Orthopedic Urgencies & Emergencies

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Disclosures

- Founding partner - Boston Outpatient Surgical Suites (BOSS), Waltham MA
- Chief Medical officer & partner Parcell Labs - Needham, MA – ELA cell
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- Investing Partner Ativa
Orthopedic Urgencies & Emergencies

Objectives

• Define some Orthopedic urgencies and emergencies that walk (or Call) into your office
• Discuss Practice relevance
• Review Examples and management
Orthopedic Urgencies & Emergencies
Not Covered Today

- Obvious injuries like:
  - Open fractures
  - Major trauma

Covered Today

- “Sleepers”
Orthopedic Urgencies & Emergencies

Definition

A musculoskeletal injury or condition that, if missed, or delayed, could result in additional complications, significant impairment, or death.
Orthopedic Urgencies & Emergencies

Practice Relevance:

- Litigation!
- Mental Anguish

"Your fee is causing us more mental anguish than the accident."
Case Presentation 1

• A 12 year old African American male presents with his Mom who relates he has had intermittent right knee pain for two months
• Slight limp on occasion
• Pain usually with or after exertion (running)
• Denies any trauma - No pain with walking
• Normal Gestation-Normal PMH/FH
• Recent Growth spurt
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Case Presentation 1

Physical Exam

• A febrile
• Vital signs are normal
• Abdomen normal
• 95th Percentile in weight for his age
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**Case Presentation 1**

Knee exam

- No effusion
- ROM normal
- Patella tracts well
- Ligaments/Meniscus intact
- Has enlarged tibial apophysis
- Xrays of the knee is normal with open physisc

Dx?

Slipped Capital Femoral Epiphysis (SCFE)
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SCFE

Definition

- An abrupt displacement through the proximal femoral physis
- Similar to a Salter Harris type one fracture
- Metaphysis moves anterosuperior, epiphysis stays in the acetabulum (posteroinferior)
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SCFE

Epidemiology/Demographics

• Incidence
  – 0.25 in Japan to 10/100,000 in NE USA

• Males account for 60% of cases

• Mean duration of symptoms if stable 5 M

• Mean Age at Diagnosis
  – Male = 13.5  Female = 12
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SCFE

Epidemiology/Demographics

- Age at Dx decreases with increasing obesity
- Half above 95th percentile in weight for age
- Bilateral 18% to 63%
- Racial differences highest in pacific islanders and African ancestry
Classification # 1:

- **Pre Slip** 1-3 m prodromal symptoms
  - Seen in 90% of patients
- **Acute Slip** 10 – 15% of pt, sympt < 3 weeks
- **Chronic Slip** 85% pt, Symptoms > 3 weeks
- **Acute-on-Chronic**-sympt >3weeks with new increased pain
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SCFE

Classification #2:
Stable SCFE vs Unstable SCFE

• **Stable SCFE** - can walk with or without crutches
• **Unstable SCFE** – cannot walk due to pain
• ***Unstable SCFE has up to 50% incidence of osteonecrosis***
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SCFE

How do they Present?

• Short overweight male
• Pain in groin, hip or knee (Knee usually)
• Limp
• Chronic vs acute pain
• Walking or unable to walk
• Inform the receptionist – they can pick these up
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SCFE
Etiology

Biomechanical
- Obesity
- Femoral retroversion
- Increased physeal obliquity

Biochemical
- Puberty
- Testosterone
  - Weakens physis
- Estrogen
  - Strengthens physis
- Hypothyroidism
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SCFE

Radiology

- A/P Pelvis
- Lateral of hip
- Need comparison
- Klein’s line
- Increased Sclerosis
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SCFE

Treatment

- Admitted - NWB
- In situ fixation
- May need bilateral fixation

Recommended reading:

Slipped Capital Femoral Epiphysis: Current Concepts, Aronsson, Loder et al

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Case Example 2
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Case Example 2

- A 6 year old ADHD male presents with his parents for evaluation of a painless R limp over the last two months
- Insidious onset/ constant
- No significant past medical history
- No significant family history
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Case Presentation 2

Physical Exam:
• Afebrile, Vitals normal
• 40\textsuperscript{th} percentile Ht/Wt
• Appears younger than 6
• Slight Trendelenburg gait
• Limited Abd and Int rotation of his hip
• Knee / foot/ back exams are normal

Dx ?

Legg-Calve-Perthes Disease (LCPD)
Osteonecrosis
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Legg-Calve-Perthes Disease

• Affect a wide age range of children
• Most common age 5-8
• 5:1 male-to-female ratio
• Bilateral in 10 – 15% of patients
• Child appears younger than chronologic age
• Some are Hyperactive
• Dx of exclusion (sickle cell, steroids, skeletal displasia)
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Legg-Calve-Perthes Disease

***Painless Limp***

- 4 Radiographic Stages - Waldenstrom
  - Increased radio-density
  - Subchondral Collapse
  - Fragmentation
  - Re-ossification
  - Healed
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Legg-Calve-Perthes Disease

Prognostic indicators:

- Age at onset (<6 yrs, 6 to 8 yrs vs >8 yrs)
- Femoral head deformity
- Extent of head involvement
- Premature Physeal closure
- Catteral “Head at risk” signs
Legg-Calve-Perthes Disease

Management:

• Based on age at onset
• <6 yrs – Non weight bearing / non surgical
• 6-8 yrs – surgical / Phys Therapy appears to have better results
• > 8 yrs bracing and surgery
• Refer to orthopedics
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Legg-Calve-Perthes Disease

Suggested reading:

Legg-Calves-Perthes Disease (a review article)
Harry K. Kim, MD
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Case Presentation 3
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Case Presentation 3

• Your 45 year old chronic asthmatic patient is admitted through the ER for respiratory distress

• ER workup includes CXR, CBC w Diff, Abg, and Sputum culture

• O2 sat on O2 is 89%

• She is admitted to you for treatment of her respiratory distress
Case Presentation 3

• One hour after admission she starts complaining of right forearm pain which increases in intensity over the next 2 hours

• Her pain continues to get worse and she is begging for pain medication
Physical exam:

- Respiratory distress resolving
- Her forearm is tight and firm
- Decrease pulses compared to the opposite side
- Capillary refill is diminished
- She has pain with passive extension of her middle finger
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Case Presentation 3

Dx ?

