Technique: How I Address Femoral Pathology

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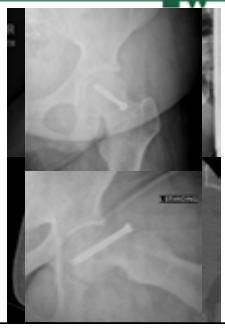
Comprehensive Treatment of CAM Deformity

Can you treat this with arthroscopy?

Can you see the deformity comprehensively?

Can I leave the OR satisfied with my osteochondroplasty?



Why 3D Assessment is Important

- Diagnosis and treatment of cam-type FAI relies on radiographic identification of deformity and correction of 3D asphericity / loss of femoral head-neck offset
- Three-dimensional (3D) imaging is the gold standard for detecting femoral head-neck junction malformations
- Surgical hip dislocation allows direct, circumferential visualization

Inadequate Treatment of FAI

Arthroscopy

Comprehensive FAI Treatment

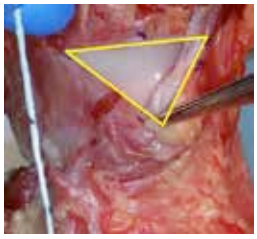
Improving Visualization of the Peripheral Compartment

Aim: Effect of the size of the rim cut on the surface area visualized in the peripheral compartment

10 Cadaver Specimens

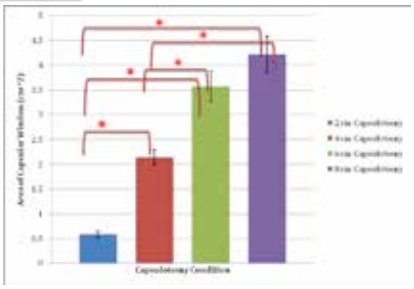
Testing Conditions
- 2 cm Rim Cut
- 4 cm Rim Cut
- 6 cm Rim Cut
- 8 cm Rim Cut

Surface Area using Image J



Grzybowski et al. Arthroscopy 2015 (Submitted).

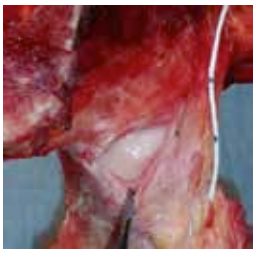
Improving Visualization of the Peripheral Compartment



Grzybowski et al. Arthroscopy 2015 (Submitted).

Comparing Capsulotomy Types

Interportal Capsulotomy (4cm) **T-Capsulotomy**



Technique for Access and Visualization in the Peripheral Compartment

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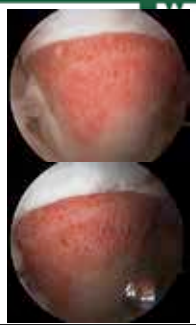
AGS: None, RCM: None
BTK: Consultant Pivot Medical, A2 Surgical, Smith & Nephew
SJN: Consultant Pivot Medical, Stryker

Suspension Technique

Challenges of Arthroscopy

- Hip arthroscopy allows visualization of the anteroinferior/medial to posterosuperior/lateral femoral head-neck junction
- Full visualization requires regional viewing through multiple portals or extensive capsulotomy
  - Makes comprehensive cam-resection difficult
- Intraoperative fluoroscopy is used by many surgeons to evaluate and verify adequate correction of the deformity



Use Fluoroscopy Effectively

- Larson† previously described a reproducible and systematic intraoperative fluoroscopic evaluation for management of cam & pincer morphology during arthroscopy
- Location on the clock-face of the femur that each view demonstrates is unclear

†Larson CM. Arthroscopy 2009; 25: 1183

Fluoroscopy Clockface Assessment

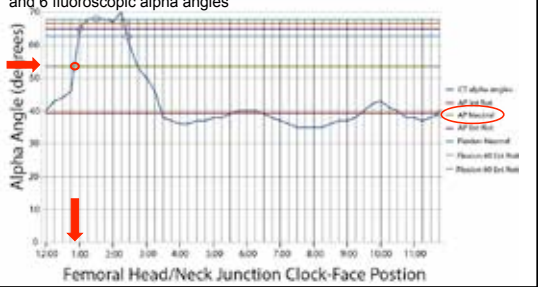
Femoral head-neck junction assessed with fluoroscopy with 6 different leg positions

