



# Guidelines for MR Imaging of Sports Injuries

European Society of Skeletal Radiology  
Sports Sub-committee

2016



# Contributors

- Ara Kassarian, Spain
- Lars Benjamin Fritz, Germany
- P. Diana Afonso, Portugal
- Andrea Alcalá-Galiano, Spain
- María José Ereño, Spain
- Andrew Grainger, UK
- Eva Llopis, Spain
- Eugene McNally, UK
- Claudia Schüller-Weidekamm, Austria
- Reto Sutter, Switzerland

# Abbreviations and clarifications

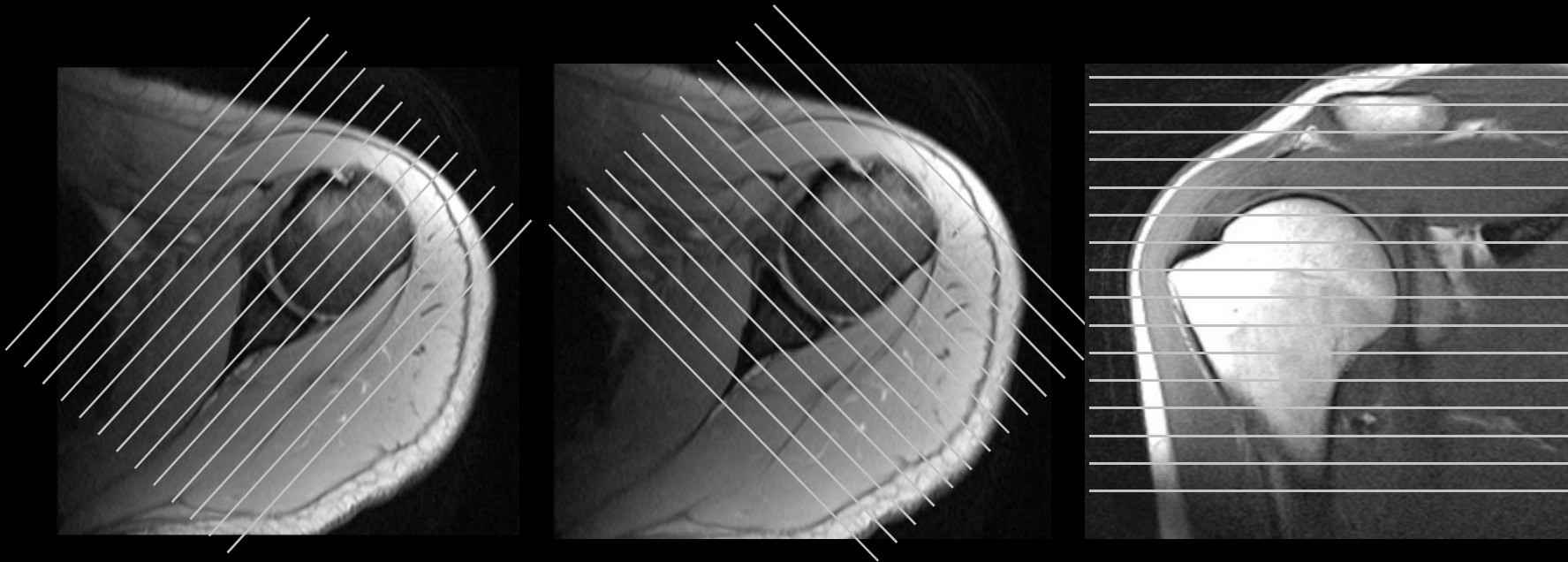


- Ax = axial
- Cor = coronal
- Sag = sagittal
- FOV = field of view
- PD = proton density
- TE = time to echo in milliseconds
- FS = fat suppressed
- Int = intermediate
- Int FS: this is a fat suppressed sequence with a long TR and a TE between that of a traditional PD (e.g. TE= 10-20) and a traditional T2 (e.g. TE=80-100). The advantage of this sequence is that the TE is short enough to maintain sufficient signal for visualisation of the anatomy (like a PD) yet long enough to be more fluid sensitive (like a T2)
- For STIR sequence, TI (inversion time) should be 140-150 at 1.5T

# Shoulder



- Patient in supine position with arm in mild external rotation
- Coronal obliques parallel to scapular body or parallel to supraspinatus tendon - include entire humeral head
- Sagittal obliques include volume lateral deltoid to scapular body
- Axials include volume from above AC joint to below axillary pouch



