

Soft tissue masses that are hypointense to muscle on T1W and hyperintense on fluid sensitive MRI sequences

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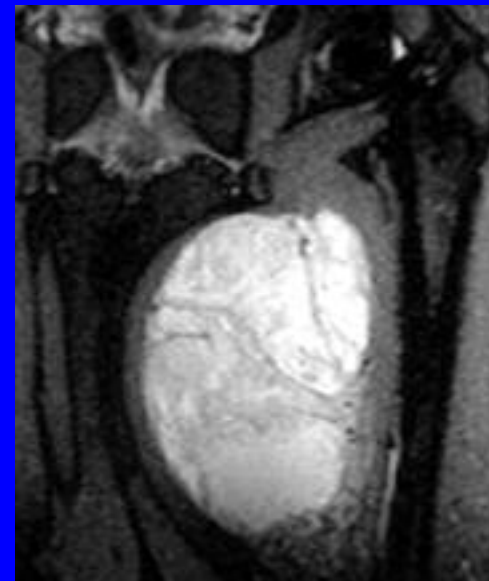
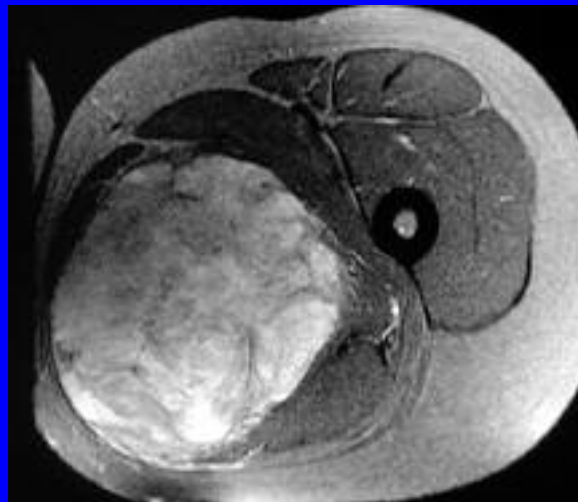
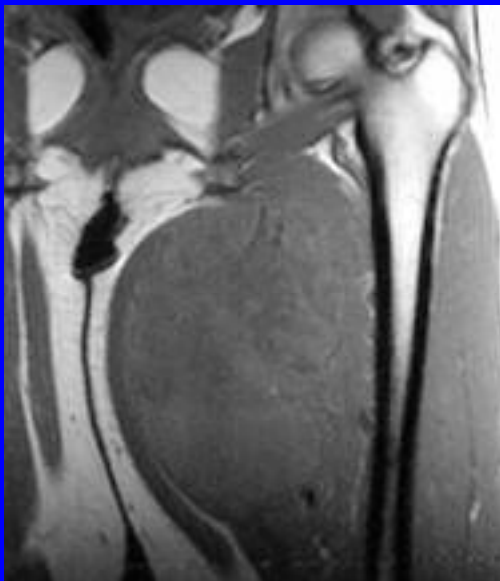
S Harish

