100 CARDINAL PED PRESENTATIONS

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CASES 71-80

What is this lecture about?

- Pediatric – exclusive to or commonly seen in kids
- Not a Zebra (ie something I've either seen during my career or know has been seen in our PED)
- Not a horse either – ie something you may make it through training without seeing
- Emergency practitioner can make the diagnosis or at least suspect it
- Emergency practitioner *should* make the diagnosis or at least suspect it, and can make a difference by either getting diagnostic studies, appropriate consultations, and starting initial management or by not doing unnecessary work-up

Quick info in 3 slides

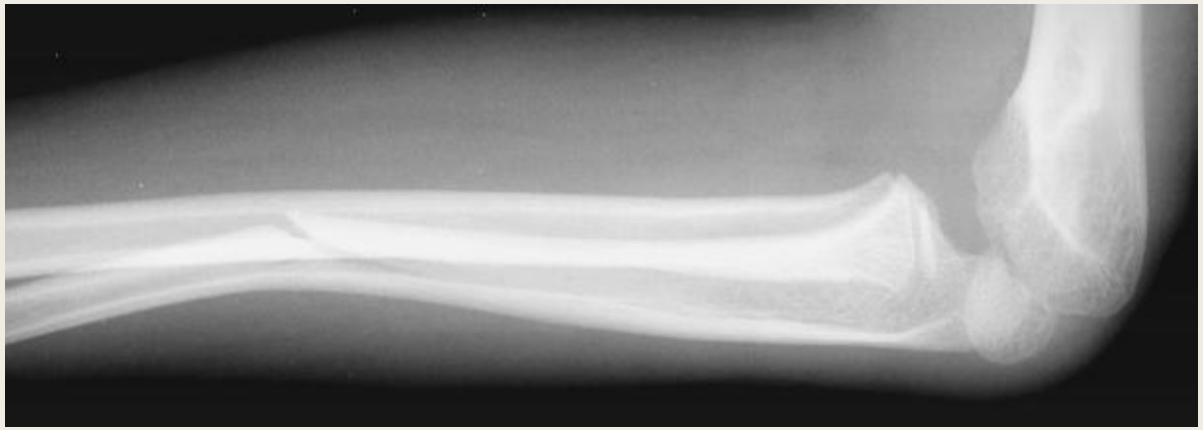
- Classic case – build on illness scripts to reinforce when you should suspect this entity
- What should make you suspect this diagnosis
- Basics of diagnosis and ED management
- You can look it up for more detail, but you can’t look it up until you at least suspect it
- FOAM resources for additional readings

How to use this lecture

- After the initial case presentation, think about the differential diagnosis
- Helpful framework: SPIT
  - *What is the most Serious diagnosis?*
  - *What is the most Probable diagnosis?*
  - *What is the most Interesting diagnosis?*
  - *What is the most Treatable diagnosis (ie what diagnosis should the EP do something about ASAP)?*
- Write down what you think is the diagnosis – commit!
  - *At the end, see how many you got right*

7 year old with elbow and forearm pain

- 7yo boy was at school and fell on outstretched hand (FOOSH) on left
- Complains of pain in left elbow and mid-forearm, and refuses to range the elbow
- He is tender over his proximal left forearm, and there is mild swelling there
- He is able to wiggle his fingers, and distal neurovascular is intact



You get an x-ray. What do you see?

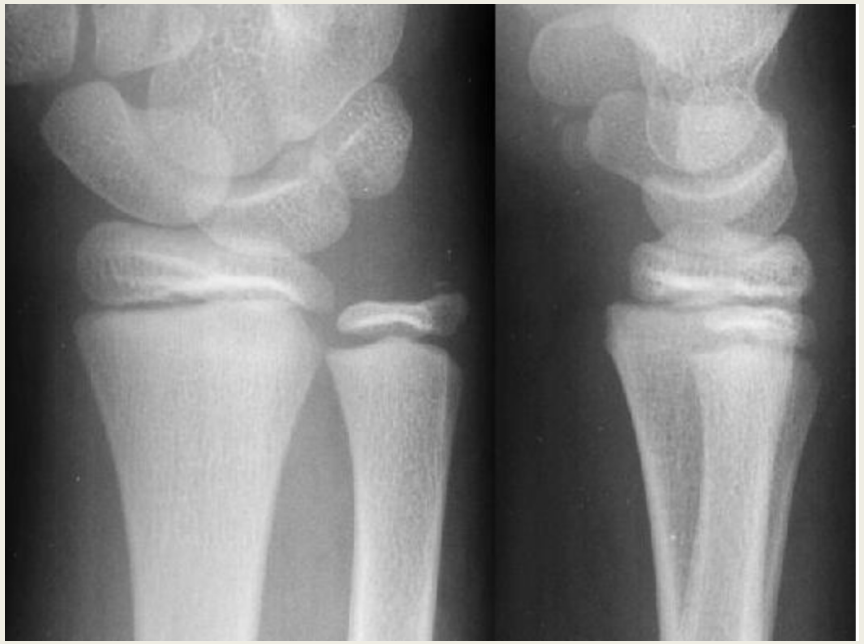
https://www.hawaii.edu/medicine/pediatrics/pemxray/v1c15.html

7 year old boy with leg pain and limp

- 8 year old boy comes in complaining of bilateral lower leg pain and limping x 1 day
- Review of the EMR reveals that he was in the ED last week with fever to 40.2, cough, sore throat, and headache
  - *He was diagnosed with viral syndrome and discharged with supportive care and acetaminophen*
  - *The above symptoms have resolved except for a mild lingering cough*
- No trauma, no fever for last 2 days
- Temp 37.7, HR 110, RR 20, BP 90/46. FROM hip, knee, ankle joints although passive dorsiflexion of bilateral ankles is uncomfortable. No erythema, edema, bony point tenderness, but c/o diffuse calf tenderness on palpation
- CBC WBC 8.5, 50% PMNs, ESR 16, xrays of knees, tib-fib, ankle normal

8 year old boy with right wrist pain

- 8yo boy fell on outstretched right hand (FOOSH) during a soccer game
- No other trauma, no fever, no previous injury
- On exam, no swelling, deformity, ecchymoses
- Tender only at distal radius just proximal to wrist crease
  - *Nontender at snuffbox*
- You order an xray



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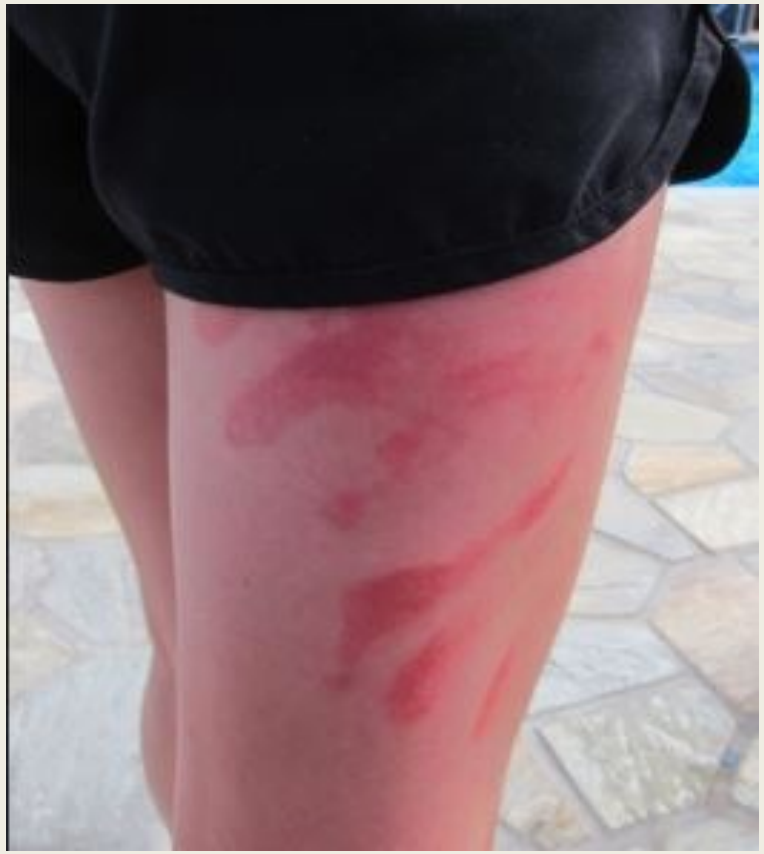
8 year old girl with hyperpigmentation

