Hip Injuries and Rehab Concepts for the Young Athlete

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No Disclosures

Objectives

- Discuss 3 common hip injuries among young athletes
  - Strains, apophyseal avulsion fractures, post-op rehab for FAI + labral tear
- Discuss rehab concepts and components
  - Early vs late stage rehab
  - Common issues with suggested solutions
- Discuss rehab process from patient and clinician view
  - Patient experiences
  - Clinician experiences

Areas NOT covered

- Slipped Capped Femoral epiphysis
  - Growth plate fracture
- Legg-Calve-Perthes
  - Avascular necrosis of proximal femoral epiphysis
- Hip dysplasia
  - Lack of acetabular covering; typically seen in infancy to young children
- Coxa Saltans (aka Snapping Hip)
  - Typically iliopsoas, IT band or glut. med
- Osteitis Pubis
  - Sprain/strain to pubic symphysis typically due to repeated trauma
- Athletic Pubalgia (aka Sports Hernia)
  - Not an ACTUAL hernia; involves the pubic bone + rectus abdominis and adductor longus

Basic Anatomy review

- Bony Anatomy:
  - Ilium:
    - ASIS: Sartorius origin
    - AIIS: rectus femoris origin
  - Ischium
    - Ischial tuberosity: hamstrings, adductor magnus
  - Pubis
    - Pubic rami: adductors
  - Femoral head
    - CAM
  - Acetabulum:
    - Pincer

Not Pictured: …a lot

Strains

- Hamstring
  - Most common overall
  - Risk factors: (Lee at al, 2015)
    - HS:Q ratio <50.5%
    - Peak torque <2.4Nm/kg
- Hip Flexor*
  - Soccer (NCAA)
- Adductor*
  - Ice hockey (NCAA)
- Higher injury rate in competition*

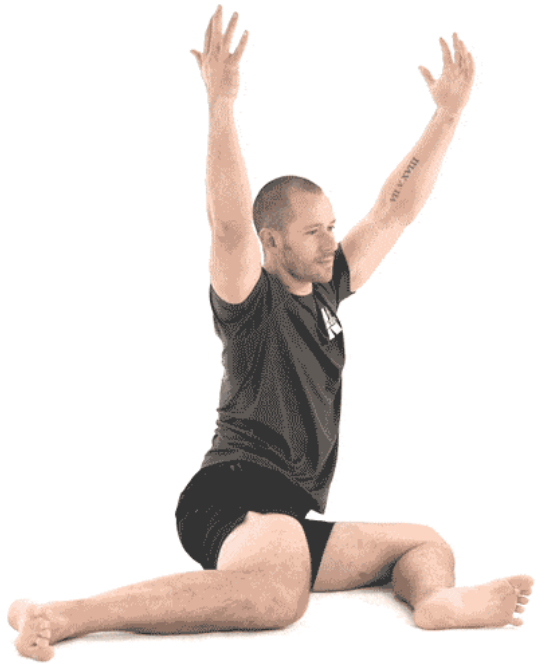
*Eckard et al, 2017

Early Phase Rehab

- Pain control
  - Manual therapy: light STM, joint mobilizations
  - Dry needling
- Range of motion
  - >72hrs post injury
- Strength
  - Isometrics
  - Activation and pain modulator

Late Stage Rehab

- Mobility
  - CARs
  - 90/90s
- Function
  - Squat
  - Lunges
- Sports
  - Increase load before speed
  - Increase speed before change of direction

