

SOFT TISSUE U/S

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Introduction

- ▣ Enable the operator to respond to different clinical situations in the most appropriate way.
- ▣ Discuss the process of analysis of the US appearances of various commonly encountered lesions.
- ▣ Evaluation of the soft tissue lesions is complex and should be carried out by a select group of professionals to allow a degree of expertise to build up.

US/ MRI

- ▣ US and MRI are principal techniques and are complementary.
- ▣ Both have a role to play in the diagnosis and management of soft tissue lesions and it is important for the clinician to be familiar with the use of each modality
- ▣ We will discuss the role of US imaging for clinically benign soft tissue masses to make a diagnosis and differentiate them from soft tissue sarcoma
- ▣ Discuss defined management strategies when the US appearances are indeterminate.

Indications

- ▣ Soft tissue lump in the superficial soft tissues
- ▣ Generally size smaller than 5-6 cm (except purely superficial lumps)
- ▣ Change in size and texture of a known lump.
- ▣ Superficial lump with pain.

Not Routinely Indicated

- ▣ Diffuse pain without palpable abnormality.
Ultrasound is not a good screening tool in this situation.
- ▣ Large lumps > 5 cm although with some purely superficial lesions US can be used with caution.
- ▣ Concerning symptoms should be referred directly to the local sarcoma unit.
 - Palpable lump >5 cm
 - Deep to the fascia
 - Increasing in size rapidly

Approach to US Evaluation

1. Take a clinical history

Is the lesion painful?
How long has it been there?

Is it growing

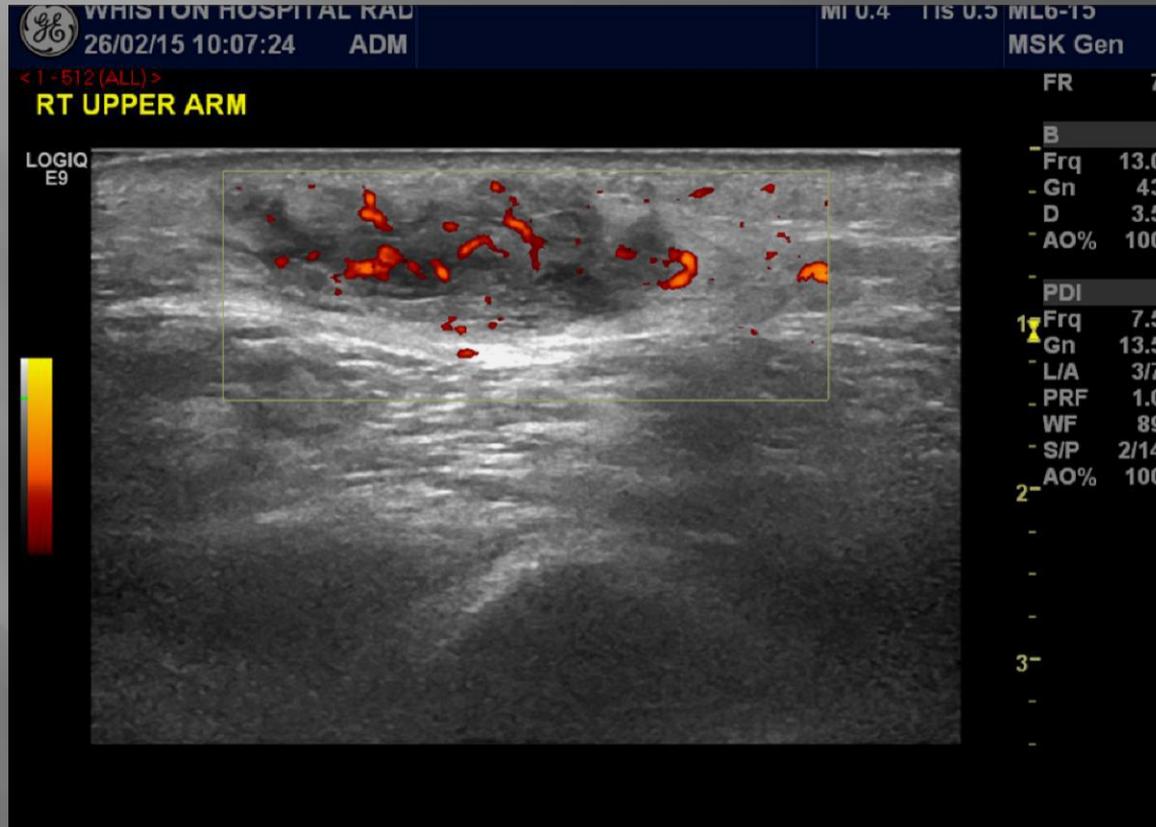
Has there been an injury

Does it discharge?