# Shoulder



	FOV (max)	Slice (max)	TE	Matrix (min)
Ax Int FS	16 cm	3.5 mm	40-60	256x256
Cor Obl Int FS	16 cm	3.5 mm	40-60	256x256
Sag Obl Int FS	16 cm	3.5 mm	40-60	256x256
Sag Obl T1	16 cm	4 mm	min	256x256
Cor Obl T2	16 cm	3.5 mm	80-100	256x256
Ax GRE (optional)*	16 cm	3.5 mm	10-20	256x256

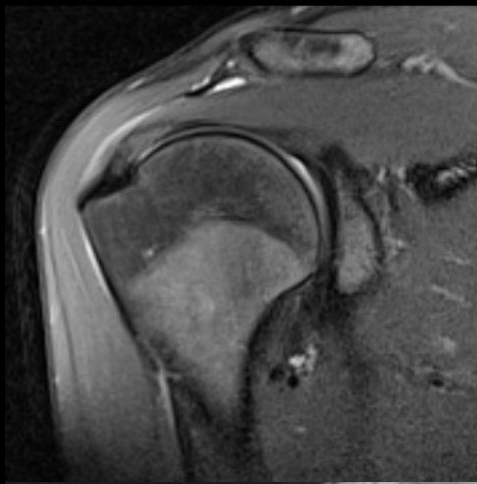
# Shoulder



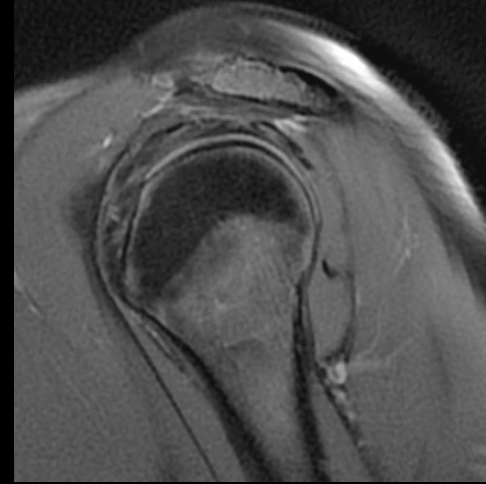
Ax Int FS



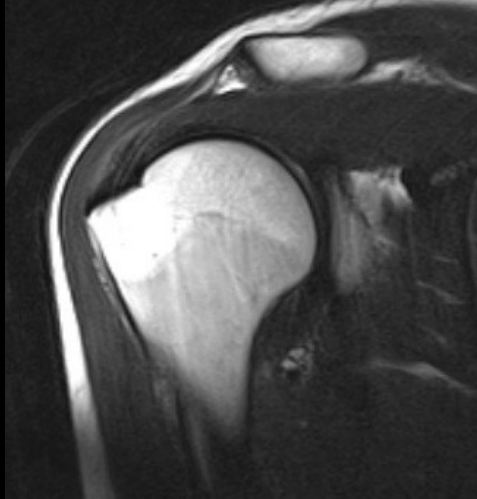
Cor Obl Int FS



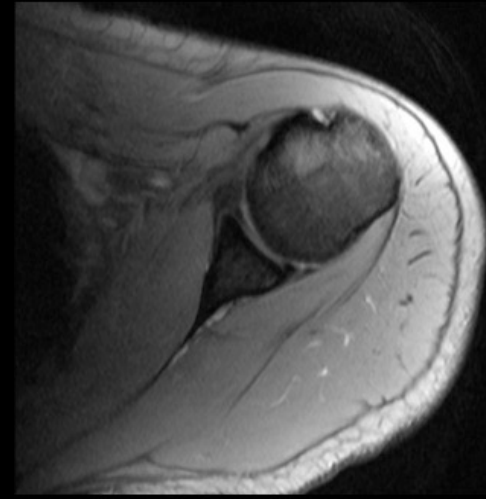
Sag Obl Int FS



Sag T1



Cor Obl T2

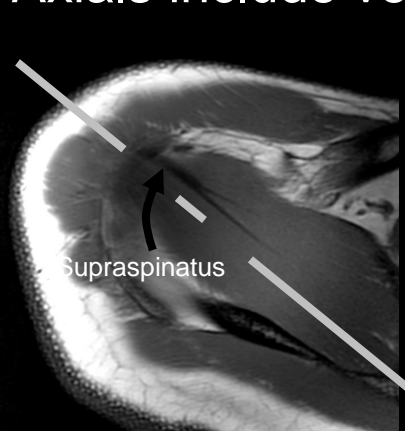


Ax GRE\*

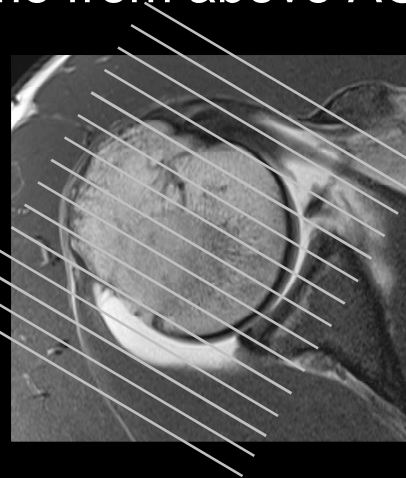
# Shoulder MR Arthrogram



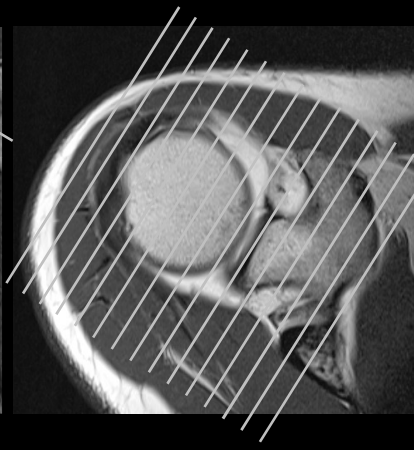
- Patient in supine position with arm in mild external rotation
- Coronal obliques parallel to course of supraspinatus tendon (identified on axial) - include coracoid and entire humeral head
- Sagittal obliques perpendicular to coronal obliques
