

Turf Toe etc: An Update

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Disclosures

*Consulting/Royalties:
Wright Medical, DJO, Arthrex
Consulting: Amnioc*

***Turf Toe/Plantar
Plate/Sesamoid Injuries:
How Can We Treat These Patients
and get them back Fast?***

You Don't!

"Turf Toe"

n Term first used in 1976 for hyperextension hallux injury on an artificial field surface

- » Astrodome, Houston TX
- Now seen with all sports and on any surface
- Effect of shoes?
- Cleat/surface interaction?

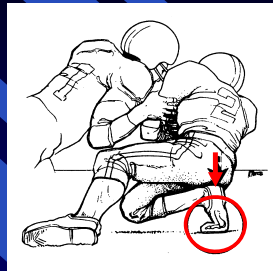


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Mechanism of Injury

n Classic scenario

- Foot fixed in equinus
- Axial load
- Forefoot progresses into dorsiflexion

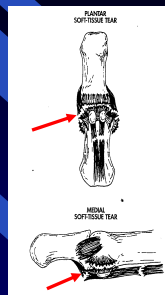


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Classic Pathology

n Soft tissue injury

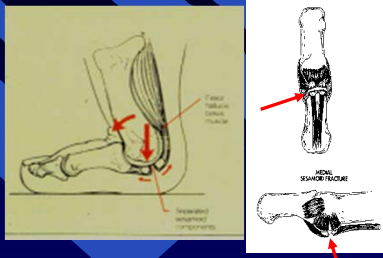
- Disruption of FHB and plantar complex distal to sesamoids
- Variable in degree and extent = complete vs partial



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Another Pathology

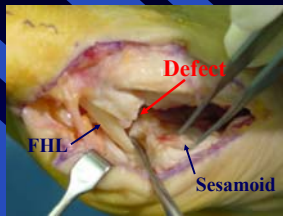
- n Can also present as a diastasis of bipartite or fractured sesamoids = *weak link*



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Result of Hyperextension Injury

- n Soft tissue injury
 - Loss of plantar restraints
 - If unrecognized can lead to joint damage and deformity



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“Turf Toe” = Not all “Classic”

- n Can also occur on grass and with any sport
- n Dislocation the most severe form



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Other Mechanisms of Injury

- n Turf toe injuries can be highly variable
 - Not all axial load
 - Can be non-contact
 - Some chronic "attritional"



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"Turf Toe": Variable Injury Patterns

- n Direction of force
 - Unlike classic turf toe (pure hyperextension) → valgus or varus component can occur



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"Turf Toe": Variable Injury Patterns

- n Consider force and what is ruptured
 - *Valgus force common*
 - MCL/Abd Hall rupture
 - » Loss of tendon balance
 - » Leads to traumatic bunion/progressive hallux valgus



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Clinical Examination



- n Standing alignment and toe posture
- n FHL function
- n Lachman exam
 - Vertical instability = lack of plantar restraints

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Lachman/Drawer test = Stabilize 2nd MPJ to test hallux



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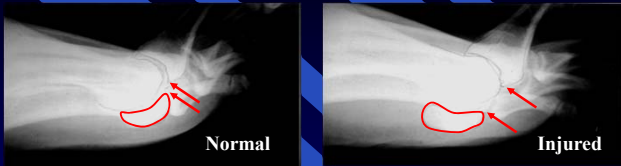
Radiographic Evaluation

- n Mandatory in the evaluation of turf toe
- n Comparison AP of opposite side recommended
- n Assess for proximal migration of sesamoids



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Radiographic Evaluation



- n Forced dorsiflexion lateral view
 - Assess distance from distal tibial sesamoid to base of phalanx (nl avg: 8mm)

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Fluoroscopy Invaluable



- n Assess trailing motion of the sesamoids with dorsiflexion of the hallux
 - *Educational to patient*

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Flouro: Assess for Complete Rupture/Instability



- n Example: post-reduction hallux mp dislocation; vertical stress testing (*toe Lachman/drawer test*)

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MRI

- n Consider intra-articular injuries that can occur at time of incident
- n Useful with subtle injuries
 - Identifies osseous and articular damage



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Treatment

- n Most can be treated nonoperatively
 - R.I.C.E.
 - Walker boot or short leg cast with toe spica
 - » Plantarflex hallux
 - Turf toe plate/tape



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Surgical Treatment – Who Needs It?

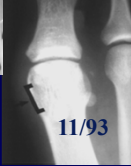
- n “A Gestalt”
- n Failure to respond to conservative measures
 - Loss of push-off strength
 - Gross instability
 - » + Lachman
 - » Excessive DF
 - Progressive clawing



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Surgical Treatment – Who Needs It?

- n Other indications for surgical intervention
 - Progressive proximal migration of sesamoids
 - Progressive diastasis of a bipartite sesamoid



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Surgical Goal

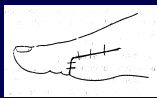
- n Restoration of anatomy is necessary for restoration of function



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Surgical Technique

- n Exposure through medial or J-incision



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Surgical Technique

- Exposure through both medial and plantar incisions
 - Less traction on nerve
 - Improved lateral exposure
 - Better wound healing



medial



plantar

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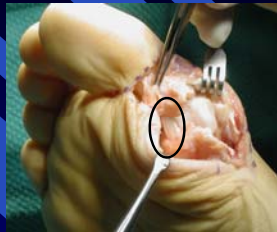
Extensile vs 2-Incision Approach = Identify and Protect the Nerves!