Clinical History

Patient presents with a painful lump on the upper arm

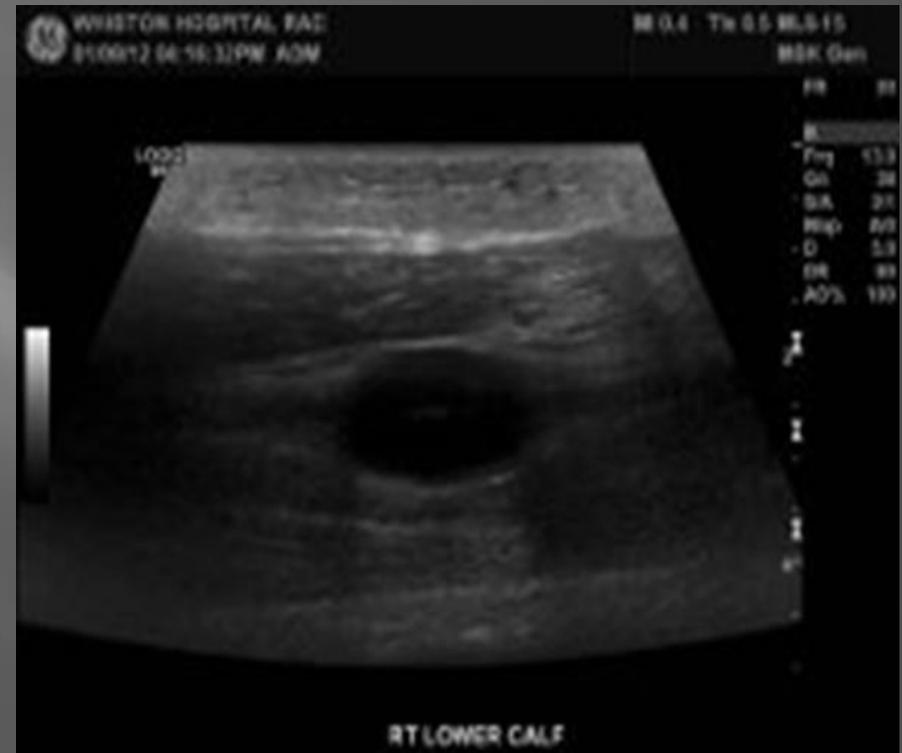


Approach to US Evaluation

2. Location

Pay close attention to the location of the mass within the body. Observe structure and origin

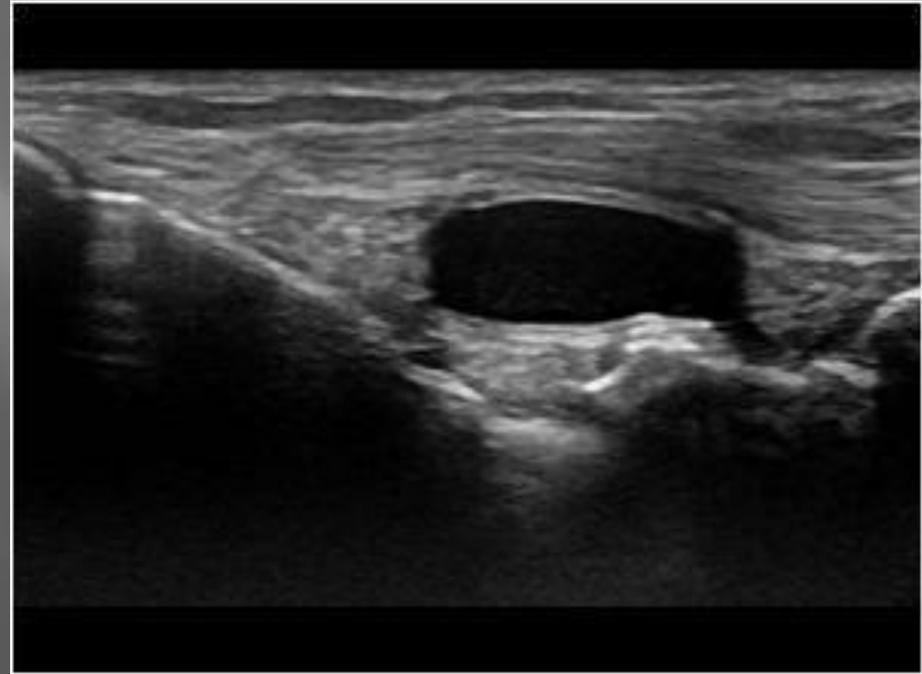
Eg Subcutaneous,
Intramuscular, arising from
nerves or vessels, attached
to the tendon sheath. Juxta
articular



