

# MUSCULOSKELETAL EMERGENCIES

## *MRI FOCUSED*

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# DISCLOSURE

- No financial conflict of interest

# OBJECTIVES

- Understand pathophysiology of MSK emergencies
- Proficient in interrogating MRI for MSK emergencies
- Making the call – when to reach for the phone ?

# INTRODUCTION

- MSK emergencies - soft tissue / bone
  - Traumatic
  - Non-traumatic
    - Infective
    - Inflammatory

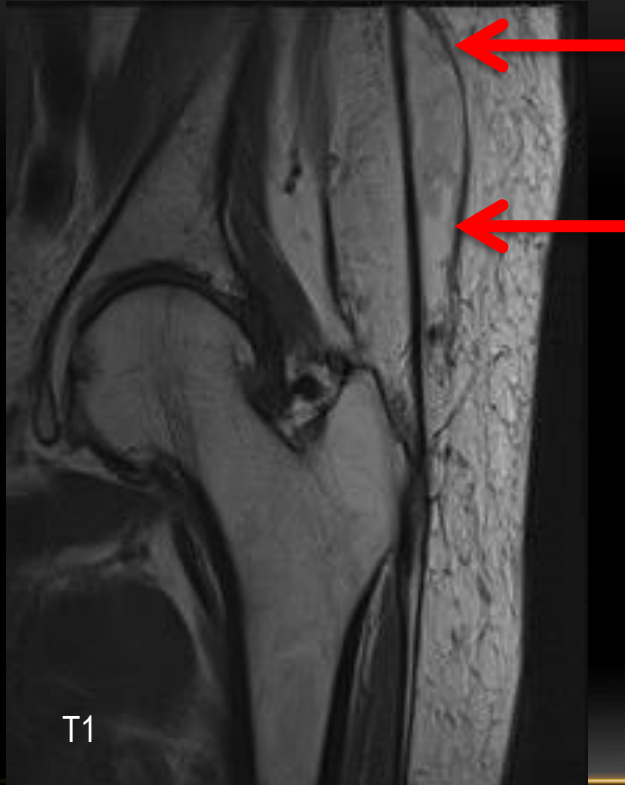
*MRI*

# MRI

- Superior contrast resolution
- Excellent analysis of compartmental anatomy
- Becoming more widely available for ER patients

# TRAUMATIC - SOFT TISSUE

# TRAUMATIC – SOFT TISSUE



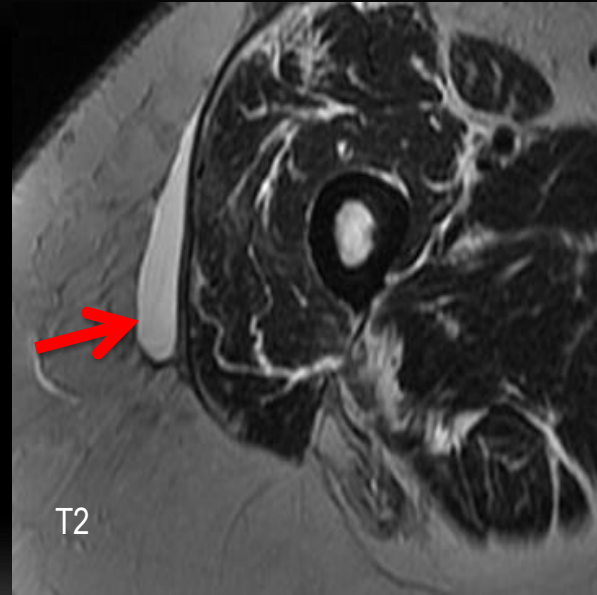
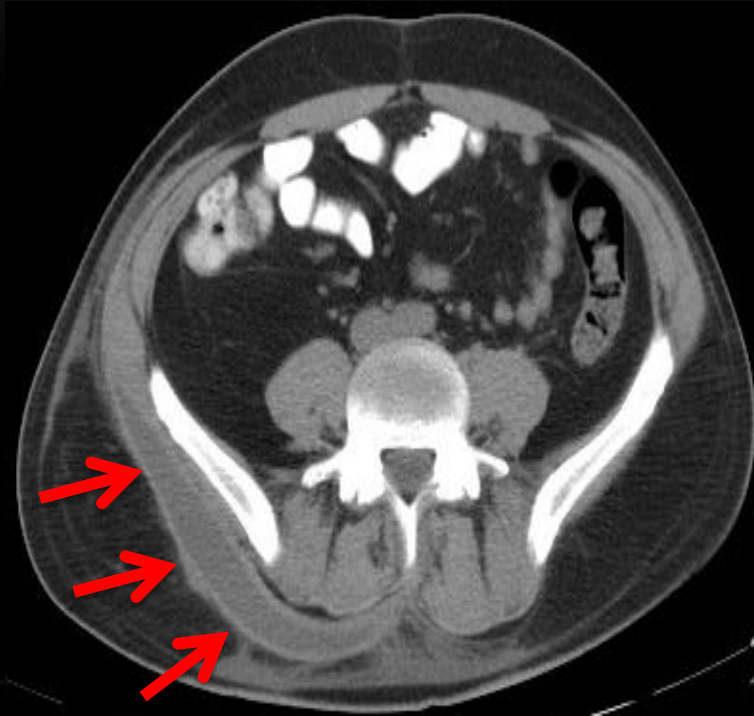
Morel-Lavallée lesion

## MOREL-LAVALLÉE LESION

- Hemolymphocele
- Traumatic degloving injury – shear
- Inflammatory reaction creates a pseudocapsule
- Complications – infection



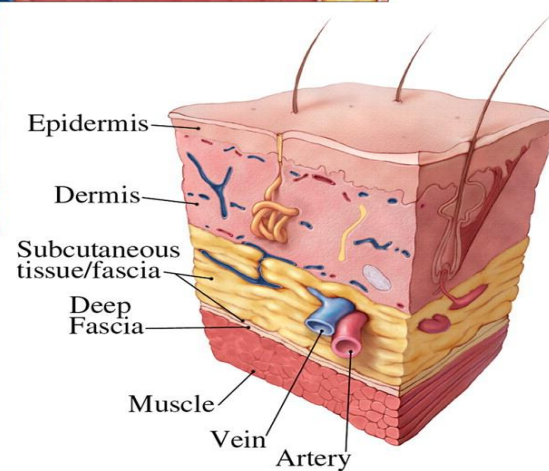
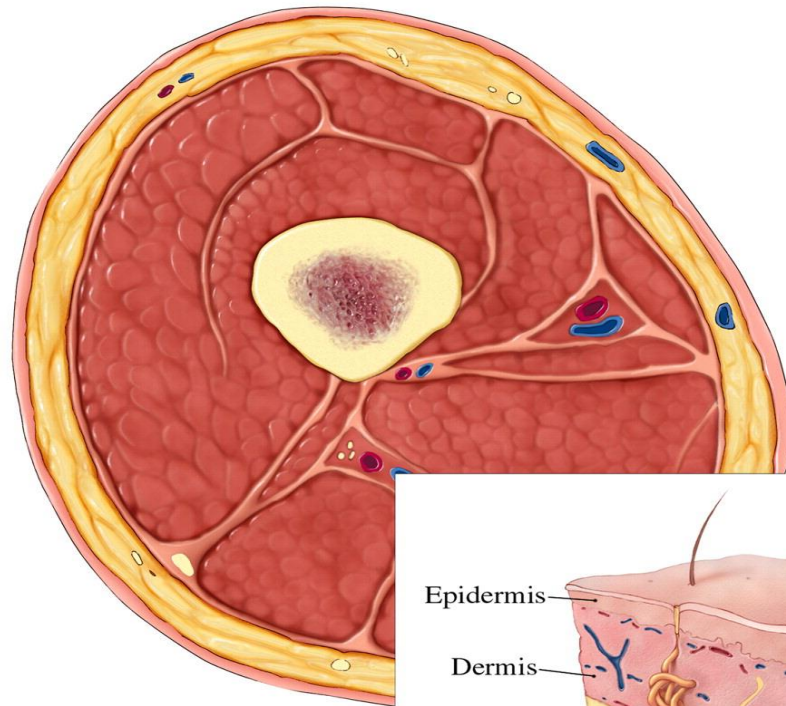
# MOREL-LAVALLÉE LESION



# NON-TRAUMATIC SOFT TISSUE EMERGENCIES

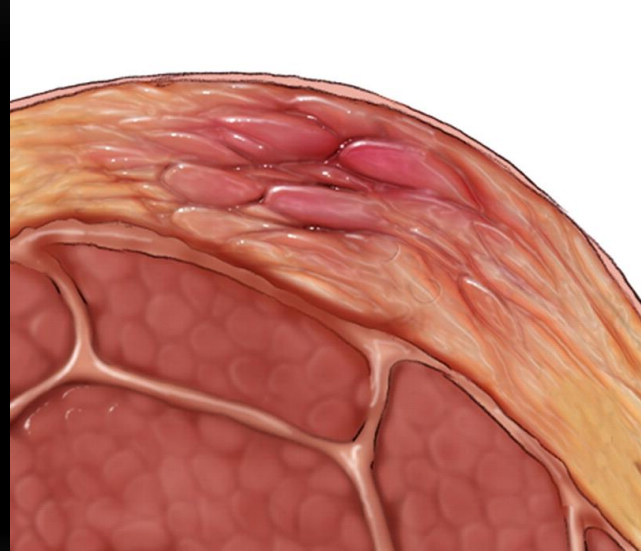
# NON- TRAUMATIC – INFECTIONS!

