



# SHOULDER SYMPOSIUM

**The Challenge of the Problem Shoulder**

**Monday 28<sup>th</sup> September 2009**

**Alice Fisher Suite—Addenbrooke's Hospital, Cambridge**

## Shoulder MRI and Ultrasound

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# Outline of Lecture

Plain films

Arthrography

Ultrasound (US)

Magnetic Resonance Imaging (MRI)

Imaging/Pathology correlation

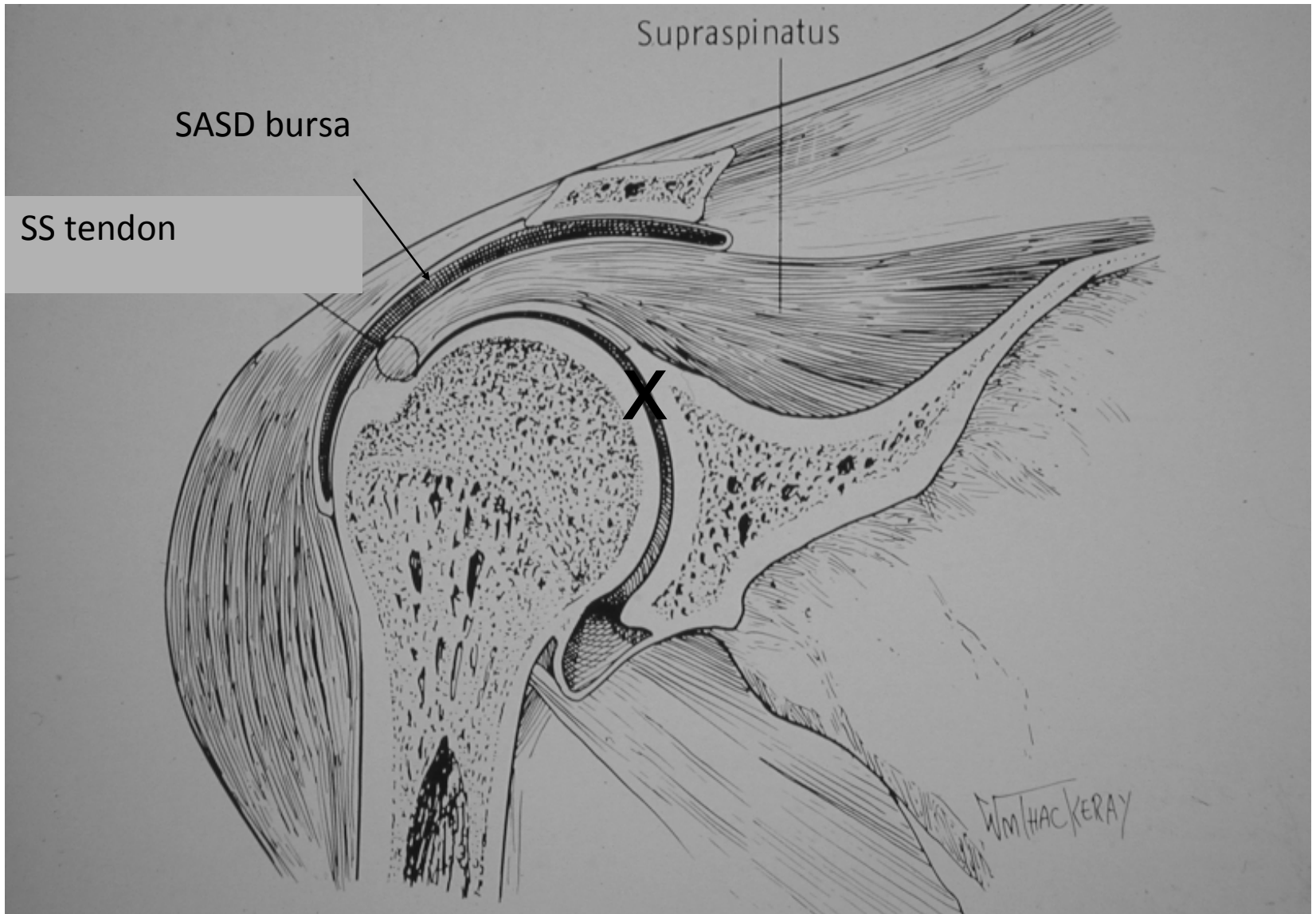
Which technique is best?

