

Indiana University Health

Diabetic Ankle Fractures:
Tips for Practical Treatment

14th Annual "Trauma 101"
FRACTURE CARE FOR THE COMMUNITY ORTHOPEDIST AND
ORTHOPAEDIC PA & NP
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Disclosures 

- Stryker Trauma
 - Research and Design Consultant
 - Speaker Board
 - Stock Ownership
- DepuySynthes
 - Stock Ownership, J&J



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No Shortage of Challenges 

- Closed ankle fractures
 - One of the most common injuries encountered in the ER
 - Over 250,000/yr
- Diabetes very common
 - Indiana incidence 7%
 - 18th in US
- Obesity also a bit of an issue
 - Indiana incidence 33%
 - 7th in US



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No Shortage of Challenges



- Most common presentation is an elderly woman with a distal fibula fracture



No Shortage of Challenges



- SooHoo, et al. *JBJS*, 2009.
 - 57,183 patients identified in CA that had undergone ORIF ankle fx between 1995-2005
 - Diabetes one of the risk factors predictive of short-term complications (wound issues, revision ORIF)



No Shortage of Challenges



- Wukich, et al. *Foot Ankle Int.* 2011.
 - Diabetic pts with ankle fractures have higher rates of
 - Hospital mortality
 - In-hospital post-operative complications
 - Length-of-stay
 - Non-routine discharges
 - 'Complicated' diabetic pts have much higher risk than 'non-complicated'
 - Include those pts with end-organ failure such as peripheral neuropathy, nephropathy, PAD, etc.



Diabetes



- Two types
 - Type I – early onset, insulin not produced
 - Type II – adult onset, insulin resistance; obesity
 - » More than 90% of diabetics are Type II
- Lack of insulin leads to hyperglycemia and protein glycosylation
 - These big sugar/proteins then lead to end organ damage
 - » Peripheral neuropathy
 - » Vasculopathy
 - » Retinopathy
 - » Nephropathy
 - » Gastroparesis

⇒ Impaired Healing



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Talking Points



- Presentation
- Evaluation/Diagnosis
- Treatment Options
- Aftercare



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Presentation



- Usually the result of a fall
 - Curb, stairs, barstool
- Pain
- Swelling
- Deformity
- BEWARE!
 - Deformity without pain
 - Pain without sensation
 - Swelling/blisters with little to no history of trauma



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Presentation



- The 'Silent Deformity'
 - 55yo male
 - Pain, swelling, 'erythema'
 - Poorly controlled DM
 - A1c = 8
 - Difficulty getting meds
 - Admitted twice in 2 months for treatment of cellulitis and to rule out DVT
 - XR ordered by med student to 'rule out' nec fasc



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Evaluation/Diagnosis



- Complete history
 - Co-morbidities
 - Medications
 - Family history
 - Activity level
- Complete physical exam
 - Condition of skin
 - Neurovascular exam
- Lab work
 - Glucose, kidney function, coags
 - A1c not important in acute setting (barometer for compliance)
- XR's - 'follow the pain'
 - Tibia, foot as indicated



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Evaluation/Diagnosis



- Supplemental Imaging
 - Stress views to evaluate syndesmosis and/or deltoid ligament
- CT scan
 - Suspected involvement of the plafond
- MRI
 - Evaluate lesions or defects in talar dome



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Evaluation/Diagnosis



- Job #1 in ER – REDUCE the joint
 - Reconstruction dependent on integrity of skin envelope
 - Minimize joint injury
 - Pain control



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Evaluation/Diagnosis



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Evaluation/Diagnosis



- Open fracture wounds are
 - IV abx
 - REDUCE
 - Wet betad
 - Splint with long slabs



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Treatment Options



- Non-Operative Indications
 - Becoming more narrow
 - "If it needs to be reduced it needs surgery"
 - Nondisplaced/stable fractures
 - Rare bimalleolar fx's
 - Isolated medial malleolar avulsion fx's
 - Minimally displaced lateral malleolar fx's w/out medial injury
 - **Must** consider soft-tissue, neurovascular exam

Treatment Options



- Non-operative Treatment
 - Failure usually related to in



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Treatment Options



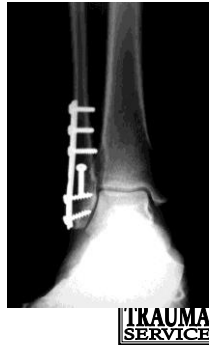
- Operative Indications
 - Failure of closed reduction
 - Inability to obtain and maintain adequate reduction
 - Significantly displaced fractures
 - Unstable fractures
 - Intra-articular fractures
 - Patients that are not a candidate for conservative management