Approach to US Evaluation

3. Grey scale appearances

- ▣ Evaluate the grey scale appearances of the lesion. Is it homogenous or heterogeneous, contain internal calcification, solid or cystic. Some masses have very characteristic internal appearances.



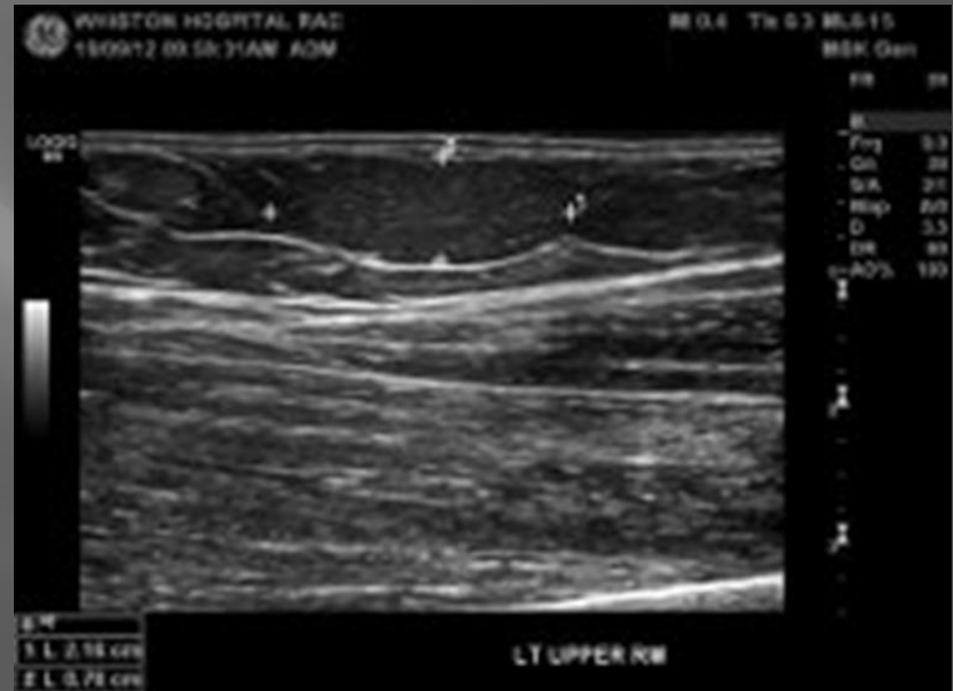
Lipoma



Approach to US Evaluation

4. Margins

Most soft tissue masses have smooth well defined margins. Irregular, poor defined margins are less common and are indicative of certain conditions such as fibromatosis, endometriosis, inflammatory masses, fat necrosis.



Approach to US Evaluation

5. Calcification

Can be seen in a variety of benign and malignant tumours.

