Turf Toe etc: An Update

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

You Don’t!
“Turf Toe”
- 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?

Mechanism of Injury
- Classic scenario
  - Foot fixed in equinus
  - Axial load
  - Forefoot progresses into dorsiflexion

Classic Pathology
- Soft tissue injury
  - Disruption of FHB and plantar complex distal to sesamoids
  - Variable in degree and extent = complete vs partial
Another Pathology

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

Result of Hyperextension Injury

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

“Turf Toe” = Not all “Classic”

- Can also occur on grass and with any sport
- Dislocation the most severe form
Other Mechanisms of Injury

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

“Turf Toe”: Variable Injury Patterns

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

“Turf Toe”: Variable Injury Patterns

- Consider force and what is ruptured
  - Valgus force common
  - MCL/Abd Hall rupture
    » Loss of tendon balance
    » Leads to traumatic bunion/progressive hallux valgus
Clinical Examination
- Standing alignment and toe posture
- FHL function
- Lachman exam
  - Vertical instability = lack of plantar restraints

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

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

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

Flouroscopy Invaluable

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

Flouro: Assess for Complete Rupture/Instability

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

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

**Treatment**

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

**Surgical Treatment – Who Needs It?**

- "A Gestalt"
- Failure to respond to conservative measures
  - Loss of push-off strength
  - Gross instability
    » + Lachman
    » Excessive DF
  - Progressive clawing
Surgical Treatment – Who Needs It?

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

Surgical Goal

- Restoration of anatomy is necessary for restoration of function

Surgical Technique

- Exposure through medial or J-incision
**Surgical Technique**

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

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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
Surgical Technique

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

Surgical Technique

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

Direct Repair
**Case Example**

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

**Case Example**

- 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

**Surgical Technique**

- If no soft tissue attachments for primary repair
  - Distal: suture anchors in proximal phalanx
  - Proximal: transverse drill hole in distal sesamoid
Surgical Technique

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

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

Check nerve one last time prior to closure
**Case – Turf Toe Variant**

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

**Case: Traumatic hallux valgus**

- Treatment
  - Modified McBride bunionectomy with adductor tenotomy and repair of medial defect
“Turf Toe”: Variable Injury Pattern

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

Turf Toe with Bad Sesamoids?

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

Solution = Tibial Sesamoidectomy with Abductor Hallucis Transfer

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

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

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
Late Presentation: Cock-up Deformity

- MP hyperextension deformity (often IP flexion contracture)

Surgical Technique

- Late cock-up deformity
  - Consider FHL tendon transfer
  - Girdlestone-Taylor
  - Thru drill hole in proximal phalanx
  - 4 mm biotenodesis screw
Case Example

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

Old Turf Toe/Sesamoidectomy

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

Intraop
  - Plantarmedial incision
    » Used old incision and extended across plantar flexion crease
Old Turf Toe/Sesamoidectomy

Intraop
- FHL rupture

Old Turf Toe/Sesamoidectomy

Intraop
- Tenodesis at master knot

Old Turf Toe/Sesamoidectomy

Intraop
- Tenolysis at master knot performed
  » Restored excursion
Old Turf Toe/Sesamoidectomy

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

Old Turf Toe/Sesamoidectomy

- Intraop
  - FHB advancement
  - Hallux IP fusion
  - Returned to pro football after 6 months…