Acute Compartment Syndrome
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Compartment Syndrome

- An increase in intra-compartmental pressure that is above 20 mmHg below diastolic pressure (> 30 mmHg)
- Undiagnosed CS can have disastrous consequences
- 4 hours ischemia is tolerated
- 6 hours ?? 8 hours irreversible
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**Compartment Syndrome**

- Muscles contained in compartments
- Increased pressure
- Fascia is the containment system
- Vascular compromise
- Muscle/Nerve hypoxia - necrosis
Compartiment Syndrome

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**Causes:**

- Muscle Injury (crush)
- Open/Closed fractures
- Arterial Injury
- Temporary Vascular occlusion
- Drug Overdose (compression injuries)
- Snake Bites (injection)
- Gunshot wounds
- Burns
- Exertional states
- Leaking IV’s
- Bruises in Hemophilia patient’s
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Compartment Syndrome

BEWARE!

- **Head injury, Overdose, Obtunded Pt’s**
- Will be progressive and self sustaining
- Failure to recognize will lead to litigation
- High index of suspicion
- Can and will occur after admission!!
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Compartment Syndrome

Clinical Evaluation:

• 5 P’s?

PAIN, Pallor, Pulselessness, paralysis, Paresthesia
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Compartment Syndrome

Diagnosis:
• Best done by intracomp pressure testing
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Compartment Syndrome

Treatment:

- Hypothermia, Steroids, anticoag’s (animal)
- Surgical Fasciotomy best

Suggested Reading:

Acute Compartment Syndrome: Update on Dx & Treatment

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Case Presentation 4

• A 46 yr old construction worker calls for an appointment with c/o chronic LBP that occasionally radiates down his leg
• He has just moved to the area and has been treated by his last Primary care with physical therapy and occasional steroids
• His new complaint is of numbness down his thigh that started after lifting a heavy box
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Case Presentation 4

- He is given an appointment however he calls back later that day to report a c/o urinary retention
- Perineal paresthesias

Dx ?

Cauda Equina Syndrome

“Horses Tail” Terminal spinal cord beginning with first lumbar nerve root
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Cauda Equina Syndrome

Symptoms:

- Varying Low Back Pain
- Sciatica
- Lower Extremity sensory motor loss
- LE weakness/DTR loss
- Perineal hypoesthesia or saddle anesthesia
- **Bowel or Bladder dysfunction**
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Cauda Equina Syndrome

Pathophysiology

- Unclear
- Nerve root damage by:
  - Compression
  - Ischemia
  - Venous congestion
- Tumors
- Trauma
- Spinal Stenosis
- Epidural abscess
- Epidural hematoma
Orthopedic Urgencies & Emergencies
Cauda Equina Syndrome

Evaluation:

• Detailed History of back or leg pain
• Pain is progressive in nature
• Bowel or Bladder dysfunction
• High index of suspicion with anticoagulated patients
Orthopedic Urgencies & Emergencies
Cauda Equina Syndrome

Evaluation:

- Sacral nerve root evaluation
- S2-S4 dermatomes perianal and posterior thigh
- Pinprick sensation (may have light touch)
- Rectal tone and voluntary contracture
- Bulbocavernosus reflex
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Cauda Equina Syndrome

Treatment:

- Orthopedic evaluation emergently
- Surgical decompression

Suggested Reading:
Cauda Equina Syndrome, Spector et al,
J Am Acad Orthop Surg;2008;16; No 8; 471-479
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Case Presentation 5
Orthopedic Urgencies & Emergencies
Case Presentation 5

• 68 year old male calls complaining of knee pain for several days
• Today awoke with a large hot swollen painful knee
• Denies PmHx or Family Hx of Gout or Pseudo-gout
• Recently had dental work done
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Case Presentation 5

- Low grade temp 101.3
- WBC slight left shift
- ESR 20
- CRP 3

Dx?

Septic Arthritis
Treatment:

• Aspiration - cultures
• Urgent surgical washout
  Arthroscopic
• Please do not start Abx
  (screws up the cultures)
Orthopedic Urgencies & Emergencies
Recap

- Septic Arthritis
- Compartment Syndrome
- Slipped Capital Femoral Epiphysis (SCFE)
- Legg-Calves-Perthes Disease (LCPD)
- Cauda Equina Syndrome
- Flexor tendon Injuries/Infections – Knavel’s signs
- Open Fractures
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Pearls:

- **SCFE** – Knee pain in peripubescent overweight child
- **LCPD** – Painless limp @ 6-8 yr old
- **Compartment Syndrome** – Pain out of proportion to injury (beware the Obtundet)
- **Cauda Equina Syndrome** – Bowel/Bladder
- **Septic Arthritis** – don’t start abx
THANK YOU!