J Lee

M Ahmed

INTRODUCTION

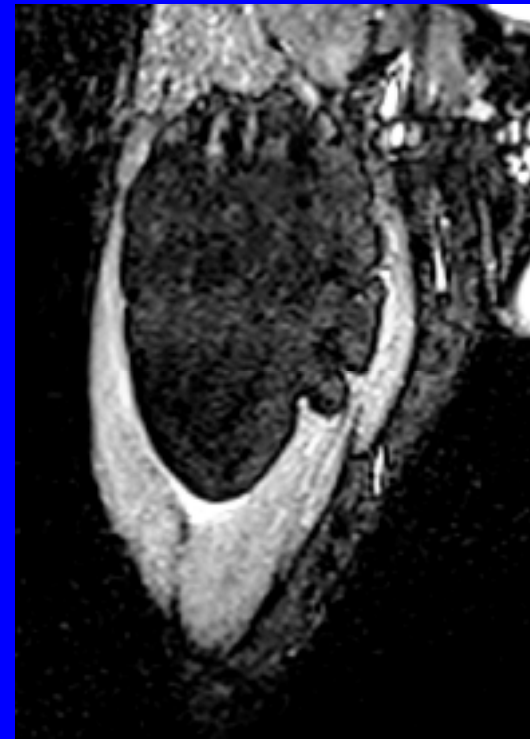
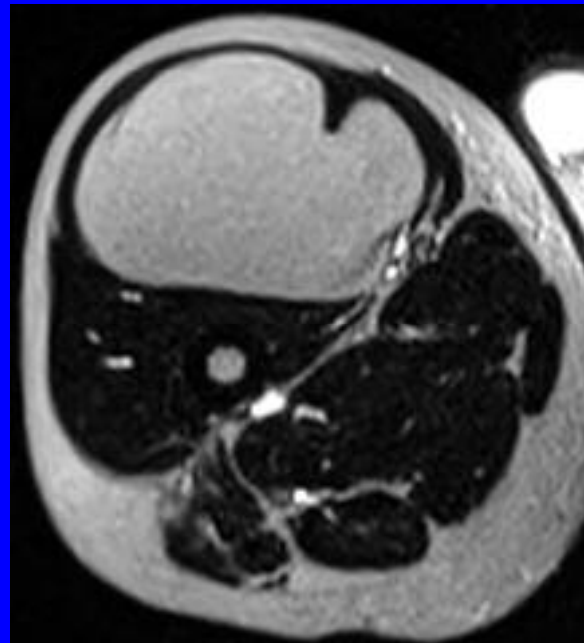
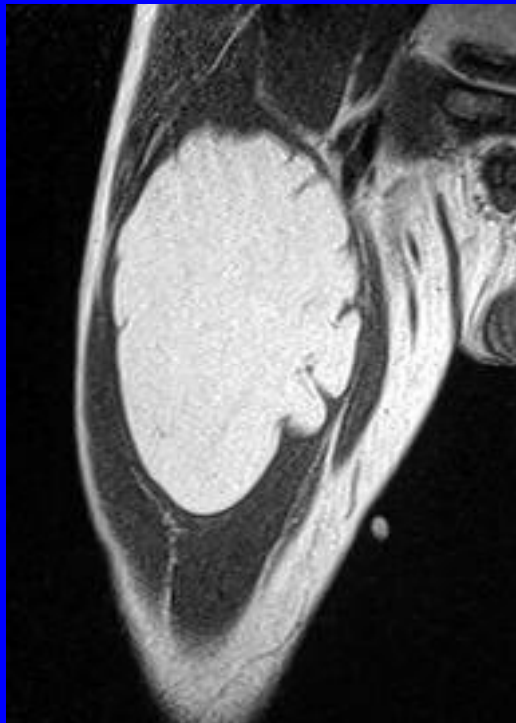
- ◆ The majority of soft tissue sarcomas show non-specific appearances on MRI
 - Isointense to muscle on T1W
 - Hyperintense on T2W/STIR



