Small Injury, Big Consequence: Subtle Orthopedic Injuries Not to Miss

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Objectives

Recognize 5 commonly missed orthopedic injuries
All with morbidity consequences
Pitfalls in diagnosis
Tricks to catch them
6 year old male

Grabbed Knife “Helping” to Unload Dishwasher
Cooperative child

Repaired in clinic, LET and local

Follow up 7 days for suture removal
See child 6 months later

“We had to have surgical repair”
Flexor Tendon Injury

Up to 10% of important hand injuries missed on initial evaluation

Late repair? Increased disability

Errors of omission
Flexor Tendon Injury

<25% - Nothing to Do
25-50% - Probably don’t repair
>50% - Repair
Kumil, R; Yao, J. Plastic and Recon. Surg. 7/17
Triggering

Entrapment

Rupture
Examine wound through FULL RANGE OF MOTION
Positions of Function

20° wrist extension

90 ° at MCP

PIP, DIP fully extended
Extensor tendon lacerations

Modified Elson’s test

Central slip injury

From ALIEM.com
Flexor (and Extensor) Tendon Lacerations

Failure to fully evaluate the injury through a full ROM

Failure to perform appropriate exam maneuvers
16 year old male

R Shoulder Pain after Weightlifting
Home with sling, mobility exercises

Seen 6 weeks later, now in post-surgical brace
Posterior Shoulder Dislocation

Seizure, Weightlifting, Electrocution

Persistent Shoulder Pain

AP view misses 50% of cases

“Lightbulb” Sign

Axillary View
To Recap:

Shoulder Pain with Mechanism

AP views will miss half!

Don’t fail to order appropriate views!

Axillary view clinches
10 year old male

Twisted Ankle Playing Football

Not weight bearing 24h later
X-ray ankle normal

TTP

Ace Bandage, Crutches, WBAT

Ortho f/u 1 wk
FYI email

“Thank you for this consult”

Brought rapidly to OR
Syndesmosis injuries

Fibrous joint holding 2 bones together

Interosseous membrane

Force transmission
Squeeze test

AP force proximal to mid tib/fib
Positive – Replicate pain @ ankle

“High Ankle Sprain”
Where else can this occur?
Ulna/Radius Interface

Monteggia fracture/dislocation

Transmitted force along syndesmosis

~1/3 radial dislocations missed

MINORITY (1/3) have good functional outcomes if missed
Pitfall

Bowing fracture of ulna/radius

Miss radial dislocation
Syndesmosis injuries

Maisonneuve Fracture
Monteggia, Galleazi
Failure to image where the force is transmitted

”Image joint above and below”
16 Year Old Male

Ankle Pain After Tackle
Moderate midfoot ttp

Hard soled shoe
Lisfranc Injury

Axial load on plantar flexed foot

Jumping off bunk bed

Football
Lisfranc Injury

Fracture Dislocation

Surgical Repair Common
Exam predictors

Mechanism
Plantar flexion w external rotation

TTP midfoot
Midfoot plantar bruising
Pain with rotation of midfoot

Piano key test
X-Ray Findings

Widening of 1st, 2nd or 3rd metatarsal bases >2mm requires urgent surgical referral

Fleck sign

Sometimes subtle
If in doubt, image both feet weight bearing
CT more sensitive, but rarely needed

Suspected without widening?
Posterior back slab, NWB, and ortho follow up
Lisfranc Injury

Failure to localize pain

Can’t diagnose what you don’t suspect

Not obtaining weight bearing view with clinical suspicion
12 year old female

Right hip pain for 2 weeks
Right hip x ray normal

Recent viral uri

Dx: Transient Synovitis
Follow up

Ortho pinning!
Slipped Capital Femoral Epiphysis

Special Salter I Variant

Mean age: 12-13

Obesity the only significant risk factor
Klein Lines
Klein Lines

Frog Leg view

Line along external part of femoral neck

Should intersect part of femoral head

Symmetry can mislead!
20-40% bilateral
If suspecting SCFE, obtain pelvis views

Visualize both femoroacetabular joints

Acute & Chronic types
Miss the diagnosis?

- Leg length discrepancy
- Permanent gait abnormality
- Avascular necrosis
SCFE
Consider in the 8-18yo with limp and hip pain
Obtain B hip views
Klein lines
To Review

Flexor tendon lacerations – know how to assess FDP, FDS. Put through full ROM.
If in doubt, splint and refer to hand

Posterior Shoulder dislocation – Axillary view best, light bulb sign on AP

Syndesmosis injuries – Force transmitted to proximal joints
Squeeze test

Lisfranc injury – Weight bearing can clinch, suspicious injuries

SCFE – Klein lines on frog view
Know the age range