



# Improving Painful Hip Conditions

Austin Chen, MD

Boulder Center for Orthopedics and Spine

303-963-9701



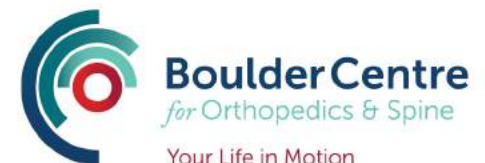
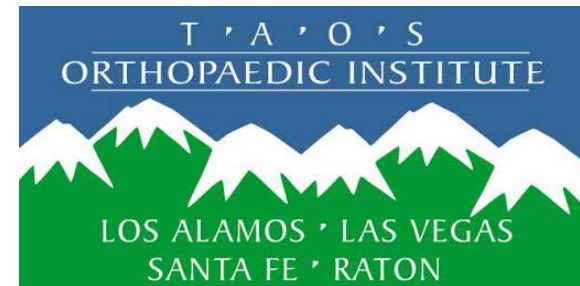
Boulder Community Health

# Objectives

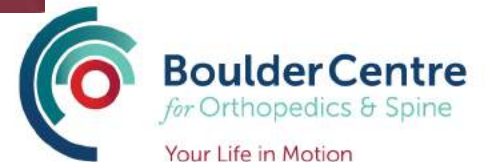
- Know who is and who is not a candidate for hip arthroscopy
- Recognize the characteristics of a hip that cause labral tearing and importance of the hip labrum
- Be introduced to the fundamentals of hip arthroscopy and its recovery

# About me...

- From Pittsburgh, PA
- Undergrad at U. of Notre Dame
- Medical School and Orthopaedic Surgery Residency at U. of Illinois Chicago
- Sports Medicine Surgery fellowship at Taos Orthopaedic Institute, Taos, NM
- Comprehensive Hip Surgery fellowship at the American Hip Institute, Chicago, IL



# U.S. Ski Team



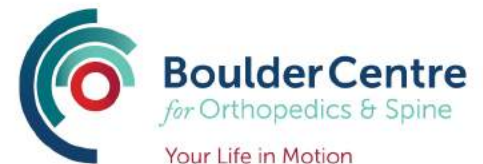
# Outline

- Correct Patient
  - Indications for hip arthroscopy
  - Prognosis
- Correct Surgery
  - Identify source of pain
    - FAI vs Instability
  - Goal: restore the seal!
- Correct Time
  - Non-operative management