- Superficial cellulitis
- Necrotizing fasciitis
- Myositis
- Pyomyositis
- Soft tissue abscess
  
- *Osteomyelitis*
- *Septic arthritis*

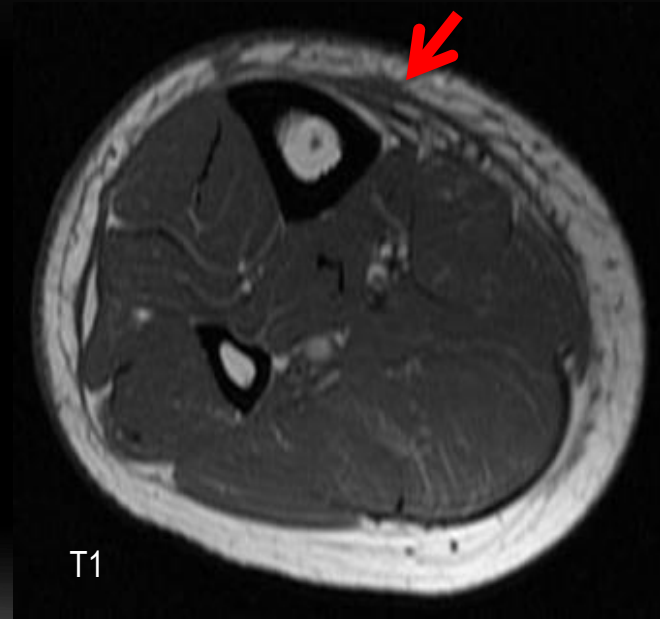
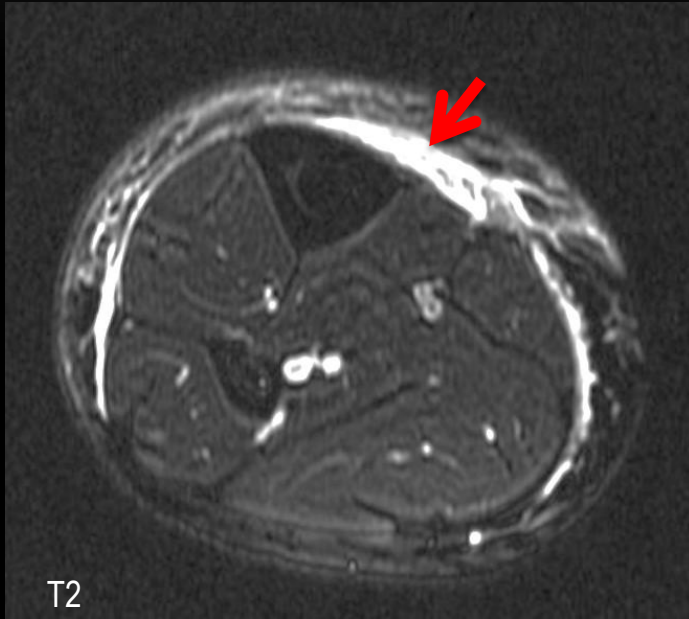


# CELLULITIS

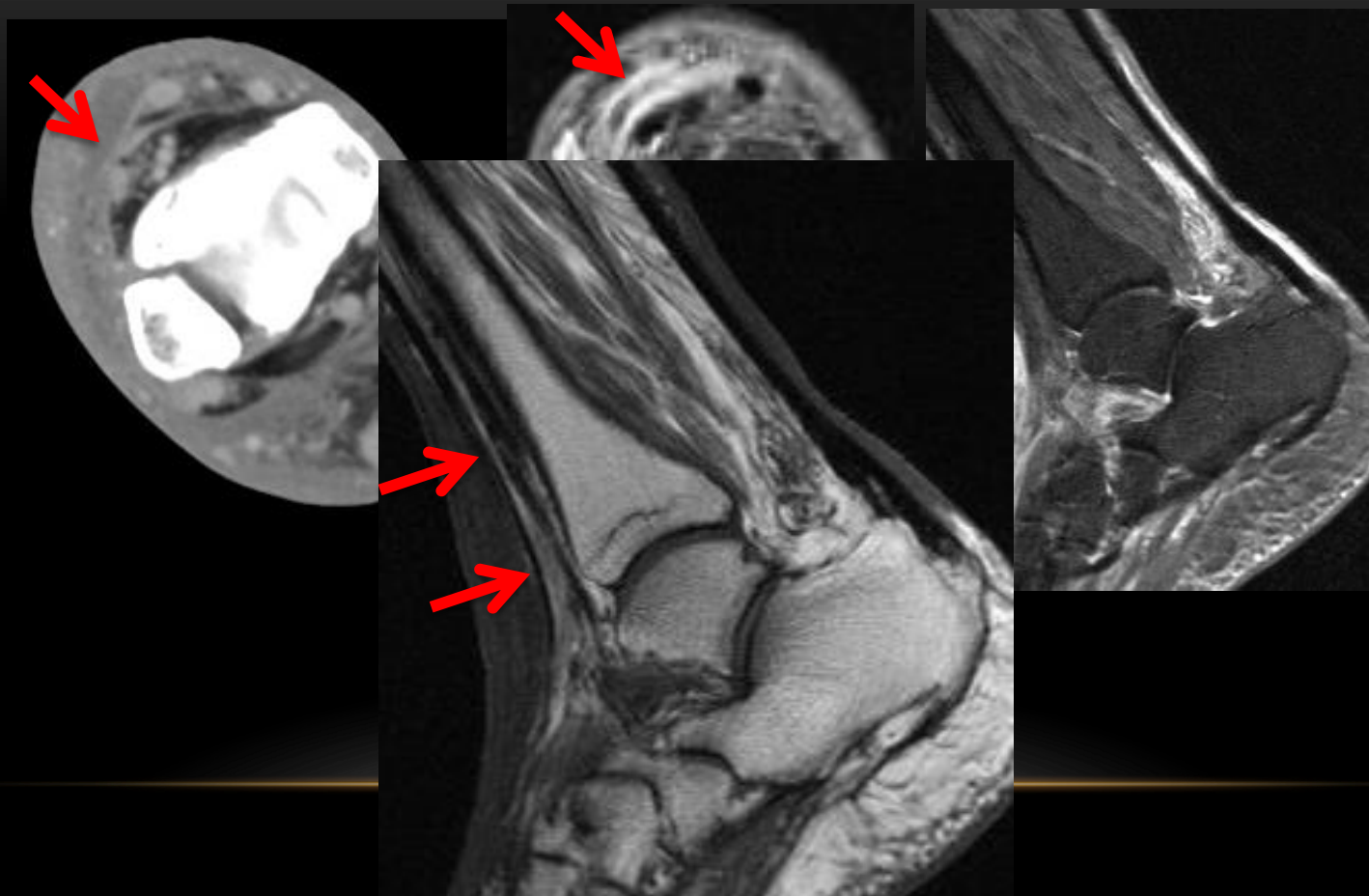
- Pain , erythema, warmth
- Staphylococcus aureus
- Risk = HIV, Diabetes, peripheral vascular disease
- Rx – antibiotics , review



