General Surgery Lecture Series:

Orthopaedic Trauma & Emergencies

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6/7/2017

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Outline & Goals

- Case based learning
  - "Practical" and "testable"
- Trauma & Emergencies
- Interactive
- *Key take away points regarding evaluation of the patient with pathology of the musculoskeletal system. Principles and algorithms. Not "nitty gritty" evidence.*

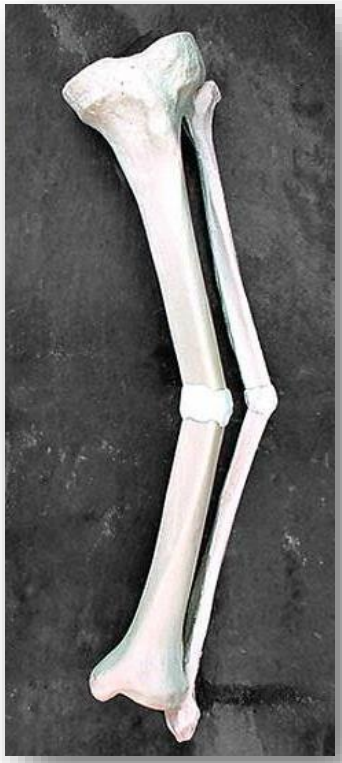
Case #1: JL

- *41 yo female s/p skate boarding injury. Patient reports that she wanted to show the neighborhood children "how it is done". Now with right leg pain, deformity, and swelling. Concomitant left wrist pain and deformity.*

➢ What Next?

Physical Exam

- Inspection?
  - Skin
- Palpation?
- ~~Auscultation?~~
- Special Tests?
- *What Next?*



X-Rays

Reading X-rays

- Start with what you know!
- Describe fracture location
- Describe fracture orientation
- Describe fracture pattern & characteristics
- Classification system
- Associated injuries

Trauma Radiograph Principles

- You have to have them
- One view is **NO** view
- Adequate visualization
- Joint above and below
- Image what hurts
  - Secondary
- Special views
  - Axillary
  - mortise

Where were we?

What should we do next with our patient?

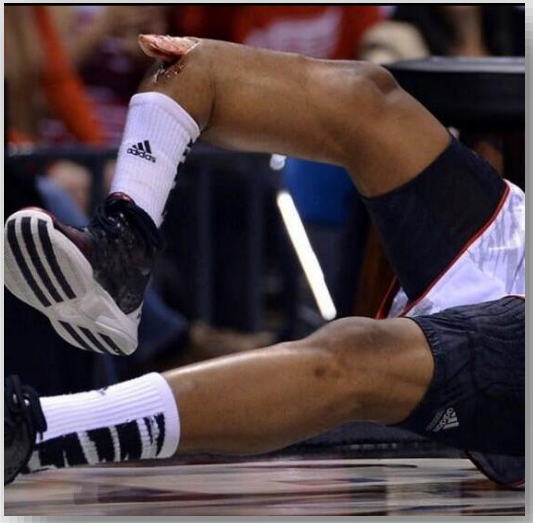
Management options….

Management

- Provisional
  - Principles

- Definitive
  - Options
  - Healing types
  - Indications

Case 1(a): What if ???



- Open
  - Classification
  - Management
    & Why (careful w/ irrigation)
  - Prognosis (all about the energy)

Important Consequences

1. Contamination of wound/bone with exposure to external environment

2. Crushing, striping, & devascularization results in soft tissue compromise with increase susceptibility to infection

3. Soft tissue envelope destruction can effect immobilization, compromise healing of fracture (progenitor cell injury), and result in loss of function (muscle, tendon, nerve, ligament, skin, etc)

Antibiotics Cheat Sheet

	Type I	Type II	Type III	Organic Contamination
Cefazolin 1gm Q8H	X	X	X	
Aminoglycoside 3-5 mg/kg/day			X	
PCN 2 mil U Q4H				X

Grade I, II: Fist generation cephalosporin

Grade III: Add aminoglycoside (fluoroquinolone)

Farm Injury: PCN or Flagyl

Tetanus PPX Cheat Sheet

Immunization history	dT	TIG	dT	TIG
Incomplete (< 3 doses) or unknown	+	-	+	+
Complete / >10 yrs since last dose	+	-	+	-
Complete / <10 yrs since last dose	-	-	-*	-

dT: diptheria and toxoid

TIG: immunoglobulin

*: required if >5 yrs since last dose

- ER
- Toxoid dose 0.5 mL always
- TIG dependent on age
- IM (different syringe)

So…. What did we do….?

Surgery

- Patient underwent ORIF with IMN
  - Post-op plan
  - Complications
  - Expectations
  - Bone = Bone

Case 1(b): What if ???