# Correct Patient

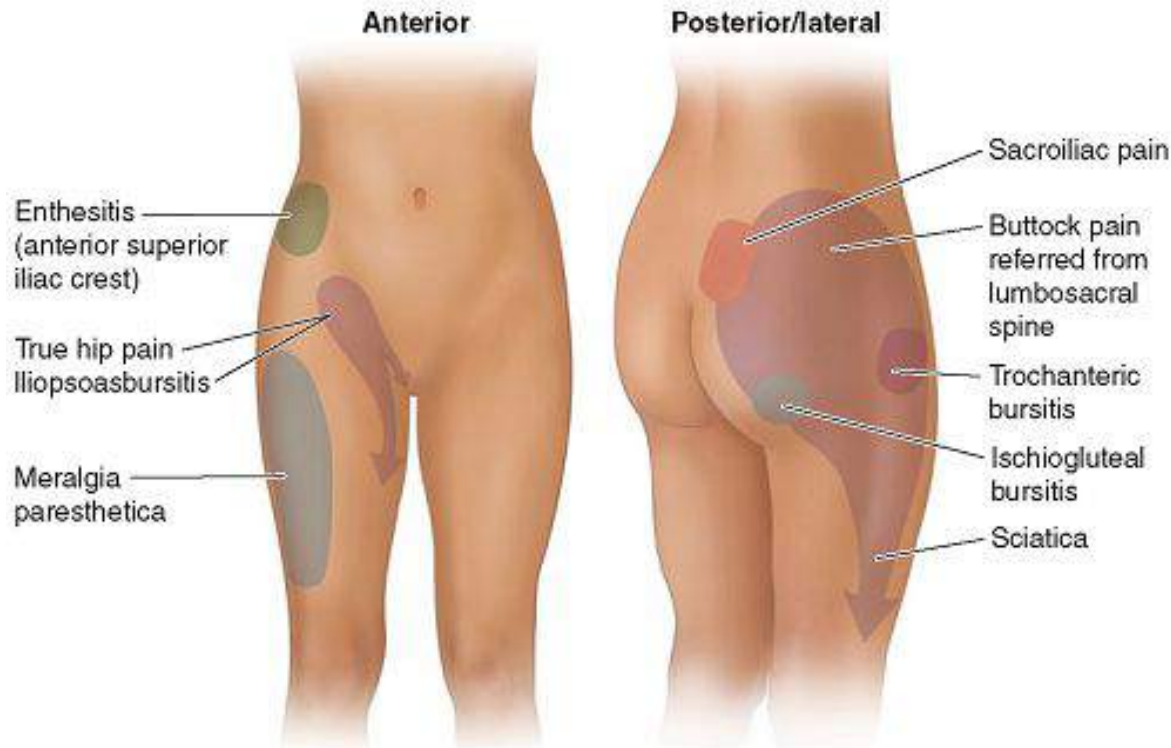
## • Indications for Hip Arthroscopy

- Clinical history = physical exam = radiographic findings
  - Not Spine
- Failed non-op mgmt (min 3 mo)
  - PT
  - NSAIDs
  - Activity modification
  - +/- Injections
    - Offierski, MacNab, Spine 2007
    - Nwachukwu et al, AJSM, 2016
    - Frank et al, Arthroscopy, 2015
    - Peters et al, Br J Sports Med, 2017
    - Domb et al, Arthroscopy, 2015
- Not too much OA
  - Tonnis Grade 0-1
  - Joint space > 2mm
- Dysplasia?
  - PAO
- CAN'T LIVE WITH IT.