  - include entire coracoid and humeral head, and extend medially to scapular body to include some rotator cuff muscles bellies
- Axials include volume from above AC joint to below axillary pouch



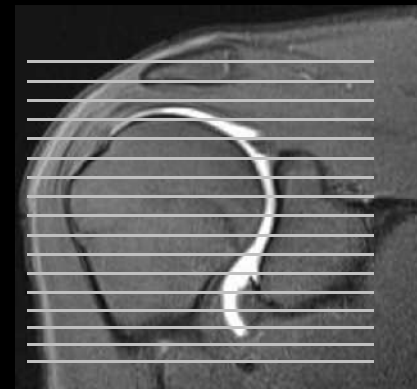
Coronal Obl Alignment



Cor Obl Coverage



Sag Obl Coverage



Axial Coverage

# Shoulder MR Arthrogram



	FOV (max)	Slice (max)	TE	Matrix (min)
Axial T1	16 cm	3.5 mm	Min	256x256
Axial PD FS	16 cm	3.5 mm	35-45	256x256
Sag Obl PD FS	16 cm	3.5 mm	40-60	256x256
Cor Obl T1 FS	16 cm	3.5 mm	Min	256x256
Cor Obl T2 FS	16 cm	3.5 mm	80-100	256x256
ABER T1 FS (optional)	16 cm	3.5 mm	Min	256x256



# Shoulder MR Arthrogram



- Patient positioned hand and above or behind head (abduction external rotation)
- Start with coronal scout
- Align sections perpendicular to glenoid



*Ideal Plane for ABER*



*Plane for ABER with arm more abducted*

# Shoulder MR Arthrogram



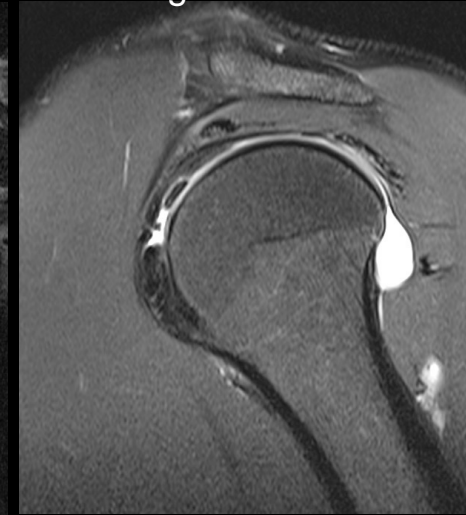
Axial PD FS



Axial T1



Sag Obl PD FS



Cor Obl T1 FS



Cor Obl T2 FS



ABER T1 FS