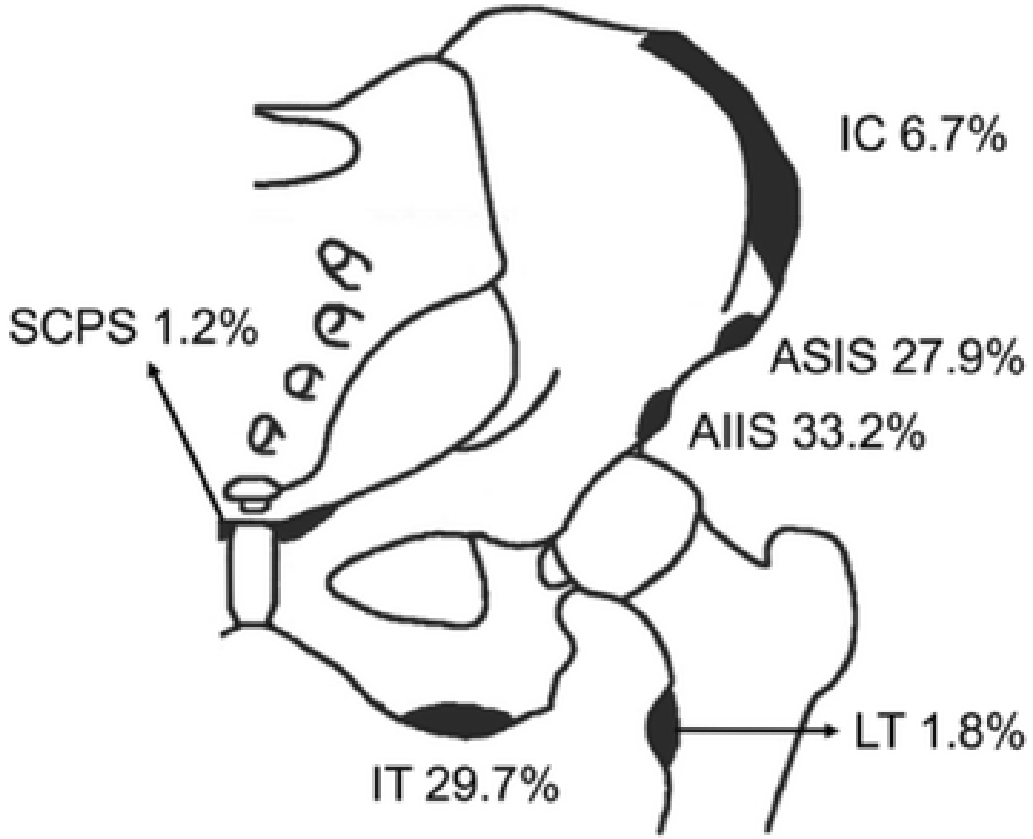


Clinical Notes

- Problems
  - Hip flexion strengthening often overlooked
  - History of low back pain missed on initial evaluation
  - Squat shifting or anterior pain at end range squat
    *Most common!
- Solutions
  - Hip flexor progressions
    - SL hip thrust → SL HT with banded march → Toe-banded wall marching
  - Low back pain + hip pain
    - Psoas involvement
    - Lumbar + thoracic spine mobility
    - Lack of hip extension; instability
  - Squat shift
    - Banded squat increases glut activation; improves stability in joint
    - Ankle dorsiflexion range creating excessive hip hinge moment

Apophyseal Avulsion fractures

- Typically seen male>females 14-17yo
- Explosive sports: soccer, gymnastics, football, track
- Most common (in order)
  1. AIIS = rectus femoris
  2. Ischial tuberosity = hamstrings
  3. ASIS = TFL, sartorius
  4. Lesser trochanter = iliopsoas
- May require surgery if displaced >2cm



*Eperbach et al, 2017 (Germany)

Early Stage Rehab

- Weight bearing status?
  - Strongly recommend use of BFR
- Due to pain/fracture stability, may need to think global vs local strengthening
  - Core, multifidi, antagonists, stabilizers
- Begin loading ASAP
- Quickly mimics a “strain” in terms of rehab

