Soft Tissue Masses: When to Worry

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Disclosures

- No relevant financial disclosures

Goals

- Distinguish between benign and malignant soft tissue tumors
- Learn the pitfalls of incorrect management
- Learn basic rules for which masses need further work up and which do not

Agenda

- Background
- Features of Masses
- Examples of Errors

Background

- As a Orthopaedic Surgery PA
  - Critically important to obtain history, examination, obtain imaging and refer when appropriate
  - Learn the basics about which soft tissue masses need further workup
  - Know the difference in what needs imaging/referral to those that do not

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Soft tissue tumors - Background

- Incredibly common
- Range from completely benign to highly aggressive
  - Critical to differentiate between them

- -oma
  - Benign mesenchymal derived tumor
  - ie. Lipoma, hemangioma
- -sarcoma
  - Malignant mesenchymal derived tumor
  - ie. Osteosarcoma, Soft tissue sarcoma

History

- Growth rate?
- Duration?
- Pain?
- Fluctuation in size?
- Associated symptoms?
- Neurologic, swelling?
- Trauma?
- Other masses?
- Cancer history?

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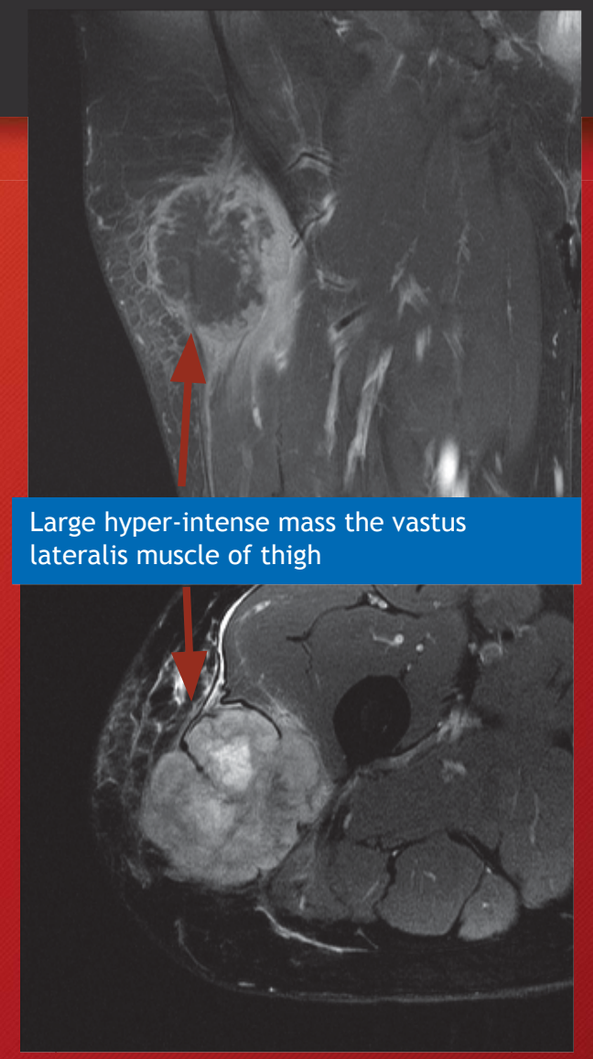
Examination

- Determine boundaries and depth
  - Tinel's
  - Weakness in the extremity?
  - Tender
  - Compressible
  - Firm or soft?
  - Fixed

So, what is a Sarcoma?

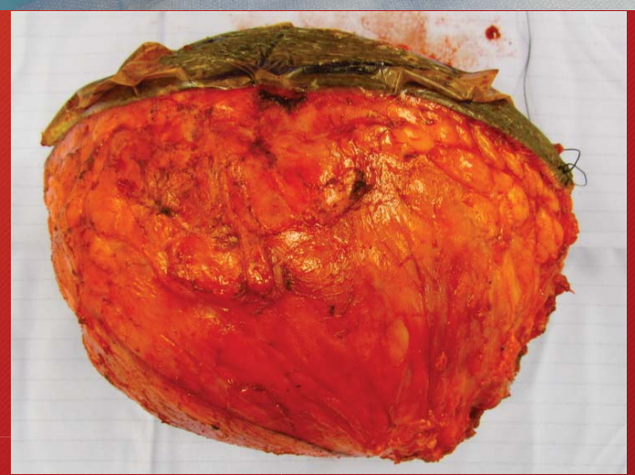
- A **malignant** tumor that originates from mesenchymal tissues
  - Bone
  - Muscle
  - Tendon
  - Ligament
  - Cartilage



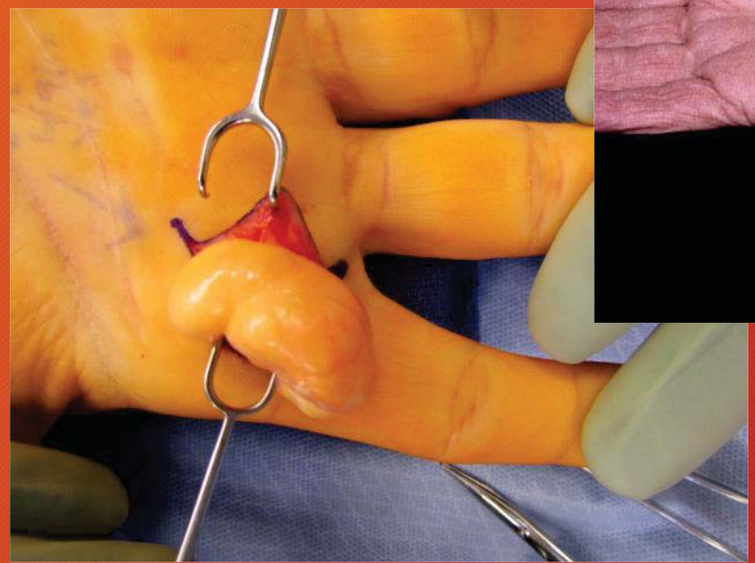
Large hyper-intense mass the vastus lateralis muscle of thigh

Why do we care about sarcomas?

