OVERUSE INJURIES IN ELITE GYMNASTS

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DISCLOSURES

- DJ Global Primary Care Sports Medicine Advisory Board
- Research funding NFL Charities
- Chair, Big Ten-Ivy League Traumatic Brain Injury Research Committee
- No off label uses
- Internationally rated women’s gymnastics judge & former coach/athlete
OVERVIEW

❖ Epidemiology

❖ Ankle
  • Anterior Impingement
  • Posterior Impingement
  • Talus stress injury

❖ Gymnast’s Wrist
  • Distal radial physeal injury
  • + ulnar variance
  • Scaphoid stress fx
OBJECTIVES

- Recognize 3 different types of ankle impingement syndromes.
- Consider a talus stress fx as a cause of ankle pain in a gymnast.
- Know the radiographic signs (xray & MRI) c/w distal radial physeal stress injury.
EPIDEMIOLOGY

- 187 Greek elite gymnasts followed for injuries for 1 yr
  - Almost 40% overuse
  - Overuse injury sites: ankle, knee, lumbar
  - Floor exercise; landing

- 24 elite Australian gymnasts; 18 mo
  - Spend 21% of the year training at less than full capacity due to injury
  - 56% of injuries were chronic

Kirialanis; J Back & MSK Rehab 2002
Kolt; Bj SM 1999
"My ankles hurt when I land."
“LANDING SHORT”

- Common phrase in gymnastics
- Usually refers to bwk landing skills that are under-rotated
- Compression of anterior ankle structures
- Acute or chronic injury
ANKLE IMPINGEMENT

- The ankle is the work horse for gymnasts
- Soft tissue & bony impingement
- Anterior: Landing “short” repetitively
- Posterior: Releve & jumping/leaping
ANTEOR ANKLE IMPINGEMENT

- **Bone spurs**
  - Anterior tibia
  - Talus

- **Soft tissue**
  - Capsule
  - Ligament
May have decreased ankle DF

Imaging
- Xrays
- MRI

Walking boot
- Avoid hyperdorsiflexion
- No landings for a 4-6 wk trial

PT

Corticosteroid injection

Arthroscopic debridement

Spiga S; Musculoskel Surg 2013
ANTERIOR ANKLE PAIN

- Avoid short landings!
  - Too much stress across ankle joint
  - “Total cumulative insult”
- Land on soft surfaces
- Rehab all ankle injuries
- Keep ankles flexible
  - Squat test
ANTERO-LATERAL ANKLE IMPINGEMENT

- Can occur after a lateral ankle sprain (3%)
- Scar tissue in the lateral gutter
- Pinching sensation laterally
- May c/o instability
- MRI w/ contrast is best imaging test
- Corticosteroid injection may help
- Surgical debridement

Gehrmann RM; Am J Orthop 2005
Spiga S; Musculoskel Surg 2013
ANTEROLATERAL ANKLE IMPINGEMENT

Photos courtesy of Dr. Bert Mandelbaum
POSTERIOR ANKLE IMPINGEMENT

❖ Bone
  • Os trigonum
  • Posterior process of the talus
  • Downsloping posterior tibial lip
  • Posterosuperior calcaneus

❖ Soft tissue
  • FHL
  • Tibiotalar & subtalar joint capsule
  • Posterior ankle ligaments

Roche; Foot Ankle Clin N Am 2013
POSTERIOR ANKLE IMPINGEMENT

- Imaging: x-rays, MRI, CT
- Treatment
  - Walking boot
  - Avoidance of plantarflexion
  - PT
  - Corticosteroid injection
  - Arthroscopic debridement (6-8 wk return)
  - Open debridement (8-24 wk return)

Roche; Foot Ankle Clin N Am 2013
TALUS STRESS FRACTURE

- Case series of 3 elite gymnasts
- Deep ankle pain + perimalleolar edema
- Pain with forced dorsiflexion
- All recovered w/ non-surgical tx

Rossi; Skeletal Radiol 2005
"My wrists hurt when I tumble."
DISTAL RADIAL PHYSEAL STRESS INJURY

• **X-ray** (Roy; AJSM1985)
  - Growth plate widening
  - Beaking of the epiphysis
  - Physeal haziness
  - Metaphyseal cyst formation
DISTAL RADIAL PHYSEAL STRESS INJURY

- **MRI** (Shih; Radiology 1995, DiFiori; AJSM 1996)
  - Growth plate widening
  - Lack of physeal homogeneity
  - Physeal cartilage extension
  - Metaphyseal bone bruise
  - Linear striations
TREATMENT

❖ Relative rest
  • No UE wt bearing for 4-12 wks
  • +/- brace or casting
  • PT: ROM, especially wrist & finger flexors, grip strengthening; shoulder flexibility
  • Address technique

❖ Gradual return to wt bearing
  • Start with handstands, round-offs on FX
  • Ok to swing bars

❖ Consider “Lion Paw” wrist braces
Lion / Tiger Paws;
Easy-Pro Brace

www.lionpaw.com
www.tigerpawwristsupports.com
**SCAPHOID STRESS FX**

- **Case reports in literature**
- **Think of this dx in a gymnast w/**
  - no acute trauma
  - +t tp over scaphoid
  - Repetitive FOOSH mechanism
- **Usually need MRI**
- **Treatment**
  - Immobilization 2-4 months
  - Long arm vs short thumb spica cast/splint
  - Surgery
GYMNAST'S ANKLE?
Having a hard time “grasping” gymnastics injuries? Please feel free to contact me with your gymnastics questions...

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