- 8yo girl brought in by DCFS due to teacher reporting marks on her thigh concerning for non-accidental trauma
- Patient denies any abuse
- Normal vitals and physical exam otherwise, unsure where the marks came from
- Was at a beach picnic 2 days ago where street tacos and other mexican food was served
- Bizarre patterned streaks of hyperpigmentation and erythema



http://imgur.com/gallery/TyE5i

9 year old boy with torticollis

- 9yo boy was pushed at school while carrying a heavy backpack
  - *No fall, no direct trauma to the neck*
- Neck twisted and unable to straighten, c/o neck pain
  - *Parent called to pick him up and came directly to ED*
- Temp 37.1 C, HR 90, RR 20, BP 98/36
- Right ear tilted toward right shoulder and chin rotated toward patient's left in "cock robin" position
- The sternocleidomastoid muscle on the left is spastic
- Decreased ROM and unable to move neck position to neutral actively or passively

pedsinreview.aappublications.org

http://tidsskriftet.no/2013/03/

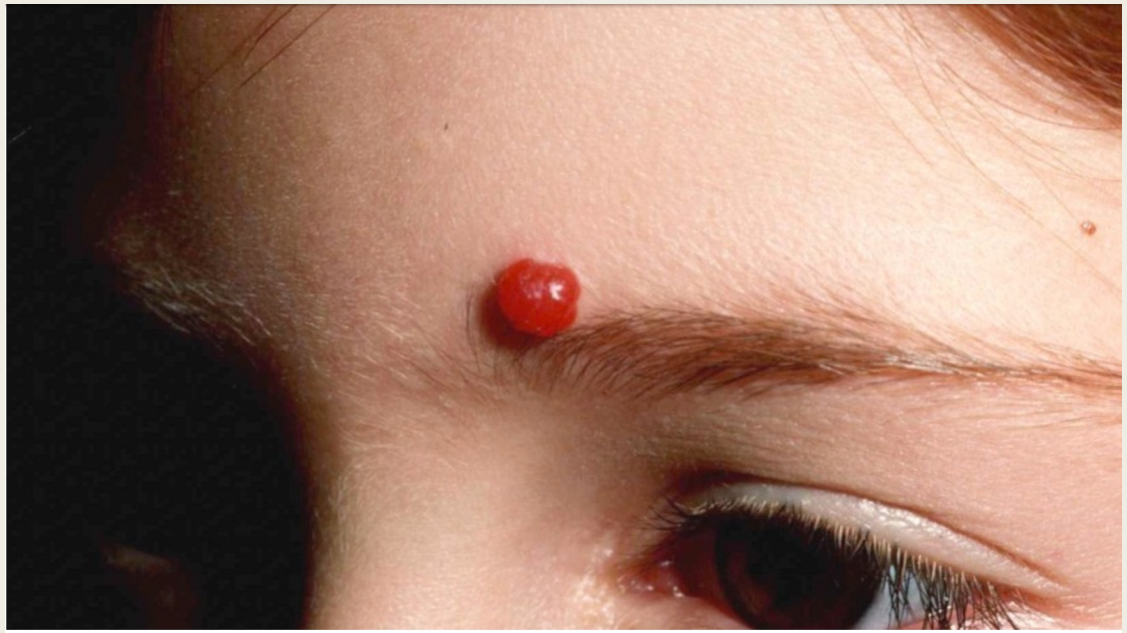
9 year old boy with dark colored urine

- 9 year old boy with 2 days of dark coca cola colored urine
- Otherwise asymptomatic, except that mom thinks his face looked puffy this morning, but doesn't now
- Had a fever and sore throat for which he received amoxicillin 2 weeks ago
- VS: temp 37.5, HR 90, BP 128/52
- PE: no abnormalities appreciated

canadaQbank.com

10 year old girl with bleeding bump over eyebrow

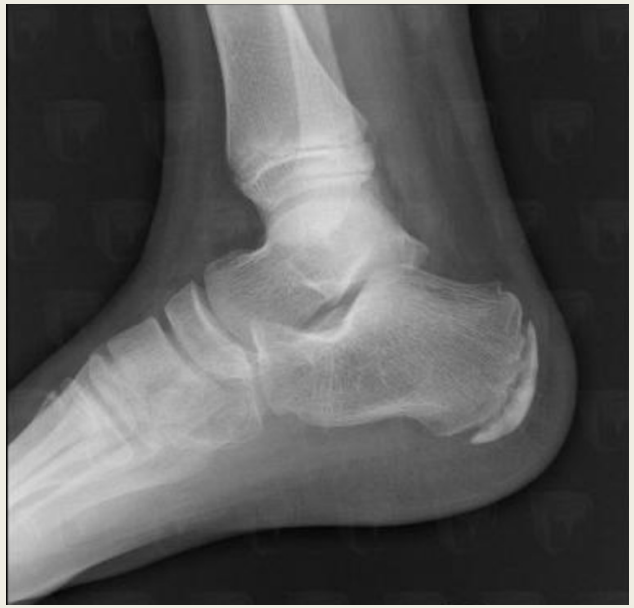
- 10yo previously healthy girl has had an enlarging red bump over left eyebrow x 1 month
  - *Started as a small red dot*
  - *Grew rapidly, became somewhat pedunculated, and now has been intermittently bleeding*
- Temp 37.2, HR 78, RR 18, BP 95/40
- Remainder of exam normal, no bleeding diathesis history



http://www.remington-laser.ca/

10 year old boy with heel pain

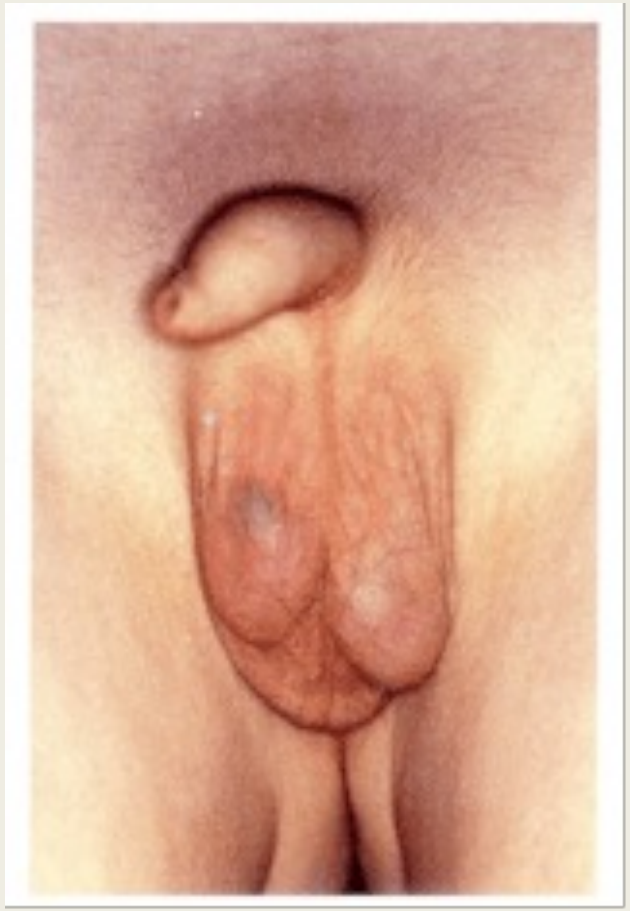
- 10 year old previously healthy boy presents with gradual onset intermittent posterior bilateral heel pain (right > left) for last 2-3 weeks
- Patient plays recreational soccer and basketball, and notices pain in particular after coming out between quarters of play
- Patient had a ground level fall about a month ago while slide tackling in a soccer game, but did not have pain afterwards
- No fever; pain is relieved by rest and by standing on tiptoes
- On exam, pain with medial and lateral pressure on the heel and with forced dorsiflexion
  - *Normal gait, strength; no deformities, redness, warmth, effusions*