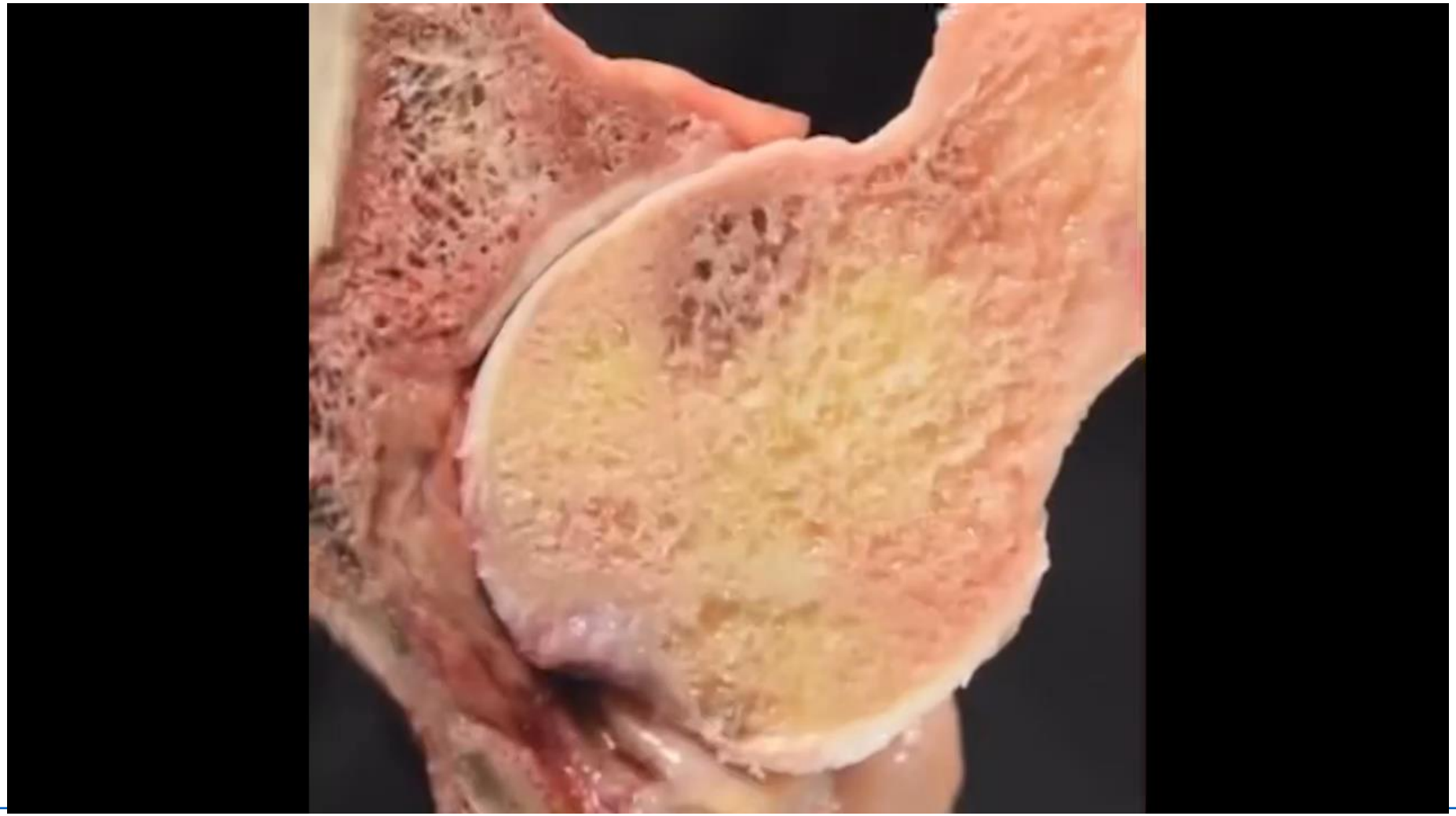
Clinical Notes

- Problems
  - Compensatory patterns won't go away!
  - Continued pain symptoms >3mo from injury (AIIS most common)
  - Fear of reinjury: low effort in rehab = poor outcomes
- Solutions
  - Compensatory solutions
    - Muscle firing imbalance: Russian Stim goes a long way
    - Eyes closed proprioceptive corrections
    - Ankle mobility!
  - MODALITIES: dry needling, BFR with isolated strengthening, vibration therapy*
  - Validate the fear, focus on the progress, refer out

