



<p>Raymond AC, McCann PA, Sarangi PP. Magnetic resonance scanning vs arthrography in the assessment of glenoid version for osteoarthritis. <i>Journal of Shoulder and Elbow Surgery</i> 2013; 23(8): 1079-1083.</p>	<p>Low</p>	<p>retrospective consecutive</p>	<p>Inclusion criteria was a diagnosis of end-stage glenohumeral osteoarthritis.</p>	<p>Excluded were patients who had previous surgery that would alter the anatomy of the glenoid, such as an open stabilization with bone block, or those whose images could not be accurately assessed because the quality was too poor</p>	<p>There were 26 women and 17 men who were mean age of 68 years (range, 44-85 years) at the initial assessment. There were 37 right shoulders and 29 left shoulders. Primary glenohumeral osteoarthritis was the pathology in all shoulders.</p>	<p>Intraobserver reliability, intraobserver reliability, glenoid version, Wash glenoid morphology</p>	<p>The mean retroversion measured on ARX was significantly greater than that measured on MRI, with the mean difference of glenoid version of 7.36 degrees (P &lt; .001), whereas the interobserver and intraobserver reliabilities for MRI were greater than that of ARX. The largest difference between MRI and ARX of the same shoulder was 33 degrees. Glenoid retroversion was greater compared with MRI in 73% of ARX.</p>	<p>This study confirms that ARXs should be interpreted with caution when assessing the pattern and extent of posterior glenoid wear in osteoarthritis. The authors suggest that plain radiographs should not be used for preoperative templating in isolation but concede that they provide an easily accessible and economically sound modality for basic diagnostic purposes. MRI represents a precise and accurate technique for evaluating glenoid wear, without exposure to ionizing radiation, in addition to established roles in the assessment of the rotator cuff.</p>	<p>This work has some limitations. Firstly, the observers were not blinded to patient identity when assessing the MRIs and ARXs. This limitation was minimized by performing ARX observations consecutively, followed by the MRI observations. The initial ARX readings were hidden to prevent influence on subsequent MRI readings. Secondly, calculations were performed in only the axial plane. It is feasible that 3-dimensional MRI assessments would be even more accurate. Multiphasic analysis of the pattern of glenoid wear would prove useful in the planning of glenoid reaming and prosthetic alignment, and future work comparing MRI and CT modalities would be particularly informative.</p>
<p>Razmyou H, Fournier-Gosselin S, Christaki K, Pevneggi A, Elmaghrabi A, Hobbie A. Accuracy of magnetic resonance imaging in detecting biceps pathology in patients with rotator cuff disorders: Comparison with arthroscopy. <i>Journal of Shoulder and Elbow Surgery</i> 2016; 25(1):38-44.</p>	<p>Low</p>	<p>retrospective non consecutive</p>	<p>Patients with impingement syndrome or rotator cuff tear, with study group) or without (control group) biceps disease, who had participated in previous studies from 2003 to 2014 were reviewed. For the purpose of consistency, only patients whose noncontrast MRI study was performed in the institution were included.</p>	<p>Patients with an unknown response for the extent of biceps disease on the MRI report were excluded.</p>	<p>183 (130 study and 53 control) patients (73 women [60%], 110 men [60%], mean age, 62 years [standard deviation (SD), 9; range, 41-84])</p>	<p>Sensitivity and specificity of MRI at finding partial-thickness biceps tear; Sensitivity and specificity of MRI at finding full-thickness biceps tear;</p>	<p>Full thickness tear accuracy .76, sensitivity .54, specificity .96, LR+ 26 LR- 47                  Partial thickness tear accuracy .57 sensitivity .27 specificity .96 LR+ 1.2 and LR- 3.8                  Dilatation accuracy .92 sensitivity 1.00 specificity .83 LR+ 6 LR- .92</p>	<p>88% specificity for biceps tendon tears, 100% sensitivity for biceps subluxation/dilatations</p>	<p>The study was retrospective in nature with deficiencies. Inherent in such studies, however, missing data applied only to the MRI findings, as the research database had details on biceps disease that was completed prospectively. In addition, patients with unknown responses were detected and excluded from analysis. In this study, MRI reports were interpreted by radiologists trained in musculoskeletal pathology, which limits the generalizability of the results, considering level of training does influence diagnostic accuracy</p>
