Treating the Weekend Warrior: “Twisted Ankles & Broken Toes”

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Disclosures

Merete – Royalties, Consultant
Vilex – Royalties, Consultant
Darco – Royalties, Consultant
CurveBeam – Consultant
Mimedex – Consultant
Trident Orthopedics – Consultant
Wright Medical – Research Support
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NONE ARE RELAVENT TO THIS TALK
Outline

• Foot Injuries
  – Phalanx Fractures
  – Metatarsal Fractures
  – Midfoot Fractures

• Ankle Injuries
  – Sprains
Mechanism of injury

- How did it happen?
- High Energy or Low Energy (fall vs MCA)
- Direction of forces involved
- Where does it hurt?
- What lives There?
- Open or Closed Fracture
Toe (Phalangeal) Fractures

• Most common fractures in the foot
• Exam:
  – Tenderness, swelling, ecchymosis
  – Look for rotation deformity!
Toe Fractures: Treatment

• Commonly treated nonsurgically
  – Clinical appearance
  – Buddy taping and stiff-soled shoe x 4-6 wks
  – Repeat xrays in 1-2 wks to ensure stability

• Surgical treatment may be considered for significant articular displacement/angulation or rotation (20°)
Great Toe Fractures

Potentially more serious injury

- Treatments:
  - Nondisplaced: WB boot or cast
  - Displaced/rotated/intra-articular: consider surgery
Metatarsal Fractures

• Imaging
  • Standard foot series (AP, Lateral, Oblique)

• Types
  • 1\textsuperscript{st} metatarsal, Central metatarsals, 5\textsuperscript{th} metatarsal

• General Treatment:
  – Non-displaced, extra-articular fractures can be treated nonsurgical
  – Displaced, intra-articular fractures may need to be fixed
1st Metatarsal Fractures

- Usually direct trauma
- More Serious Injury
- Displacement not well tolerated
MT Fractures: 1\textsuperscript{st} Metatarsal

Non-Displaced extra-articular 1\textsuperscript{st} MT fractures
- posterior splint
- NWB
- F/U 5-7 days
- Short leg walking boot (of cast) for 6wks

Displaced or intra-articular 1\textsuperscript{st} MT fractures
- not well tolerated
- consider surgery
MT Fractures: Central (2-4)

Shaft Fractures rarely require surgery

- 3-4mm displacement well tolerated
- $< 10^\circ$ angulation well tolerated
MT Fractures: **Central 2-4**

**Non-Operative Treatment**

- initial immobilization in a splint/boot
- Crutches for comfort
- Ice, Elevation, analgesics as needed
- F/U 5-7 days to repeat X-rays to assure stability then q2-4 weeks
- Progressive WBAT
- Expect fracture to be healed around 6 weeks
Central MT Fractures

- Shortening or sagittal displacement can result in painful metatarsalgia
- Multiple metatarsal fractures - decreased stability

Refer To Orthopedic Surgeon!
5th Metatarsal Fractures

- Most frequently fractured metatarsal
- Inversion twisting mechanism (like an ankle sprain)
- Anatomy - base, tuberosity, shaft, head
5th Metatarsal Fractures

- Tuberosity
- Jones
- Diaphyseal

Three Different Patterns

Three Different Treatments

Prognosis depends on fracture location
5th Metatarsal Fracture - SHAFT

Shaft, spiral, oblique
- No Surgery. No Cast
- Use postop shoe/boot until no symptoms!
- Takes a long time to fully heal (6-8 weeks)
Tuberosity/Avulsion Fracture

- 90% of 5\(^{TH}\) MT fractures
- Avulsion of lateral plantar fascia band
- Usually stable
- No Surgery
5th Metatarsal – Avulsion and Tuberosity Fractures

- Treatment:
  - Hard-Sole rigid shoe or boot
  - Initial f/u 4-7 days then 4-6 weeks
  - 6-8 weeks until healed and pain diminished
  - Typically Return to activities 6-8 wks
  - 85% return to pre-injury function at 6 months
5th Metatarsal - Jones Fracture

- Poor blood supply
- Worse fracture
- Recent articles:
  - 44% failure rate with nonsurgical
  - 5% failure rate with fracture union at a mean of 8 weeks with ORIF
5th Metatarsal - Jones Fracture

Treatment depends on patient and expectations:

CAST
- Non-displaced
- Sedentary patient
- **6-8 weeks cast: no weight**
- **Healing can take 10-12 wks**
- WB when healing (callus & no point tenderness)

SURGERY
- Displaced
- Chronicity intramedullary sclerosis
- No healing after 10-12 weeks conservative care
- Most athletes because they can WB sooner
25 year old injured her foot...

- Pain, swelling
- Can’t bear weight

What’s the Dx?
Tarsal Metatarsal Injury (LisFranc)

- High vs. Low energy
- 20%- overlooked (litigation)
- Increased frequency in athletic injuries

**EXAM**

- Midfoot Pain, swelling
- Passive pronation abduction stress
Lis Franc Injury

• Diagnosis
  – Mechanism of Injury
  – Radiographs (WB ideal)
  – CT/MRI scan if any doubt
  – Always X-ray opposite foot
  – Beware of subtle X-ray findings.

avulsion fracture
2\textsuperscript{nd} metatarsal or medial cuneiform: “fleck sign”
If unsure: get a WB xray and Opposite side!