# CELLULITIS



# CELLULITIS + SUB Q FLUID

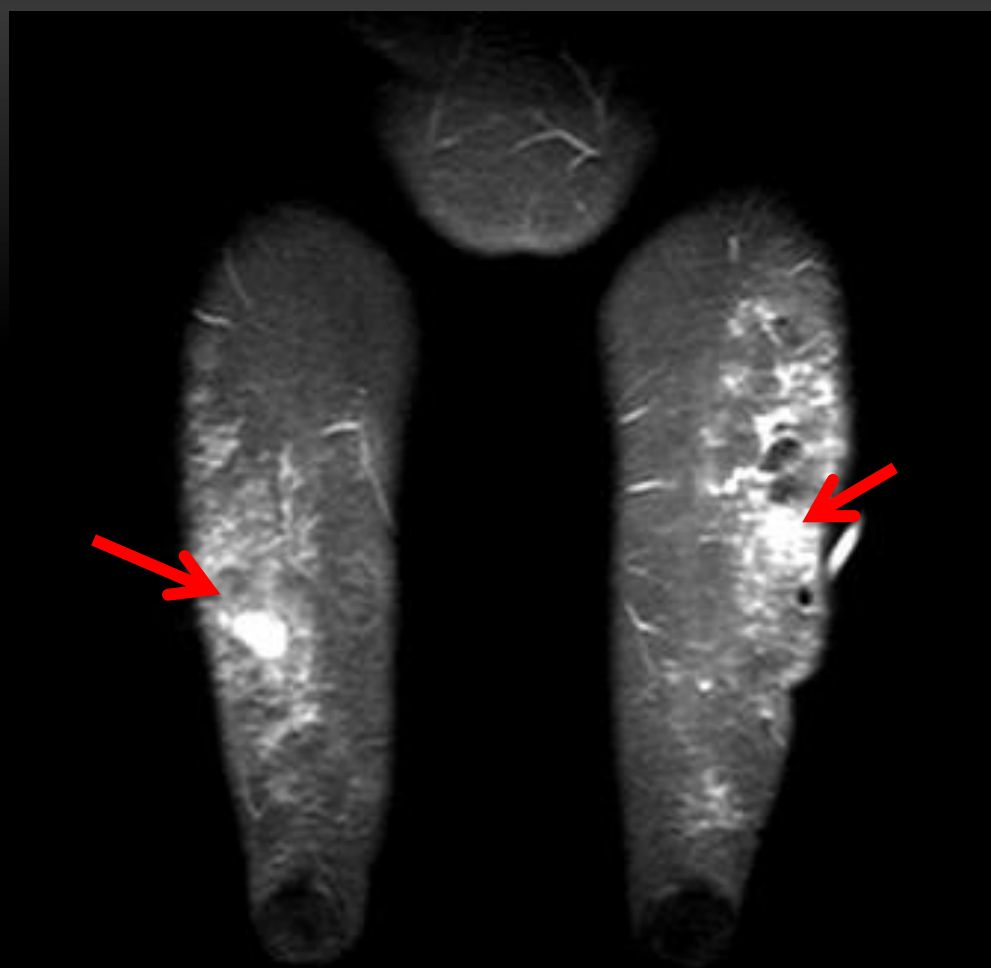


# WHAT THE CLINICIANS WHAT TO KNOW?

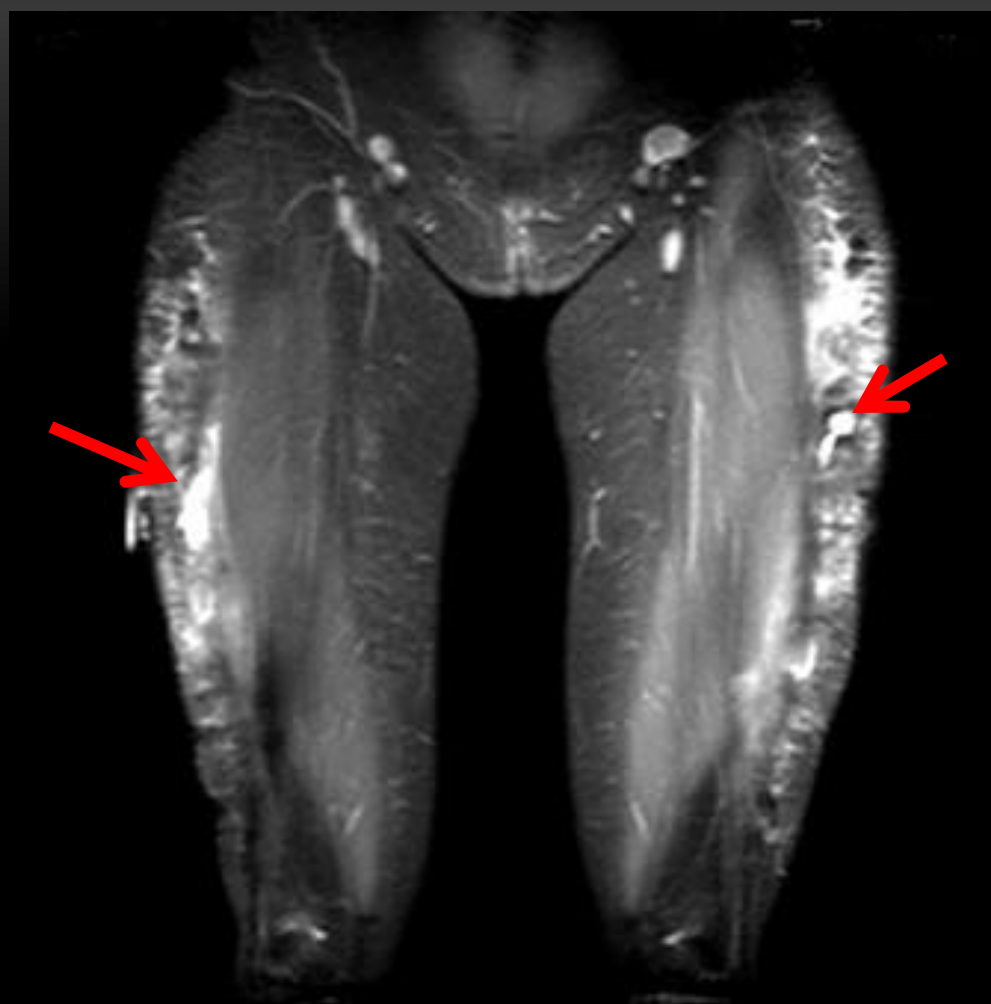
- Cellulitis
  - Extent
  - Any fluid collections superficial to deep fascia -? drainable
  - If follow up – progression / regression



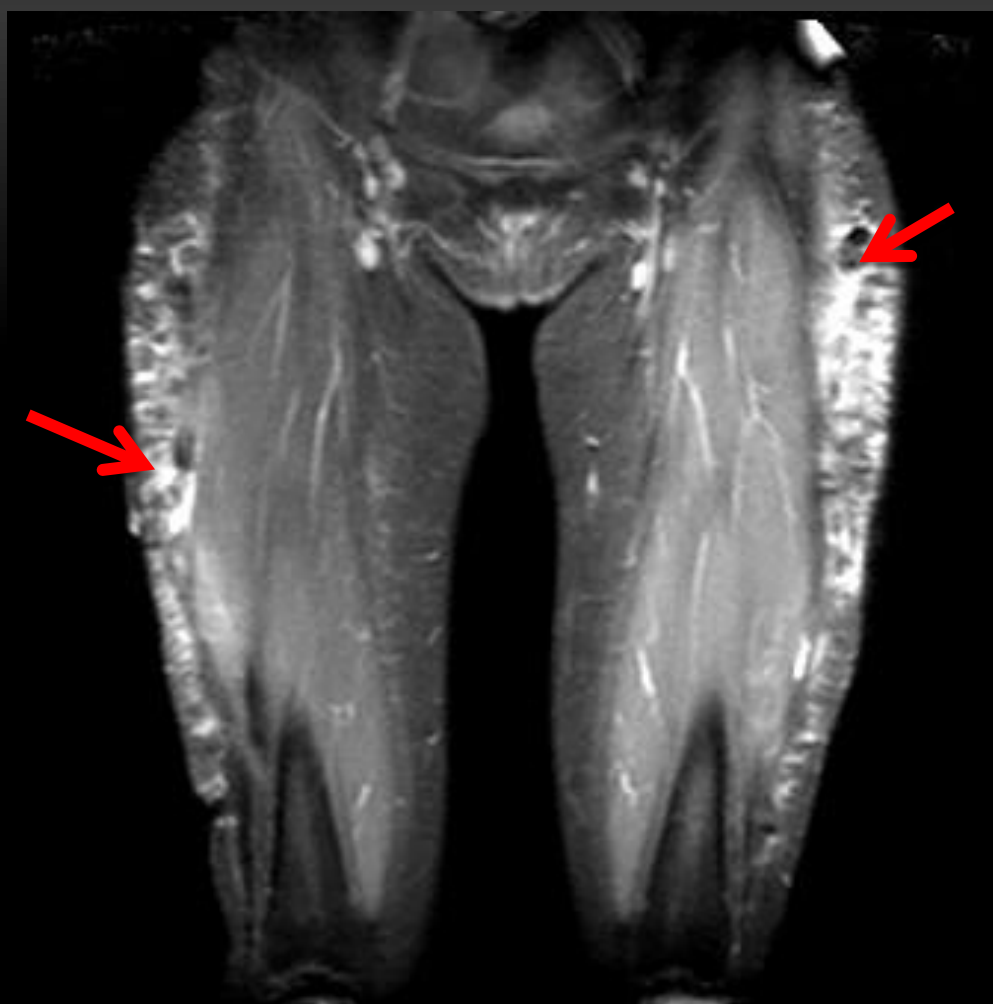
So what happens if the cellulitis spreads?