http://www.diagnologic.com/

10 year old boy with scrotal pain

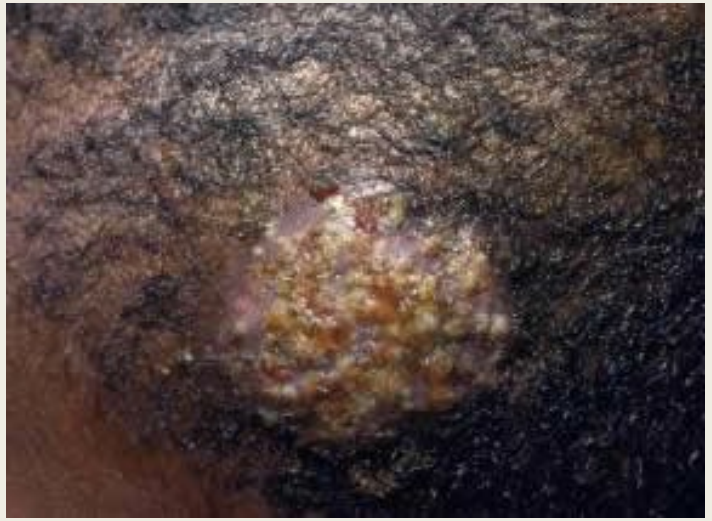
- 10 year old previously healthy boy with gradual onset right scrotal pain x 3 days
- No fever, no trauma, no nausea or vomiting
- Pain is located in the upper outer portion of the scrotum
- VS temp 37.5, HR 80, RR 18, BP 95/43
- Testis palpable, nontender, normal lie, no swelling
- + cremasteric reflex



http://dontforgetthebubbles.com

11 year old boy with lump on head

- 11 year old African-American boy with h/o tinea capitis treated with 1% clotrimazole topically, presents with 5cm boggy, tender, swelling on scalp with purulent discharge visible
  - *Broken off hairs are noted*
- Temp 37.6, HR 80, RR 22, BP 90/40
- What is it?
- What would you do?
  - *A) Incise and drain*
  - *B) Treat with oral anti-staphylococcal antibiotic*
  - *C) Admit and treat with parenteral anti-staphylococal antibiotic*
  - *D) Treat with prednisone*



http://doctorv.ca/

Did you write down what you thought the answers were? Answers on following slides

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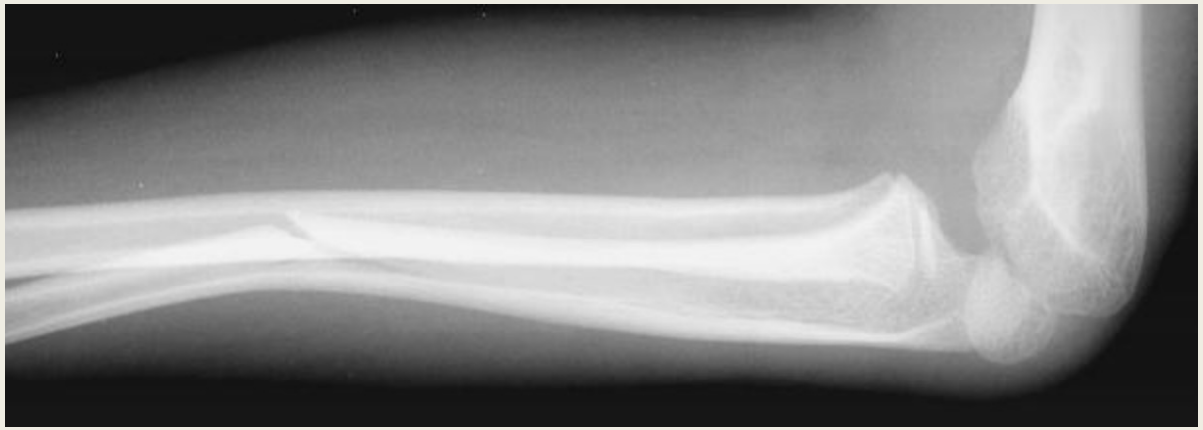

You get an x-ray. What do you see?

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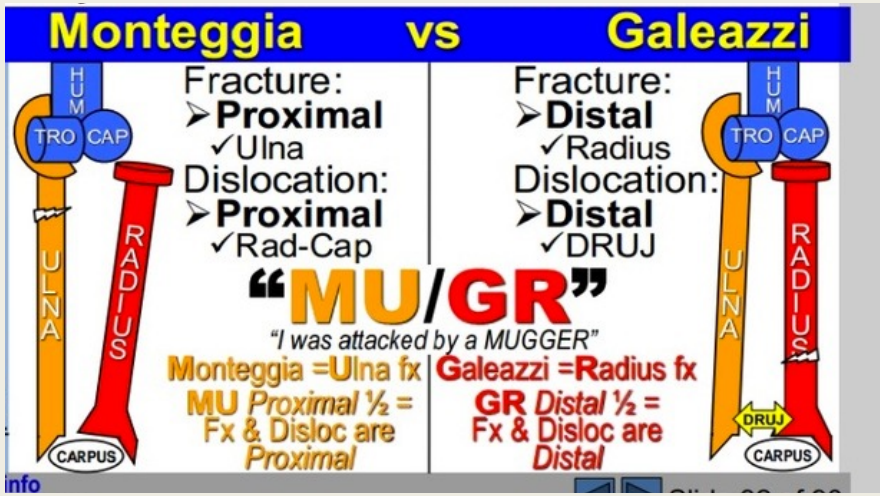
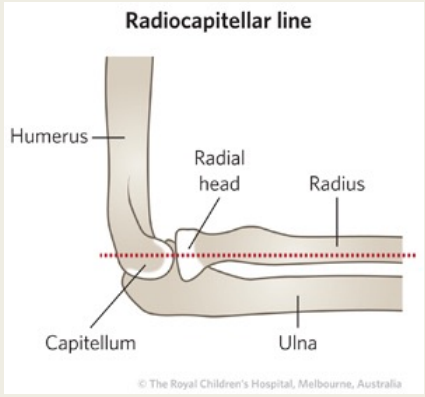
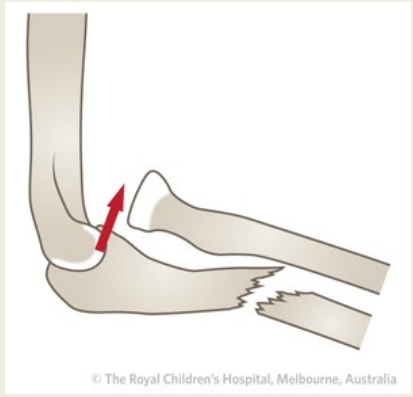
Monteggia fracture / dislocation – suspect it