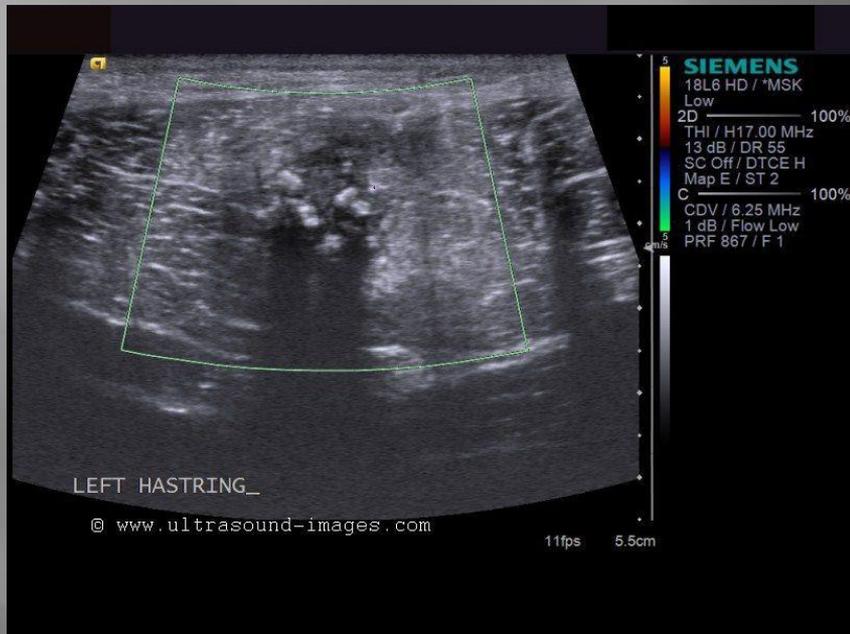
Can be present in loose bodies.

In bursae.

Around joints.

Within tendon sheath.

Approach to US Evaluation



Myositis Ossificans
Benign lesion precipitated
by a trivial injury.

Prior to ossification can
have a solid/cystic
appearance on ultrasound.
Usually oedema of the
surrounding muscle tissue.

Follow up plain films
advised to look for the
characteristic pattern.

Approach to US Evaluation

6. Vascularity

Malignant lesions can demonstrate disorganised branching internal vascularity.

Vascularity within lesions can however be misleading.

Some STS may have little demonstrable blood flow or may be necrotic centrally.

Some benign lesions such as schwannomas can be highly vascular.



Approach to US Evaluation

7. Dynamic nature of US

Use the Ultrasound probe to ballot the lesion.

Enables differentiation of solid and cystic lesions.

Diagnosis of muscle hernias



Management Strategies

Ultrasound features fall into 3 categories

- ▣ 1) Features strongly suggest benign characteristics and can be discharged back to the clinician for medical management
- ▣ 2) "Indeterminate" ultrasound features.
- ▣ 3) Positive features of malignancy

Benign Lesions

Can be discharged back to the referring clinician and requires no further follow up.

Report Example:

There is a well defined homogenous elliptical lesion measuring 23 mm x 15 mm x 21 mm situated within the subcutaneous fatty tissues of the left upper arm. No associated vascularity noted. Appearance most likely represent a small lipoma.

Epidermoid Cyst



Subcutaneous Lesion



Indeterminate Features on Ultrasound

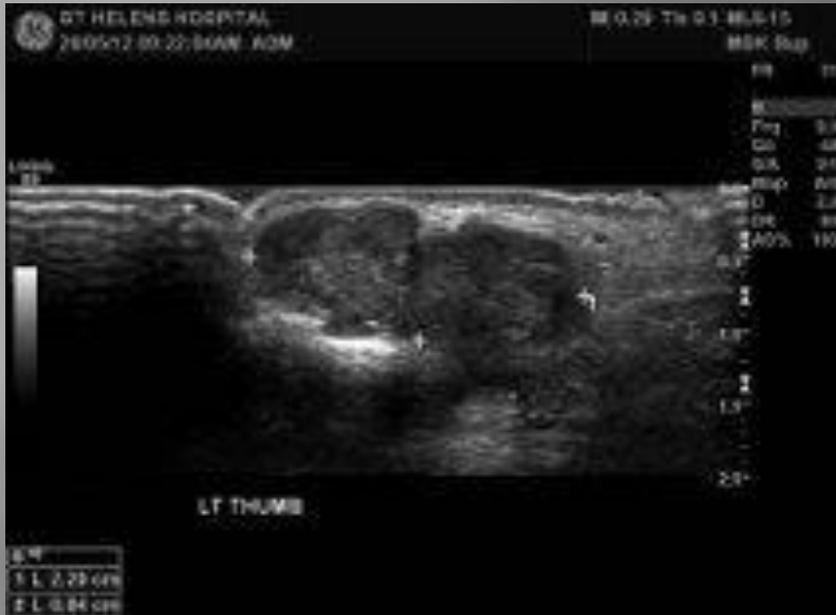
- ▣ Calcification
- ▣ Vascularity
- ▣ Deep
- ▣ Crossing tissue plane
- ▣ Lack of uniformity.
- ▣ Rapid growth.