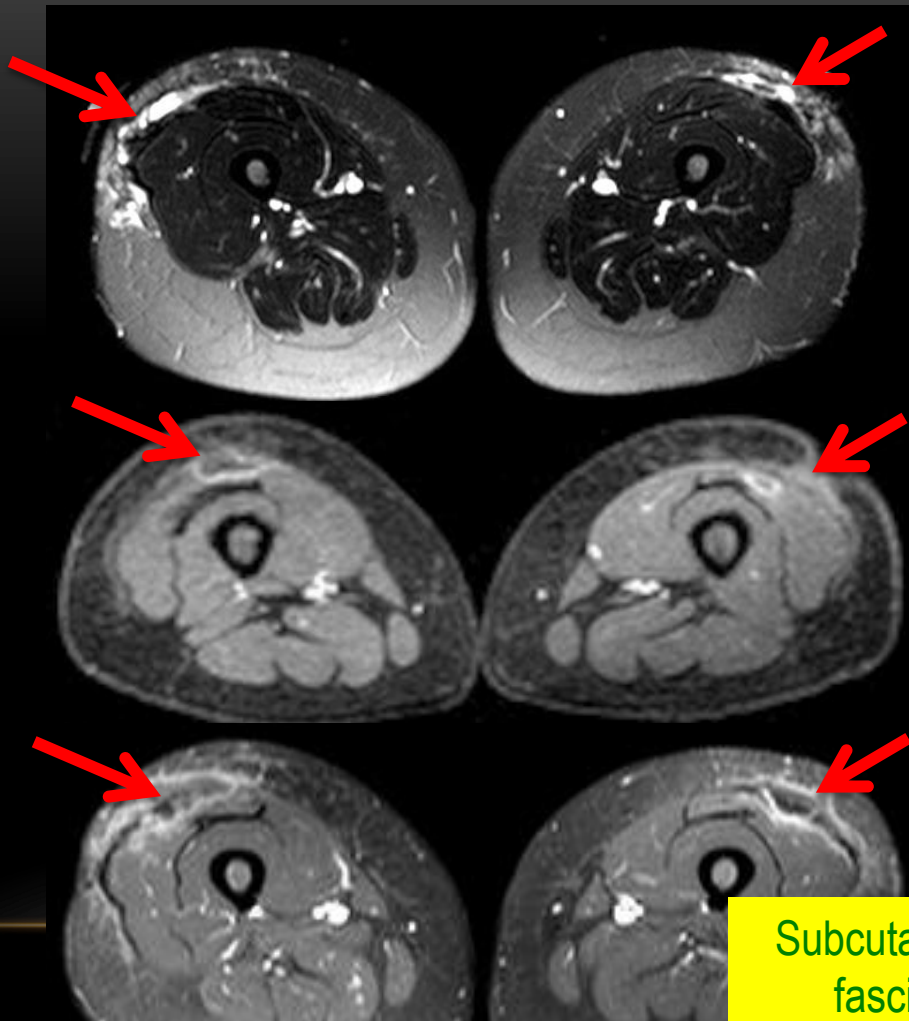
*33 yr old female*



*33 yr old female*



*33 yr old female*



Fasciitis

Subcutaneous + deep  
fascial abscess

So now that we have breached the fascia.....

# Man contracts flesh-eating bacteria while cleaning dock in North Fort Myers

by Sarah Metts — 7:56 PM EST, Fri January 27, 2023

AA



People

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View Profile

## 4-Year-Old Girl Nearly Dies After Strep A Leads to Flesh-Eating Bacteria: 'She Was Deteriorating'

Story by Vanessa Etienne • Jan 26



3



7

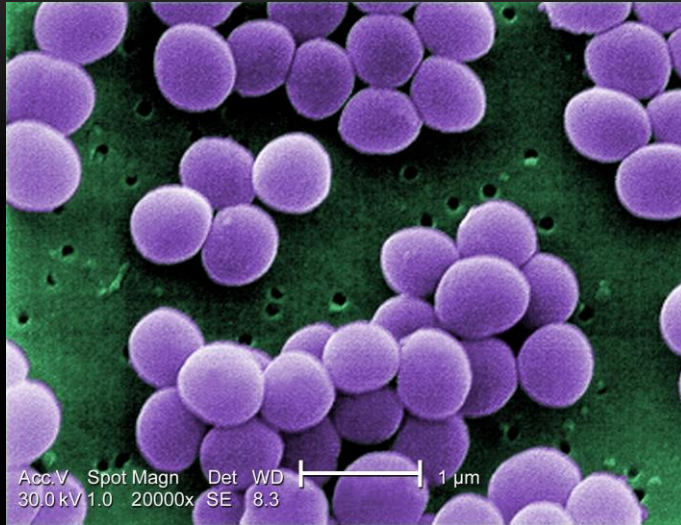


Comments

So I guess I should pay more attention to  
these “flesh eating” monsters .....