- Monteggia: ulnar fracture and radial head dislocation, most common in children
  - *Isolated ulnar fractures are uncommon*
  - *Radial head dislocation may have self-reduced*
  - *A line drawn up the middle of the radius should always intersect the capitellum*
- Peak age 4-10 years old, FOOSH mechanism of injury common
- Galeazzi: distal radius fracture and dislocation of distal radioulnar joint
  - *Uncommon in children, Peak age 9-13 years*
  - *FOOSH mechanism*



https://acilbook.com/2015/10/31/galeazzi-kirigi-vs-moteggia-kirigi/

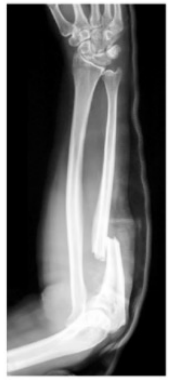


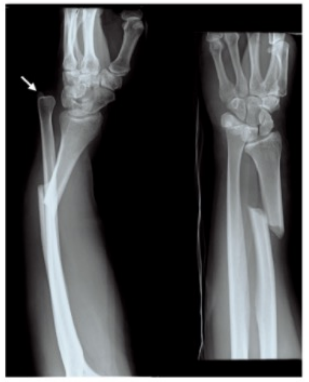


Monteggia fracture – diagnose and treat it

- Always look at radiocapitellar line when there's a mid-shaft ulnar fracture
- Pain management, Consult Orthopedist
- Reduce radial head dislocation ASAP, preferably within 6-8 hours of injury
  - *Supination of forearm, sometimes traction with direct pressure to radial head*
- For more info: https://www.hawaii.edu/medicine/pediatrics/pemxray/v1c15.html and http://www.orthobullets.com/pediatrics/4015/montegg ia-fracture–pediatric
- Monteggia video: https://www.youtube.com/watch?v=yCJhQe3wLYM
- Galeazzi video: https://www.youtube.com/watch?v=B-nbxsUrzy8

Monteggia		Galeazzi
Anterior dislocation of the radial head with a fracture of the ulna, usually angulated dorsally	Description	Fracture of the radius with shortening and dislocation of the distal ulna
Dislocation at the head	Radius	Isolated fracture at the junction of the distal and middle third
Fracture of the proximal third	Ulna	Subluxation or dislocation of the distal radio-ulnar joint
Fall on an outstretched hand with the forearm in excessive pronation Direct blow on back of upper forearm in self-defense (night-stick injury)	Mechanism	Fall on an outstretched arm with elbow flexed
ORIF	Management	Open reduction in adults Closed reduction in children
Nonunion Limitation of motion at elbow	Complications	Malunion/Nonunion Limitation of pronation or supination Anterior interosseous nerve palsy
Giovanni Battista Monteggia	Credit goes to…	Ricardo Galeazzi





http://pemcincinnati.com/blog/fracture-fridays-monteggiazzi-re-post/

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Benign acute childhood myositis – suspect it

- Benign acute childhood myositis, most commonly reported after influenza
- Peak affected 6-8 years of age, boys 2.4x more than girls
- Occurs as the viral syndrome is improving, commonly 24-48 hours after resolution of fever, coryza
- Presents with difficulty of refusal to walk, may walk on tiptoes
- Tenderness of calves without signs of infection or trauma
- Dorsiflexion of the ankle causes pain
- May also present in other muscles eg thighs, back, neck, proximal upper extremity

Benign acute childhood myositis – diagnose and manage it

- Diagnosis is confirmed by an elevated creatine kinase, often 20-30x normal
- Main differential to rule out is viral myositis with rhabdomyolysis
  - *Much higher CK levels, myoglobinuria rare in BACM*
  - *Suspect myoglobinuria when have a urinalysis positive for blood but no RBCs on microscopic analysis*
  - *Myoglobinuria may also produce dark or "tea-colored" urine*
  - *Viral prodrome of 1-14 days, then high fever, diffuse myalgias, anorexia, tender muscles that may be boggy and edematous*
- If CK > 1000 - 3000, admit for IV hydration, follow urine output, renal function, and serial CK measurements; else, monitor as outpatient with close f/u & oral hydration
- Benign acute childhood myositis typically resolves over 3-10 days
- For more info: http://www.lucianoschiazza.it/documenti/Benign_acute_childhood_myositis_eng.html and on rhabdomyolysis http://pedemmorsels.com/rhabdomyolysis/

8 year old boy with right wrist pain

- 8yo boy fell on outstretched right hand during a soccer game
- No other trauma, no fever, no previous injury
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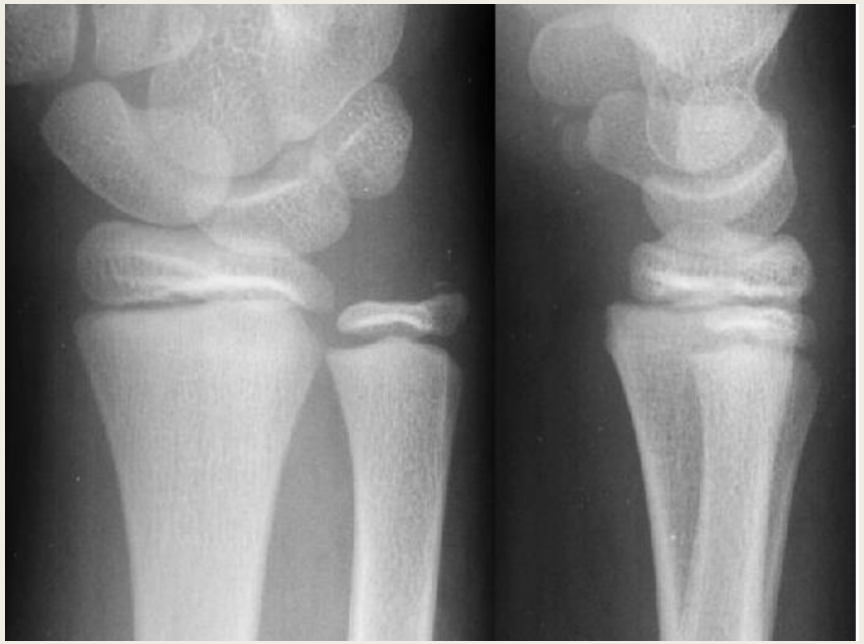

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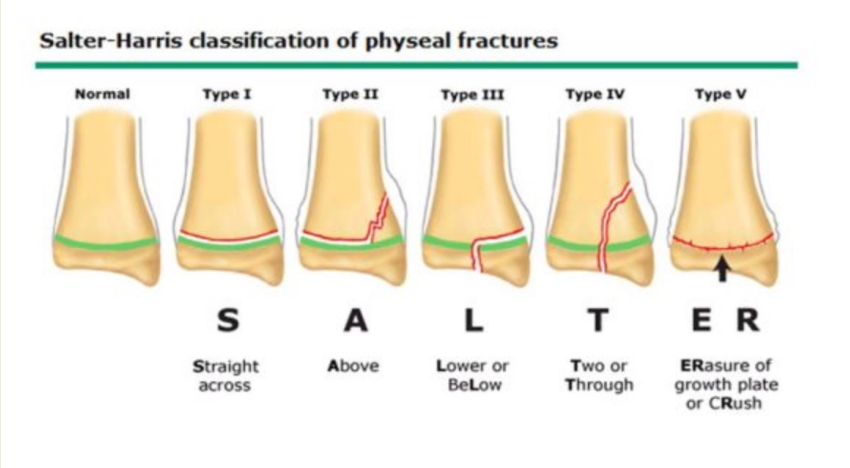
Salter-Harris I Fracture – suspect it

- Salter-Harris fractures are through the open growth plate
- FOOSH is a common mechanism causing a distal radius fracture
- The xray on the previous slide shows a subtle SH I fracture in that the lateral view shows the epiphysis not centered on the distal metaphysis; the epiphysis has slid dorsally
- Suspect with tenderness at the growth plate in child with open growth plates