- About 13000 sarcomas diagnosed in 2019 in US
- Almost 40% will die due to their disease
- 50% are in the extremities
- Heterogeneous group of cancers
- High morbidity and mortality disease



Lipoma/Ganglion/Hematoma



Key Rules

- A mass needs to be imaged (appropriately assessed) if

1) Growing
2) Painful
3) Deep
4) Larger than a golf ball

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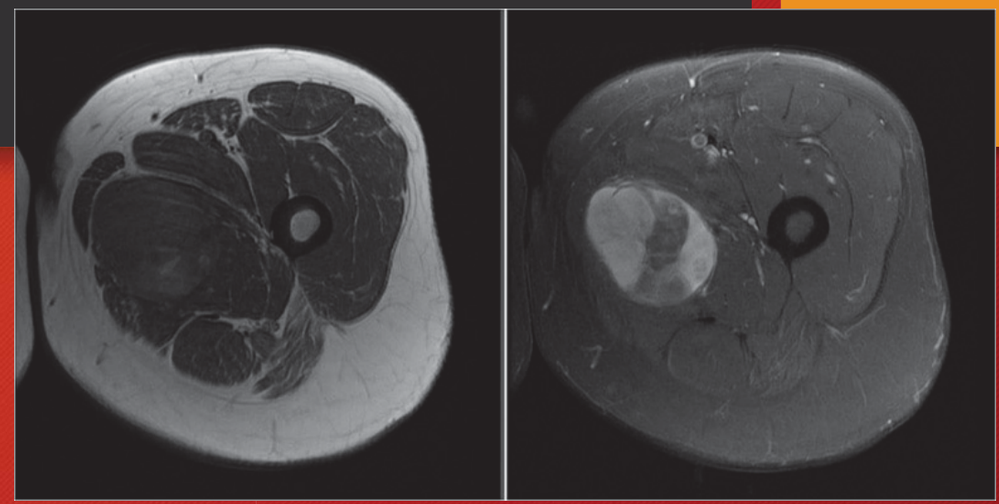
Imaging



- Rules:
  - Don’t ignore the patient
  - Obtain the right imaging
  - Don’t ignore the imaging
  - Solid masses should not be ignored
  - **Any mass over the size of a golf ball needs to be imaged**

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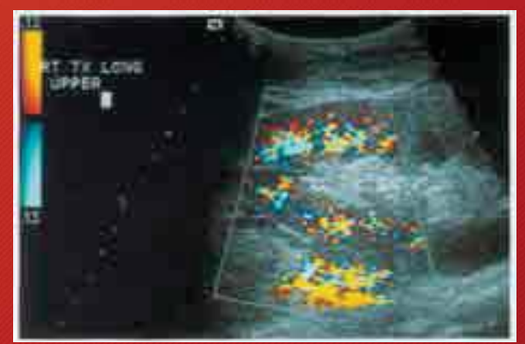
Xrays

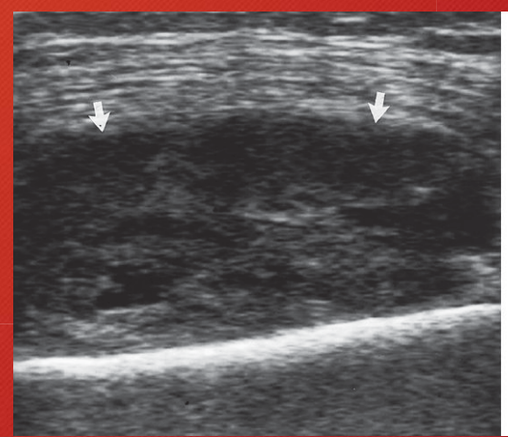
- Some debate, but most would recommend two view xrays of all masses
  - Could be a bony mass with soft tissue extension
  - Calcifications within the lesion could suggest a sarcoma
  - Hemangiomas have characteristic phleboliths

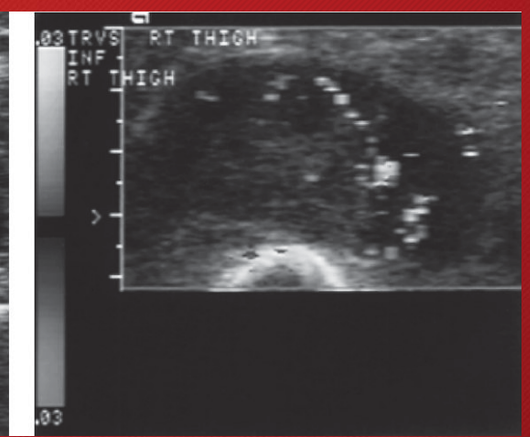
Ultrasound

- Pros:
- A reasonably cheap, easy to perform test
- Vascularity is a sign of malignancy
- Usually can differentiate between benign and malignant
- Can tell the difference between solid and cystic

- Cons
- Doesn't show anatomic relationships for surgical treatment
- Operator dependent



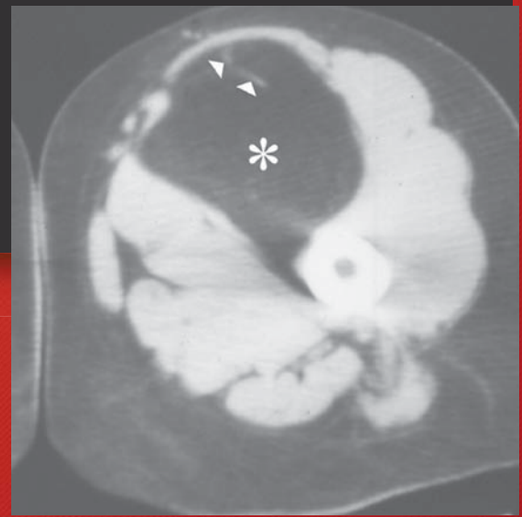


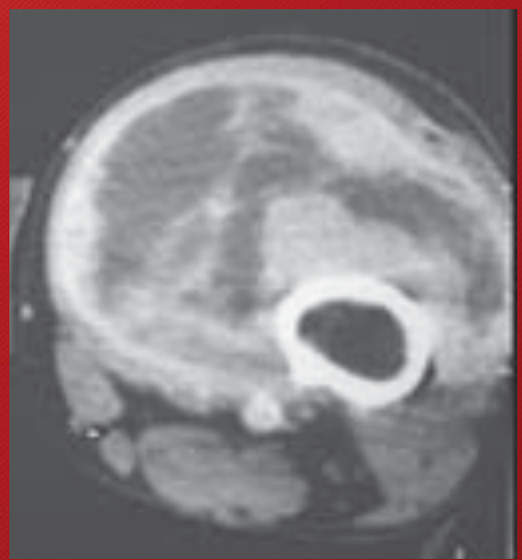


CT scan

- Pros: Fast, relatively cheap cross sectional imaging; Good for deep **FATTY** tumors and **BONE** anatomy
- Pacemaker compatible

- Cons: Not ideal for sarcoma imaging ie location of neurovascular structures; Doesn't characterize lesion thoroughly