# NECROTIZING FASCIITIS



Staph aureus



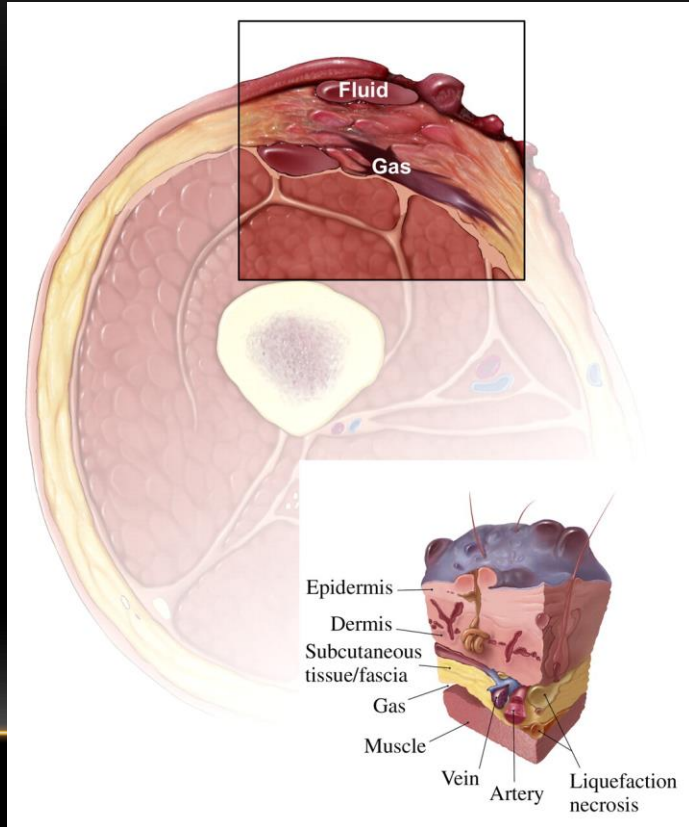
Strep pyogenes



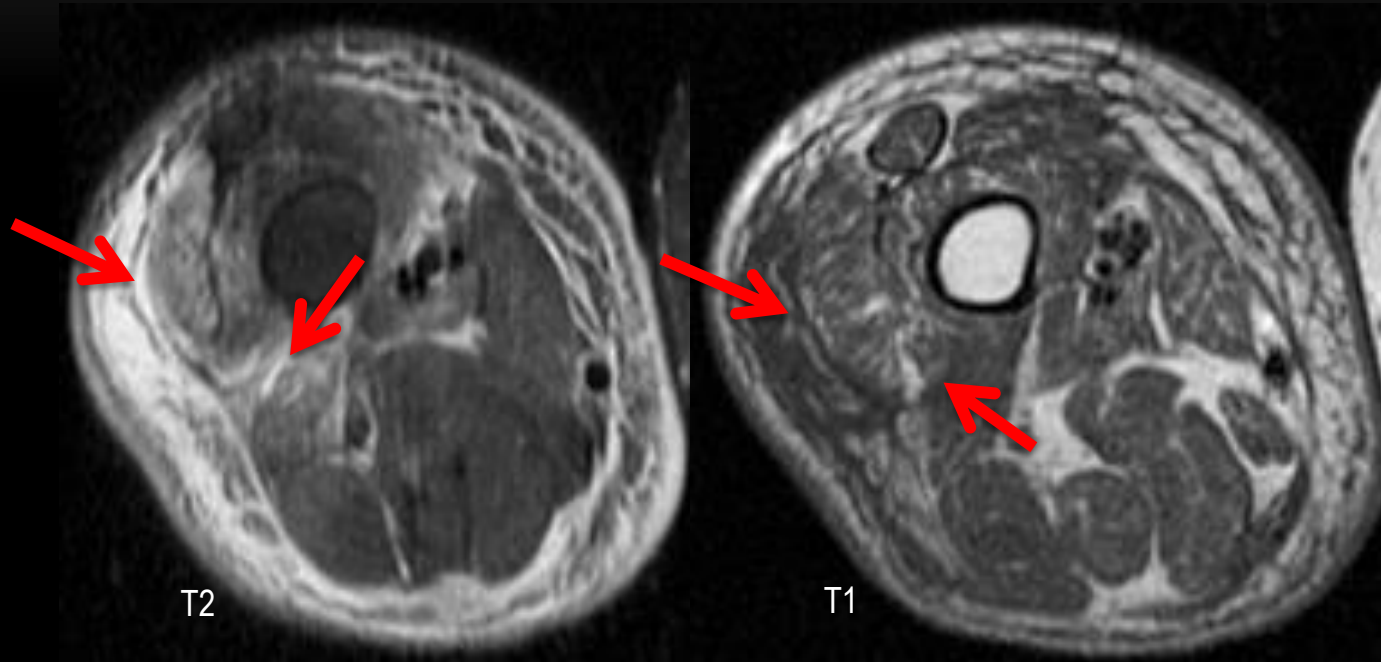
Clostridium perfringens

# NECROTIZING FASCIITIS

- Rapidly progressive infection of deep fascia
- Aerobic & gas forming anaerobic organisms
- Risk = HIV, diabetes, organ transplant, immuno-compromised
- Morbidity & mortality – high 60 – 80%
- DO NOT DELAY



# NECROTIZING FASCIITIS



48 year male



56 year male.....



Necrotizing fasciitis + myonecrosis + osteomyelitis

.....56 year male

# 58 YEAR OLD DIABETIC

Caution – Gross images !



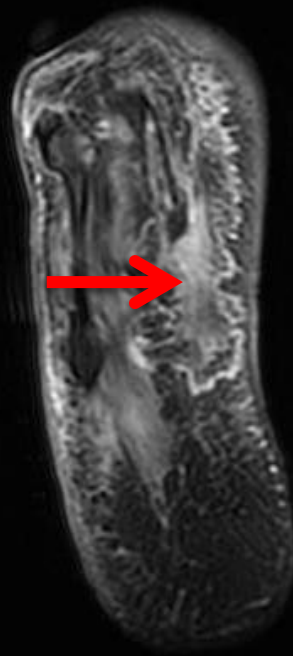


1 week





T1 FS + C



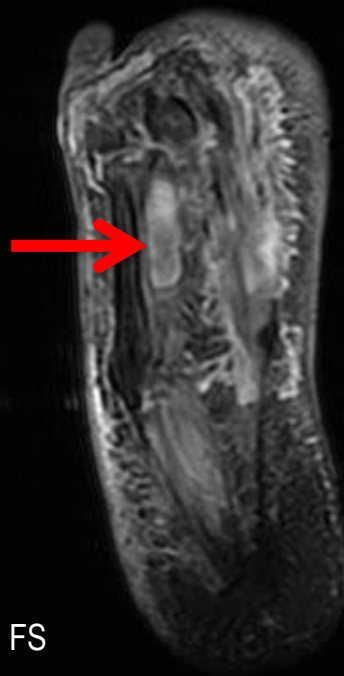
T2 FS





T1 FS + C

: 12 of 36



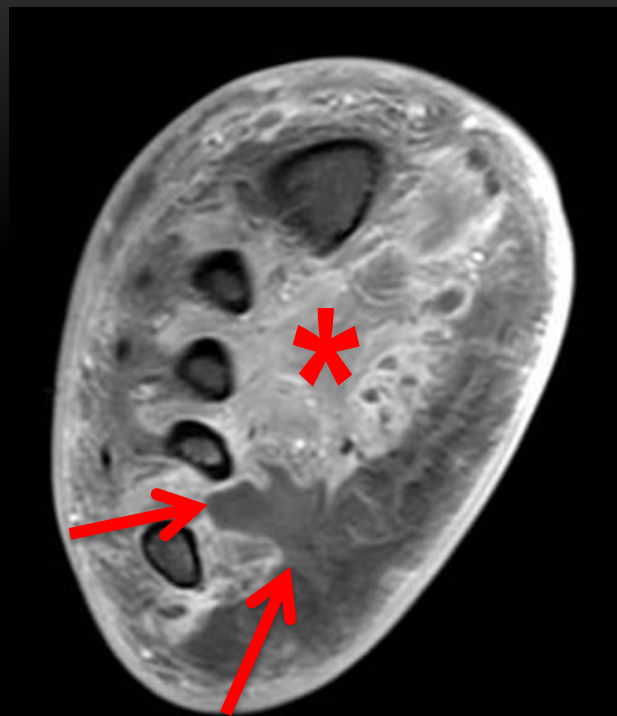
T2 FS

: 12 of 36

IM:12



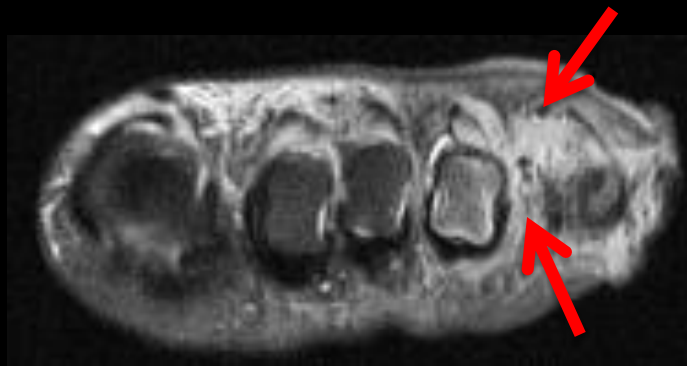
Necrotizing fasciitis



Amputation

# NECROTIZING FASCIITIS - IMAGING

- Gas – superficial or deep
- Relative less subcutaneous edema in comparison to cellulitis
- Thickening of fascia - enhancing superficial and deep fascia with contrast
- Fascial fluid



# WHAT THE CLINICIANS WHAT TO KNOW?

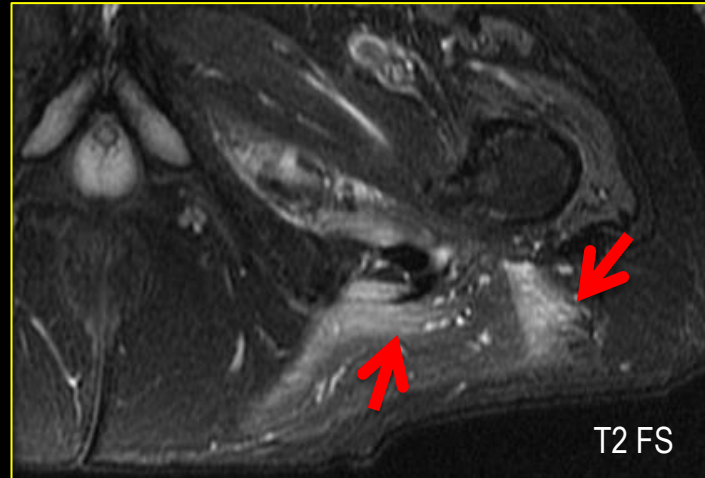
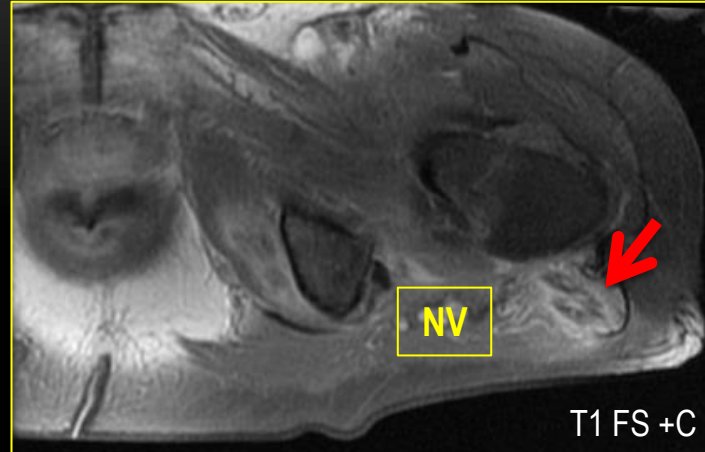
- Necrotizing fasciitis
  - Extent
  - Associated myonecrosis , osteomyelitis
  - Ominous signs – gas , abscess formation