Clinical Notes: continued

- *Vibration therapy
  - Wolff's Law (continued…)
  - Current evidence is highly variable; average treatment time 20min at 20-60Hz
  - Clinical experiences from patients:
    - "My whole body feels loose and ready to go after." JC, 18yo male
    - "I feel like I can squat further and with less pain." LL, 18yo female

FAI + Labral Repair



FAI + Labral Repair

FAI + Labral Repair

- Steadily growing procedure
  - 2011-2015: hip arthroscopy procedures almost doubled
  - 80% of those included labral repair (Westermann et al, 2019)
- Athletes with increased odds
  - ~66% of athlete's had evidence of FAI, regardless of symptoms (Mascarenhas et al 2016)
  - Intensity and frequency of sport believed to be related

Early Stage Rehab

- Most protocols similar restrictions:
  - hip flexion <90deg, <20deg external rotation, 0deg extension ~4wks
  - Caution with hip flexors AND quads!
  - Joint mobs 2-6wks (varies)
    - Posterior glide recommended to improve hip flexion…
    - Loubert et al 2013 found only 3.8% mechanics affected with 50% bodyweight of force
- HIP EXT ROT VIDEO WITH DISLOCATION

Late Phase Rehab

- Hip flexor and quad strengthening
  - Hamstring:quad ratios
- Hip extension strength through range
  - Eccentric control/concentric power from end range
- VERY sport specific training

Clinical Notes

- Problems
  - Post-op restrictions limit rehab → Solutions
    - AQUATIC!
      - Even non-formal aquatic rehab can be beneficial
  - Anterior hip pain with most movements → Reset and refocus
    - Possible rest from PT for 24-48 hours; treat as a new patient
  - Mobility issues with squats, lunges → Powerband mobilizations

Sources

- Westermann, R. W., Day, M. A., Duchman, K. R., Glass, N. A., Lynch, T. S., & Rosneck, J. T. (2019). Trends in Hip Arthroscopic Labral Repair: An American Board of Orthopaedic Surgery Database Study. Arthroscopy : the journal of arthroscopic & related surgery : official publication of the Arthroscopy Association of North America and the International Arthroscopy Association, 35(5), 1413–1419. https://doi.org/10.1016/j.arthro.2018.11.016
- Kemp, J., Grimaldi, A., Heerey, J., Jones, D., Scholes, M., Lawrenson, P., Coburn, S., & King, M. (2019). Current trends in sport and exercise hip conditions: Intra-articular and extra-articular hip pain, with detailed focus on femoroacetabular impingement (FAI) syndrome. Best practice & research. Clinical rheumatology, 33(1), 66–87. https://doi.org/10.1016/j.berh.2019.02.006
- Mascarenhas V.V., Rego P., Dantas P., Morais F., McWilliams J., Collado D., et. al.: Imaging prevalence of femoroacetabular impingement in symptomatic patients, athletes, and asymptomatic individuals: a systematic review. Eur J Radiol 2016; 85: pp. 73-95.
- Dunning, J., Butts, R., Mourad, F., Young, I., Flannagan, S., & Perreault, T. (2014). Dry needling: a literature review with implications for clinical practice guidelines. Physical therapy reviews : PTR, 19(4), 252–265. https://doi.org/10.1179/108331913X13844245102034
- Haser C, Stöggl T, Kriner M, et al. Effect of Dry Needling on Thigh Muscle Strength and Hip Flexion in Elite Soccer Players. Med Sci Sports Exerc. 2017;49(2):378-383. doi:10.1249/MSS.0000000000001111
- Chahla, Jorge. (@chicagosportsdoc) Instragram, 2018-2022.