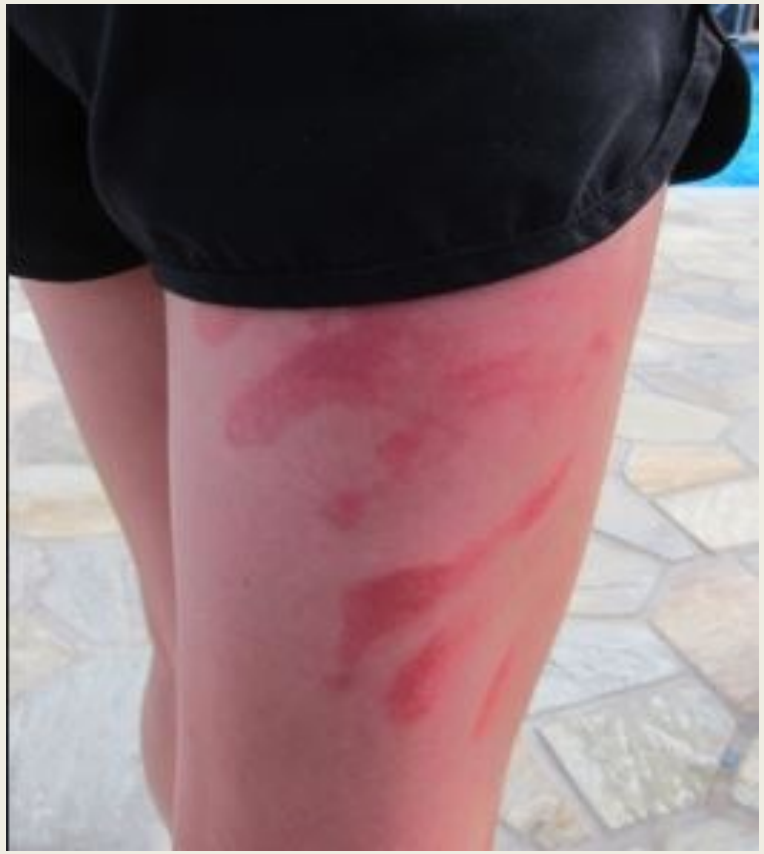
http://www.tylerfootclinic.com/salter-harris-fractures.html

Salter-Harris fractures – diagnose and manage it

- For Salter-Harris II and above, and for displaced Salter-Harris I, consult with Orthopedics for reduction as needed, splinting / casting
- Pain management
- Somewhat controversial is the nondisplaced SH I fracture evidenced by tenderness at the growth plate but a normal appearing xray
  - *Classically, these patients immobilized and followed in a few weeks to look for periosteal reaction corroborating fracture*
  - *Concern is potential for growth arrest (higher risk with III, IV, V)*
- For more info: https://cdemcurriculum.com/approach-to-childhood-fractures-salter-harris/ and http://www.learningradiology.com/archives2007/COW%20241-Salter%204/saltercorrect.html
- For an interesting rant on nondisplaced SH I: https://first10em.com/2015/06/16/ebm-lecture-handout-6-salter-harris-1-injuries/

8 year old girl with hyperpigmentation

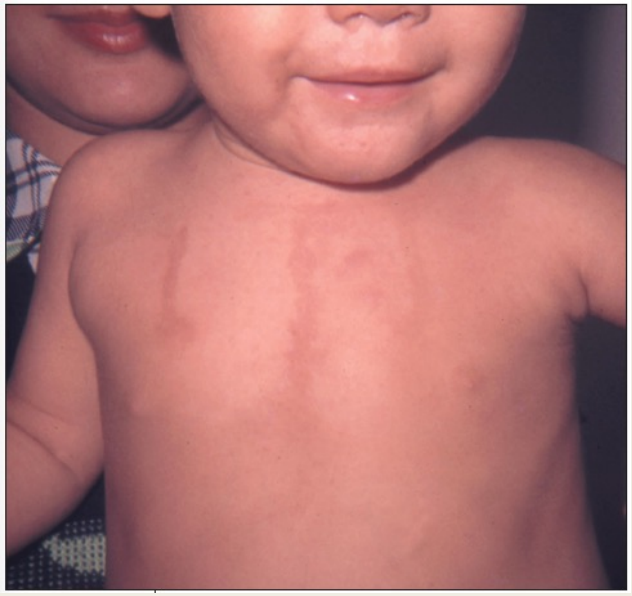
- 8yo girl brought in by DCFS due to teacher reporting marks on her thigh concerning for non-accidental trauma
- Patient denies any abuse
- Normal vitals and physical exam otherwise, unsure where the marks came from
- Was at a beach picnic 2 days ago where street tacos and other mexican food was served
- Bizarre patterned streaks of hyperpigmentation and erythema



http://imgur.com/gallery/TyE5i

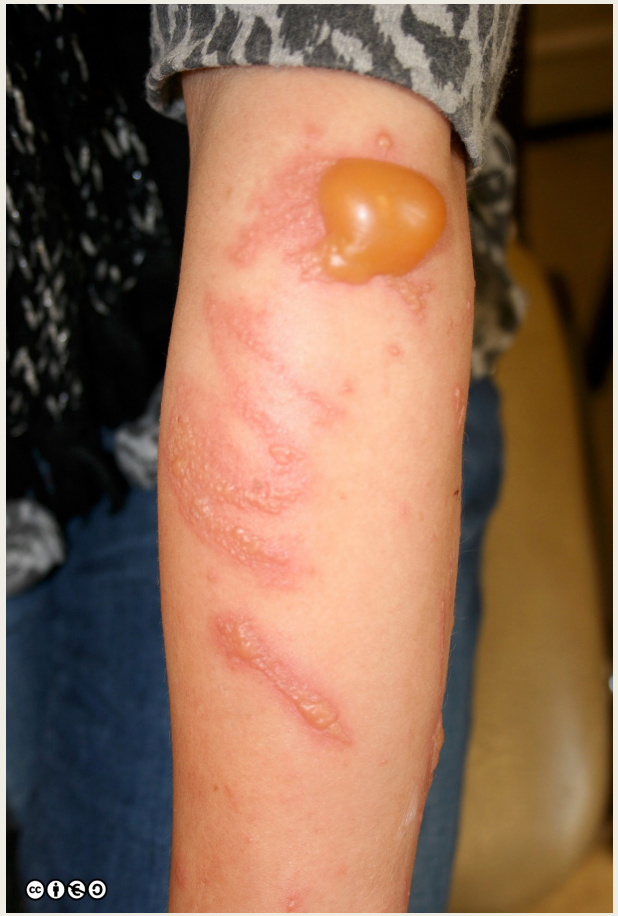
Phytophotodermatitis – suspect it

- Photosensitizing chemicals (psoralens) from limes and other plants (parsley, celery, carrots, others) get onto patient's skin and interact with sun
- Starts 24 hours after exposure, peaks in 48-72 hours
- Bizarre inflammatory patterns of erythema and hyperpigmentation, often in drip marks, streaks from fingers, or handprints
- Occur in sun-exposed areas
- May have blistering, may be mistaken for abuse



http://www.consultant360.com/

Phytophotodermatitis – diagnose and manage it



- Clinical diagnosis
- Need to suspect it, then ask the history of exposure to e.g. lime juice + sunlight 24-48 hours prior to onset
- Treatment: reassurance only for small lesions
- Cool compresses, topical steroids for bothersome inflamed lesions; sunscreen once healed
- For more info: https://www.dermnetnz.org/topics/phytophotodermatitis/