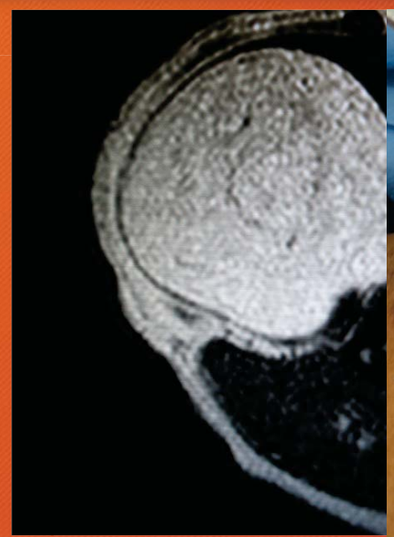


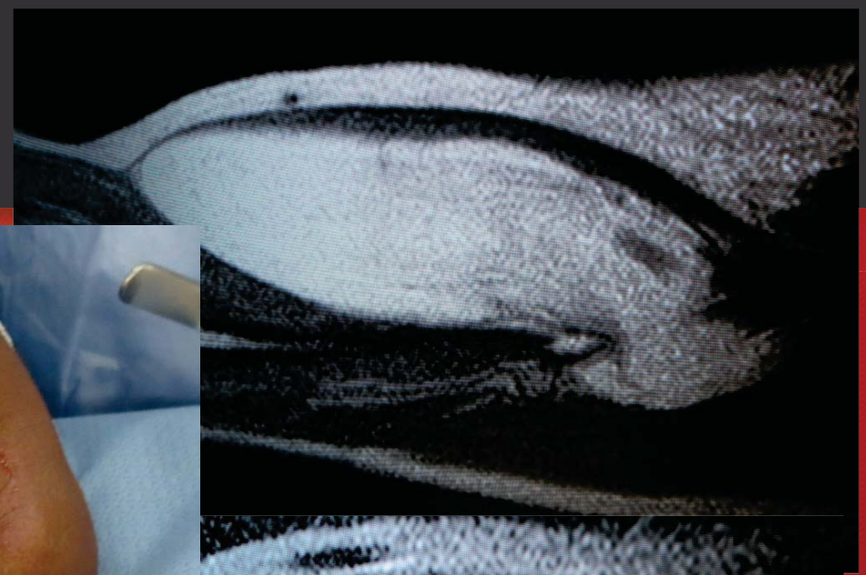


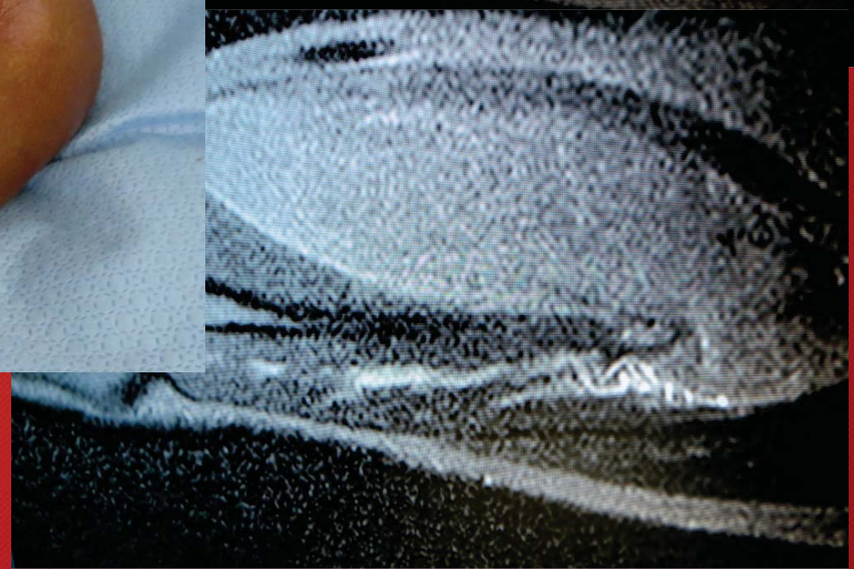
MRI with and without Contrast

- The Gold Standard
- MRI Principles:
  - Cysts enhance peripherally (must give contrast)
  - Lipomas appear as fat on EVERY sequence
  - If read as a hematoma, be skeptical.