Moving on to something that could be  
anywhere ..... literally

# SOFT TISSUE ABSCESS

68 yr old

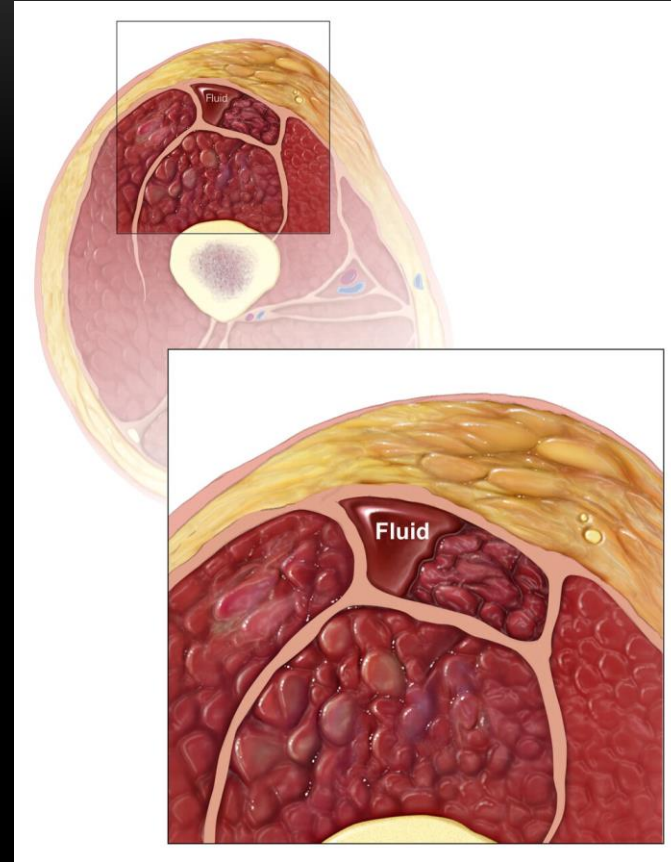
- Staph aureus
- MRSA
- Immuno compromised
- What the clinicians want to know
  - Extent
  - Planes involved
  - Neurovascular structures
  - Walled off ?
  - Single / multiple



Moving on to muscle.....

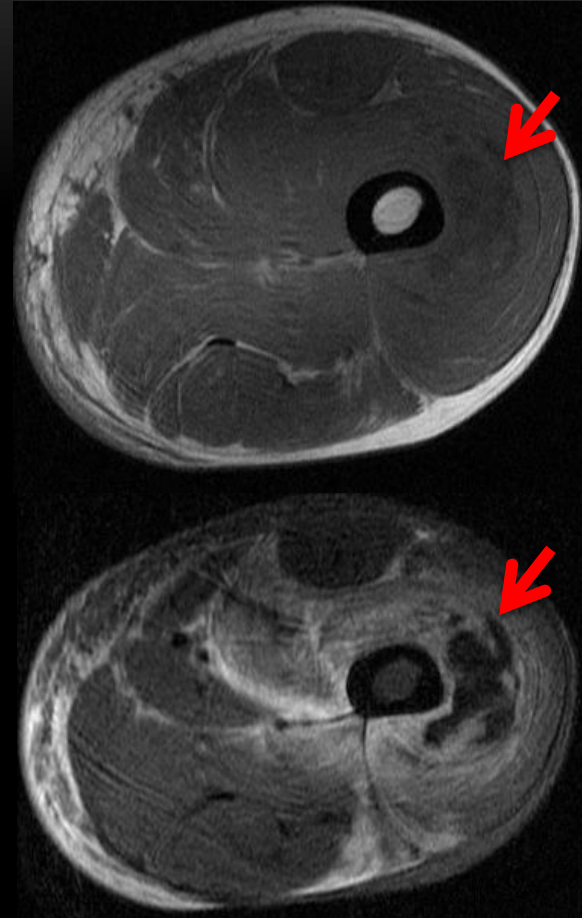
# PYOMYOSITIS

- Staph aureus
- Invasive →  
Suppurative →  
bacteremia / septic
- Immunocompromised  
, muscle trauma,  
injections predispose



