Tillaux Fracture in a 15 y.o. Male

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Diagnostic Radiology, RAD 4001
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Clinical History

• 15 y.o male with no PMHx presents with a L. distal tibial fracture requiring ORIF vs CRPS.

• HPI and Current Symptoms:
  • Pt reported that he fell during a school kickball game 1 week prior to presentation and twisted his L ankle.
  • Pt was asx and denies numbness/tingling, lack of sensation, weakness
  • Pain controlled with Tylenol PRN

• Physical exam findings:
  • LLE bandaged and wrapped in splint.
  • Toes warm and well perfused.
  • Able to wiggle R and L toes
Tillaux Fracture

- Avulsion of the anterior tibiofibular ligament
- The ligament is stronger than the lateral physis

Image Source URL: https://www.orthobullets.com/pediatrics/4028/tillaux-fractures
Tillaux Fracture

• Closure of the distal tibial physis begins centrally and extends medially then laterally

Image Source URL: https://www.orthobullets.com/pediatrics/4028/tillaux-fractures
Tillaux Fracture

- 11/25/19: XR Ankle 3 View

**Label Key**

- Tibial Fracture
Tillaux Fracture

• 11/25/19: XR Ankle and XR Foot

Label

Key

Anterior Displacement of Fragment (5mm)
Tillaux Fracture

• 11/25/19: CT Coronal and Sagittal View

Label Key

- Tibial Fracture
- Small Bone Fragments
- Anterior Displacement of Fragment
Tillaux Fracture

- 11/25/19: CT Axial View

Label Key

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<th>Label</th>
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<tr>
<td>Tibial Fracture</td>
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<td>Fibular Fracture</td>
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Tillaux Fracture

- 11/25/19: CT Axial View

**Label Key**
- Tibial Fracture
- Fibular Fracture
Tillaux Fracture

- 11/25/19: 3D Volume Rendered CT scan

Label Key

- Tibial Fracture
- Anterior Displacement of Fragment
Summary of Key Imaging Findings

Knee 3 View, Ankle 4 View, and Tibia Fibula Series

1. Salter-Harris III type (Tillaux) Fracture – subluxation of the distal tibial epiphysis with 3-4 mm step-off of the tibial plateau and a probable tiny intra-articular osseous fragment.

2. Minimally displaced, intra-articular oblique fracture of the base of the proximal great toe

3. Suspected widening of the medial clear space concerning for ligamentous injury

Ankle CT w/o Contrast

1. Salter-Harris IV fracture through the anterolateral distal tibia representing triplane fracture pattern

2. Minimally displaced Salter Harris II fracture of the distal fibula

3. Diffuse soft tissue swelling of the ankle
Differential Diagnosis: Salter-Harris Fractures

Image Source URL: https://www.uptodate.com/contents/image?imageKey=EM%2F54582&topicKey=EM%2F6547&source=outline_link

McGovern Medical School
Treatment Options: Operative vs Nonoperative

**Nonoperative: Closed reduction and casting**
- For fractures with < 2mm displacement
- Reduced by internally rotating foot
- Cast for 3-4 weeks to control rotational component of injury
- Immobilization for an additional 2-4 weeks in short cast or boot

**Operative: CRPP or ORIF**
- For fractures with > 2mm displacement
- Both have good outcomes
Discussion: CRPP vs ORIF

**CRPP**
- Use K wire or guidewire to reduce
- Assess reduction with fluoroscopy or arthrogram
- K wire or cannulated screw for final fixation
- Minimizes surgical time and avoids incision

**ORIF**
- Anterolateral approach
- K wire or cannulated screw for final fixation
- Use for failed closed reduction or delayed presentation

Screw placed lateral -> medial
Transphyseal fixation is (usually) ok!

Take Home Points

• Salter-Harris III (Tillaux) Fractures are intraarticular fractures through the epiphysis and across the physis
• They are most common in adolescents as the physes are often the weakest points in bone at that age
• Treatment involves reducing the fracture via CRPP or ORIF
References

• (1) Anthony I. Riccio, MD Texas Scottish Rite Hospital for Children Update 07/2016 Pediatric Ankle Fractures. Website URL: https://slideplayer.com/slide/11499416/


• (3) Ahn, L, Williams B. Tillaux Fractures. Website URL: https://www.orthobullets.com/pediatrics/4028/tillaux-fractures


• (6) Crawford, A. Triplane and Tillaux Fractures: Is a 2mm Residual Gap Acceptable? Journal of Pediatric Orthopedics, Volume 32, Number 1 Supplement, June 2012