

Accuracy of Non-contrast Magnetic Resonance Imaging in the Diagnosis of Type II Superior Labrum Anterior-to-Posterior (SLAP) Lesions



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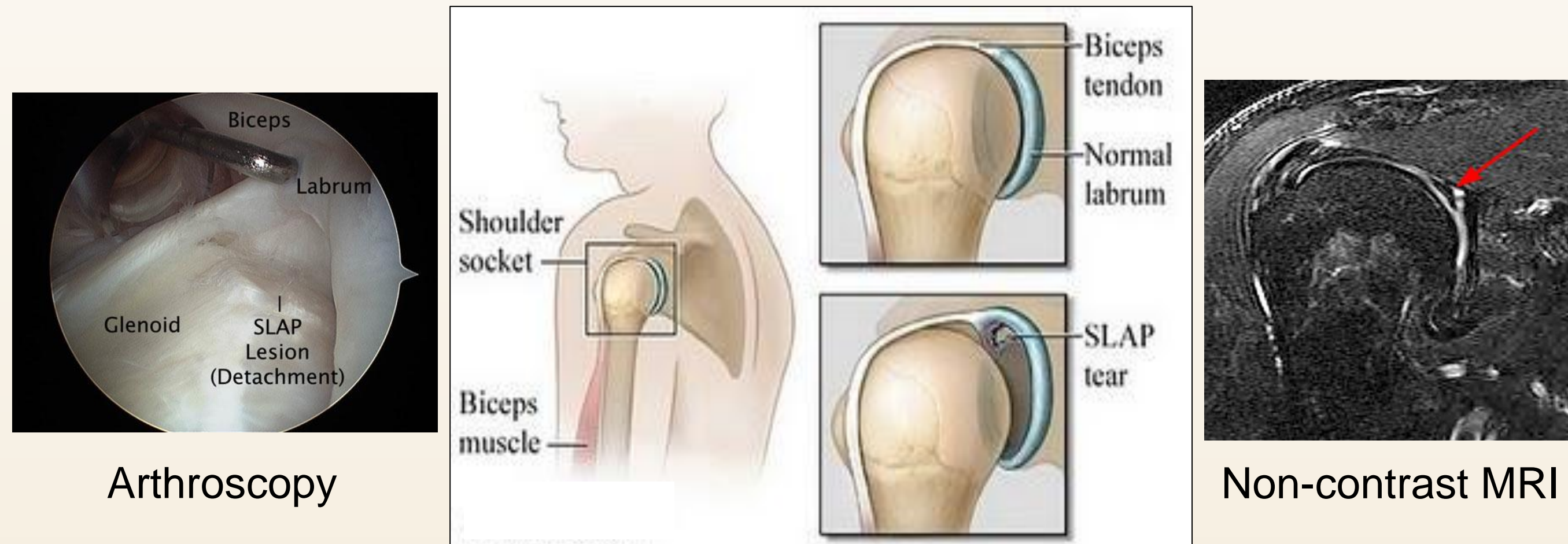