Lipoma on MRI

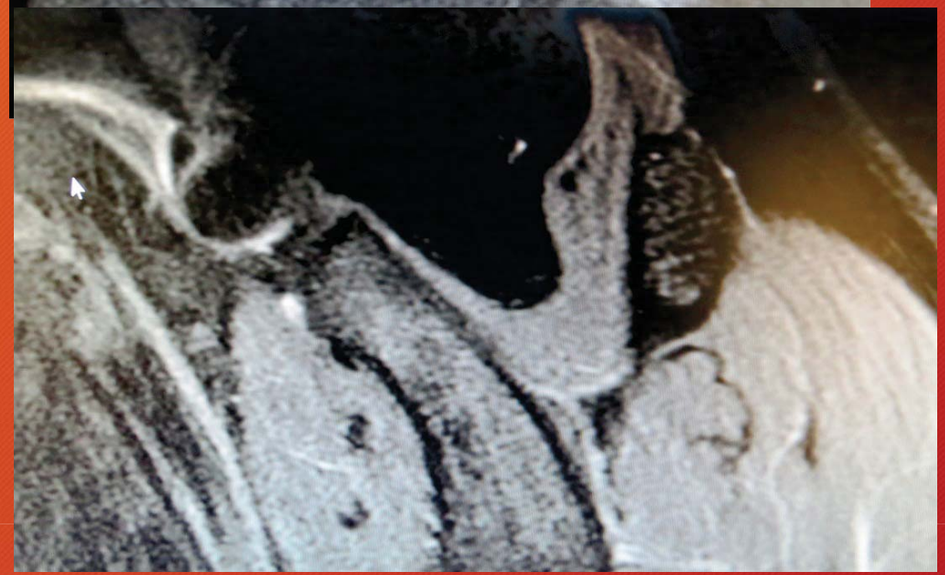






On every sequence, the mass looks like the subcutaneous fat

Another example



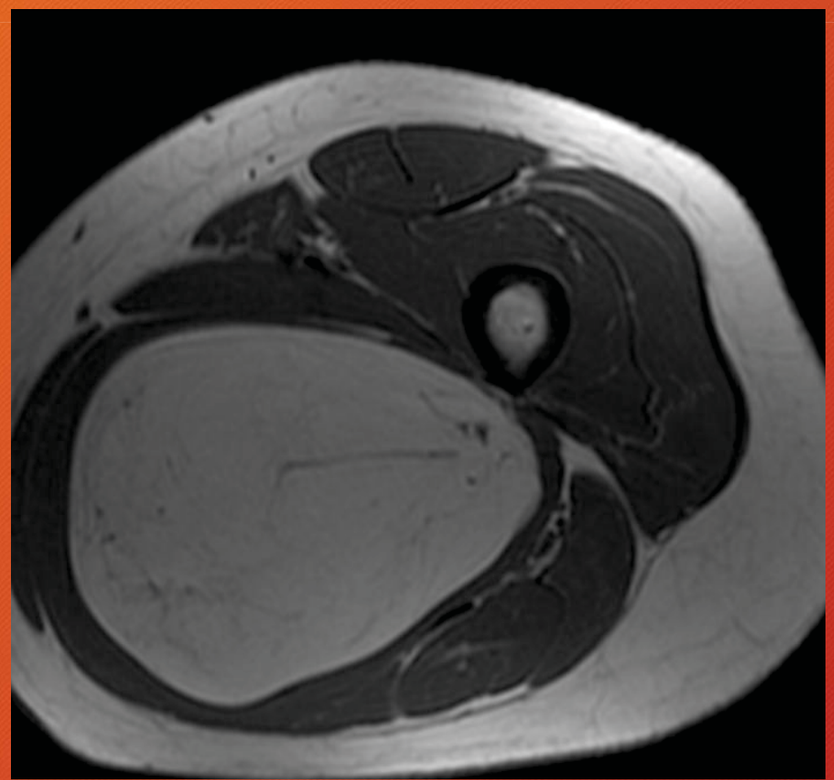
Lipoma versus Atypical Lipomatous Tumor (ALT)

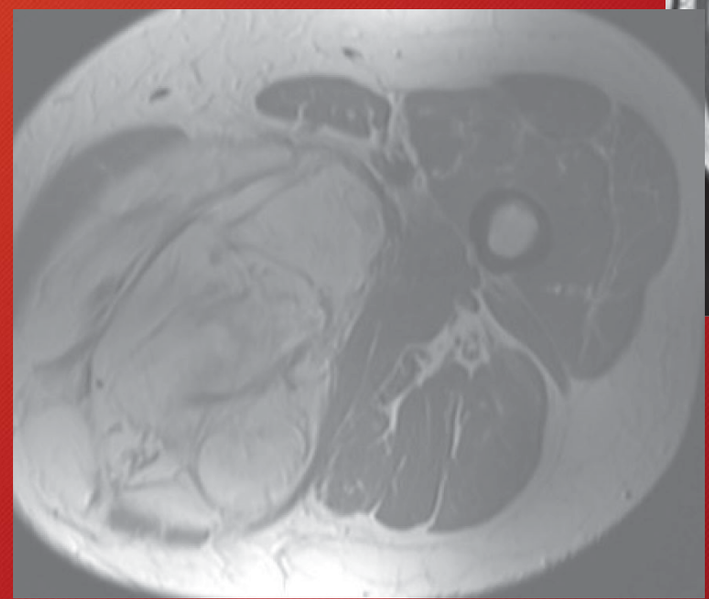
- ALT (the tumor formerly known as well-differentiated liposarcoma)
  - Can look like lipoma or “dirty” lipoma on MRI
  - Often times confused as a large lipoma

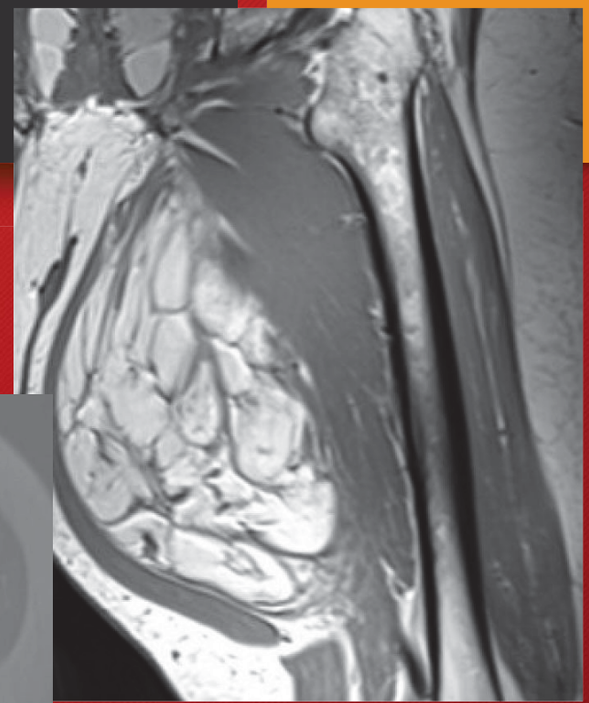
  - Deep, fatty mass

  - ZERO risk for metastasis
  - High local recurrence rates (25%)