<p>Sill AP, Zaw T, Flug JA, et al. Calcific tendinitis reduces diagnostic performance of magnetic resonance imaging in the detection of rotator cuff tears. <i>J Comput Assist Tomogr</i>. 2022; 46(2):219-223.</p>	<p>Low</p>	<p>retrospective</p>	<p>Patients who had a shoulder MRI or MRI arthrogram performed, and calcific tendinitis, calcific tendinitis, or calcific tendinopathy mentioned in the report between 1998 and 2017 were returned from a search of an institutional database.</p>	<p>Three patients were excluded for lack of an available operative report.</p>	<p>Forty-eight MRI (mean age, 63.4 years, range 57-85 years; female-to-male ratio, 29:19) and 7 MRA (mean age, 49.2 years, range 25-90 years; female-to-male ratio, 4:3) patients were included.</p>	<p>Calcific tendinosis was confirmed radiographically. Two musculoskeletal radiologists then retrospectively and independently reviewed the MRI/MRA examinations, with surgery or arthroscopy performed within 90 days of the MRI. Rotator cuffs were categorized as no tear, partial-thickness tear, and full-thickness tear. Partial-thickness tear/full-thickness tear groups were combined for analysis.</p>	<p>Reader 1 and reader 3 sensitivity/specificity values for RCTs on MRI were 95%/50% and 89%/30%, and the values on MRA were 100%/67% and 100%/100%, respectively. Overall agreement was present in 87% (46 of 53, κ = 0.55 [95% confidence interval, 0.26-0.83]).</p>	<p>The authors conclude that magnetic resonance imaging has decreased specificity in diagnosing RCT when calcific tendinitis is present. Magnetic resonance arthrography performed better in this population and could be considered.</p>	<p>First, few patients with MRA performed met the inclusion criteria, which limited findings. Second, because of the retrospective design of the study, complete clinical history and operative reports were not always available. Retrospective bias was also present as only patients who had shoulder surgery after imaging were included. Finally, authors did not directly correlate the location of calcification and the location of rotator cuff tears.</p>
<p>Spanner BA, Dattanas CA, Szymour PA, Thomas SJ, Abboud JA. Glenohumeral articular cartilage lesions: prospective comparison of non-contrast magnetic resonance imaging and findings of arthroscopy. <i>Arthroscopy</i> 2013; 29(9):1466-1470.</p>	<p>Low</p>	<p>low (downgrade 2 levels for small sample size, partial non blinding to arthroscopy results, no confidence intervals)</p>	<p>Inclusion criteria were a clinical diagnosis of subacromial impingement or rotator cuff tendinopathy who failed conservative management; a non-contrast MRI study obtained in a closed scanner at 1.5 T or greater, and a surgical arthroscopy performed by the senior author</p>	<p>Exclusion criteria were any revision surgery or inflammatory arthropathy or an MRI study of insufficient strength. Patients with radiographic evidence of glenohumeral osteoarthritis including joint space narrowing, inferior osteophyte formation, subacromial sclerosis, or posterior glenoid wear were also excluded. Fifteen patients were excluded from the study</p>	<p>The sensitivity, specificity, accuracy, PPV, and NPV of detecting articular cartilage lesions on MRI were calculated as a percent (ranging from 0% to 100%, with 0% being the worst and 100% being perfect) and compared with arthroscopy findings as the gold standard. Detection of partial-versus full-thickness cartilage lesions was also evaluated.</p>	<p>The 3 readers combined read 11 of 34 humeral lesions as positive and 44 of 54 normal humeral cartilage surfaces as negative; sensitivity, 32%; specificity, 80%; accuracy, 63%; PPV, 57%; and NPV, 66%. Combined, the 2 readers read 5 of 16 glenoid lesions as positive and 62 of 72 normal glenoid cartilage surfaces as negative; sensitivity, 31%; specificity, 86%; accuracy, 76%; PPV, 33%; and NPV, 85%. In detecting partial- versus full-thickness lesions on MRI, the 2 readers combined correctly read only 2 of 28 partial-thickness lesions (7%) as partial thickness and 8 of 22 full-thickness lesions (36%) as full thickness.</p>	<p>Effect sizes detected were small. In the study the overall accuracy of detecting articular cartilage lesions on MRI was 69%. The accuracy of detecting humeral lesions was 62% (sensitivity, 36%; specificity, 80%), and the accuracy of detecting glenoid lesions was 73% (sensitivity, 28%; specificity, 82%).</p>	<p>This study had several limitations. The authors used various MRI scanners from the community rather than one MRI scanner, which introduced inter-scanner variability. However, the authors believed that the use of different MRI scanners throughout the community better simulated clinical practice. Another limitation is that a single surgeon prospectively identified and graded all lesions, at the time of arthroscopy. The inclusion of multiple surgeons and readers would have allowed us to assess interobserver reliability. Finally, although the sample size is similar to comparable reports, on the basis of the low prevalence, a larger sample size would be necessary to draw stronger conclusions regarding the statistical measures of detecting glenohumeral cartilage lesions with the use of non-contrast MRI.</p>	