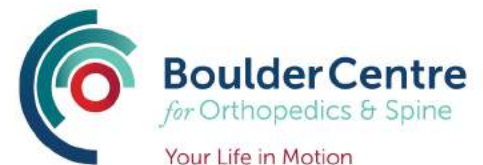


# Where is the pain? Is it actually the hip?



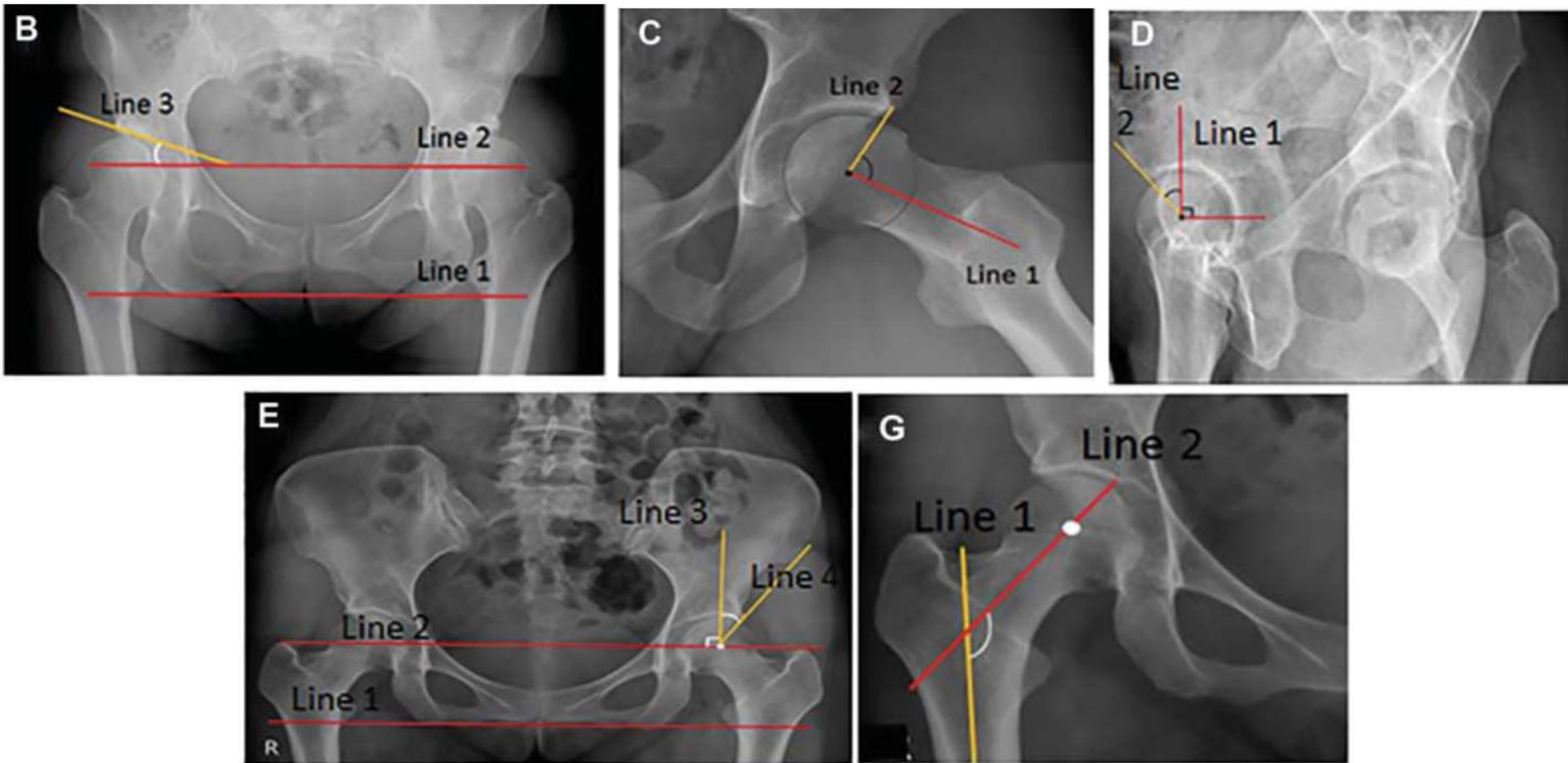
# Most Common Differential Diagnoses

- Spine
  - Stenosis, radiculopathy, Sacroiliac dysfunction
- Peripheral nerve dysfunction
  - Ilioinguinal, genitofemoral, LFCN/meralgia paresthetica
- Stress fracture
- Hernia
- Athletic pubalgia – i.e. “sports hernia”/adductor
- Systemic inflammatory disease
- Gout
- Gynecologic/Urologic
- Psychosocial

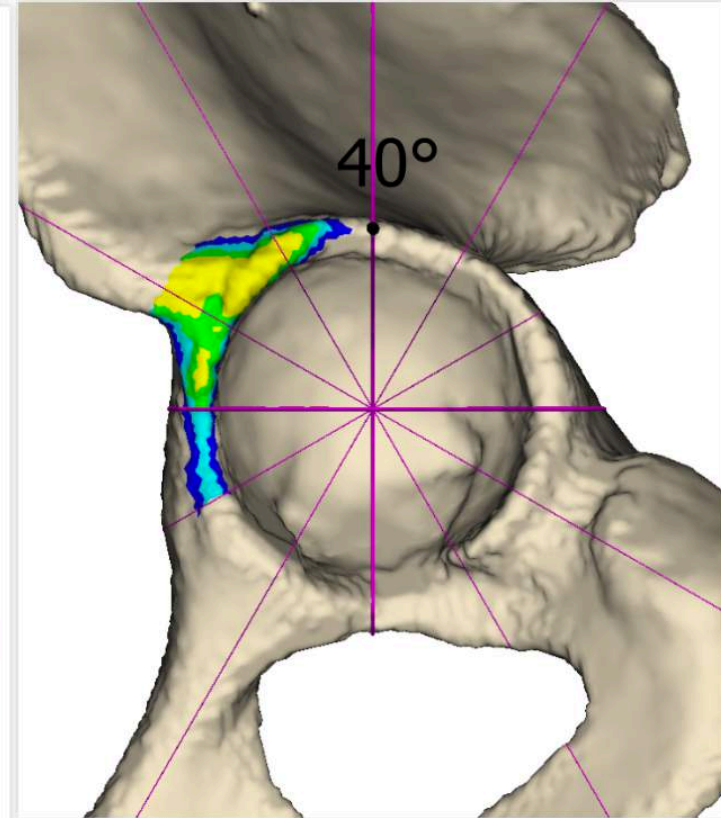
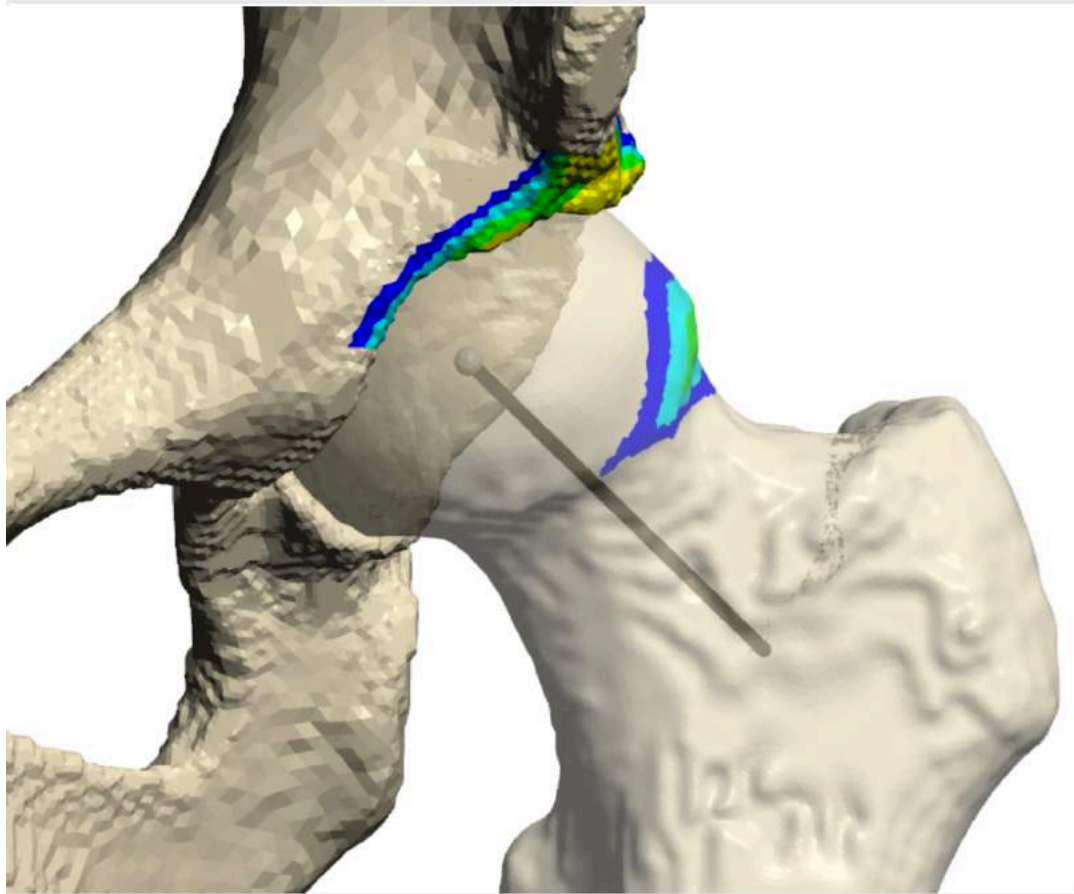