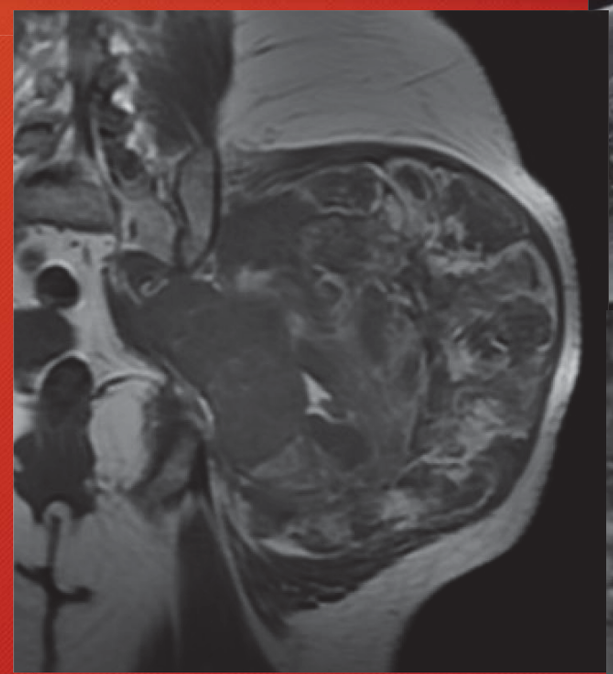
Lipoma versus ALT

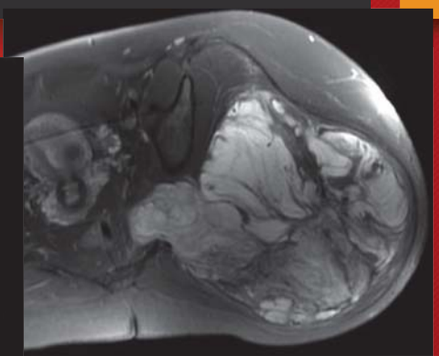


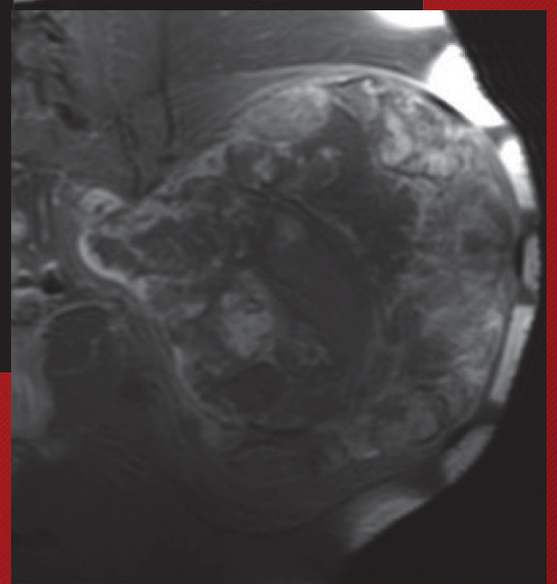




Lipoma versus Sarcoma

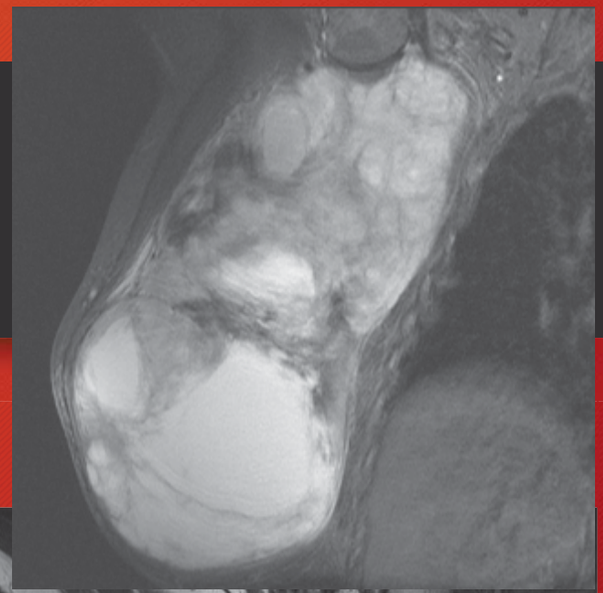






Compare to Sarcoma

Exam: firm. Not soft, not mobile.

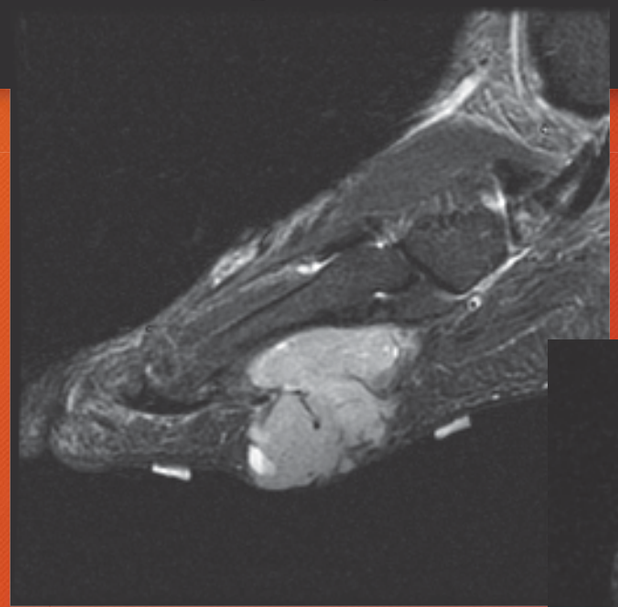


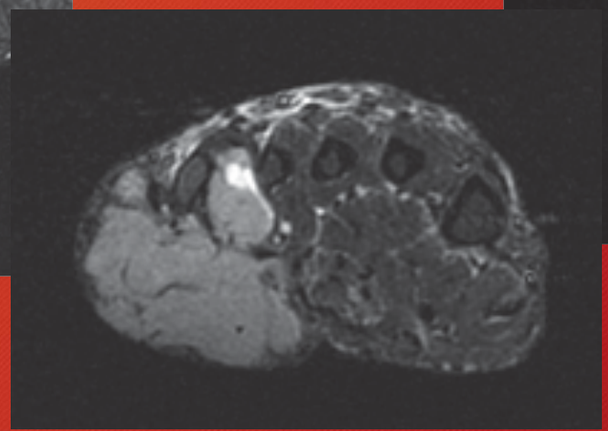
Cases with Pitfalls

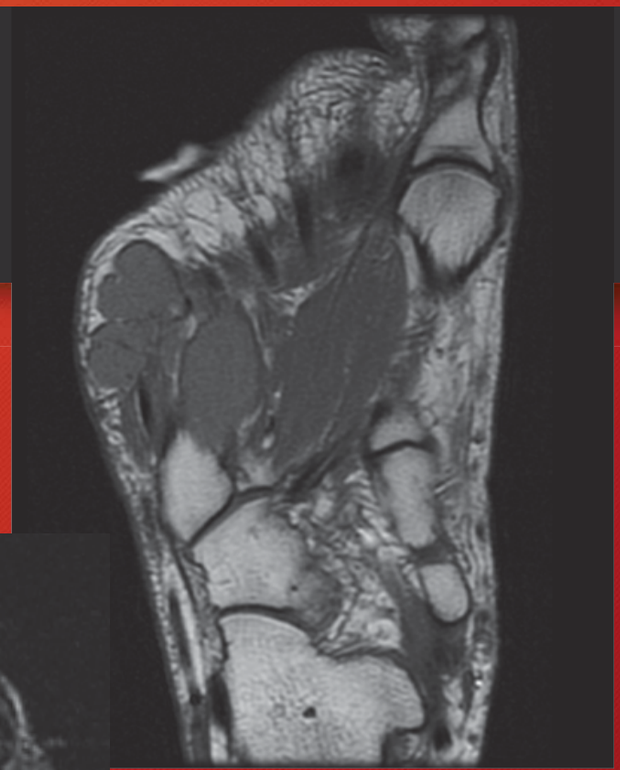
Pitfalls 1

- 28 yo female with foot pain
- She tells her PCP. “There’s a bump on my foot and I’m having trouble walking due to the pain.”
- Told she had a sprain or plantar fasciitis
- Patient comes back 6 weeks later. “This is really painful and the bump is bigger.”