<p>Falroo ASH, B. K.; Wymore, L.; Hoesbeck, H.; Frost, J. Long head of the biceps brachii tendon: unenhanced MRI versus direct MRI arthrography. <i>Skeletal Radiol</i>. 2015;44(9):1263-72.</p>	<p>Low</p>	<p>downgrade for non comparability of populations with significant differences: no case control)</p>	<p>The study cohort included all patients who underwent arthroscopy. Although there were a variety of indications for shoulder arthroscopy in the cohort, in general, pain that was not responsive to conservative treatment was the most common indication. Patients with suspected internal derangements, including abnormality of the labrum with or without instability, rotator cuff disease with or without subacromial impingement, adhesive capsulitis, glenohumeral arthritis, and biceps tendon lesions were all included.</p>	<p>Patients were excluded if 12 months elapsed between MRI imaging and arthroscopy or prior surgical procedure on the LHBT had been performed.</p>	<p>199 patients (66 females, 133 males). The mean age of patients was 50.3 years (SD=14.5 years). There were 132 unenhanced MRIs and 67 direct MRAs. Mean age of patients who underwent unenhanced MRI versus direct MRI was 54.4 years (SD=14.3 years) and 38.8 years (SD=14.4 years), respectively (p&lt;0.01). The median number of days between MRI imaging and arthroscopy was 61 (range=1-336). Median days from imaging to surgery for unenhanced MRI versus direct MRI was 63 (range, 1-336) and 56 (range, 7-313), respectively (p=0.62). Arthroscopic surgery diagnosed 80/199 (40.2%) of LHBTs as normal, 46/199 (23.1%) with tendinosis, 26/199 (14%) with partial thickness tears less than 50%, 21/199 (11%) with partial thickness tears greater than 50%, and 15/199 (8%) with complete tears.</p>	<p>Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy for tendinosis and tear detection using unenhanced MRI and direct MRI were calculated.</p>	<p>Sensitivity, specificity, PPV, NPV, and accuracy were reported in Table 3, Table 4, Table 5 for independent raters; for tendinosis, MRI versus MRA showed 88.36% and 85.38% sensitivity, 69.79% and 83.91% specificity, 22.28% and 18.50% PPV, 74.76% and 89.86% NPV, and 61.64% and 70.81% accuracy, respectively. For tears, MRI versus MRA showed 75.83% and 64.73% sensitivity, 73.75% and 82.91% specificity, 66.69% and 41.62% NPV, 82.87% and 92.94% PPV, and 74.79% and 79.88% accuracy, respectively.</p>	<p>Both unenhanced MRI and direct MRA are fairly accurate for the diagnosis of LHBT pathology. No significant difference was found between unenhanced MRI and direct MRA for the detection of tendinosis and tears of LHBTs, and therefore the addition of intra-articular contrast may not add any significant benefit to unenhanced MRI for the evaluation of LHBT pathology. Both MRI techniques show poor sensitivity and PPV for detecting tendinosis, which may be related to differences in grading knowledge of potential pitfalls and strategies for improving evaluation of the LHBT may allow the radiologist to be confident when appropriate.</p>	<p>There are several limitations to this study. First, the study was a retrospective review rather than a prospective design. Second, there may have been a bias related to inclusion of only patients with arthroscopy performed. Indeed, the prevalence of LHBT disease was relatively high in the series of patients (55% compared to 21-25%). Third, the study included a variable and sometimes lengthy time between MRI imaging and arthroscopy. However, other radiology-surgical comparison studies have utilized similar contrast may not add any significant benefit to unenhanced MRI for the evaluation of LHBT pathology. Both MRI techniques show poor sensitivity and PPV for detecting tendinosis, which may be related to differences in grading knowledge of potential pitfalls and strategies for improving evaluation of the LHBT may allow the radiologist to be confident when appropriate.</p>