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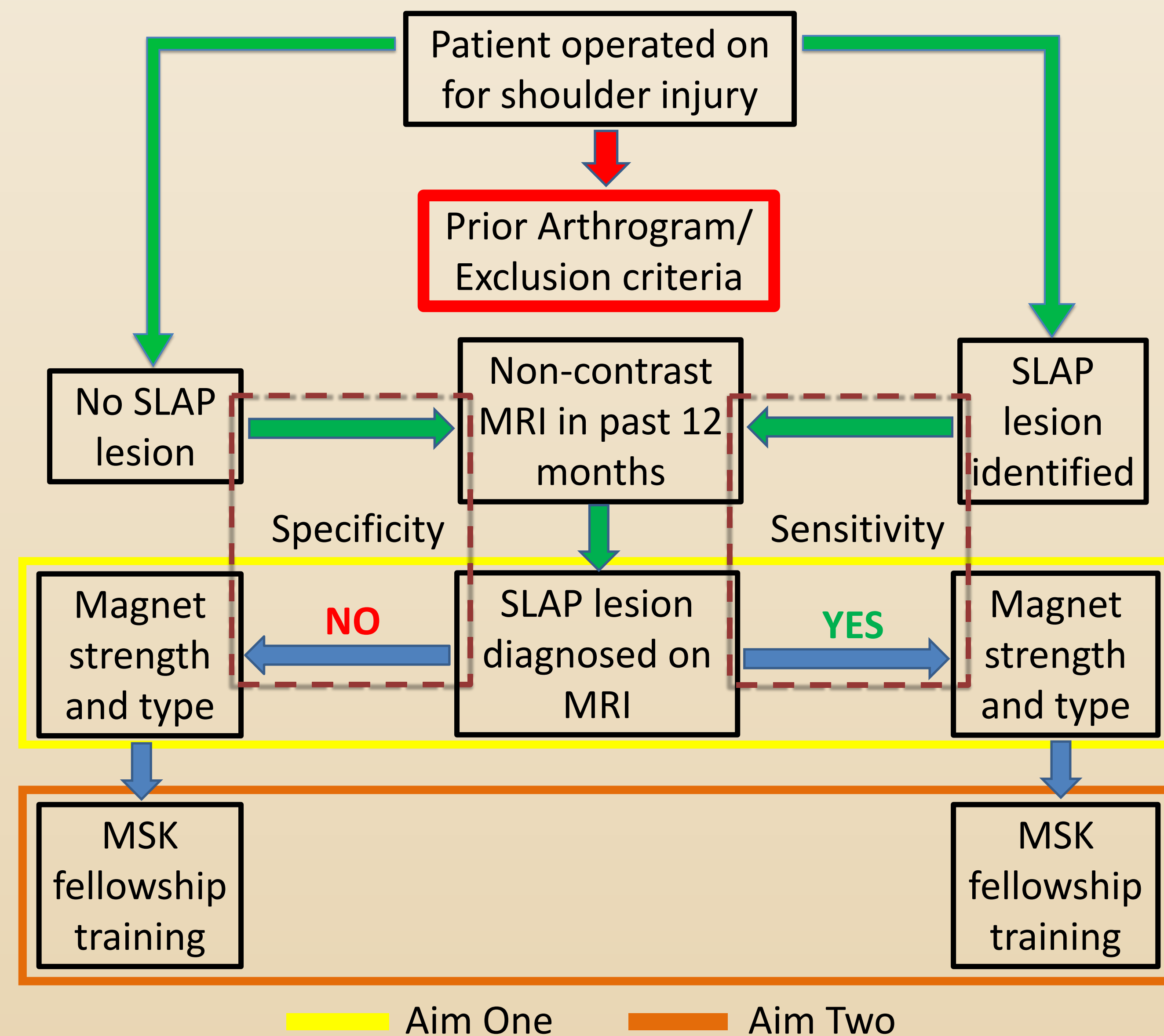
Introduction

A Type II SLAP lesion is characterized by a detachment of the superior aspect of the glenoid labrum, a fibrocartilagenous ring of tissue where the head of the humerus articulates, at the insertion of the long head of the biceps tendon. Non-contrast MRI is an imaging method commonly used to assess patients with shoulder pain. This study looked at the MRI reports from 144 arthroscopically confirmed Type II SLAP lesions and evaluated the performance of MRI in a community setting and the influence of fellowship training.



Study Overview

417 cases of superior labrum tears from 4 surgeons at 2 orthopedic practices were reviewed for the study. Cases of arthroscopically confirmed Type II SLAP lesions were compared to the radiology report to determine sensitivity. 100 cases that did not have a superior labrum lesion were reviewed to determine specificity.



