16 yo with injury to 1\textsuperscript{st} toe during gymnastics class 1 month prior to presentation.
SUMMARY:

DORSAL CAPSULE INJURY

- Edema in the dorsal hood surrounding the extensor hallucis longus and brevis tendons
- Partial avulsion of the proximal phalangeal attachment of the extensor hallucis brevis tendon with a possible tiny osseous component
- Partial tearing of dorsal aspects of the medial and lateral collateral ligaments
- Intact extensor hallucis longus tendon
Partial tearing of the dorsal aspect of the medial and lateral collateral Ligamentous complex of the 1st metatarsophalangeal joint
TWO MECHANISMS, SAME RESULT

Dorsal capsule injury of the 1\textsuperscript{st} MTP

1. “Skimboarder’s Toe” - Hyperdorsiflexion injury

2. “Sand Toe” - Hyperplantarflexion injury

CONTRADISTINCTION:

“Turf Toe” - Hyperdorsiflexion injury resulting in PLANTAR capsuloligamentous injury, common in athletes participating in pivoting or cutting sports (e.g. football)
STRUCTURES OF THE GREAT TOE MTP
1st MTP PROXIMAL TO SESAMOIDS
1st MTP AT SESAMOIDS
1st MTP AT BASE OF PROXIMAL PHALANX
Skimboarders use toes to grip and control board...

If the board slips posteriorly in relation to the skimboarder, hyperdorsiflexion at the MTP joint may occur.

Commonly at the great toe but can occur at the lesser MTPs.
Skimboarder’s Toe: Mechanism of Injury

- In neutral position, EHL tendon traverse under the extensor expansion at the level of the MTP joint.

- In hyperdorsiflexion, EHL tendon exerts force in the dorsal direction at the level of the metatarsophalangeal joint leading to disruption of the dorsal hood (extensor expansion). +/- Avulsion of the EHB tendon.
CASE: 39 yo skimboarder who sustained hyperdorsiflexion injury of the first metatarsophalangeal joint

- Dorsal ST swelling at 1st MTPJ
- Disruption of the extensor hood medially
- Intact plantar plate and extensor hallucis longus tendon
TURF TOE VS SKIMBOARDER’S TOE

BAREFEET!
Renders EHL tendon more apt to hyperdorsiflex & tear the extensor hood

Why anatomic distribution of injury differ despite similar mechanism - hyperdorsiflexion?
“Sand Toe”

Same anatomic injury to “Skimboarder’s Toe”

Different mechanism
“Sand Toe”: Mechanism of Injury

- Caused when the weight of the body lands on neutral or slightly plantar flexed toes causing buckling or hyperplantarflexion of the MTPJ with the weight of the body driving the foot in the sand.

- Hyperplantarflexion injury at the MTP.
- Also results in dorsal capsuloligamentous injury.

- Commonly seen in sand volleyball players.
- Most common scenario involves a running approach from a jump serve or a running spike.

“Sand Toe”

- Being barefoot thought to increase risk of this injury since footwear would most likely prevent the vast majority of these injuries.

- Commonly 1st MTP commonly affected but can affect the other MTPs.

- Typically takes 6 months to recovery

“Sand Toe”: Treatment

- Toe taping most effective
  - 1\textsuperscript{st} MTP taped in neutral position
  - Buddy taping of lesser toes
- Anti inflammatory medications
- Shoe wear modification
- Ice
- Rest
- Rehab with toe strengthening program
- Steroid injection not recommended → lead to weakening of capsule and further disability
- Surgery rarely needed
References

Donnelly et al. Skimboarder’s Toe: Findings on High-Field MRI. AJR 2005;184:1481-1485


Watson TS, Anderson RB, Davis WH. Periarticular injuries to the hallux metatarsophalangeal joint in athletes. Foot Ankle Clin 2000;5:687–713


http://radsouce.us/clinic-turf-toe/