# Radiographic Analysis

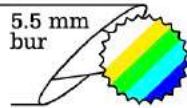


# Computed Tomography (CT)



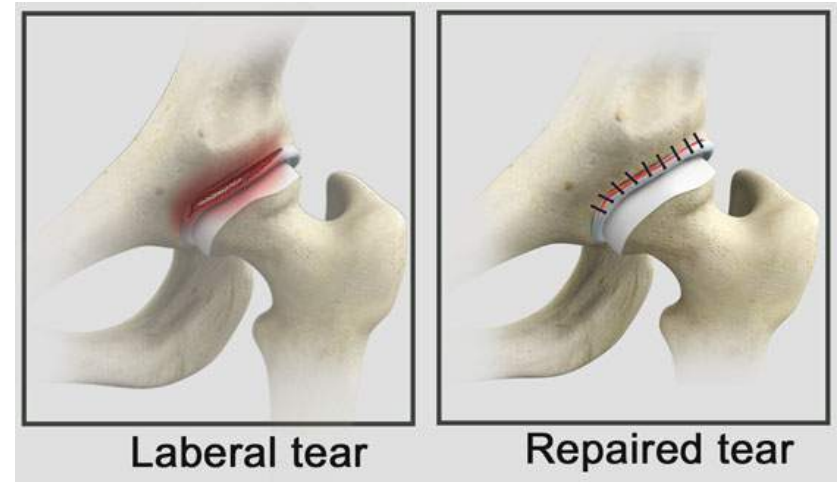
## Pincer / cam depth

- |        |        |
|--------|--------|
| 0-1 mm | 2-3 mm |
| 1-2 mm | >3 mm  |



# Importance of the Labrum

- Labrum increases...
  - Articulating surface by 22%
  - Acetabular volume by 33%
- Regulates fluid lubrication
- Joint stability
- Load bearing
- Suction seal of hip joint