<p>VanBeek CL, B. J.; Narzikh, A.; Gordon, V.; Rasig, M. J.; Kazam, I. K.; Abboud, J. A. Diagnostic accuracy of noncontrast MRIs for detection of glenohumeral cartilage lesions: a prospective comparison to arthroscopy. <i>J Shoulder Elbow Surg</i>. 2014;23(7):1010-6.</p>	<p>moderate</p>	<p>downgrade for small number of events, no reporting of confidence intervals,</p>	<p>Consecutive patients undergoing shoulder arthroscopy for rotator cuff tendinopathy by the senior author were prospectively enrolled preoperatively. To be included, patients had to have a noncontrast shoulder MRI study performed in a closed scanner at 1.5 T or 3T, and all MRI sequences were available for review. None of the enrolled patients had prior shoulder surgery on the affected side.</p>	<p>none stated</p>	<p>There were 46 (55%) male patients, with a mean age 54.8 years (range, 17-82 years). There were 59 right and 25 left shoulders in the study cohort.</p>	<p>Sensitivity, specificity, accuracy, PPV, NPV of MRI in detection of bot all glenohumeral cartilage lesions (ICRS grade 1-4) and of high grade lesions (ICRS grade 3 and 4), when compared to arthroscopy, intraobserver agreement, intraobserver agreement</p>	<p>1) In evaluating the humeral articular cartilage, reader 1 correctly diagnosed lesions in 64 of 84 cases (76% accuracy). Reader 2 made the correct diagnosis in 67 of 84 cases (80% accuracy). 2) For the glenoid cartilage, reader 1 correctly diagnosed lesions in 69 of 84 cases (82% accuracy). Reader 2 correctly diagnosed the presence of a cartilage lesion in 71 of 84 glenoid cases (85% accuracy). 3) For detection of a humeral lesion on MRI, accuracy was 76% and 80%, sensitivity was 61% and 26%, and specificity was 82% and 100% for reader 1 and reader 2, respectively. 4) For detection of glenoid lesions on MRI, the accuracy was 82% and 85%, the sensitivity was 55% and 50%, and the specificity was 91% and 95% for reader 1 and reader 2, respectively. 5) Low grade lesions (ICRS grades 1 and 2) of the glenoid and humerus were read as negative on MRI in 63% and 86% of cases, respectively. Intraobserver agreement for the detection of humeral and glenoid lesions with noncontrast MRI was fair (κ 0.24) and moderate (κ 0.41), respectively. Intraobserver reliability for detection of humeral head lesions was very good (κ 0.31) for reader 1 and moderate (κ 0.33) for reader 2. 6) For glenoid lesions, intraobserver agreement was very good (κ 0.81) and a reader (κ 0.49) for reader 2. Agreement on size of the humeral head lesions for all observations was fair (ICC 0.21), whereas the ICC for glenoid lesion size was 0.47, indicating a moderate level of agreement.</p>	<p>Overall accuracy of noncontrast MRI in detecting glenohumeral articular cartilage lesions was good. However, detection of cartilage lesions is reader dependent. Furthermore, accurate characterization of a lesion by MRI, including location, depth, and size, is difficult, probably secondary to the relatively thin glenohumeral articular cartilage. On the basis of these findings, the authors recommend that patients with rotator cuff tendinopathy undergoing arthroscopy be informed that the presence and severity of cartilage lesions may be underestimated on MRI. Orthopedic surgeons must exercise caution when relying on noncontrast MRI for the detection and characterization of cartilage lesions. Whereas shoulder arthroscopy remains the gold standard, future studies should aim to better define the most useful MRI sequences for identification and characterization of articular cartilage lesions, and to determine a critical lesion size for detection.</p>	<p>This study did have a few notable limitations. Shoulder MRI studies were performed at multiple institutions and thus lacked a standardized protocol. Despite this variability, all studies were performed with at least a 1.5T Magnet and overall were regarded as high quality images. To further substantiate the findings, additional analysis evaluating the cause for disagreement in the findings among the radiologists and orthopedic surgeon (i.e. imaging artifact such as cartilage lesion) would have provided additional insight. Frequently, orthopedic surgeons read magnetic resonance images before receiving the radiologist's report, and thus having the treating orthopedic surgeon blindly evaluate the MRI study prospectively would have proved beneficial. Lastly, the results suggest a trend that larger cartilage lesions are more likely to be accurately detected. However, the authors were unable to determine a critical lesion size below which lesions are less likely to be identified. This information could then be used to better inform patients preoperatively about the likelihood of additional necessary treatment.</p>