Indeterminate Features

A small minority will have sinister features on further imaging; the majority (80-90%) will prove benign after further investigation.

Some are too small to assess well with other imaging modalities and these should be considered for excision biopsy by an appropriately trained surgeon.

Giant Cell Tumour



Indeterminate Features

Sample Report:

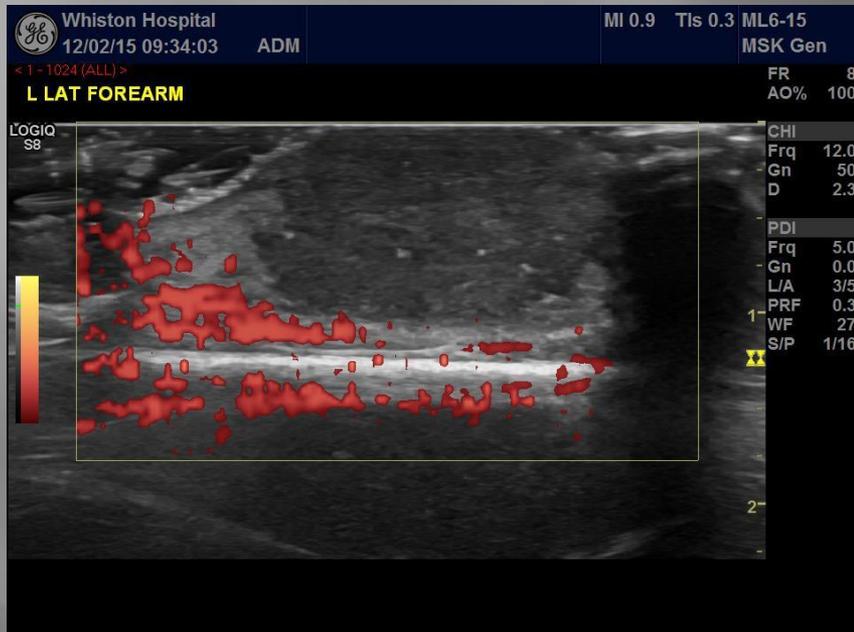
There is a lobulated hypoechoic solid lesion within the subcutaneous tissues of the left thumb measuring approx 23 mm x 9 mm x 13 mm. This extends deep to the FPL tendon and lies in close proximity to the tendon sheath. Some internal vascularity is noted. Features are suggestive of a GCT.

It is difficult to examine the true extent with ultrasound and an MRI has been arranged to further characterise.

Intramuscular Lipoma



Indeterminate Features.