# Intact Labrum





# Labral Removed



# After Labral Repair...



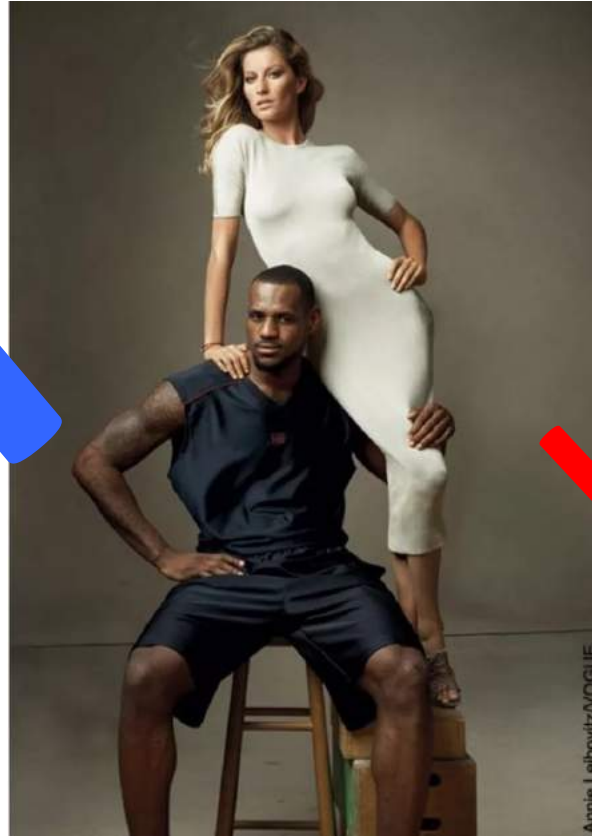
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## His

- Big cam
- Stiff ligaments
- Good/over Coverage
- No snapping



## Hers

- Small cam
- Loose ligaments
- Borderline dysplasia
- Internal snapping



Instability

FAI

# FAI – Gender Differences?

## Adolescent Femoroacetabular Impingement: Gender Differences in Hip Morphology

Perry Hooper, D.O., Sameer R. Oak, M.D., T. Sean Lynch, M.D., Gehan Ibrahim, M.D., Ryan Goodwin, M.D., and James Rosneck, M.D.

177 patients that underwent hip arthroscopy

**Table 4.** MRI Alpha Angle Measurements for Male and Female Patients

Alpha Angle on MRI	Female Patients, % (n)	Male Patients, % (n)
$\leq 44.9^\circ$	74.5 (73)	19.4 (7)
$45^\circ - 54.9^\circ$	24.5 (24)	41.7 (15)
$55^\circ - 64.9^\circ$	1.0 (1)	22.2 (8)
$\geq 65^\circ$	0 (0)	16.7 (6)
Total	100 (98)	100 (36)

MRI, magnetic resonance imaging.