Treatment Options



- Goals:
 - Stable internal fixation
 - Anatomic restoration of joint
 - Normal ankle/foot alignment
 - Axial, sagittal, coronal plane
 - Stabilize the ankle joint
 - Allow for early restoration of function
 - Consider slowing down in this population



Tips for Treatment



- Do not rely on a splint to maintain a reduction for more than a day



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Tips for Treatment



- Actively manage soft-tissue
 - Wait on Wrinkles/Dry Eschar (7-14days)
 - Lance blisters, apply nonstick/dry dressing
 - Elevation/ice

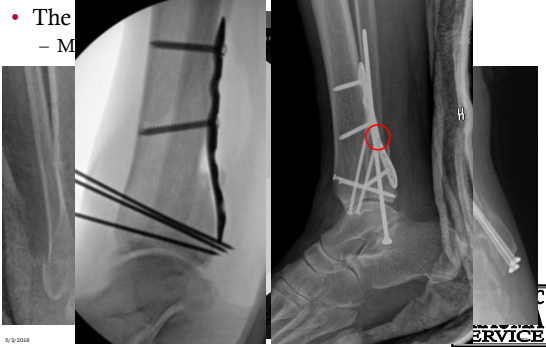


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Tips for Treatment



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Tips for Treatment



- Critical to Tailor Treatment
 - IM fixation for fibula or double stack 1/3 tubular plates
 - ‘Syndesmotic screws’ to enhance fixation
 - Bi-cortical medial screws
 - Adjunctive external fixation



Tips for Treatment



- Don't ruin a perfectly good surgery with a poorly applied splint or boot
 - Surveillance Surveillance Surveillance ...



Tips for Treatment Options



- Don't ignore unhappy wounds
 - Kettle
 - En
 - Get a
- Staples
 - leg/ankle
 - Wound
 - 3-0
 - Le
 - Vicryl
 - Sprinkle vanc powder in at risk wounds



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Aftercare

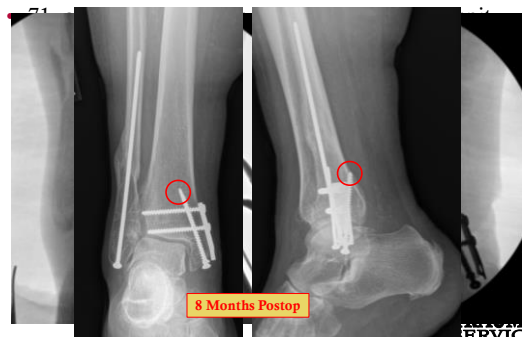


- Everything is longer than you think
- Wounds heal slowly
 - Do not get fooled into removing sutures before three weeks
- My protocol
 - Well-padded splint until wounds heal; 3-4wks
 - In office weekly for wound checks
 - Short-leg cast for 3-4 wks, TTWB
 - In office every two weeks for skin checks
 - (**) Adjunctive exfix removed between 6-8 wks
 - Then a boot, progressive increase WB (25%/wk)
- Get assistance with tight postop glucose control

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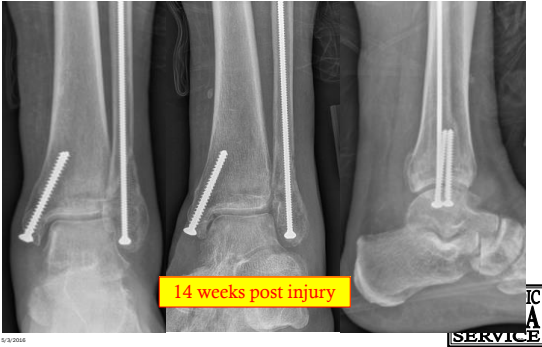
Sample Cases



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Sample Cases



Sample Cases



Summary



- Diabetic Patients with Ankle Fractures
 - Challenging and time consuming
 - Adopt policy of weekly surveillance of wounds or soft-tissue for first few weeks of treatment
 - Surgical decision making critical
 - Balance between minimizing further insult to soft-tissue and maximizing stability
 - Knowledge is power; talk to patients and family about possible complication rate as high as 40%
 - Late Charcot Arthropathy common