- Injured side
- Normal side
- Injured side

No Weight (ER film)  Weight Bearing  Weight Bearing
Treatments

- Surgery (ORIF)
- Ankle/Foot/ Toe range of motion at 2 weeks
- NWB for 8 weeks
- 6 month recovery!
<table>
<thead>
<tr>
<th>Fracture</th>
<th>Work Up</th>
<th>Initial Tx</th>
<th>Definitive Tx</th>
<th>When to Refer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toe</strong></td>
<td>X-rays 3 views</td>
<td>Buddy Tape, postop shoe, F/U 5-7 days</td>
<td>Buddy Tape, WB postop shoe 4-6 wks</td>
<td>Sig rotation/angulation/displacement</td>
</tr>
<tr>
<td><strong>Great Toe</strong></td>
<td>X-rays 3 views</td>
<td>Splint/boot, F/U 5-7 days</td>
<td>WB Boot 4-6 wks Xrays q 2wks</td>
<td>intra-articular, Sig angulation/displacement</td>
</tr>
<tr>
<td><strong>Metatarsal – 1st</strong></td>
<td>X-rays 3 views</td>
<td>Splint, NWB, F/U 5-7 days</td>
<td>WB boot/cast 6 wks Xrays q 2wks</td>
<td>Displaced, intra-articular</td>
</tr>
<tr>
<td><strong>Metatarsal: Central</strong></td>
<td>X-rays 3 views</td>
<td>NWB Splint/boot, F/U 5-7 d</td>
<td>WB boot/cast 6 wks Xrays q 2wks</td>
<td>Multiple MT, displaced, angulated</td>
</tr>
<tr>
<td><strong>5th MT: Shaft</strong></td>
<td>X-rays 3 views</td>
<td>WB Postop shoe/boot F/U 5-7 days</td>
<td>WB boot/postop shoe 6-8 wks Xrays q 3wks</td>
<td>Symptoms after 8 wks</td>
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<tr>
<td><strong>5th MT: Avulsion/Tuberosity</strong></td>
<td>X-rays 3 views</td>
<td>WB Postop shoe/boot F/U 5-7 days</td>
<td>WB boot/postop shoe 6-8 wks Xrays q 3wks</td>
<td>Symptoms after 8 wks</td>
</tr>
<tr>
<td><strong>5th MT: “Jones”</strong></td>
<td>X-rays 3 views</td>
<td>NWB Splint, F/U 5-7 days</td>
<td>NWB cast 6-8 wks Surgery</td>
<td>Displaced, active patient, no healing</td>
</tr>
<tr>
<td><strong>Lis Franc</strong></td>
<td>X-rays 3 views plus contralateral side</td>
<td>NWB Splint, F/U 5-7 days</td>
<td>NWB cast 6-8 wks Surgery</td>
<td>always</td>
</tr>
</tbody>
</table>
Case (RG3)
Ankle Sprain

- Most common orthopedic injury presenting to an emergency room
- 2 million ankle sprains annually
- ATFL most commonly torn ligament

• 20-40% can progress to chronic problems!
Work Up: Physical Exam

• Inversion/plantarflexion injury
• Popping or tearing sensation
• Difficulty weight bearing
• Limited ROM
• Often history of sprains
Work Up: Physical Exam

Anterior Drawer Test

Sulcus sign
Work Up: Radiographs

• Radiographic Evaluation
  – 3 views (AP, lateral, mortise)
  – *Get foot films as well*
    • AP foot for base of 5th, talus fx

- No role for an MRI for an acute ankle sprain!
Acute Ankle Sprain: Treatment

- **Phase 1 - (P.R.I.C.E):** weeks 1-2
- **Phase 2 – Rehab:** weeks 2-6
- **Phase 3 – Advanced rehab (if needed):**

- excellent or good prognosis >90%

Surgery Not recommended
Phase 1

“PRICE” 1-2 weeks

- Protection
- Rest
- Ice
- Compression
- Elevation
Phase 2

• Rehab (weeks 2-6)
  – Start when able to weight bear
  – ROM exercises
  – Peroneal strengthening
  – Proprioceptive training when pain allows
What if it just doesn’t seem routine?

High Ankle Sprain (syndesmosis)
- Requires treatment 2x longer than usual
- Initial Treatment: Splint and NWB

“Infrequent injuries but... frequently misdiagnosed.”
“High ankle Sprain”

- Squeeze test (examines for syndesmosis injury)
  - squeeze fibula and tibia above mid calf
  - pain distally vs. pain proximally
  - Xrays: wide mortise

Refer to an Orthopod...
## Ankle Sprain Presentations

<table>
<thead>
<tr>
<th></th>
<th>Lateral Sprain</th>
<th>High Ankle Sprain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenderness</td>
<td>Lat ankle lig +/- Med ankle</td>
<td>Anterolat ankle +/- prox ankle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+/- med</td>
</tr>
<tr>
<td>Swelling</td>
<td>More</td>
<td>Less</td>
</tr>
<tr>
<td>Ecchymosis</td>
<td>Ankle</td>
<td>Prox to ankle</td>
</tr>
<tr>
<td>Anterior drawer</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Squeeze Test</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Summary

- Understand Mechanism/Anatomy
- Physical Exam
- Appropriate Tests (radiographs)
- Refer in timely fashion if indicated
THANK YOU !!