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Surgical Technique

- Transect abductor tendon - identify defect in plantar capsule, condition of the FHL tendon and sesamoids



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Surgical Technique

- n Primary repair to soft tissue on base of proximal phalanx usually possible



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Surgical Technique

- n Advance capsule and repair
 - 2-0 nonabsorbable
 - 10-15° plantarflexion
- n Work from lateral to medial
 - Avoid nerve



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Direct Repair



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Case Example

n Intraop view

- Medial incision used to identify extent of rupture/condition of the FHL tendon with plan to debride and repair primarily



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Case Example

n Intraop view

- Plantar incision used to directly repair the lateral FHB/plate rupture
 - » Beware of digital nerve
- Secure with toe in 10-15 degrees of plantarflexion and then complete medial repair

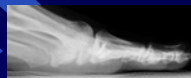


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Surgical Technique

n If no soft tissue attachments for primary repair

- Distal: suture anchors in proximal phalanx
- Proximal: transverse drill hole in distal sesamoid



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Surgical Technique

- n Technique Tip:
suture anchors in proximal phalanx
 - Must avoid supination
 - Be central – use flouro



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Surgical Technique

- n Complete repair with advancement of medial capsule
 - Repair abductor hallucis tendon



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Surgical Technique



Check nerve one last time prior to closure

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Surgical Technique

Preop (injured) *Postop* *Compare to Contralateral (normal)*

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Case – Turf Toe Variant

- n 27 y/o lineman
- n Valgus stress with axial load
- n Progressive hallux valgus
 - Can not “cut” or push-off
 - MRI: medial capsular rupture

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Case: Traumatic hallux valgus

- n Treatment
 - Modified McBride bunionectomy with adductor tenotomy and repair of medial defect

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“Turf Toe”: Variable Injury Pattern

- Medial based injury = progressive hallux valgus
- Modified McBride bunionectomy



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Turf Toe with Bad Sesamoids?

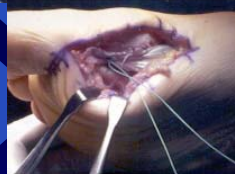
- n Tibial sesamoid pain with instability
- n Failed cast/toe spica in plantarflexion



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Solution = Tibial Sesamoidectomy with Abductor Hallucis Transfer

- n Transfer fills plantar defect
- n Provides flexion power
- n Need to release adductor hallucis tendon to balance



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Postoperative Management

- n Delicate balance between protection and early ROM
 - Immobilize for 5-7 days → passive plantar flexion (keep sesamoids moving)
- n 4 weeks NWB then walker boot
- n Active plantar flexion at 4 wks, dorsiflexion at 6-8 wks
- n Accommodative shoe with insert/plate at 8 weeks and initiate active ROM

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Postoperative Management

- n Run at 3 months; play after 4 months
- n Taping, footwear modifications
- n “Sore” for a year – risk for hallux rigidus



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Turf Toe Summary: Beware of these hallux mp plantar plate injuries and their variations = best to treat early; appreciate long term risk for hallux rigidus



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Thank you



Late Presentation: Cock-up Deformity

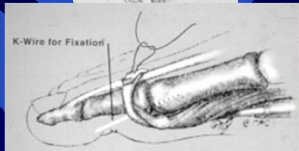
- n MP hyperextension deformity (often IP flexion contracture)



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Surgical Technique

- n Late cock-up deformity
 - Consider FHL tendon transfer
 - » Girdlestone-Taylor
 - » Thru drill hole in proximal phalanx
 - n 4 mm biotenesis screw



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Case Example

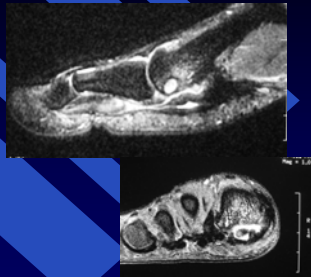
- n 33 y/o wide receiver
- n Turf toe injury 3 years ago
 - Tibial sesamoidectomy
 - Cock-up deformity



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Old Turf Toe/Sesamoidectomy

- n Sudden plantar pain while cutting
- n Cock-up deformity gone
- n Hallux elevated off ground – no push off strength



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Old Turf Toe/Sesamoidectomy

- n Intraop
 - Plantar medial incision
 - » Used old incision and extended across plantar flexion crease



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Old Turf Toe/Sesamoidectomy

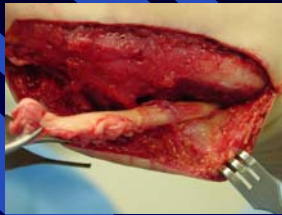
- n Intraop
- FHL rupture



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Old Turf Toe/Sesamoidectomy

- n Intraop
- Tenodesis at master knot



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Old Turf Toe/Sesamoidectomy

- n Intraop
- Tenolysis at master knot performed
- » Restored excursion

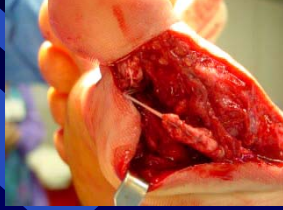


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Old Turf Toe/Sesamoidectomy

Intraop

- FHL tendon recession/transfer to proximal phalanx
- » Fixed with interference screw



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Old Turf Toe/Sesamoidectomy

Intraop

- FHB advancement
- Hallux IP fusion

Returned to pro football after 6 months...



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