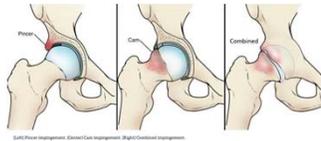


FAI

- Characterized typically by groin pain
- Caused by a pathological contact between the acetabular rim and the femoral head-neck junction, leading to specific cartilage damage
- Two separate mechanisms, the cam and pincer FAI.



Ganz R, Parvizi J, Beck M et al. CORR. 2003.

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Femoral Torsion

- Femoral torsion abnormalities is an additional structural feature of FAI
- Increased and decreased femoral torsion are both associated with degeneration of the hip joint

Beck M. et al. JHPS. 2017.
Ricciardi BF. et al. CORR. 2015.

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What is femoral torsion?

- Femoral torsion is the twisting of femur between its proximal and distal end.

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Femoral Torsion

- Femoral torsion could occur anywhere between the femoral neck and the femoral condyles:
 - intertrochanteric region
 - subtrochanteric region
 - both sites

Waisbrod G, Schiebel M, Beck M. JHPS. 2017.

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FEMORAL ANTEVERSION

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Femoral Rotational Malalignment

- Idiopathic femoral anteversion creates alterations to normal gait and should not be considered a cosmetic issue
- Associated with pain and functional disability and may be a contributing factor to hip impingement as well as to instability

Bedi A, Dolan M, Leung M et al. Arthroscopy. 2011.
Stevens PM, et al. Gait & Posture. 2016.

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Femoral Anteversion

- Valgus hips in combination with high anteversion showed decreased external rotation and predispose to posterior extra-articular FAI as well as to anteroinferior subspine impingement

Siebenrock KA, et al. CORR. 2013.



Femoral Anteversion

- The combination of increased femoral and acetabular anteversion has been suggested to compromise joint stability causing the femoral head to dislocate laterally and forward during gait

Rekeras O, Bjerkeim I, Kolbenstedt A. Acta Orthop Scand 1982.



Femoral Anteversion

- Higher incidence of more anterior labral tears in patients with increased femoral antetorsion.

Ejnisman L, Philippon MJ, Lertwanich P et al. Orthopedics 2013.



Femoral Anteversion

- General agreement, abnormal femoral torsion effects hip biomechanics
- Excessive femoral anteversion may lead to increased stress placed on the anterior acetabulum and soft tissues
- Predispose intra-articular hip pathology

Limited research on patients with severe femoral anteversion



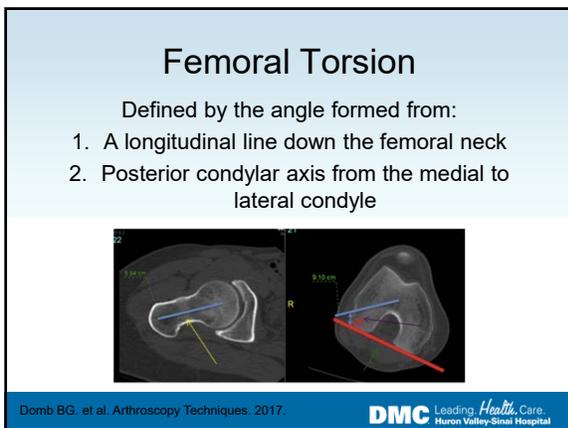
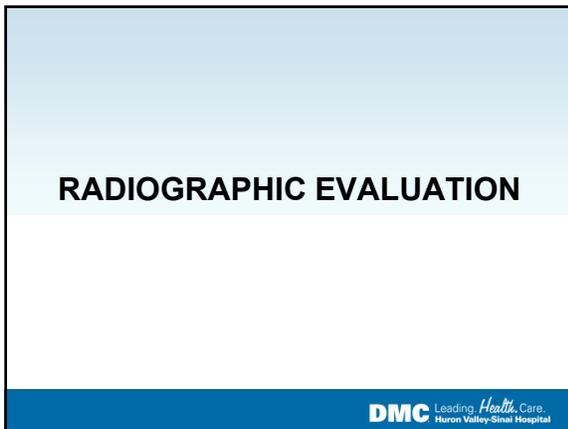
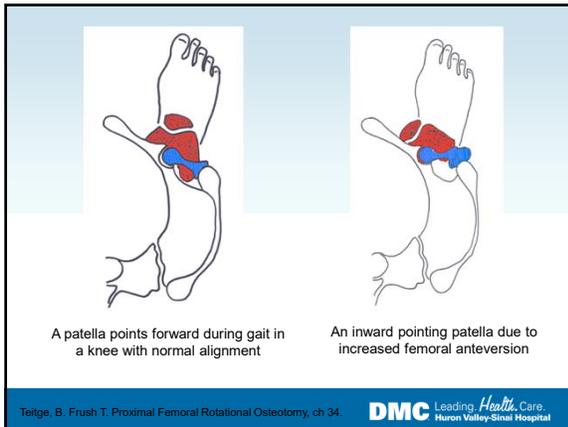
PHYSICAL EXAM