https://reestheskin.me/2016/08/10/phytophotodermatitis/

9 year old boy with torticollis

- 9yo boy was pushed at school while carrying a heavy backpack
  - *No fall, no direct trauma to the neck*
- Neck twisted and unable to straighten, c/o neck pain
  - *Parent called to pick him up and came directly to ED*
- Temp 37.1 C, HR 90, RR 20, BP 98/36
- Right ear tilted toward right shoulder and chin rotated toward patient's left in "cock robin" position
- The sternocleidomastoid muscle on the left is spastic
- Decreased ROM and unable to move neck position to neutral actively or passively

pedsinreview.aappublications.org

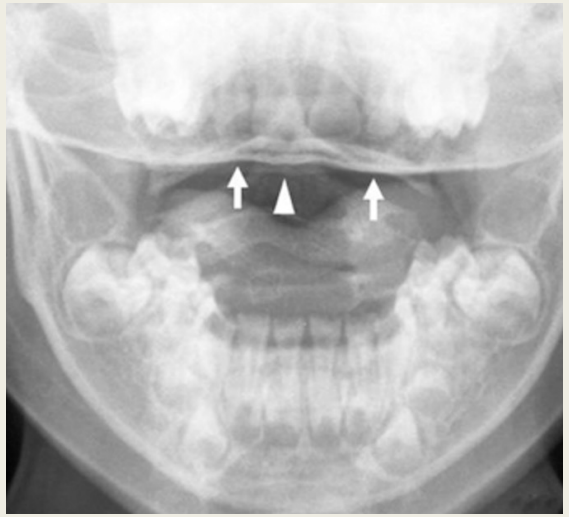
http://tidsskriftet.no/2013/03/

Atlantoaxial rotatory subluxation – suspect it

- Rotational subluxation of C1 on C2, may also be a dislocation
  - *May be associated with neurologic deficit*
- Increased risk: Down syndrome, achondroplasia, Larsen syndrome, Klippel-Feil syndrome, Morquio syndrome, spondyloepiphyseal dysplasia, rheumatoid arthritis, ankylosing spondylitis
- Associated with: trauma (can be minor), post-operative H&N surgery (eg tonsillectomy), retropharyngeal irritation from URI ("Grisel syndrome")
- Differentiate from far more common SCM spasm where SCM on side *opposite* to where chin is pointing is spastic & patient can get neck to neutral position albeit with pain. Congenital torticollis also has SCM tight and shortened on side *opposite* to where chin is pointing, commonly presents at 6 to 8 weeks of age
- AARS patients may have: SCM spasm on *same* side as where chin is pointing, palpable deviation of C2 in same direction as chin pointing, bulge in the posterior pharynx from anterior displacement of arch of C1, flattening of the skull and face on the same side that the chin is pointing in longstanding cases

Atlantoaxial rotatory subluxation – diagnose and manage it

- Plain cervical spine films may show asymmetry between lateral masses and the dens
  - *Atlantodens interval > 5 mm is concerning for instability*
- CT scan is the diagnostic test of choice
- Consult with neurosurgeon; if no instability or neuro deficit, may try conservative management with soft collar, physical therapy, NSAIDs, stretching exercises
- More common muscular torticollis due to SCM spasm managed with heat, massage, NSAIDs+/- muscle relaxants, stretching exercises, close follow-up
  - *Should see improvement in ROM while in the ED with NSAID +/- muscle relaxant, heat, gentle passive stretching*
- Congenital torticollis managed with stretching exercises, position crib and carry baby to encourage turning head toward limited side to see parents, room



http://synapse.koreamed.org/DOIx.php?id=10.4184/jkss.2012.19.2.59&vmode=PUBREADER

AARS: https://posna.org/Physician-Education/Study-Guide/Acute-Atlantoaxial-Rotary-Subluxation(AARS)

Acquired torticollis: http://pemcincinnati.com/blog/briefs-torticollis/

Congenital torticollis: http://orthoinfo.aaos.org/topic.cfm?topic=a00054

9 year old boy with dark colored urine

- 9 year old boy with 2 days of dark coca cola colored urine
- Otherwise asymptomatic, except that mom thinks his face looked puffy this morning, but doesn't now
- Had a fever and sore throat for which he received amoxicillin 2 weeks ago
- VS: temp 37.5, HR 90, BP 128/52
- PE: no abnormalities appreciated

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Post-streptococcal glomerulonephritis – suspect it

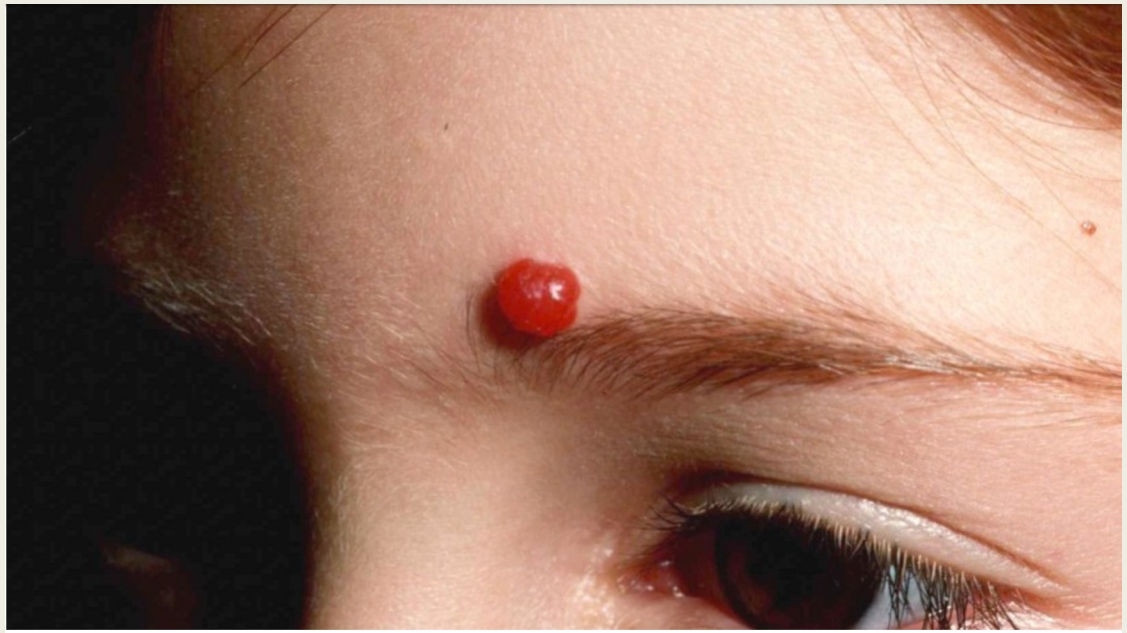
- Occurs 1-3 weeks after a group A strep pharyngitis infection, or 3-6 weeks after a Group A strep skin infection
  - *Not prevented by antibiotic treatment at the time of infection*
- Peak age 5-12 years, more common in boys
- Typically presents with hematuria that causes urine to be dark, described as coca-cola or tea colored
- May have edema (especially periorbital, on awakening, improves over course of day), hypertension, oliguria

Post-streptococcal glomerulonephritis – diagnose and manage it

- Hematuria on urinalysis, sometimes proteinuria and pyuria also
- May have elevated BUN, creatinine
- Low C3 and CH50 early in course
- Streptozyme (antibody titers to ASO, AntiDNase B, AHase, ASKase, anti-NAD) to prove previous strep infection
  - *Since infection resolved, not likely to have positive rapid antigen strep test or throat culture*
- Consult with pediatric nephrologist, treatment is supportive, dietary salt & water restriction initially
- Admit for severe hypertension, renal dysfunction, or edema
- Most children recover over the next several months
- For more information: https://www.symptoma.com/en/info/post-streptococcal-glomerulonephritis

