Lisfranc Injury

See also Lisfranc Fx/Dislocation

Background

1. Lisfranc joint:
   - Articulation of first and second metatarsals medial/middle cuneiform
2. Lisfranc complex:
   - Tarsometatarsal articulation of midfoot
3. Lisfranc ligament connects lateral surface of medial cuneiform to second metatarsal base
4. Disruption of Lisfranc ligament results in tarsometatarsal instability

Pathophysiology

1. Rare: <1% of all fractures
2. Occurs in 4% of football players
3. Athletes: low-energy loading mechanism
   - Baseball player sliding into fixed base
   - Windsurfer/ equestrian hyperplantarflexing foot while foot caught in strap
   - Offensive lineman tackled from behind
4. General population: high-energy loading mechanism (MVA/ industrial trauma)

Diagnostics

1. 20% missed on ER evaluation
2. Physical exam
   - Midfoot instability
   - Inability to bear wt
   - Plantar midfoot ecchymosis/ edema
   - Medial/ lateral tarsometatarsal region tenderness
   - Dorsalis pedis pulse/ cap refill must be evaluated
3. Radiography
   - Wt-bearing AP, lateral, 30 degree oblique
   - Findings
     - Incr diastasis between base of first/ second metatarsal
     - Incongruity of first metatarsal lateral margin w/medial cuneiform lateral margin
     - Incongruity of second metatarsal medial margin w/middle cuneiform middle margin
     - Incr diastasis between medial and middle cuneiform
     - "Fleck Sign": small avulsion fracture of second metatarsal base or first cuneiform (occurs in 90% of injuries)
4. MRI/ CT: can be helpful in acute injuries
5. MRI: for evaluation of chronic injuries
6. Injury grading
   - Grade I: joint pain, minimal swelling, no instability (most common)
   - Grade II: incr pain and swelling w/mild laxity, no instability
   - Grade III: complete ligamentous disruption, may be fracture/dislocation

Therapeutics

1. Athlete will be sidelined for 12-16 wks w/conservative or operative tx
2. Grade I & II injury w/normal radiographs or metatarsal diastasis <2mm
    - Conservative tx: cast immobilization or walking boot for 4-6 wks
    - Ambulation and rehabilitation should begin after immobilization
    - Repeat wt bearing X-rays to evaluate delayed joint separation if pain w/rehabilitation
3. Grade III injury or metatarsal diastasis >2mm
    - Surgical referral for ORIF in all athletes
    - Immobilization for 8 wks
    - Partial wt-bearing for 4 wks
    - Full wt-bearing w/protective shoe/ well-molded orthotic 12 wks post immobilization
    - Hardware removal
        - 12-16 wks in athletes <200 lbs
        - 24 wks in athletes >200 lbs

Prognosis

1. Return to play
    - Athlete faces 3-6 month recovery period
    - Do no clear until completely pain-free in sport-specific activities
2. Complications
    - Post-traumatic arthritis
    - Misalignment
    - Pain w/wt bearing
    - Arch collapse
3. Career-ending injury if dx missed or severe complications arise

Patient Education

1. http://orthoinfo.aaos.org/topic.cfm?topic=A00162
2. http://orthopedics.about.com/cs/footproblems/a/lisfranc.htm

References

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4. http://www.aafp.org/afp/980700ap/burrough.html
5. http://www.emedicine.com/orthoped/topic511.htm
6. https://ukhealthcare.uky.edu/cartilage/articles/practicalmgt.pdf

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