Merkel's Tumour

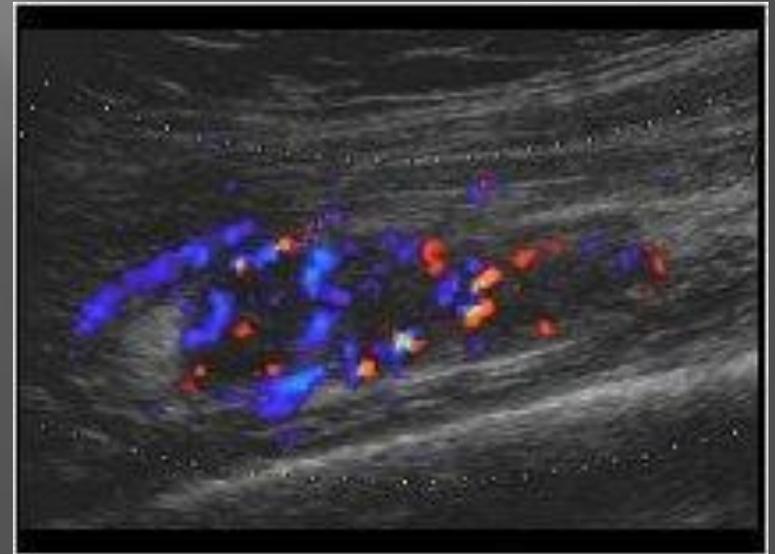
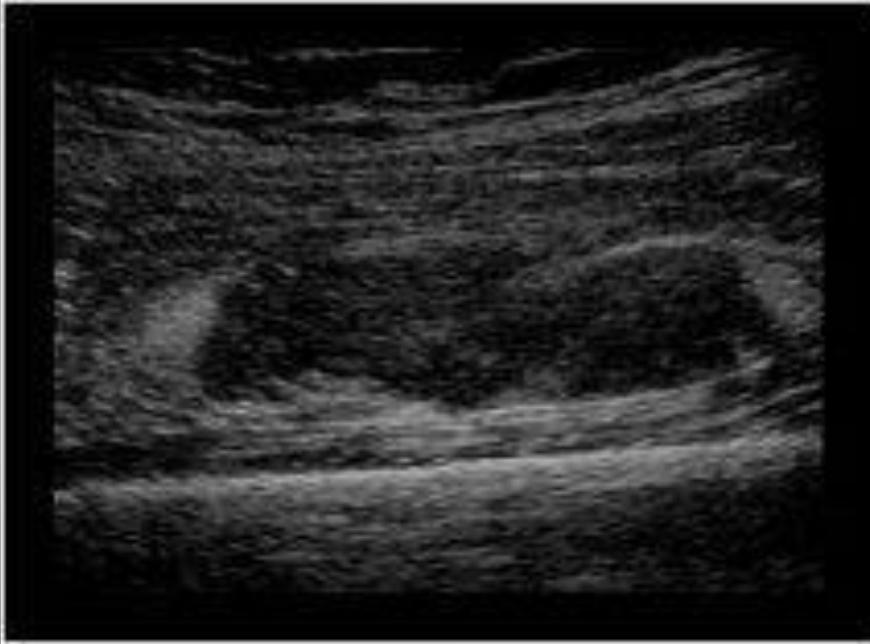
LESION SITUATED AT THE LATERAL ASPECT OF THE LEFT ARM.



Highly suspicious of Malignancy

Positive features of malignancy on the scan will not need further imaging of that area (metastases) or the scan will be suggestive of a primary soft tissue malignancy and further imaging will be used for staging purposes.