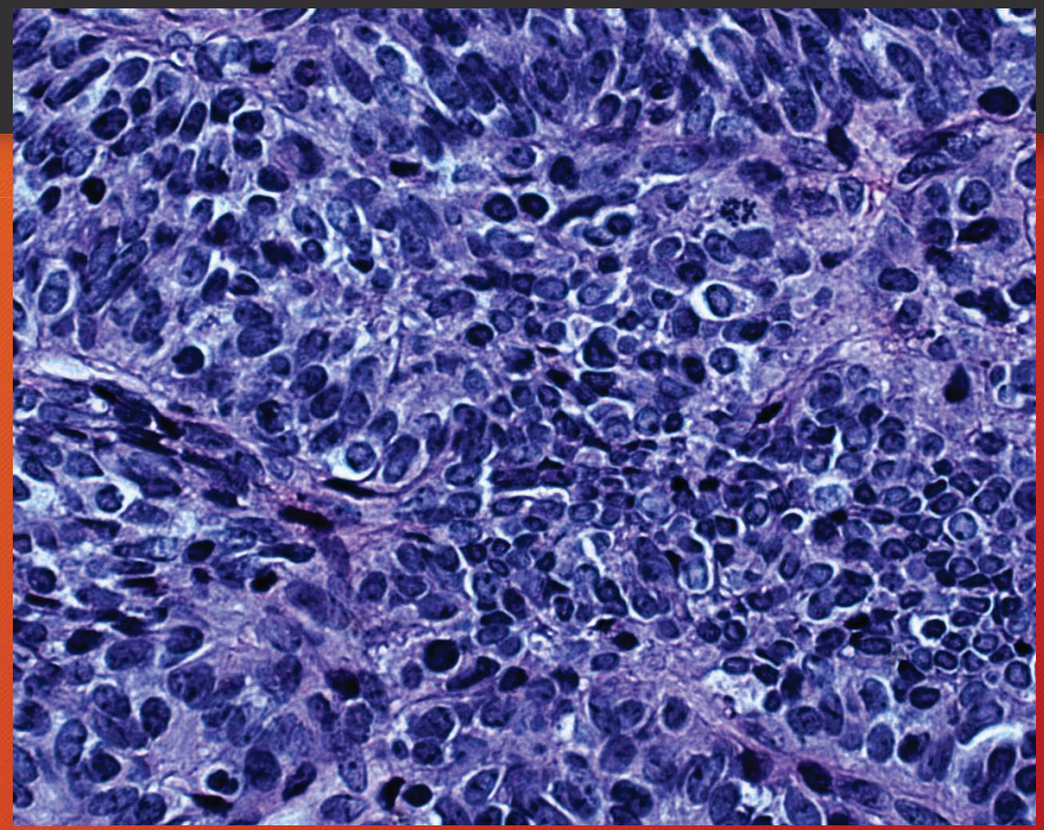
Further Imaging







Biopsy



Synovial Sarcoma

Mistakes:

1. Listen to the patient
2. Examine the patient
3. Although common diagnoses are just that, don’t forget the exceptions.

Lead to a BKA

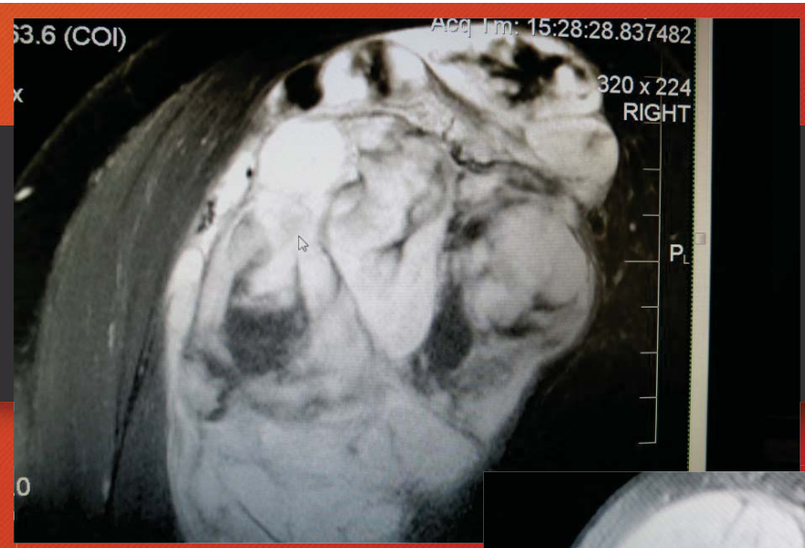
Pitfalls 2

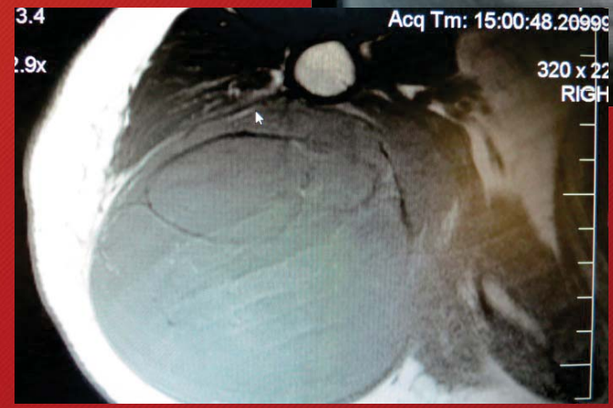
66 yo female with a right shoulder mass present for 3 months
Painful and growing
PMH: ESRD, CHF, Diabetes