# Plain films

- Limited use for tendon itself but secondary signs
- Calcific tendonitis
- Forms the basis of arthrography

# Arthrography - back to basics

- Intra-articular injection of iodinated contrast material under fluoroscopic control
- Demonstrate whether contrast escapes out of the shoulder joint into the subacromial-subdeltoid bursa



# Ultrasound

- Normal Tendon
- Tendinosis
- Partial Thickness RCT
- Full Thickness RCT
- Calcific tendonitis

# MRI

- Normal Tendon
- Tendinosis
- Partial Thickness RCT
- Full Thickness RCT
- Calcific tendonitis

**BUT**

**What pathological  
process  
are we looking at  
radiologically?**

# Histology correlation

- Arthrography: Secondary indirect information
- US changes: degenerative changes including angiofibroblastic hyperplasia without inflammatory cells, with disorganised architecture
- PD changes: corresponding eosinophilic, fibrillar, and mucoid degeneration and scarring.
- T2 changes: severe degeneration and disruption of the supraspinatus tendon.

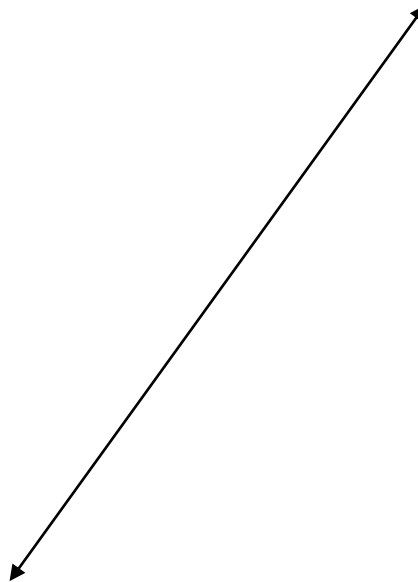
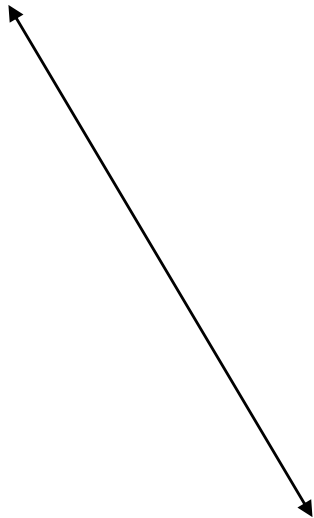
# Which test

MRI

US



?



(Arthrography)

# MRI

- Pros

- soft tissues/bones
- no radiation
- multiplanar

- Cons

- expensive
- limited resource

Accuracy:

Sensitivity - 90-95%

Specificity - 90-95%

# US

- Pros

- cheap
- widely available
- non-invasive and no ionising radiation

## Accuracy

Sensitivity - variable 85-95%

Specificity - 85-95%

- Cons

- operator dependent
- images not understood

# My preference

- Ultrasound as the first line of diagnosis
- MRI for those patients who are destined for surgery

# Effectiveness of Imaging

- Efficacy: combines “technical performance” and “diagnostic performance”. Loosely: “DOES THE TECHNOLOGY WORK?”
- Effectiveness: determines impact of imaging technology. Loosely: “DOES THE TECHNOLOGY MAKE A DIFFERENCE?”  
(in other words “so what?”)

# Making a Difference

- 1) by changing/confirming the clinician's diagnosis :-

*Diagnostic Impact*

- 2) by altering the management that the patient gets :-

*Therapeutic Impact*

- 3) by affecting the patient's outcome :-

*Impact on Health*

# Effectiveness of Shoulder MR

| Paper | Source     | Level | n=  | Diagnoses | Diagnostic Impact       | Therapeutic Impact |
|-------|------------|-------|-----|-----------|-------------------------|--------------------|
| 1     | All-comers | 3/4/5 | 86  | Various   | Change 34%<br>Shift 66% | Change 61%         |
| 2     | Rheum      | 3/4   | 53  | Various   | Change 68%<br>Shift 7%  | Change 52%         |
| 3     | Ortho Surg | 3/4   | 117 | FTRCT     | Change 30%              | Change 36%         |
| 4     | Ortho Surg | 3/4   | 100 | Various   | Change 23%              | Change 15%         |

# Summary

- Rotator cuff damage most commonly manifest in the SS tendon
- Discussed Arthrography/US/MRI
- Tendinosis/partial tear/full thickness tear
- Relative advantages to the various techniques
- Effectiveness of imaging

**Thank You**