MRI MYXOID TUMOURS: BSG-2005

INTRODUCTION

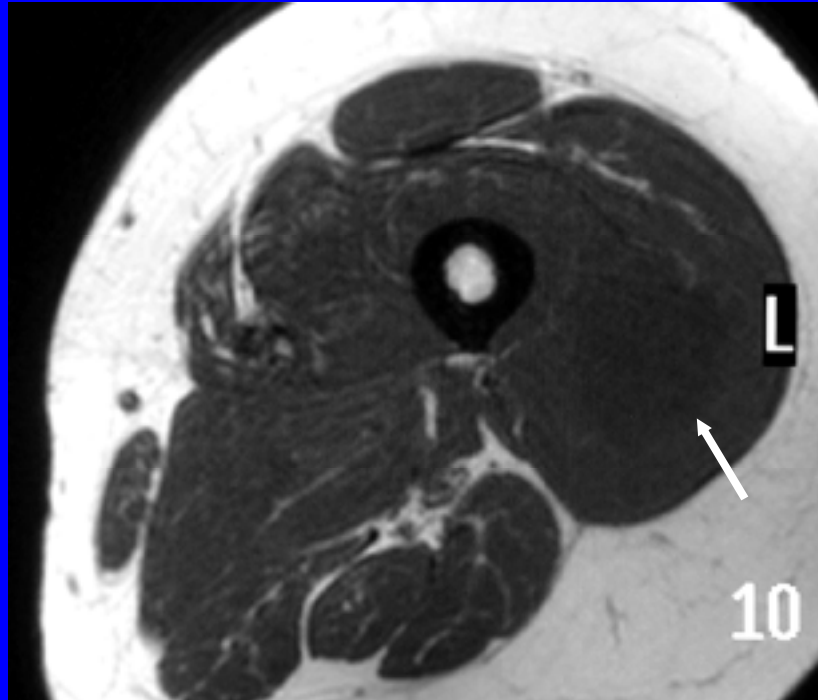
- ◆ Exception WD liposarcoma



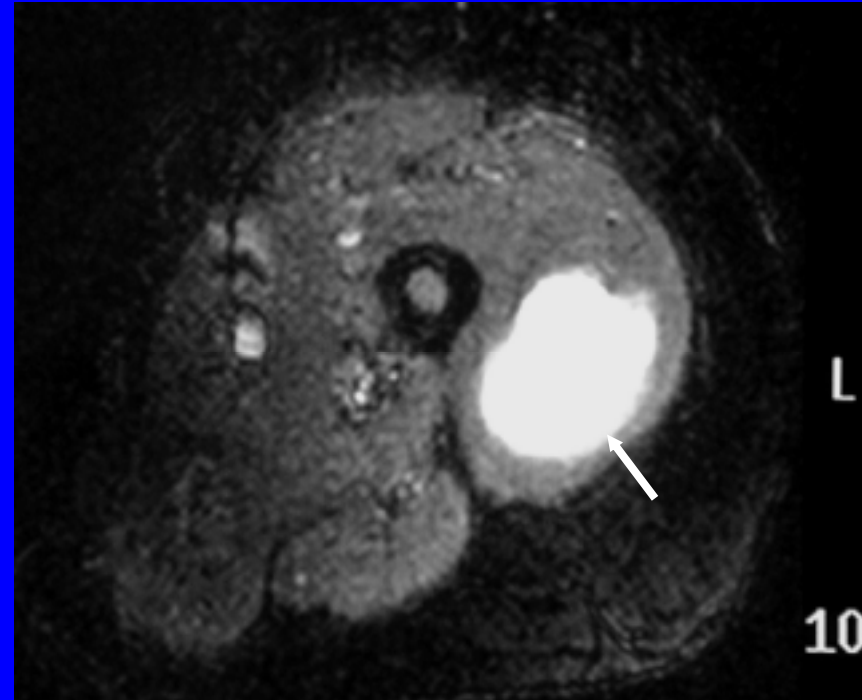
INTRODUCTION

- ◆ A sub-group of lesions is identified that are:
 - Hypointense to muscle on T1W
 - Intensely hyperintense on T2W/STIR
 - Typically have a 'myxoid' stroma at histological examination

INTRODUCTION



T1W SE



STIR

AIM OF STUDY

- ◆ To determine the differential diagnosis of lesions with 'myxoid' SI characteristics
- ◆ To identify clinical and MRI features that may differentiate benign from malignant lesions

MATERIALS AND METHODS

- ◆ Retrospective review of cases from a prospective database of ST masses referred to a supra-regional orthopaedic oncology centre over a 7 year period
 - Total number of patients: 855
 - Number with 'myxoid' SI: 40 (4.5%)
 - 17M;23F mean age 56y (range 23-82y)

MATERIALS AND METHODS

- ◆ Clinical features noted for 40 cases:
 - Patient age
 - Patient sex
 - Location of lesion
 - » Upper limb or lower limb

MATERIALS AND METHODS

- ◆ MRI features assessed for 40 cases:
 - Lesion size:
 - » Maximum and average
 - Lesion homogeneity
 - » T1W and STIR
 - Presence/absence of lobulation
 - Depth in relation to superficial fascia
 - Definition of the border
 - » Well defined vs. poorly defined

RESULTS

27 benign lesions

- Myxoma: 16
- Ganglion: 8
- Schwannoma: 2
- Bursa: 1

13 malignant lesions

- Myxoid MFH: 6
- Myxoid liposarcoma: 2
- HG spindle cell sarcoma: 2
- Pleomorphic sarcoma: 2
- Myxoid sarcoma,NOS: 1

RESULTS

- ◆ Clinical features that were not significantly different between benign and neoplastic lesions:
 - Male vs. female $p=0.72$
 - Mean age $p=0.58$
 - Location of mass
 - » Upper limb vs. lower limb $p=0.61$

RESULTS

- ◆ MRI features that were not significantly different between benign and neoplastic lesions:
 - Homogeneity on STIR p=0.085
 - Lobulation p=0.27
 - Nature of border p=0.74
 - Relationship to fascia p=0.14

RESULTS

- ◆ MRI features that were significantly different between benign and neoplastic lesions:
 - Largest dimension p=0.028
 - » Benign 5.8cm Malignant 9.6cm
 - Average dimension p=0.004
 - » Benign 4.1cm Malignant 7.1cm
 - Inhomogeneity on T1W p=0.01

RESULTS-Odds Ratios Favouring a malignant diagnosis over a benign diagnosis

<u>Feature</u>	<u>Odds ratio</u>	<u>95% CI</u>
Heterogeneity on T1 W sequence	6.7	1.5 - 30.4
Heterogeneity on T2W/STIR	3.6	0.8 - 16
Average size ≥ 7 cm (vs. < 7 cm)	30.3	3.1 - 295.3
Largest size ≥ 10 cm (vs. < 10 cm)	10.7	1.8 - 65.2
Lobulation present (vs. absent)	2.3	0.5 - 10.2
Well-defined (vs. ill defined)	1.5	0.4 - 16
Lesion location in lower limb (vs. upper limb)	1.6	0.27 - 9.1
Female (vs. male)	1.3	0.3 - 5
Age < 50 years (vs. >50 years)	1.2	0.3 - 4.7

CONCLUSIONS

- ◆ Certain MRI features are predictive of malignant myxoid sarcomas:
 - Maximal lesion dimension
 - Average lesion dimension
 - Inhomogeneity on T1W SE images