Shoulder arthroscopy based on MR arthrography findings – Are we making the correct imaging diagnosis?

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Background:

Clinical diagnosis of glenoid labral lesions of the shoulder is unreliable. Arthroscopy is the gold standard, but is an invasive test. Magnetic resonance arthrography (MRA) has emerged as the superior imaging modality in the diagnosis of these lesions, and plays a key role in determining which patients proceed to arthroscopy and intervention.[1] A recent study by Genovese et al, found good concordance between MRA and arthroscopy in shoulder instability with a positive predictive value of 71.7%.[2]

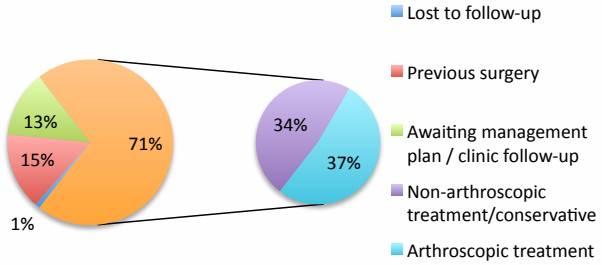
Purpose:

To assess the concordance between MRA findings and subsequent arthroscopy at our institution.

Methods:

Retrospective study of 100 consecutive MRAs performed at our institute. Patient demographics, date of examination, laterality, and MRA report were obtained. In those that proceeded to arthroscopy, operative findings were compared to MRA findings for pathology with respect to the labrum, rotator cuff, bone or ligaments.

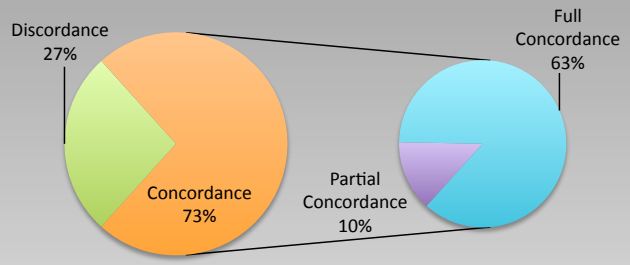
Figure 1: Number of patients undergoing shoulder MR arthrograms



Results:

100 consecutive MR shoulder arthrograms were performed between 13/5/2013 and 27/01/2014. Of these 37 patients were planned for subsequent arthroscopy. At the time of the study 30 patients had completed arthroscopy. (Figure 1)

Figure 2: Labral lesions

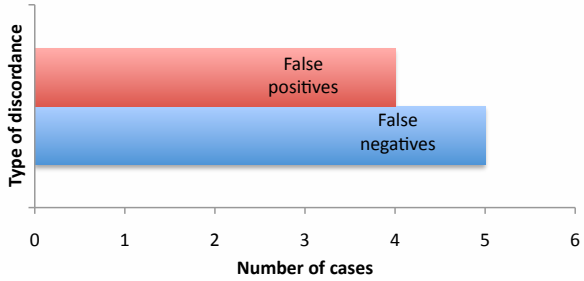


Results continued:

In the 30 patients who underwent arthroscopy, there was 71% overall concordance with MRA assessment of the labrum. These were further subdivided into full and partial concordance. In full concordance, site, severity and extent correlated. In partial concordance, the site correlated, but the severity/extent did not. (Figure 2)

With respect to rotator cuff, bone and capsuloligamentous pathology concordance was found in 100%, 91% and 50% respectively.

Figure 3: Discordant cases



In the 8 cases in which there was discordance 3 cases were due to false positives and 4 cases due to false negatives. In one case there were both false positive and false negative findings. (Figure 3)

Discussion:

Retrospective analysis of the discordant cases showed that false positives were primarily due to normal variants of the superior labrum interpreted as tears and, false negatives were related to missed lesions of the anteroinferior labrum. However, only 1 of the false positive cases could be clearly identified as a normal variant on retrospective analysis (figure 4). In the remainder, a normal variant could not be confidently diagnosed and remained suspicious for a tear (figure 5).

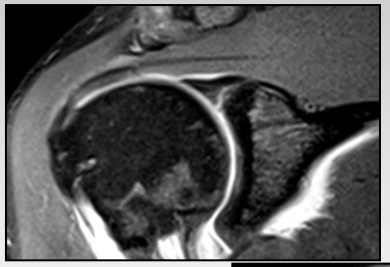


Figure 4: False positive (normal sublabral foramen at arthroscopy – visible on retrospective analysis)

Figure 5: False positive (normal variant at arthroscopy – still suspicious for tear on retrospective analysis)

Conclusion:

The concordance demonstrated in this study between MRA and arthroscopy with respect to labral, rotator cuff, bone and capsuloligamentous lesions is in keeping with published data.

Concordance of labral lesions may be improved by careful attention to normal variants and routine use of the ABER view. However a proportion of arthroscopically diagnosed normal variants of the superior labrum cannot be distinguished from tears on MRA.

References:
1. Pavic R, Margetic P, Bensic M, Brnadic RL. Diagnostic value of US, MR and MR arthrography in shoulder instability. Injury. 2013 Sep;44 Suppl 3:S26-32.
2. Genovese E1, Spanò E, Castagna A, Leonardi A, Angeretti MG, Callegari L, Fugazzola C. MR-arthrography in superior instability of the shoulder: correlation with arthroscopy. Radiol Med. 2013 Sep;118(6):1022-33.

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