10 year old girl with bleeding bump over eyebrow

- 10yo previously healthy girl has had an enlarging red bump over left eyebrow x 1 month
  - *Started as a small red dot*
  - *Grew rapidly, became somewhat pedunculated, and now has been intermittently bleeding*
- Temp 37.2, HR 78, RR 18, BP 95/40
- Remainder of exam normal, no bleeding diathesis history



http://www.remington-laser.ca/

Pyogenic granuloma – suspect it

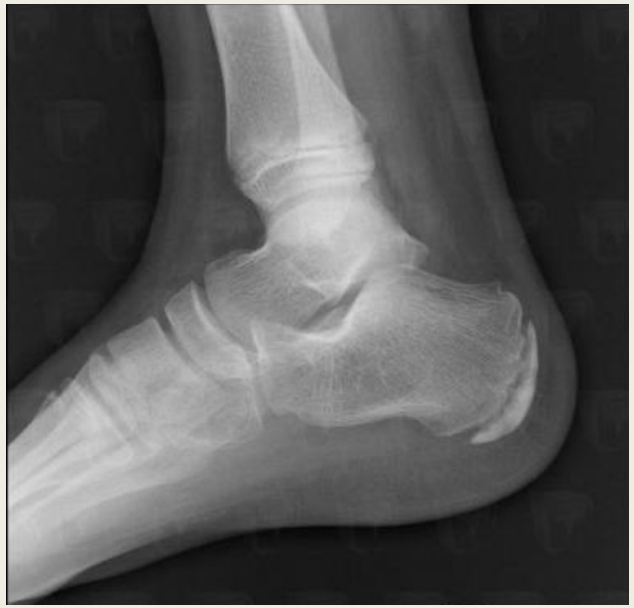
- Overgrowth of vessels: lobular capillary hemangioma
- All ages, especially common in young adults and children (but rare in < 6 months old)
- Associations with: minor trauma, pregnancy, retinoids (topical or systemic)
- Begins small (pinhead-size), rapidly grows over days to weeks to 2mm to 2cm raised lesion, may become pedunculated, often friable and bleeds easily, multiple lesions rare
  - *Usually red, may be blue-black as well*
  - *Common on face, neck, upper trunk, hands, feet*
  - *Pregnancy-associated: oral mucosa*

Pyogenic granuloma - diagnose and manage it

- Diagnosis is clinical by typical appearance and history
- If actively bleeding, apply pressure 10-15 minutes
- Can also apply LET gel to reduce bleeding, or try topical hemostatic agents such as surgicel
- Removing offending drug or waiting for end of pregnancy may result in spontaneous resolution
- Otherwise, refer to dermatologist for removal
  - *Simple excision is inadequate as feeding blood vessels are deep in dermis and must be removed as well*
- For more information: http://pemcincinnati.com/blog/briefs-pyogenicgranuloma/ and http://www.dermnetnz.org/topics/pyogenic-granuloma/

10 year old boy with heel pain

- 10 year old previously healthy boy presents with gradual onset intermittent posterior bilateral heel pain (right > left) for last 2-3 weeks
- Patient plays recreational soccer and basketball, and notices pain in particular after coming out between quarters of play
- Patient had a ground level fall about a month ago while slide tackling in a soccer game, but did not have pain afterwards
- No fever; pain is relieved by rest and by standing on tiptoes
- On exam, pain with medial and lateral pressure on the heel and with forced dorsiflexion
  - *Normal gait, strength; no deformities, redness, warmth, effusions*



http://www.diagnologic.com/

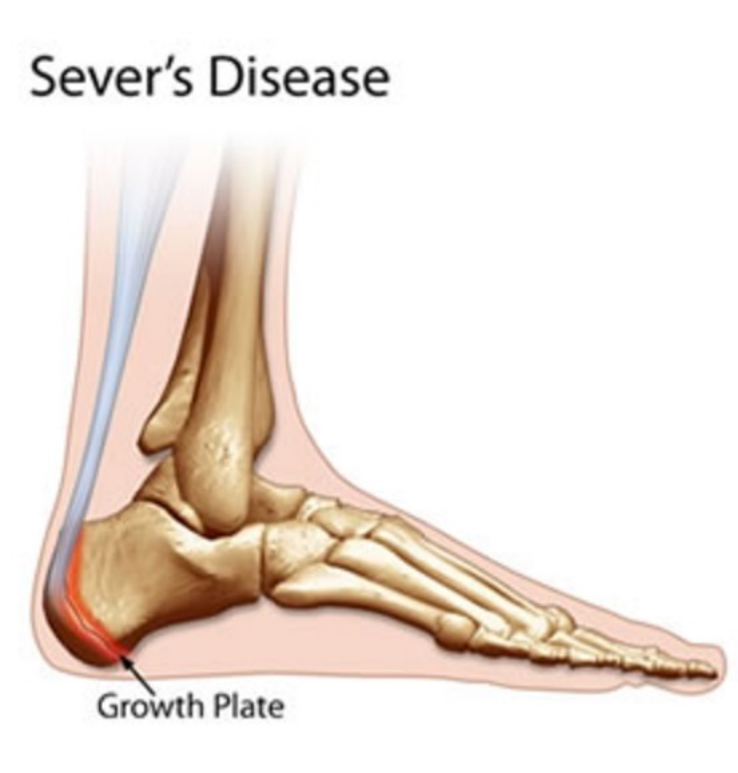
Xray is mostly normal

Sever Disease (traction apophysitis) – suspect it

- Traction apophysitis: repetitive microtrauma due to pulling on tendon attachment to apophysis
  - *Child's rapid growth may result in relative shortening of ligament and increased pulling*
- Sever disease :inflammation of the Achilles tendon insertion into the calcaneus
- Active child, typically age 9-11 years
- Gradual onset pain in posterior heel worse with sports, running, jumping
- 60% bilateral
- Pain with palpation of medial and lateral heel, stretching of Achilles tendon (forced dorsiflexion or resisted plantarflexion)
- If swelling present, very mild
- Long-standing = may have calf wasting

Traction apophysitis – diagnose and manage it

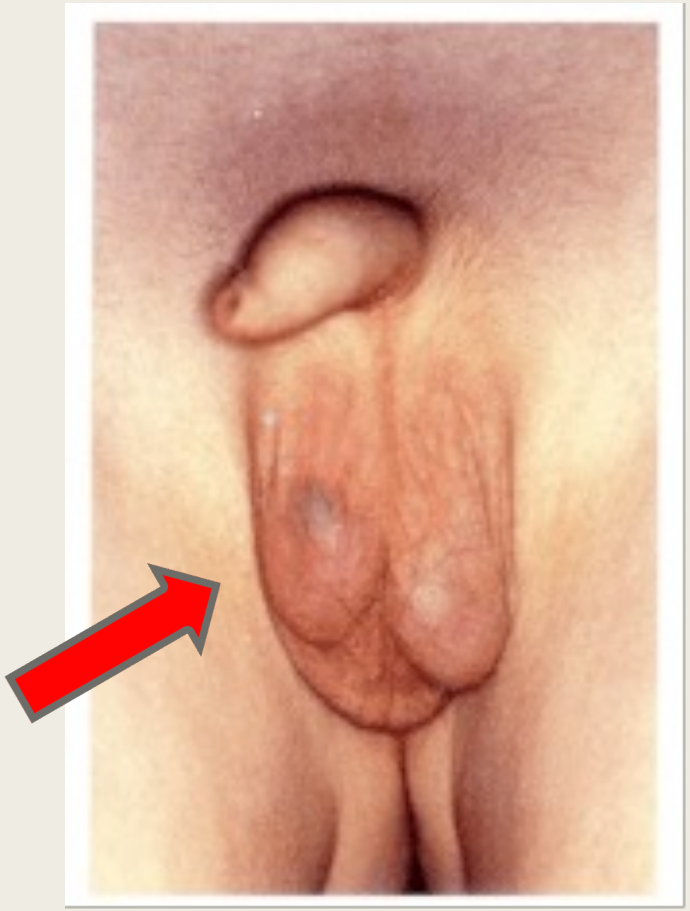
- Clinical diagnoses
- Radiographs typically normal or show nonspecific sclerosis and fragmentation of the apophysis
- NSAIDs, ice, remain active as tolerated, OTC gel heel lifts in shoes, stretching exercises, tincture of time (resolves over weeks to months)
- Osgood-Schlatter: early adolescent (girls younger than boys), tibial tubercle
- Sindig-Larsen-Johansson (Jumper's knee): 10-12yo, inferior pole of patella
- Iselin: 9-11yo girls, 11-14yo boys, base of 5th metatarsal
- For more info (must register for free): http://contemporarypediatrics.modernmedicine.com/contemporary-pediatrics/news/modernmedicine/modern-medicine-feature-articles/apophysitis-lower-extre?page=full