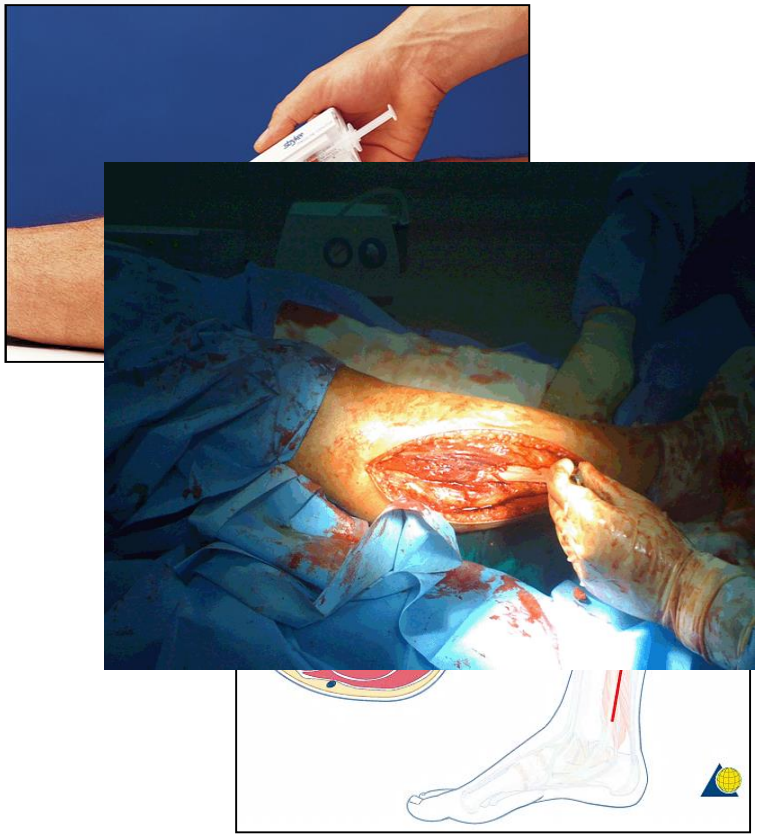
…You were called to floor for increasing pain that is not well controlled, even with oral narcotics. The patient however just had surgery about 8 hours ago, and the postop check was relatively uneventful.

- Thoughts?

Compartment Syndrome

Diagnosis

- The “P’s”
- Physiology
- Anatomy
- Open fracture
- Threshold and ΔP



Treatment

- Surgery, Surgery, Surgery
- Empirical

Pain, paresthesia, pallor, paralysis, pulselessness, poikilothermia [passive stretch and proportion]

Case 1(c): What if ???

…You were called to floor for a sudden onset of tachycardia and hypertension. Previously the patient was doing well, and had ambulated with physical therapy. She also having new onset shortness of breath.

- Thoughts
- DDx

Tachy, HYPERtensive, W/ SOB

Thromboembolic Disease (DVT/PE)

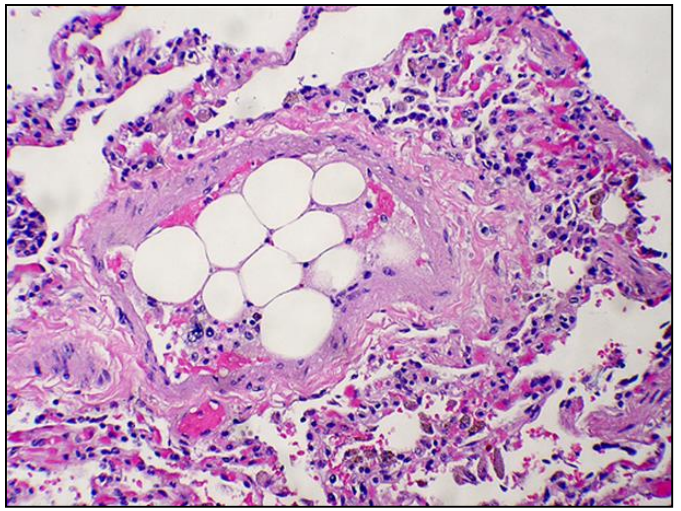
- Lower extremity trauma (thromboplastin)
- DVT ≠ PE (hyper v hypo)
- Below knee v above knee
- Diagnosis (venography/pulmonary angiography)
- PPX v treatment
- *Far more common than fat embolus (ppx)*
- *Clinical v Subclinical*
- *Double hit (hx, OC, smokers, genetic, etc)*

Tachy, SOB

Fat Embolism

- Shelf only
- Rare = highly tested
  - 3-4% v 10-15% (poly trauma)
- Long bone fractures
- ARDS!!!
- Macrogobules damage small vessel perfusion
- Mechanical (bone marrow)
- Metabolic (chylomicron Δ's)

*METHOD OF FIXATION RELEVANT?

