direct visualization and thus is regarded as the gold standard to confirm diagnoses.

Shoulder ultrasonography is a cost effective and non-invasive tool for investigationof rotaror cuff pathologies for detectin of supraspinatus tendon tears, ultrasonography attained a sensitivity of 90.9%, specificity of 33.33%, positive predictive value of 90.9% and negative predictive value of 33.33%. The relatively low specificiety (14.28%0)and positive predictive value 47.82% were due to a high false positive value. In 23 cases, ultrasonography revealed partial-thickness tears, but arthroscopy revealed only in 11 caes. Ultrasonography revealed full thickness tear in only 17 cases, while during arthroscopy, 33 cases were confirmed as full-thickness tears.

For the detection of subcapsularis tendon tears, ultrasonograhy attained a sensitivity of 22.72% specificity of 100%, positive predictive value of 22.72, and netavie predictive value of 5.5% Sensitivity, specificity, and predictive values were good in larger full-thickness tears, But were significantly reduced in subcentimetre and partial thickness tear particularly of the subscapularis tendon. The relatively low sensitivity and negative predictive value were due to a high false negative value, In the 34 false negative cases, 29 was a full thickness tear and 5 were partial- thickness tears.

	No tear (Supraspinatus tendon)	Partial tear (Supraspinatus tendon)	Full thickness tear (Supraspinatus tendon)	No tear (Subscapularis tendon)	Partial thickness tear (subscapularis tendon)	Full thicknes s tendon (subscapularis tendon)
USG	6	23	17	36	6	4
Arthroscopy	2	11	33	36	5	5

CONCLUSION:

In our series, most full-thickness tears of the supraspinatous tendon (which are clinically important and should be repaired operatively) were diagnosed as partial thickness tear by ultrasonography. Surgeons should be aware of the potential disparities between ultrasonographic and arthroscopic findings and be prepared to adjust the surgical procedure during arthroscopy. USG is technically demanding in these cases but should always be used before arthroscopy as it in non invasive modality with a considerable sensitivity and is at par with MR imaging in both full thickness and partial thickness tears in most of the studies.

Conflict Of Interest:

The author denies any conflict of interest and denies any affiliations with or involvement in any organization for financial of promotional purposes.

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