Soft tissue Sarcoma



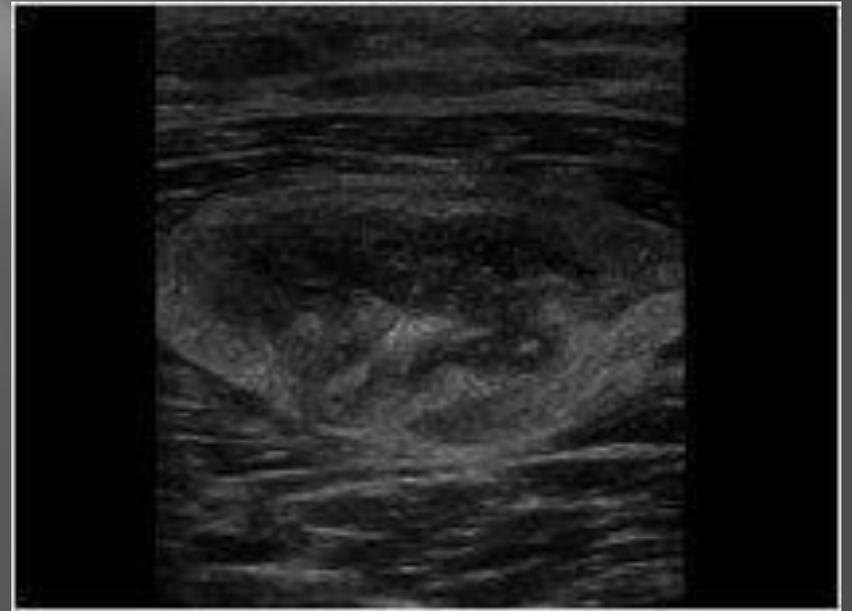
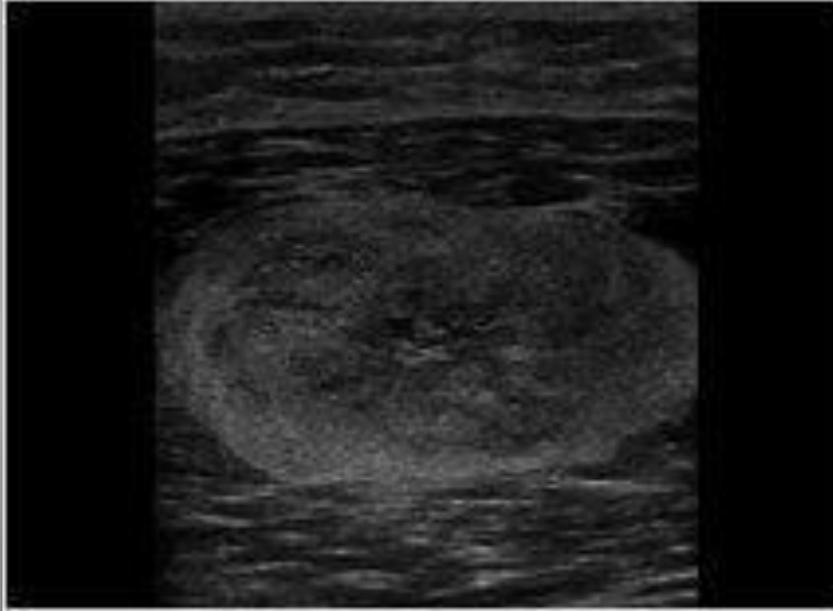
Soft tissue Sarcoma



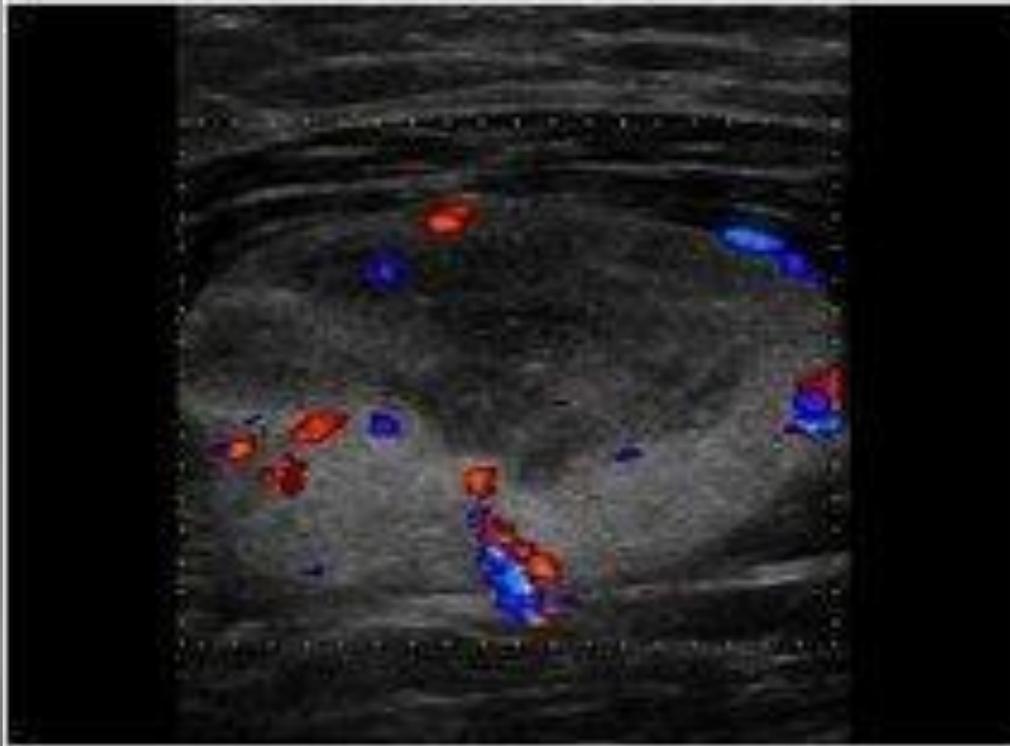
Sample Report

There is a large heterogenous lesion in the Vastus Lateralis muscle. The margins are ill defined and there is marked increased vascularity throughout the lesion. The appearances are suggestive of a soft tissue malignancy. MRI will be performed for staging purposes. Please refer to the local soft tissue sarcoma service.