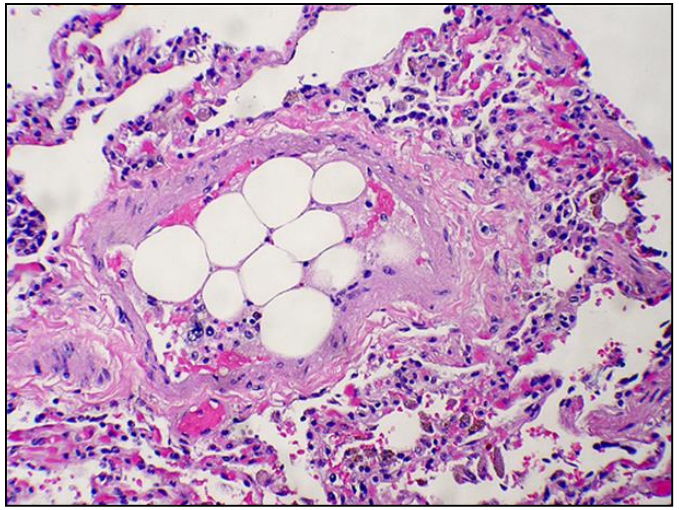


Tachy, SOB

Fat Embolism

- Hypoxia
- CNS depression
- Petechia:
  - axillae, conjunctivae, or palate
- Pulmonary edema
- Mental status changes
- Confusion

*METHOD OF FIXATION RELEVANT?

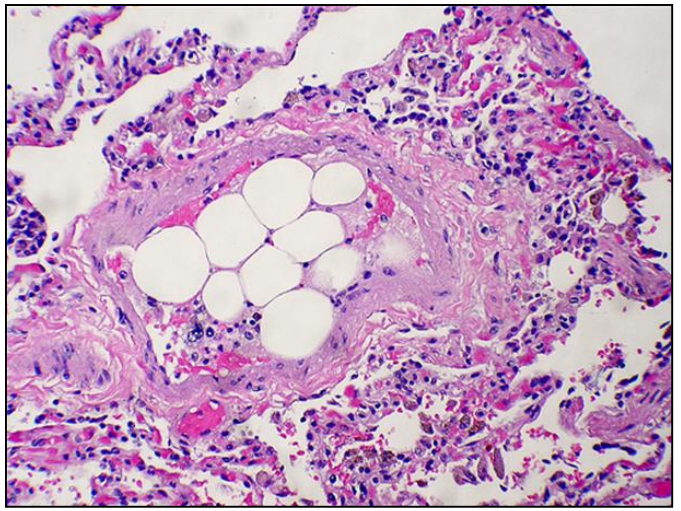


Tachy, SOB

Fat Embolism

- Major Criteria
  - Hypoxemia ($PaO_2 < 60mmHg$)
  - Mental Status changes
  - Rash
  - Pulmonary edema (ARDS)
- Minor
  - Tachy
  - Pyrexia
  - Retinal emboli
  - Fat in urine
  - Thrombocytopenia
  - HCT decrease

*METHOD OF FIXATION RELEVANT?

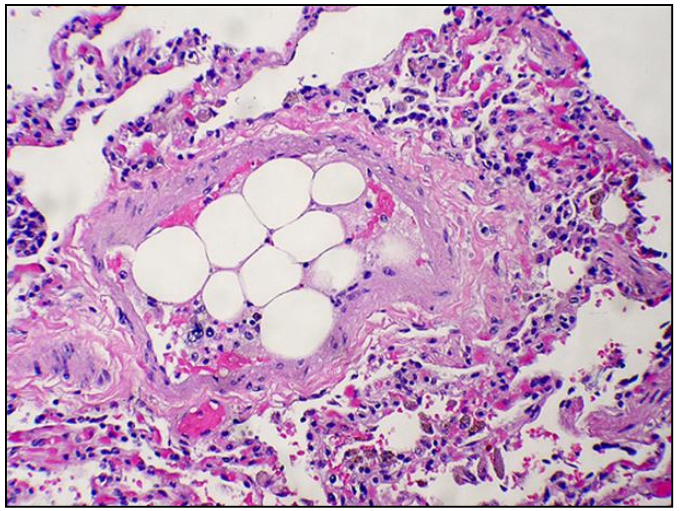


Tachy, SOB

Fat Embolism

- Mechanical ventilation
- High levels of PEEP
- Positive end expiratory pressure (PEEP)

*METHOD OF FIXATION RELEVANT?



* Larger driver shafts
* Early stabilization

Emergencies and Trauma

Shelf Principles

- Open injuries
- IMN vs ORIF and Op vs Nonop
- Compartment Syndromes
- Associated vascular injuries
- Pay attention to clues in the stems
- Questions? Practice Questions Issues?

END

Questions / Comments