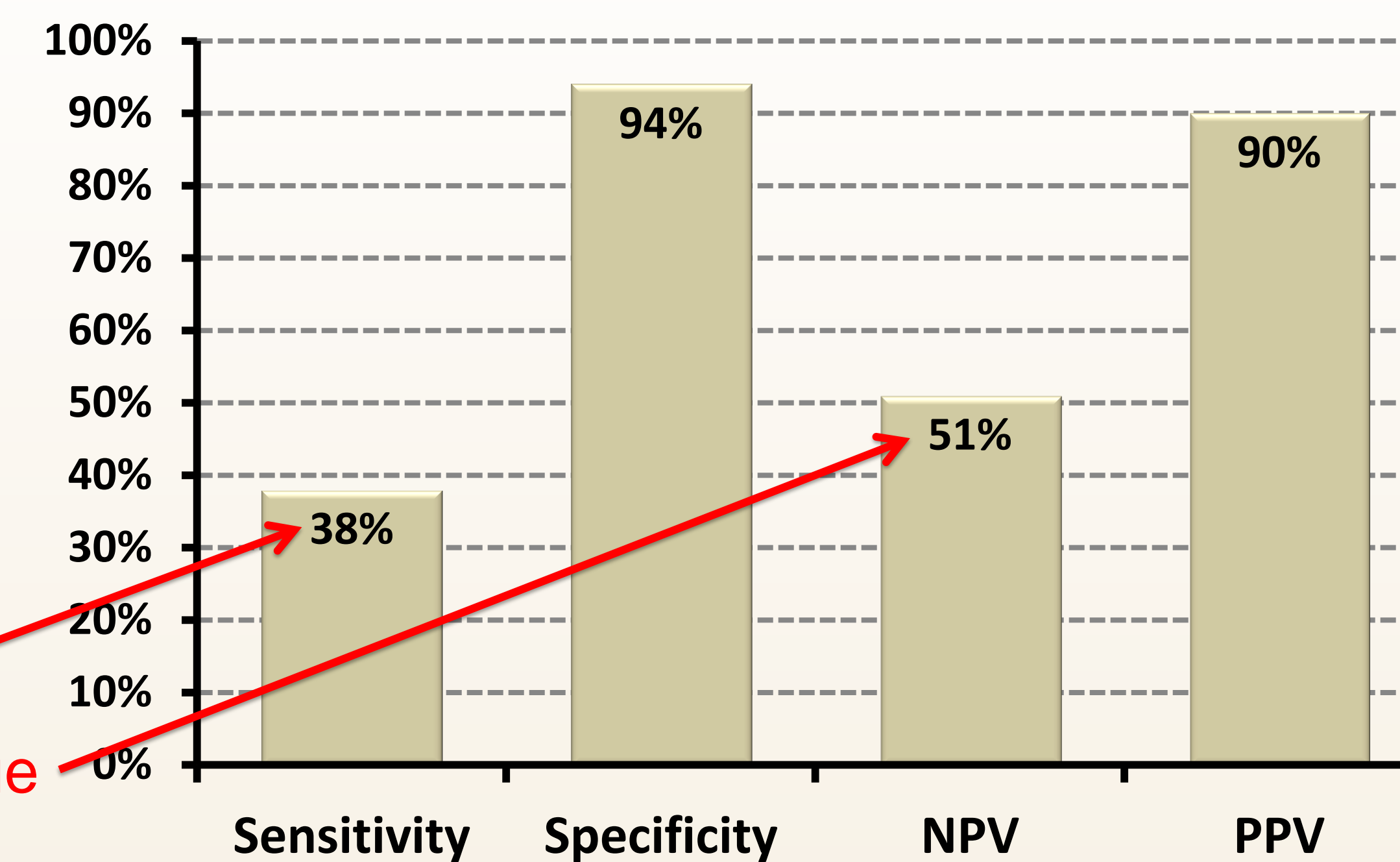
Results

244 cases included – 144 reports reviewed for sensitivity, 100 reports reviewed for specificity. 78 radiologists involved from 46 imaging centers.

Overall Analysis

	SLAP Lesion	No Lesion	Total
Positive MRI	54	6	60
Negative MRI	90	94	184
Total	144	100	244

Low Sensitivity
Low Negative Predictive Value



Category	Variable	TP	FP	TN	FN	PPV	NPV	Accuracy	Sensitivity (95%CI)	Specificity (95% CI)
All Cases		54	6	94	90	90%	51%	61%	38% (30-46%)	94% (87-98%)
Fellowship Status	MSK	45	5	66	52	90%	56%	66%	46% (36-57%)	93% (84-98%)
	Non-MSK	5	0	18	22	100%	45%	51%	19% (6-38%)	100% (85-100%)
Machine Type	Closed MRI	35	5	68	50	88%	58%	65%	41% (31-52%)	93% (84-98%)
	Open MRI	5	1	5	9	83%	36%	50%	36% (13-65%)	83% (36-100%)
Magnet Strength (Tesla)	3T	8	1	8	8	89%	50%	64%	50% (25-75%)	89% (52-100%)
	1.5T	17	3	55	33	85%	63%	67%	34% (21-49%)	95% (86-99%)
	<1.5T	2	0	1	2	100%	33%	60%	50% (7-90%)	100% (5-100%)