Exam: Mildly firm, Some areas are soft; deep, mobile with muscle

Pitfall 2 cont

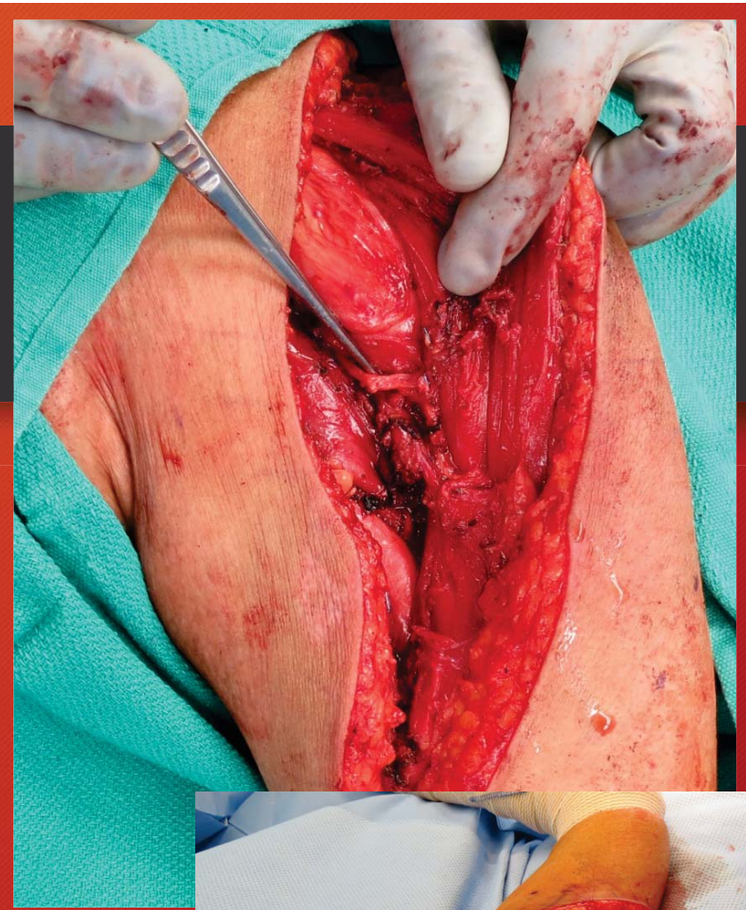
- Primary care physician ordered xrays and an MRI
- MRI Report said “likely hematoma, cannot rule out sarcoma.”
- So PCP, said come back later.





Pitfall 2 cont.

- Patient came back in 6 weeks and said it's more painful and larger.
- Repeat MRI
- Report says the mass is larger, therefore "suspicious for soft tissue sarcoma."
- Patient referred
- Biopsy, staging, radiation, chemotherapy, restaging, and resection.

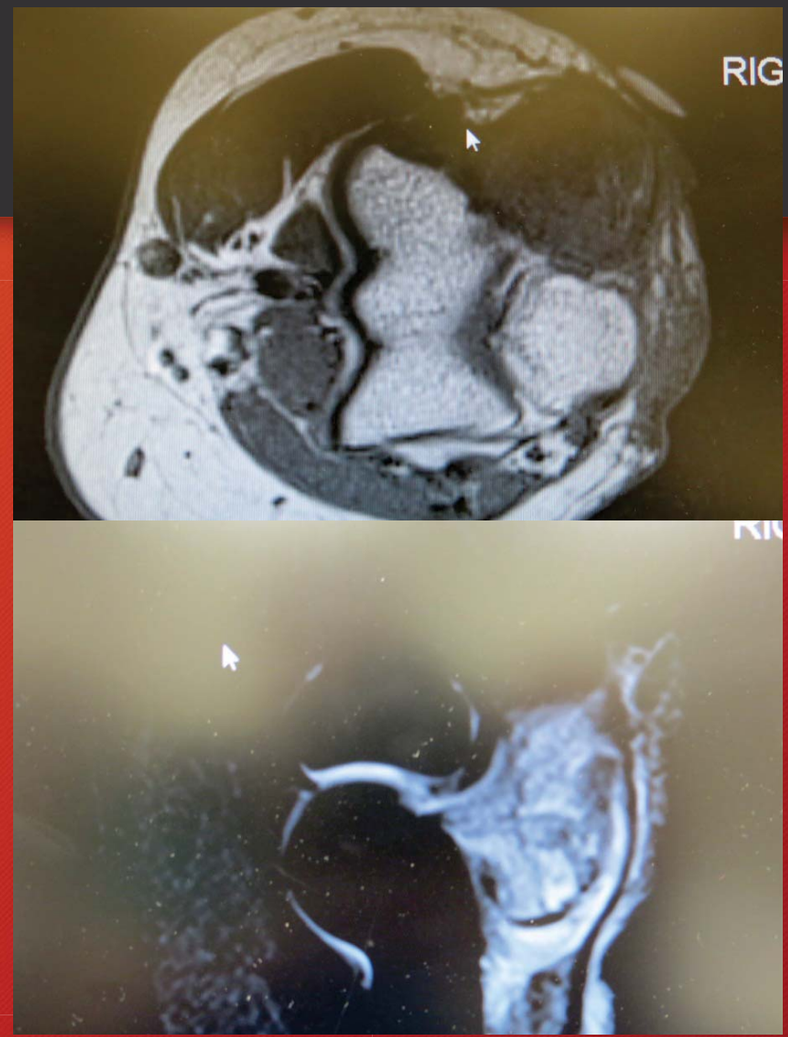


Pitfall 2 cont.

- Mistakes made:
- 1. Didn’t listen to the patient
- 2. Decided to make a decision for the patient based on odds.

Pitfalls 3

- 60 right hand dominant female with a painful right elbow mass for 2 months
- Growing, painful
- Saw a hand surgeon who ordered an MRI



Pitfalls 3

- MRI report states “mass consistent with soft tissue sarcoma, correlate clinically.”
- Per patient, hand surgeon states they believe it to be a ganglion due to the location, excises it, partially.

Pitfalls 3.

- Specimen doesn’t appear to be a ganglion upon surgical approach. Surgeon continues to enter the elbow joint.
- Pathology: Epithelioid Sarcoma
- Mistakes:
  - 1. Ignored radiology report.
  - 2. Ignored clinical correlation yet proceeded.

Pitfall 4

- 34 yo male who states a few years earlier, he was bumped into by a bus on his hip. Now he has a bump that is painful. (2009)
- Exam: superficial mass over lateral left hip, immobile, ill defined.
- Physician orders Ultrasound which reveals a mass. Thought to be a hematoma, aspiration attempted.
- Surgeon performs open surgery, closes skin.

Pitfall 4

- Patient complains about 6 months later, the bump is back. MRI is then ordered.
- Treating physician takes patient to OR again for evacuation of hematoma.
- No pathology sent.