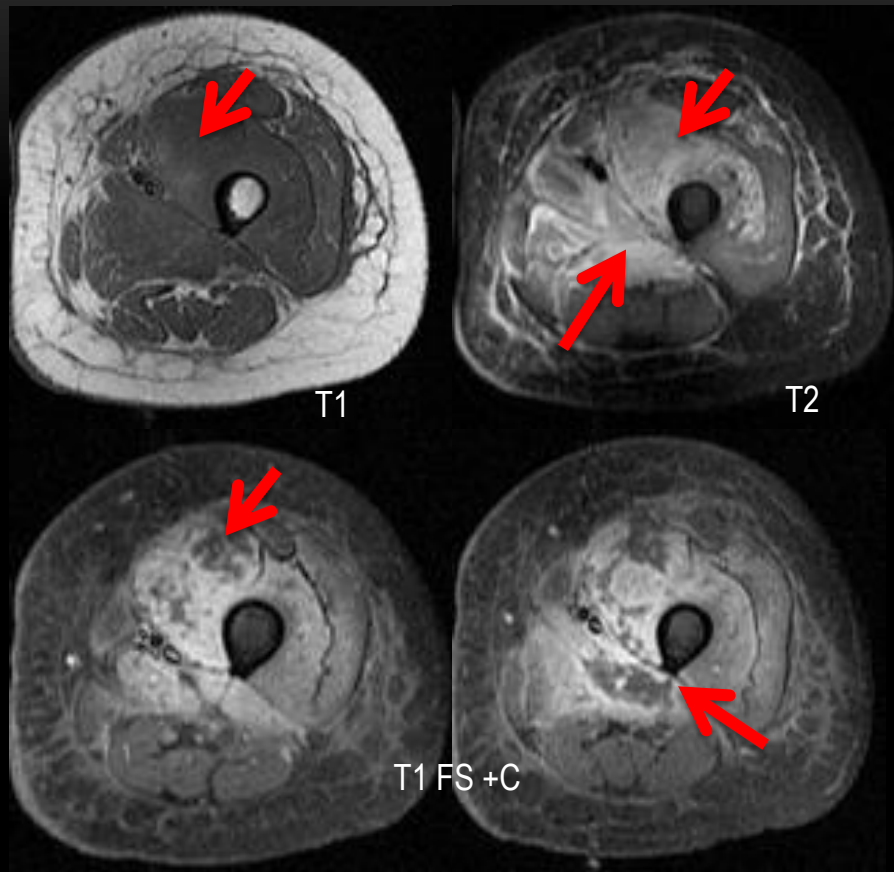


# PYOMYOSITIS



*67 yr old male*

# PYOMYOSITIS



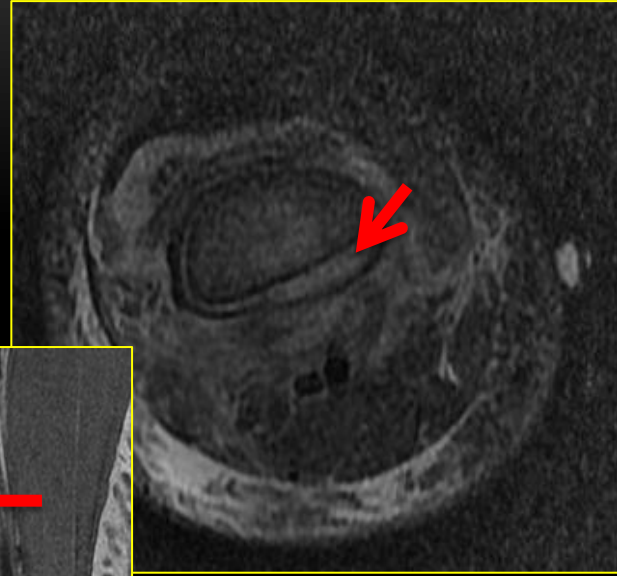
**29 yr old female Post trauma !**

## WHAT THE CLINICIANS WHAT TO KNOW?

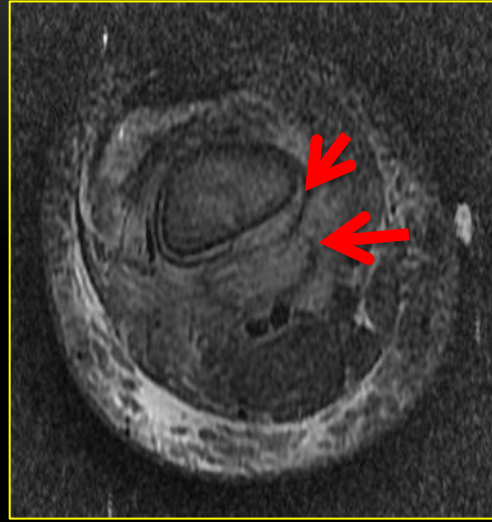
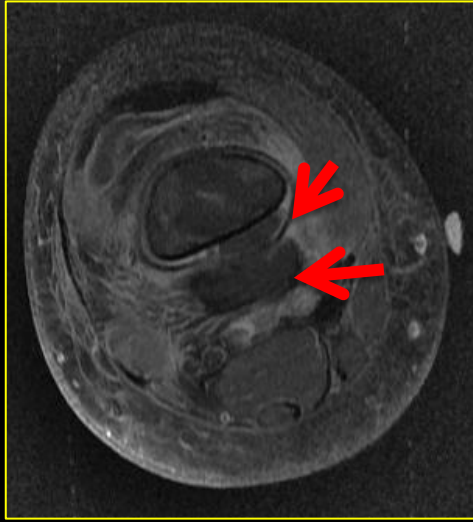
- Pyomyositis
  - Extent
  - Area of myonecrosis
  - Osteomyelitis if any
  - Neurovascular, other soft tissue involvement

Going a bit deeper!

# SUB-PERIOSTEAL ABSCESS



# SUB-PERIOSTEAL ABSCESS – RUPTURE!



*3 days later*

Clinical  
relevance

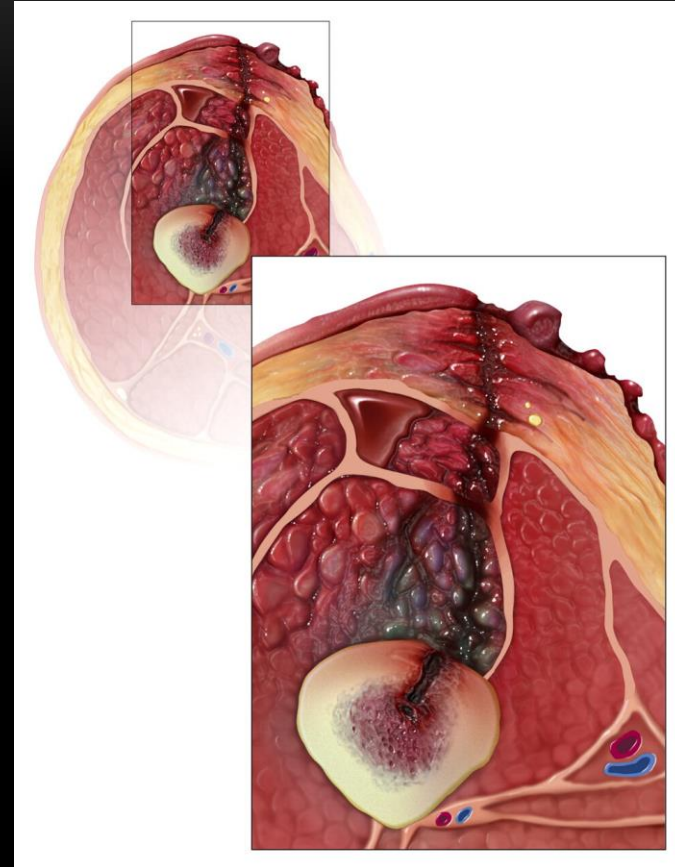
- Confined to periosteum or rupture ?
- If rupture – extent into soft tissue?
- Associated osteomyelitis?



ON TO THE BONE!

# OSTEOMYELITIS - GENERAL

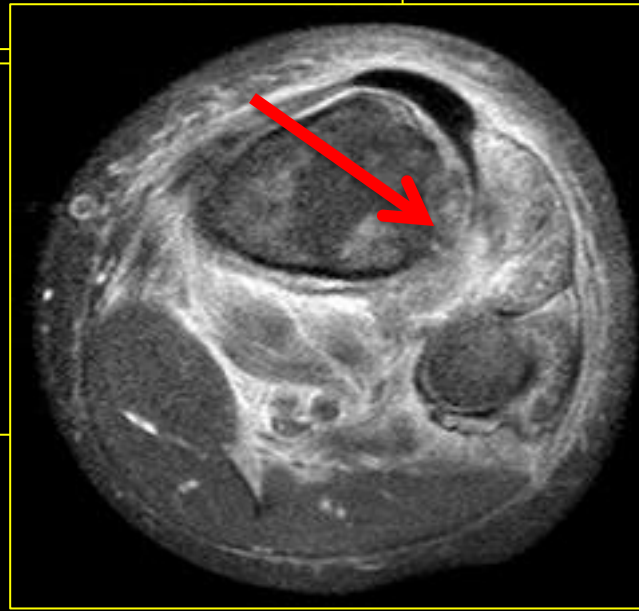
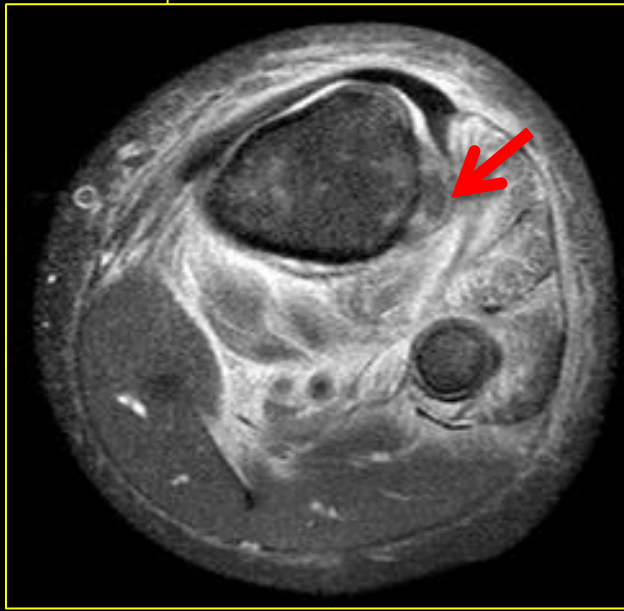
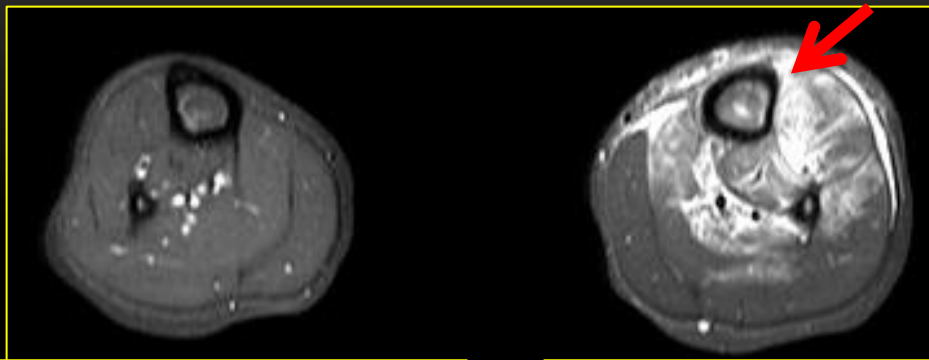
- Hematogenous spread – follows vascularity (children)
- Staph aureus
- Klebsiella, pseudomonas – IV drug abusers
- **skin ulceration** → direct seeding
- Diaphysis – also direct seeding