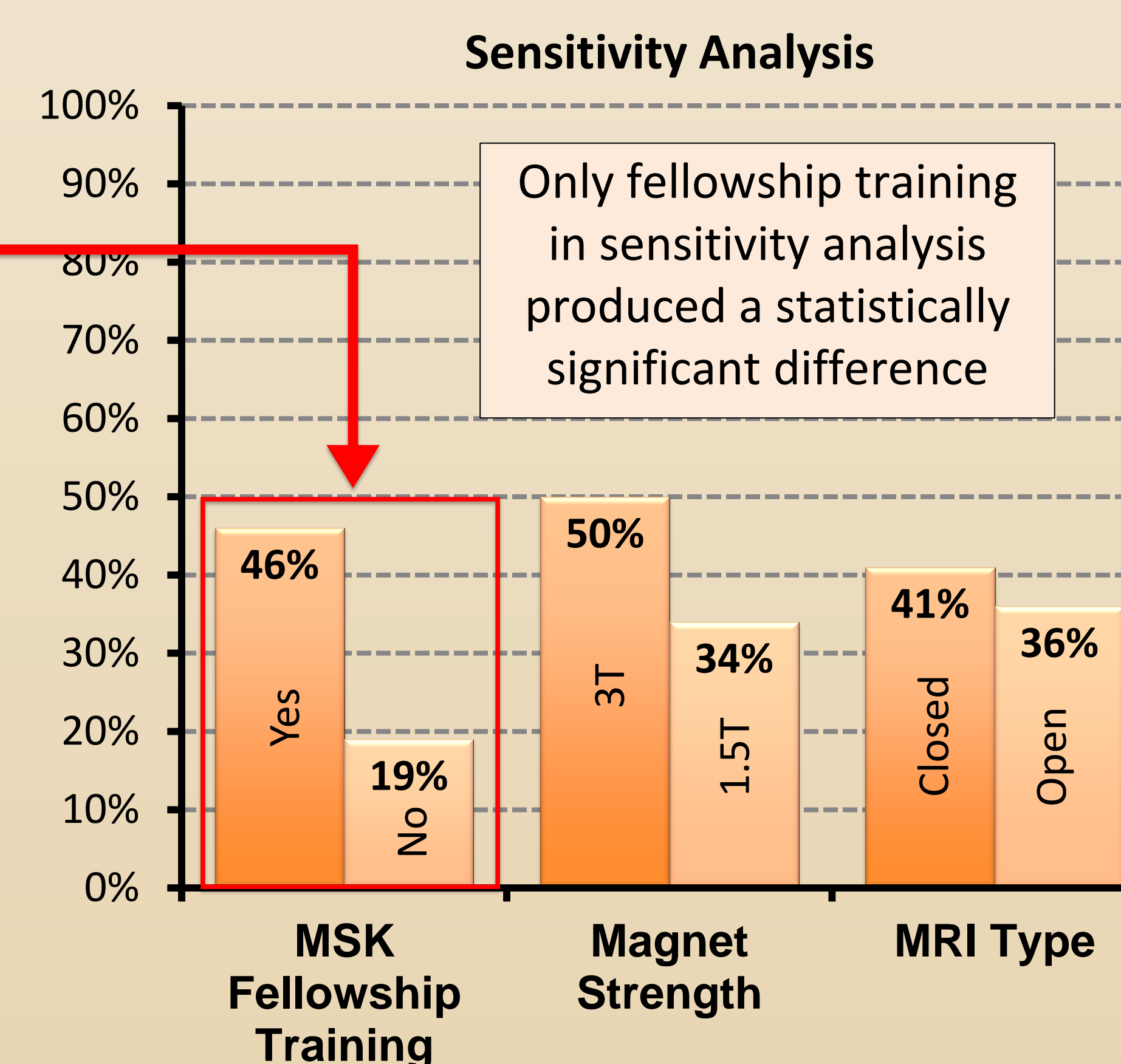
Statistical Comparisons

Radiologist completion of musculoskeletal (MSK) fellowship training
MRI Type – Open vs Closed
Magnet Strength – 3.0 Tesla (T) vs 1.5T

Sensitivity			
Category	N	Chi-Square Value	p
MSK Fellowship	124	6.819	0.009
Machine Type	99	0.149	0.700
Magnet Strength	70	1.319	0.251

Specificity			
Category	N	Chi-Square Value	p
MSK Fellowship	89	1.341	0.246
Machine Type	79	0.761	0.383
Magnet Strength	67	0.489	0.484

All comparisons calculated with 1 degree of freedom



Conclusions

Non-contrast MRI provided low sensitivity

- Sensitivity in diagnosing Type II SLAP lesions in the community setting was 38% (95% Confidence Interval [CI] = 30%, 46%).
- Non-contrast MRI provided reasonable specificity for Type II SLAP lesions in the community setting, determined to be 94% (95% CI = 87%, 98%).

Musculoskeletal fellowship training improved sensitivity

- Radiologists who completed the MSK fellowship had higher sensitivity than those that did not (46% vs. 19%, $p = 0.009$).
- Increasing magnet strength did not show to improve reliability of the diagnosis with statistical significance. Lower numbers of 3.0T magnets included in the study could have been contributory.

Open MRI performed similar to closed MRI

- The type of MRI machine used did not appreciably affect the radiologists' accuracy in interpreting the lesion (sensitivity, $p = 0.700$; specificity, $p = 0.383$).

Summary

Arthrogram or arthroscopic evaluation may be necessary to properly diagnose Type II SLAP lesions and should be considered in relevant patients with negative non-contrast MRIs.

MRI reports from musculoskeletal fellowship trained radiologists provide higher reliability for this injury.

Use of an open MRI for patient preference provides comparable evaluation of Type II SLAP lesions with respect to closed MRI machines.

Relevant Publications

- Surgeon.* **2010**, 8, 303-9.
Shoulder Elbow Surg. **2006**, 15, 580-5.
Am. J. Sports Med. **2003**, 31, 798-810.
Am. J. Sports Med. **1999**, 27, 208-13.
Am. J. Roentgenol. **2000**, 174, 1107-14.
Am. J. Roentgenol. **1994**, 163, 1425-9.