Alpine Skiing Injuries

Ulnar Collateral Ligament Sprains and Tibia Fractures

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Introduction

Skiing is an exciting winter sport; however, it is defined as a high-risk sport for significant injuries. Focusing on upper body and lower body injury, common traumas to the body in downhill skiers are sprains of the ulnar collateral ligament (UCL), which is part of the thumb joint, and tibia fractures.
The analysis and research will outline the following of each injury:

- Mechanism of injury
- Treatment
- Rehabilitation
- Prevention

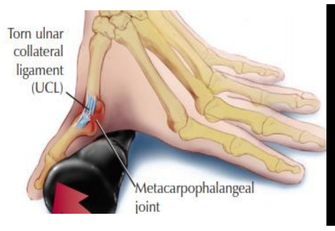
Mechanism Of Injury

Tibia fractures

- Boot bindings not releasing during a fall [1]
- Falling off the snow surface [1]
- Direct trauma to the tibia [4]

UCL Sprains

- Falling on an outstretched hand or while gripping a ski pole[3]
- The ski pole forces the thumb to deviate radially causing hyperextension and hyperabduction which stretches and/or tears the UCL[3]
- Acute, excessive force can cause an avulsion fracture

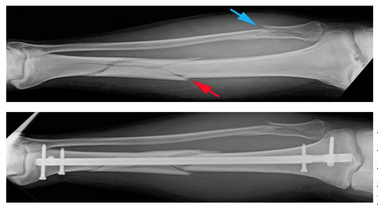


https://library.macewan.ca/full-record/s3h/83168637 https://www.ncbi.nlm.nih.gov/books//NBK541004
Left image is a grade 2 sprain, right image is a grade 3 sprain.

Treatment

Tibia Fractures

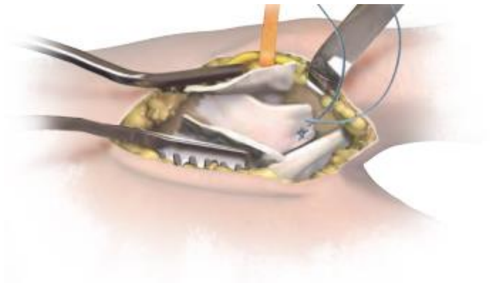
- Open and closed fractures are commonly treated by surgery [4]
- A rod and nails are placed into tibia to stabilize the injury [4]



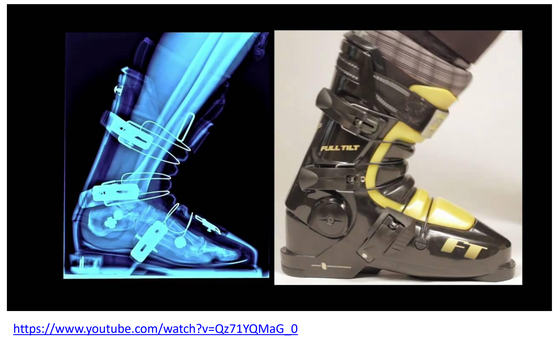
https://orthoinfo.aaos.org/en/diseases--conditions/tibia-shinbone-shaft-fractures/

UCL Sprain

- Partial (Grade I and II) tears are usually treated by immobilization in a thumb spica cast or brace [2]
- R.I.C.E. [3]
- In a complete rupture, early surgery, usually with suture anchors, is recommended [3]
- In the case of a complete rupture, a Stener lesion should be ruled out before surgery is performed [3]



https://www.zimmerbiomet.com/content/dam/zimmer-biomet/medical-professionals/000-surgical-techniques/sports-medicine/juggerknot-soft-anchor-1-mm-mini-ucl-repair-of-the-thumb-surgical-technique.pdf
Re-attaching UCL with anchor sutures.



https://www.youtube.com/watch?v=Qz71YQMaG_0
A more flexible ski boot that helps with shin bang.

Prevention

Tibia Fractures

- Proper fitting boots and bindings [1]
- Elimination of risk factors:
  - Avoiding alcohol and other impairing substances
  - Avoid risky behavior [1]
- Awareness Training [1]

UCL Sprains

- Discarding poles during a fall reduces the risk
- Wear a brace or splint if previously injured [3]
- Be aware of factors that can cause falls and/or collisions (i.e. icy conditions, poor visibility, high speed)

https://www.cvs.com/shop/thermoskin-thumb-stabilizer-universal-prodid-2380108

Risk Factors

- *External*
  - Snow surface and trial complexity/difficulty
  - Climate factors
  - Presence of other skiers
  - Equipment [1]
- *Internal*
  - Motor abilities
  - Self reported level of experience [1]
  - Fatigue level
  - Gender [1]
  - Age [1]

https://altusmountainguides.com/blog/trip-reports/how-to-get-into-backcountry-skiing/

Rehabilitation

Tibia Fractures

The Steps to Recovery:

- Accustomed to crutches [4]
- Reduce pain and normalize movement [4]
- Normalize walking without crutches and balance [4]
- Increase endurance of muscle [4]
- Increase muscle strength [4]

https://www.pinterest.ca/pin/748020437858283388
Strengthening plantar flexion.

UCL Sprain

- Initial rehabilitation is establishing range of motion while in a cast [5]
- Progression of motion from passive, active to resistive phases (i.e. rebuilding pinch proprioception) [5]
- Strengthening and sport specific movement [5]

References

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