Skiing Injuries: Upper Extremity

Background

Lower Extremity
Nordic Skiing
Snowboarding

Shoulder Injuries
Anterior glenohumeral dislocations
Acromioclavicular (AC) Joint Injuries
Clavicle fractures

1. Epidemiology
   - 39% of all upper extremity injuries
   - 4-11% of all ski injuries

2. Mechanism of injury
   - Falls (93.9%)
   - Collision with skiers (2.8%)
   - Pole planting (2.3%)
   - Collision with trees (1%)

3. Rotator cuff strain or tear
   - 24.2% shoulder injuries

4. Anterior glenohumeral dislocations
   - Epidemiology
     - 21.6% shoulder injuries
   - Mechanism of injury
     - Fall on outstretched arm
     - Abduction-external rotation torque applied to shoulder by ski pole
       - Pulls arm back as skier moves past arm on hill
   - Symptoms
     - Holds arm in neutral position
   - Physical findings
     - Do thorough neurovascular exam pre and post reduction
     - Positive apprehension test
   - Imaging
     - AP and axillary views of shoulder
     - Hill Sachs lesion indicative of dislocation
     - Posterior humeral compression fracture from impacting anterior part of glenoid fossa
   - Treatment
     - Surgery if traumatic dislocation
     - PT if first atraumatic dislocation

5. Acromioclavicular (AC) Joint Injuries
   - See also AC joint injury (sports)
   - Epidemiology
     - 19.6% shoulder injuries
     - Grade I - AC sprain, CC intact
     - Grade II - AC torn and CC sprain
     - Grade III – AC and CC torn, AC dislocated
     - Grade IV – III with clavicle posterior into/thru trapezius
     - Grade V – III with clavicle elevated >100% superiorly
Grade VI – III with clavicle inferior

Mechanism of injury
- Fall onto acromion

Imaging
- AP x-ray
- Stress view if Grade II vs. Grade III

Treatment
- Grade 1, II
  - Sling until pain subsides
  - Then increase ROM
- Grade III – consider surgery for athletes, laborer
- Grade IV-VI – surgical repair

6. Clavicle fractures

Epidemiology
- Only shoulder injury increasing in frequency
- 10.9% of all shoulder injuries

Mechanism of injury
- Fall on outreached arm
- Abduction - external rotation torque from ski pole pulling arm back as skier moves past arm on hill

Symptoms
- Cannot lift arm due to pain at fracture site

Physical exam findings
- Do thorough neurovascular exam
- Pulses
- Nerves
  - Axillary, musculocutaneous, median, ulnar, radial
- Axillary
  - Sensation over superolateral arm, arm abduction
- Musculocutaneous
  - Sensation over lateral forearm, supination of arm
- Median
  - Sensation over thumb, OK sign
- Radial
  - Sensation over dorsum of hand, thumbs up
- Ulnar
  - Sensation over pinky, finger abduction/adduction of fingers
- Pain with gentle pressure over area
- Obvious deformity or bump at fracture site
- Grinding over area with arm raising
- Imaging
- AP of clavicle
- Consider CT if AP negative and suspect medial fracture

Treatment
- Arm sling or figure 8 clavicle strap
- 3-4 weeks if <12 years old
- 4-6 weeks if >12 years old
- After 2-3 weeks start gentle exercises
Ski Injuries - Upper Extremity

- Surgery for:
  - Open fractures, neurovascular injury, associated chest trauma (rib fractures), scapulothoracic dislocation, widely displaced lat/middle clavicle fractures, segmental fractures, >4 months of painful malunion

Skiers Thumb "Gamekeeper's thumb"

1. Epidemiology
   - 8-10% of all ski injuries
   - Most common upper extremity injury

2. Mechanism of injury
   - Injury to ulnar collateral ligament
   - Occurs due to fall with ski pole in hand
     - Radial deviation stresses UCL
   - Results in forced adduction and extension of thumb
   - Severe valgus load to metacarpophalangeal joint from skier falling past thumb

3. Physical findings
   - Increased valgus opening
   - No endpoint with gentle valgus load near full extension of thumb

4. Treatment
   - Strain: splint for 4-6 weeks
     - Physical therapy
   - Rupture: Surgical repair
     - Can return to work/skiing in 1-2 days
     - High incidence of Stener lesions
       - Adductor aponeurosis becomes interposed in ruptured ligament at the attachment to base of phalanx
       - Leads to poor re-approximation of ligament
       - Residual instability
     - May need MRI to detect

5. Prevention
   - Use poles with low profile grip (finger grooves)
   - No restraining devices
   - Consciously discard pole during falls

References


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