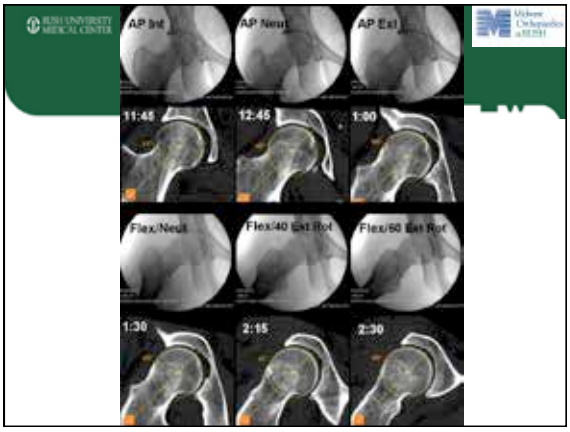
- Hip and Knee in full extension
  - 30° internal rotation
  - Neutral rotation
  - 30° external rotation
- Hip and Knee in ~50° flexion
  - Neutral rotation
  - 40° external rotation
  - 60° external rotation

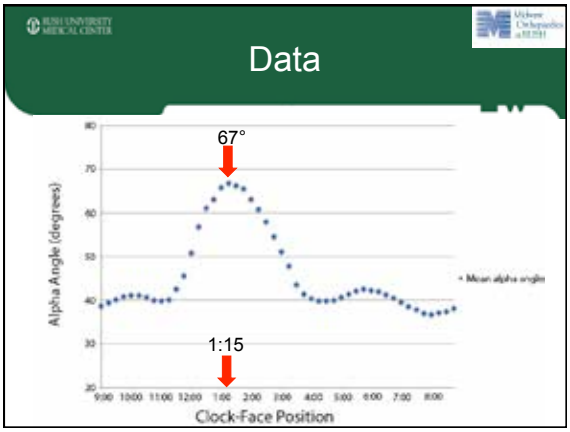
Measurements of the alpha angle performed by a single reader on each fluoroscopic view

Linking Fluoro and CT

- Patient profile of the CT-derived alpha angles of each clock-face position and 6 fluoroscopic alpha angles







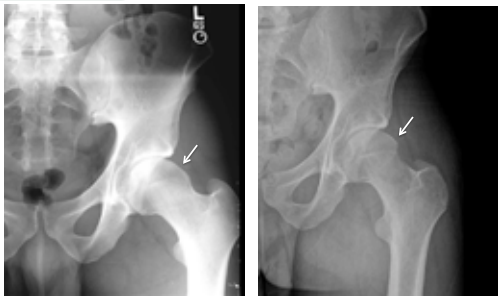
Data

- Alpha Angle Calculation from the Six Fluoroscopic Radiographs and the Corresponding Mean Clock-Face Position for Each of the Six View

Fluoroscopy View	Mean Alpha Angle	Range	CT-derived Clock-face Position	Standard Deviation
AP Internal Rotation	47.7˚	36.9˚ to 90.2˚	11:45	± 0:15
AP Neutral	60.4˚	40.0˚ to 89.3˚	12:30	± 0:15
AP External Rotation	65.3˚	41.2˚ to 92.8˚	1:00	± 0:15
Flexion Neutral	63.7˚	40.0˚ to 87.1˚	1:45	± 0:30
Flexion 40˚ Ext Rot	60.3˚	37.8˚ to 82.1˚	2:15	± 0:15
Flexion 60˚ Ext Rot	56.2˚	35.7˚ to 77.9˚	2:45	± 0:15

- Maximum CT-derived alpha angle between 11:45 and 2:45 in all hips

Femoral Osteochondroplasty



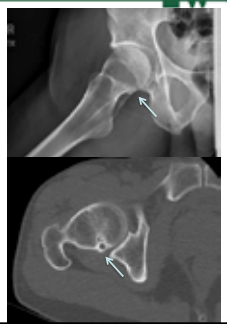
Setting Up For Success

Before you get to the OR:

- Know what is accessible with arthroscopy and your level of comfort
- Use 3D Imaging to help guide FAI deformity

Operating Room

- You cannot treat what you cannot see
  - Capsular strategy and management
- Use fluoroscopy to help visualize proximal femur
- Dynamic hip exam



Thank You!

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