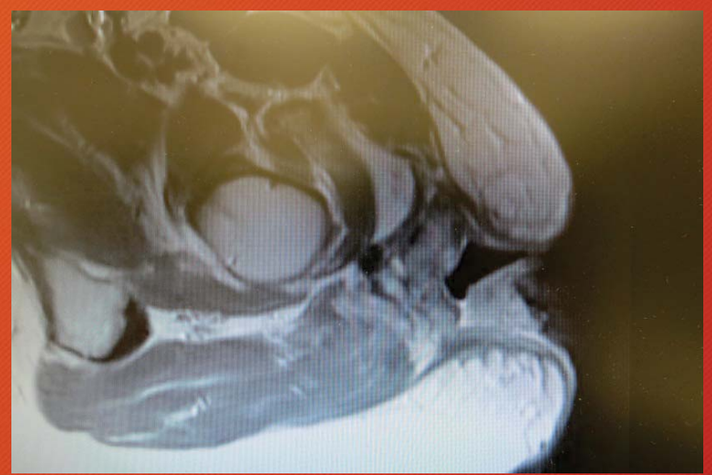
Pitfall 4

- Patient undergoes this 3 more times over the following 3 years
- A plastic surgeon is consulted to treat the hip for closure. He performs a thorough debridement, wound vac placement, but says…something doesn't look right. Sends tissue for path…

- High-grade Angiosarcoma

Pitfall 4

- Undergoes radiation, restaging, resection.



Pitfall 4

- Unfortunately.

- Mistakes
- 1. Ignored imaging
- 2. Didn’t send to Pathology (again and again)
- 3. Didn’t think about the history. Why does a healthy man keep getting “hematomas”?

Pitfall 5

28 yo male presents as a referral for his left arm
About 3 months earlier, he was noted to have a small ulcerating lesion that was thought to be a bug bite.

Saw a general surgeon who treated it multiple debridements.

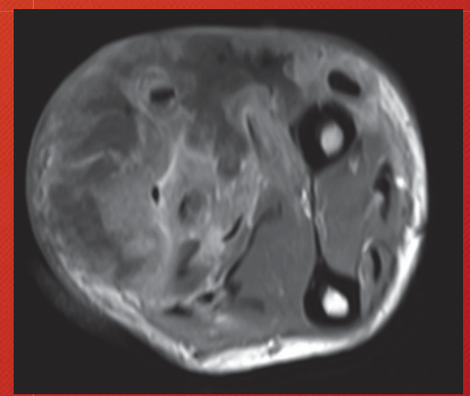
He was referred for wound care to a plastic surgeon.

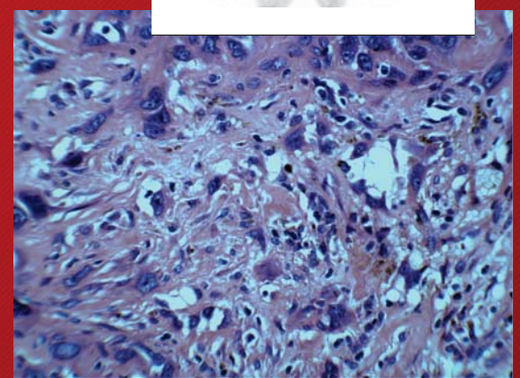
At that time he was biopsied and referred.

Pitfall 5

- Upon presentation, path reviewed
- High-grade epithelioid sarcoma

- Staging
  - Diffusely metastatic
  - Unfortunately required an amputation





Pitfall 5

- Mistakes
  - 1. No pathology sent
  - 2. No imaging
  - 3. Didn’t stop to consider why things weren’t improving.

  - Resulted in forearm amputation

Pitfall 6

- 72 yo male with a right forearm mass
- Was growing over previous 2 months
- Saw his PCP
- Recommended excision in clinic

Pitfall 6

- Per the patient
- The PCP told his assistant, “L
  the direction of his skin lines
  is why I am making an incisio
  this direction.”
- Done with local anesthesia ar
  tourniquet
- No procedure note dictated e
  that mass excision done in cl
- Exam: Clinically firm palpab
  mass remains
- Path: Intermediate grade
  myxofibrosarcoma

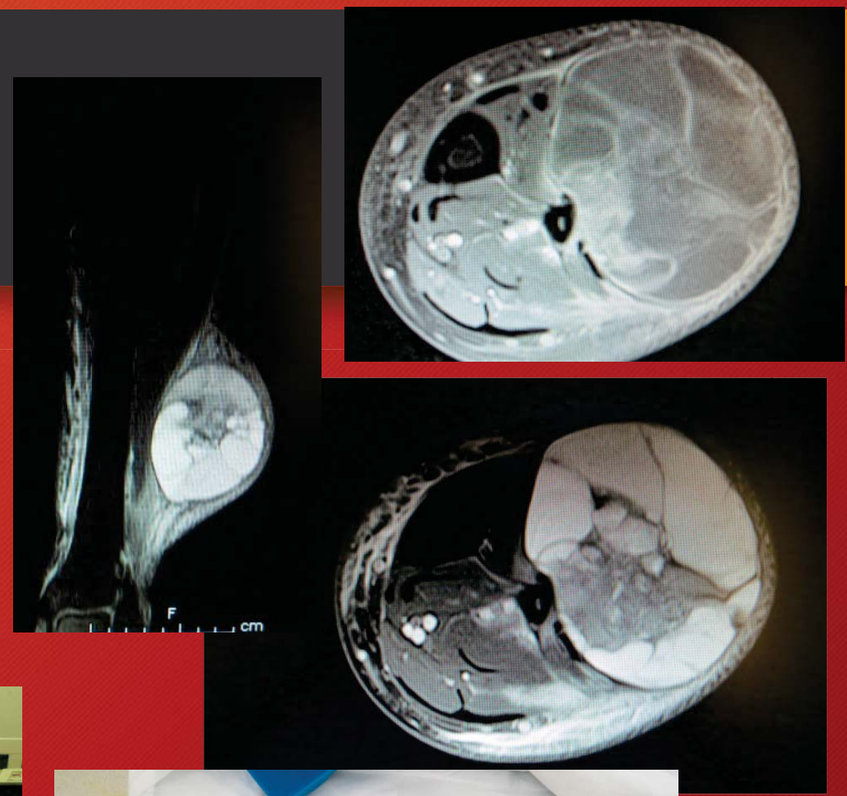
Pitfall 6

- Mistakes:
- 1. Larger than 3 cm mass with no imaging
- 2. Only partially removed
- 3. No information on depth of dissection
- 4. No tourniquet, poor hemostasis

Salvage

40 yo male with Left leg mass for 3 months. Didn't tell anybody until it was too painful to walk

Exam: Non-compressible mass on lateral left leg



Limb Salvage

Summary

- Rules
- A mass needs to be imaged (appropriately assessed)
  1) Growing OR
  2) Painful OR
  3) Deep OR
  4) Larger than a golf ball
- Don’t assume hematoma
- Follow people through to improvement

Summary

- Imaging Rules
  - 1) MRI with and without contrast for larger or deep masses
  - 2) Ultrasound reasonable as first test for superficial larger masses
  - 3) Early referral valuable to ensure appropriate management

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Thank you

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