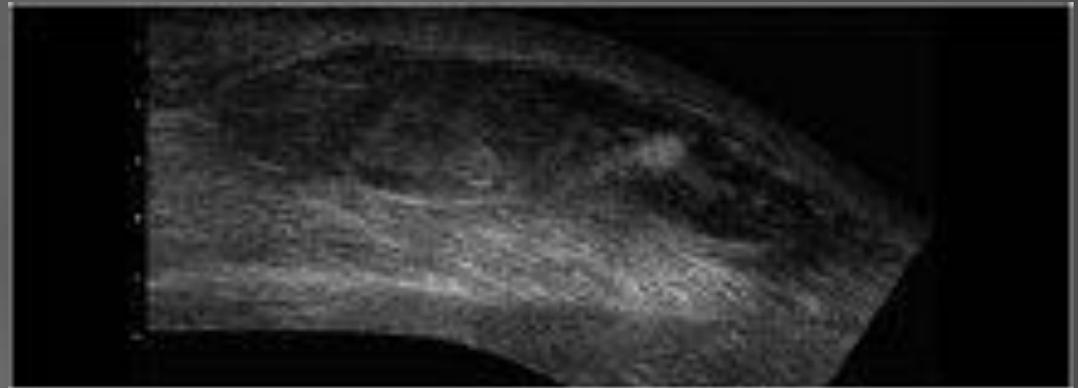
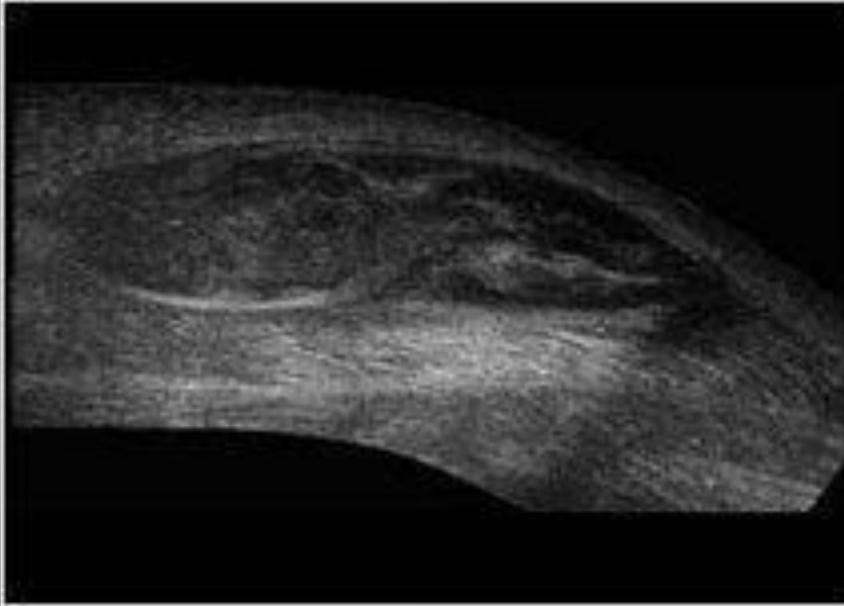
Myxoid Liposarcoma



Myxoid Liposarcoma



Gastrocnemius haematoma



Specific Diagnosis

- ▣ Accessory muscles.
- ▣ Plantar or palmer fibrosis.
- ▣ Neuroma.
- ▣ Muscle hernia.
- ▣ Tendinosis
- ▣ Tenosynovitis
- ▣ Hernia
- ▣ Foreign body-surrounding hypoechogenicity and increased vascularity.

Muscle Hernia

Abnormality only seen on stressing the muscle.

Normal muscle is seen herniating through a defect in the fascial plane



De Quervains Tenosynovitis

Fluid and tendon sheath thickening with increased vascularity.

Also consider tendon rupture.



Wrist Ganglion