http://www.texasfootdoctor.org/pediatric-heel-pain-severs-disease.html

10 year old boy with scrotal pain

- 10 year old previously healthy boy with gradual onset right scrotal pain x 3 days
- No fever, no trauma, no nausea or vomiting
- Pain is located in the upper outer portion of the scrotum
- VS temp 37.5, HR 80, RR 18, BP 95/43
- Testis palpable, nontender, normal lie, no swelling
- + cremasteric reflex
- Blue dot seen



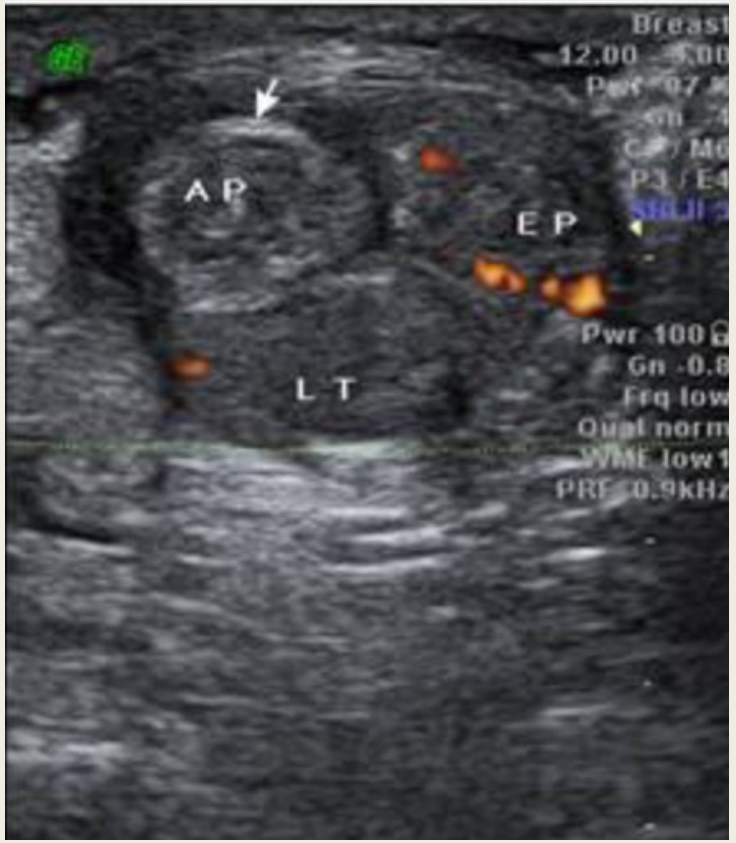
http://dontforgetthebubbles.com

Torsion of appendix testis – suspect it

- Differences from testicular torsion (which needs emergent detorsion)
  - *More gradual onset, often milder pain, may not seek care for days*
  - *Scrotum not usually erythematous or edematous*
  - *Pathognomonic blue dot sign, but only seen in about 1/5 of patients*
  - *Pain and tenderness in upper outer pole of scrotum (vs diffuse in testicular torsion)*
  - *+ cremasteric reflex*
  - *Testicle palpable, nontender, normal lie, not swollen*
- If all of the above, may consider no imaging, clinical dx of torsion of appendix testis
  - *BUT so important to not miss testicular torsion, consider Doppler ultrasound anyways and/or urology consult*

Torsion of appendix testis – diagnose and manage it

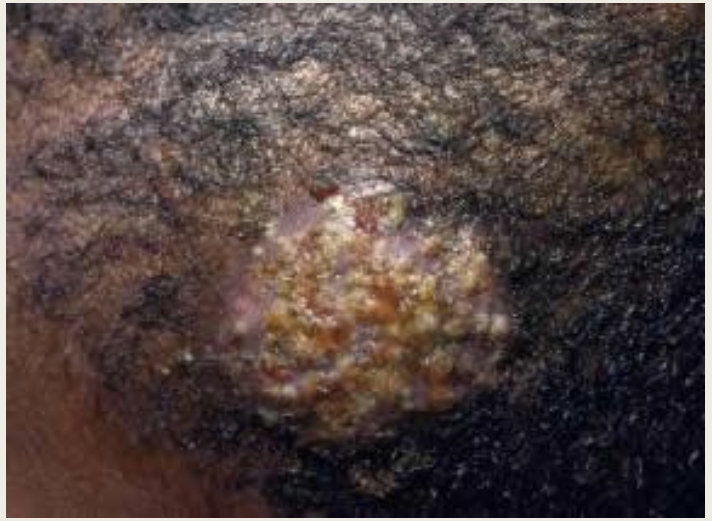
- Urinalysis to r/o epididymitis
- Doppler ultrasound of scrotum to r/o testicular torsion
  - *AP is appendix testis*
- Conservative management with pain control
  - *NSAIDs, ice, scrotal support*
  - *Usually resolves within 1 week*
  - *Rare excision for unremitting pain*
- For more info: http://dontforgetthebubbles.com/saving-balls-101-acute-scrotum/ and http://pedemmorsels.com/appendix-testis-torsion/



http://sumerdoc.blogspot.com

11 year old boy with lump on head

- 11 year old African-American boy with h/o tinea capitis treated with 1% clotrimazole topically, presents with 5cm boggy, tender, swelling on scalp with purulent discharge visible
  - *Broken off hairs are noted*
- Temp 37.6, HR 80, RR 22, BP 90/40
- What is it?
- What would you do?
  - *A) Incise and drain*
  - *B) Treat with oral anti-staphylococcal antibiotic*
  - *C) Admit and treat with parenteral anti-staphylococal antibiotic*
  - *D) Treat with prednisone*



http://doctorv.ca/

Kerion – suspect it

- Kerion results from a large inflammatory response to scalp fungal infection (commonly *Microsporum canis* or *Trychophyton* species)
- Boggy purulent tender lump with localized alopecia / broken-off hairs
- May have regional lymphadenopathy, fevers, malaise
- May fluoresce if due to *Microsporum* with Wood's lamp, but may not
  - *Not a very helpful test*
- Fungal infection transmitted from household pets, from close contacts, sharing combs & brushes or bedding & towels
- Tinea capitis more common in African-American, boys

Kerion – diagnose and manage it

- Clinical diagnosis
  - *Dermatologist may scrape for microscopy and culture to confirm fungal infection*
- Resist the urge to I&D or treat as bacterial abscess
- Oral anti-fungal eg griseofulvin, terbinafine, or itraconazole (topical is insufficient treatment for tinea capitis, kerion)
  - *Warn parents and patient, may take 2-3 months or longer*
  - *Hair will usually grow back after successful treatment*
- Often, course of prednisone given to counter kerion's hyperinflammatory reaction
- To see more kerions, https://www.youtube.com/watch?v=1DT-f-O4gmM
- For more information http://pedemmorsels.com/tinea-capitis-kerions/ and http://www.dermnetnz.org/topics/kerion/