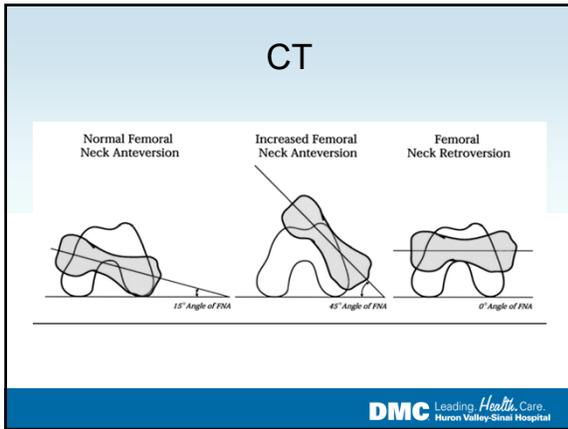


Femoral Anteversion

- Intoeing gait
- Hip Motion (Prone position)
 - Increased IR of >70deg (normal 20-60)
 - Decreased ER of <20deg (normal 30-60)
- Patella internally rotated on gait evaluation







Femoral Anteversion

- CT has a higher interobserver reliability than MRI
 - Better visualization of bony anatomy
- Low <10 deg
- Medium 10 – 20 deg
- High >20 deg

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PFO Indications

- Proximal femoral rotational osteotomy is indicated for the correction of excessive femoral rotation
- >20° of malrotation suggests PFO

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Non-surgical Treatment

- Activity modification
- Medications
- Physical Therapy
- Intra- or extra- articular injections
- Assistive devices

Poultides LA, Bedi A, Kelly BT. *HSSJ*. 2012

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SURGICAL PROCEDURE FOR EXCESSIVE ANTEVERSION

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HA Outcomes for Anteversion

- Clinically important improvements can be expected after arthroscopic FAI surgery in all femoral version groups

Bedi A, Kelly BT. et al. *JBJS*. 2015.

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Patient Criteria

- Excessive femoral anteversion
- Anterior pain with instability testing
- Posterior pain with posterior impingement testing
- In-toeing gait
- 3 months of PT

Domb BG, et al. Arthroscopy Techniques. 2017.



Surgical Procedure

1. Hip arthroscopy addressing intra-articular pathology
2. Derotation osteotomy for excessive femoral anteversion

Neither surgery in isolation addresses both clinical complaints

Domb BG, et al. Arthroscopy Techniques. 2017.



Hip Arthroscopy

- Addresses intra-articular pathology
- Transcapsular iliopsoas lengthening because the head-neck junction will increase after derotation has been performed

Domb BG, et al. Arthroscopy. 2017.



Iliopsoas Tendon

- Psoas tendon is an important passive & dynamic stabilizer of the hip
- Greater alteration of kinematics with high-demand activities, terminal extension & external rotation when tendon is at its highest tension.

Kelly et al. Arthroscopy. 2012.



Iliopsoas Tendinits

- The source of pain & snapping is an inflamed iliopsoas tendon passing over
 1. The iliopectineal eminence or
 2. The anterior capsulolabral complex and femoral head in the native hip or
 3. A malpositioned acetabular component after THA

Adler et al. Am J Roentgenol. 2005
Ilizaliturri et al. Arthroscopy. 2005
Van Riet et al. Acta Orthop Belg. 2011



Iliopsoas Tendon

- Psoas tendon transitions throughout its myotendinous junction from the muscle belly proximally to tendon distally at the lesser
- At the level of the labrum, the tendon compromises 45% of the cross-sectional area.

Alpert JM et al. AJSM. 2009.



Iliopsoas Tendon

- Increased femoral version creates a biomechanical condition in which the hip relies more on the psoas tendon for dynamic anterior stability.
- Possibly causes the tendon to become tighter, thus conflicting with the anterior labrum, explaining why anterior labral tears are more common in patients with higher version.



Derotation Osteotomy

- Proximal aspect of the femur
- Avoids damage and scarring to the distal quad
- Osteotomy stabilized with plate or nail
 - Plate preferred at our institution

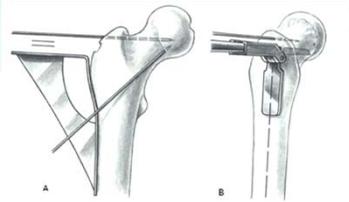


Plate vs Nail

1. Plate/screw – compression and primary bone healing
2. Iatrogenic fracture
3. Violation of IM canal



PFO Technique



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27 year old female



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23 year old female



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