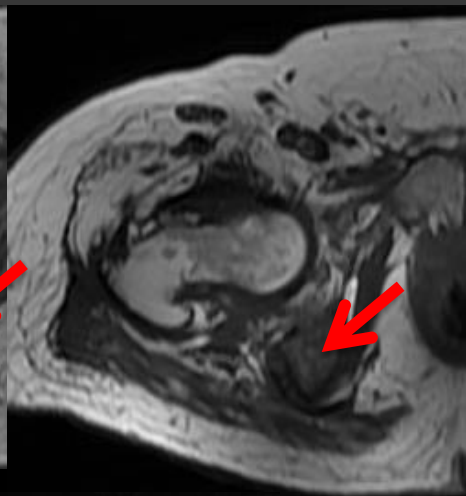
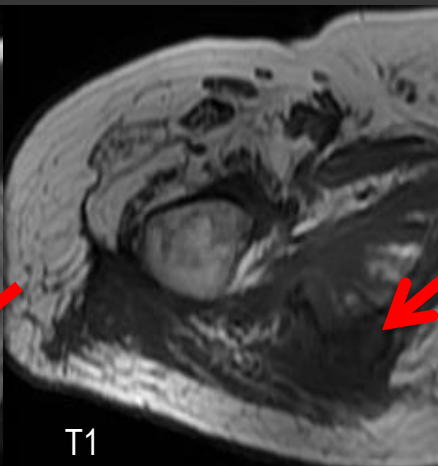
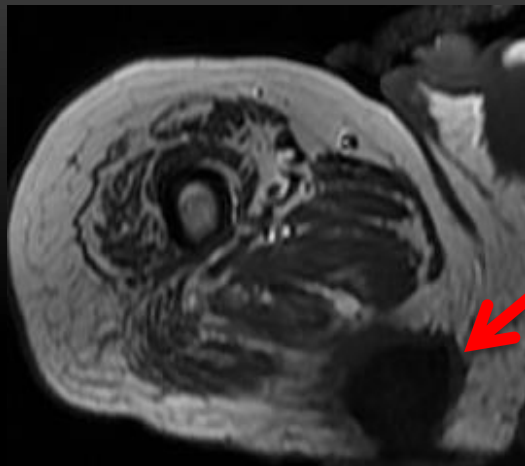




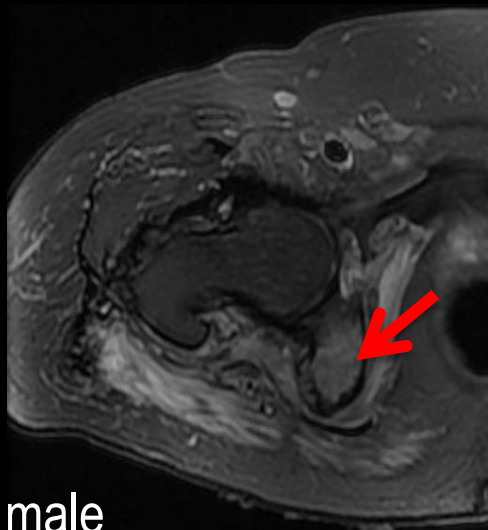
# OSTEOMYELITIS

8yr old male

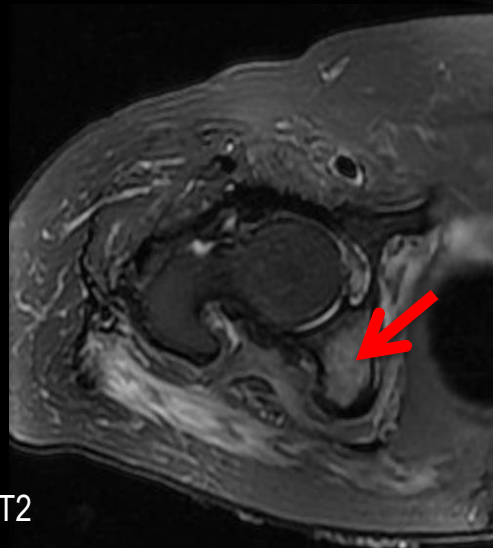




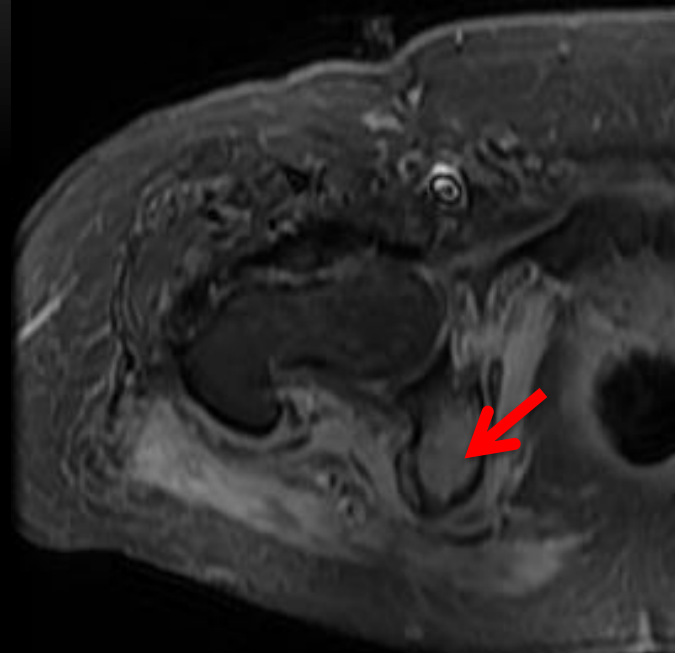
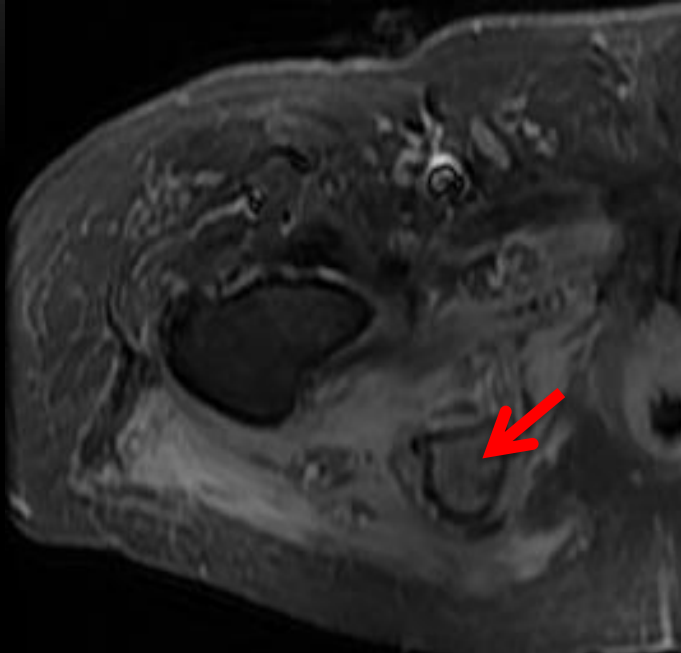
T1



73yr old male



T2



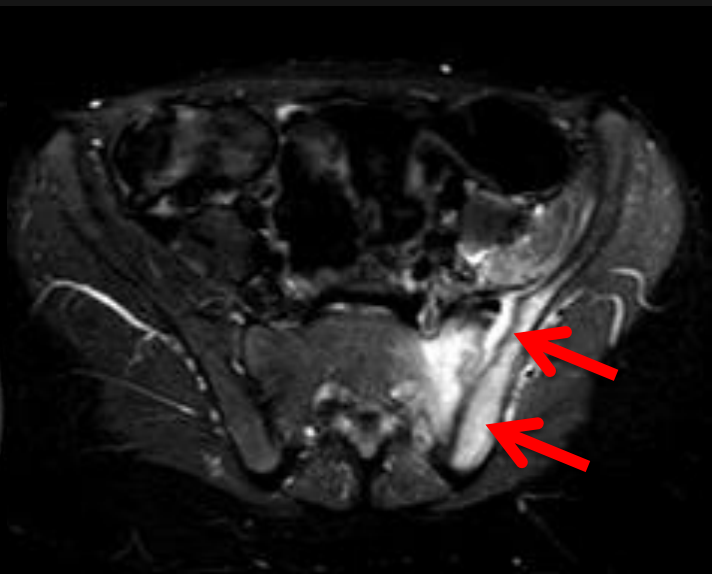
With contrast

OSTEOMYELITIS

# SEPTIC ARTHRITIS

- Hematogenous spread
- IV drug users, Immunocompromised
- Knee , hip ( more in children)
- Sternoclavicular joints in IV drug users

# SEPTIC ARTHRITIS



12 yr male

# SUMMARY

- Consider breach
  - deep fascia
  - Periosteum
  - Bone
- Extent = severity
- High degree of suspicion for Necrotizing Fasciitis

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THANK YOU FOR YOUR ATTENTION!

