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Diagnostic value of US, MR and MR arthrography in shoulder instability

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Abstract. Introduction: The aim of our study was to compare US, conventional MRI and MR arthrography findings in patients with anterior shoulder instability and with a clinical diagnosis of labral capsular ligamentous complex lesion. At the same time we evaluated the accuracy of MR arthrography in the diagnosis of this lesion.

Methods: After approval of the local Ethics Committee, our department's Trauma Registry from July 2008 up to February 2012 was retrospectively reviewed to identify all eligible patients. Eligibility criteria included: 1) history of acute or chronic shoulder instability (more than three dislocations over a period of more than two months); 2) diagnosis of labroligamentous lesion.

All patients were investigated with plain radiographs, Ultrasound Scans (US), Magnetic Resonance Imaging (MRI) and MR arthrography. Finally, all patients underwent an arthroscopy that confirmed the diagnosis.

Results: A total of 200 consecutive patients who met the inclusion criteria were included in this study. The mean age was 39 years (range 15 to 83); 147 were male and 133 involved the right shoulder. Chronic instability was documented in 133 patients, whereas acute instability was documented in 67 patients. We detected a statistically significant difference between US and MR arthrography in SLAP (Superior Labrum Anterior to Posterior) lesions (Type II, III and IV), in Bankart lesions, in glenohumeral ligament lesions (superior, middle, anterior-inferior and anterior inferior glenohumeral ligament) in Hill-Sachs lesions, in diagnosing internal subacromial impingement and in normal findings. MR arthrography was superior to the US.

A statistically significant difference was evident between MRI and MR arthrography findings in SLAP lesions (II and IV Type lesions), in glenohumeral ligament lesions (anterior inferior and posterior inferior glenohumeral ligament), in partial rotator cuff ruptures and in normal findings. MR arthrography diagnosed this lesion better than MRI without contrast.

We also found a statistically significant difference between US and MRI findings in SLAP Type II lesions, in partial rotator cuff ruptures, in Hill-Sachs lesions and in diagnosing internal subacromial impingement.

Conclusion: The US scan is a valuable diagnostic technique for rotator cuff complete or incomplete ruptures. For evaluating Hill-Sachs lesions or bony Bankart lesions, MRI is more accurate. In the case of labral capsular ligamentous complex lesions, MR arthrography is superior.