FRACTURE LOWER EXTREMITIES: PART 2

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SUBTROCHANTERIC FRACTURE FEMUR

- A PART OF FRACTURE OCCUR BETWEEN TIP OF LESSER TROCHANTER AND A POINT 5 CM DISTALLY
- CALCAR FEMORALE
- LARGE FORCES ARE NEEDED TO CAUSE FRACTURES IN YOUNG & ADULT
- INJURY IS RELATIVELY TRIVIAL IN ELDERLY
- 2° CAUSE: OSTEOPOROSIS, OSTEOMALACIA, PAGET'S

SUBTROCHANTERIC FRACTURE FEMUR

- TREATMENT
  - INITIAL
  - TRACTION
  - DEFINITE
  - ORIF WITH INTRAMEDULLARY NAIL
  - OR 95 DEGREE HIP-SCREW-PLATE

FEMUR SHAFT FRACTURE
FEMUR FRACTURE
- Severe pain, unable to bear weight
- 10% associate femoral neck fracture
- Treatment: ORIF with IM nail or P&S
- Complication: hemorrhage, neurovascular injury, fat emboli

SUPRACONDYLAR FEMUR FRACTURE
- Supracondylar zone
- Direct violence is the usual cause
- Look for intra-articular involvement
- Check tibial pulse
- Treatment: ORIF with P&S

PATELLA FRACTURE
- Function: lengthening the anterior lever arm and increasing the efficiency of the quadriceps.
- Direct vs indirect injury
- Test extensor mechanism
- Vertical fracture: Merchant view

PATELLA FRACTURE
- DDx: bipatite patella (superolateral)
- Treatment:
  - Non-displace, intact extensor: cylindrical cast
  - Displace, disrupt extensor: ORIF with TBW
DISLOCATION AROUND KNEE JOINT

PATELLAR DISLOCATION
- Adolescent female
- Usually dislocated laterally
- Treatment: Reduce by extension and manual medial displacement
- Cast 2-3 weeks

KNEE DISLOCATION
- Often reduce spontaneously
- Associated with injury to popliteal artery: Obtain ABFS (+) arteriogram
- Peroneal nerve injury > tibial nerve
- Monitor sign of vascular injury

TIBIAL PLATEAU FRACTURE
- High energy trauma: Fracture medial tibial plateau
- Associated neurovascular injury
- Be aware for compartment syndrome
- Treatment: Displace > 5mm: ORIF

TIBIA AND FIBULAR FRACTURE
FRACTURE BOTH BONE LEG

- AWARE FOR OPEN FRACTURE
- OBSERVE COMPARTMENT SYNDROME
- TREATMENT: LONG LEG CAST OR ORIF
- INDICATIONS FOR SURGERY
  - FAILED CLOSED TREATMENT
  - MULTIPLE INJURIES
  - SEGMENTAL FRACTURE
  - MALUNION
  - NONUNION
  - PATHOLOGICAL FRACTURE
  - ISOLATED TIBIAL FRACTURE

OPEN FRACTURE

Table 3.2. Classification of open fractures

<table>
<thead>
<tr>
<th>Type</th>
<th>Wound</th>
<th>Level of contamination</th>
<th>Soft tissue injury</th>
<th>Bone injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>&lt;1 cm</td>
<td>Dirty</td>
<td>Simple, minimal</td>
<td>Minimal</td>
</tr>
<tr>
<td>II</td>
<td>&gt;1 cm</td>
<td>Dirty</td>
<td>Moderate, some muscle damage</td>
<td>Moderate contamination</td>
</tr>
<tr>
<td>III</td>
<td></td>
<td>Dirty</td>
<td>Severe, major muscle damage</td>
<td>Severe contamination</td>
</tr>
</tbody>
</table>

- A: Dirty <1 cm
- B: Dirty >1 cm
- C: Dirty, sepsis

CRUSH INJURY

- TIBIAL PILON (MOST COMMON: ANTERIOR TIBIA COMPARTMENT), FOREARM
- 5 "P"'S: PAIN (EARLIEST SYMPTOM), PALOR, PARESTHESIA, PARALYSIS, PULSELESSNESS
- INDICATION FOR SURGERY: >40 MMHG OR DIASTOLIC PRESSURE - COMPARTMENT PRESSURE <30 MMHG
- IRREVERSIBLE DAMAGE >6 HOURS
- TREATMENT: FASCIOTOMY

COMPARTMENT SYNDROME

- CRUSH INJURY
- TIBIAL PILON (MOST COMMON: ANTERIOR TIBIA COMPARTMENT), FOREARM
- 5 "P"'S: PAIN (EARLIEST SYMPTOM), PALOR, PARESTHESIA, PARALYSIS, PULSELESSNESS
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- IRREVERSIBLE DAMAGE >6 HOURS
- TREATMENT: FASCIOTOMY

TIBIAL PILON FRACTURE

- TIBIAL PILON (DISTAL) = PLAFOND (CEILING)
- MECHANISM: AXIAL LOAD
- TREATMENT: ORIF

ANKLE FRACTURE
ANKLE FRACTURE

- **WEBER CLASSIFICATION 1972**
  - TYPE A: Fracture below the level of the distal tibial fibular syndesmosis
  - TYPE B: Fracture at the level of syndesmosis
  - TYPE C: Fracture above the joint line
- **TREATMENT**
  - A: Nonoperative treatment = short leg cast 6-12 weeks
  - B: +/- surgery
  - C: Surgery = ORIF

MAISONNEUVE FRACTURE

- **EXTERNAL ROTATION OF THE ANKLE CAUSING**
  - RUPTURE OF MEDIAL LIGAMENT COMPLEX (DELTOID LIGAMENT)
  - ASSOCIATED PROXIMAL FIBULAR FRACTURE
  - MAY REQUIRE SURGERY
  - MISSED ON ANKLE X-RAY

FOOT FRACTURE

- **CALCANEAL FRACTURE**
  - MECHANISM: Compression from fall
  - ASSOCIATED WITH
    - THORACOLUMBAR FRACTURE
    - KNEE OR HIP FRACTURE
    - GLI RENAL INJURY
  - X-RAY: LATERAL AND AXIAL (HARRIS) VIEW
  - BOEHLER'S ANGLE: NORMAL 25°-40°

TALUS FRACTURE

- **MECHANISM: ANKLE HYPEREXTENSION**
- **TALUS NECK**
- **TREATMENT:**
  - UNDISPLACED: Short leg slip with ankle plantar-flexion 8-12 weeks
  - DISPLACE: ORIF

LISFRANC'S FRACTURE

- **LISFRANC JOINT = TARSO-METATARSAL JOINT**
  - METATARSAL BASE FRACTURE
  - METATARSAL DISLOCATION
  - 2ND METATARSAL BASE IS CRITICAL FOR STABILITY OF MIDFOOT
  - MAY REQUIRE ORIF
**FIFTH METATARSAL FRACTURE**
- Dancer's
- Avulsion fracture base of 5th MT
- Attachment of peroneus brevis
- Inversion injury
- Cast shoe
- Jones' transverse fracture
- Proximal diaphysis
- Common in athletes (running or jumping sports)
- Increase incidence of nonunion
- ORIF or cast

**STRESS INJURY**
(March toe)
- Often a military recruit or a nurse
- Usually the second metatarsal is affected
- Elastic bandage
- No splint needed

**THANK YOU**