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Your Life in Motion

2016

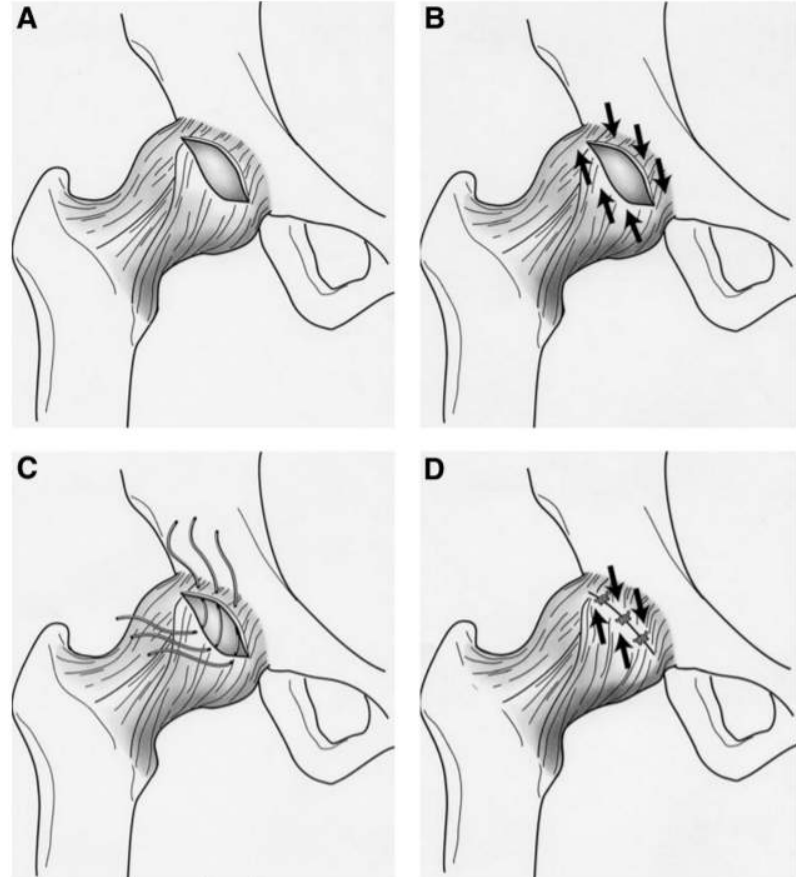
# Patterns of Disease

- Microinstability
  - F>M
  - Young > old
  - Generalized lig laxity
  - Lower acetabular coverage
  - +/- increased femoral version
  - +/- internal snapping
- FAI
  - M>F
  - Stiffer hip
  - Larger impingement deformities



# Microinstability - What to do? – FLIP!

- Femoroplasty
- Labral treatment
- Iliopsoas fractional lengthening yes/no?
- Capsular Plication



# Dysplasia - What to do?

- Borderline dysplasia (CEA  $20^{\circ}$  –  $25^{\circ}$ )
  - Capsular plication with concomitant labral repair is vital for alleviating hip pain and stabilizing the joint
  - Tonnis angle  $>10^{\circ}$ , 84% required secondary operation
- Severe dysplasia (CEA  $< 20^{\circ}$ )
  - hip arthroscopy alone can lead to poor outcomes and iatrogenic instability
  - PAO must be considered +/- concomitant hip arthroscopy
    - labral and capsular treatments are carefully performed

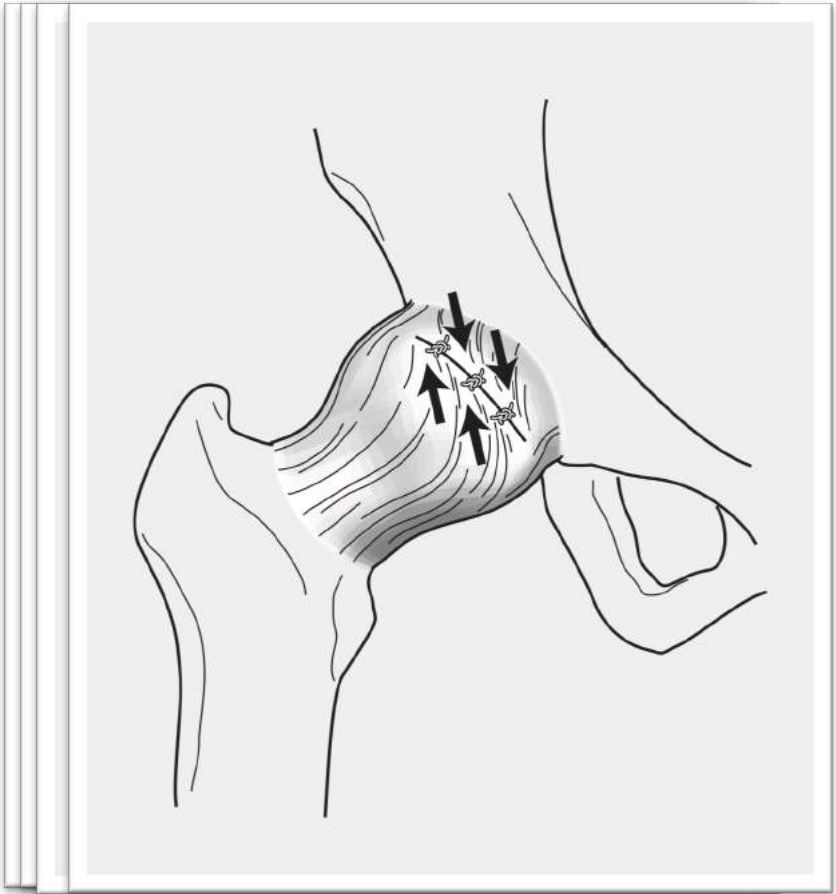
Kelly et al, Arthroscopy 2005

Chandrasekaran et al Arthrosc Tech, 2015

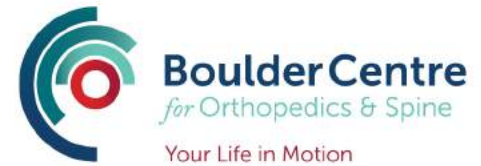
McQuivey et al, AJSM 2020



# Capsular Plication



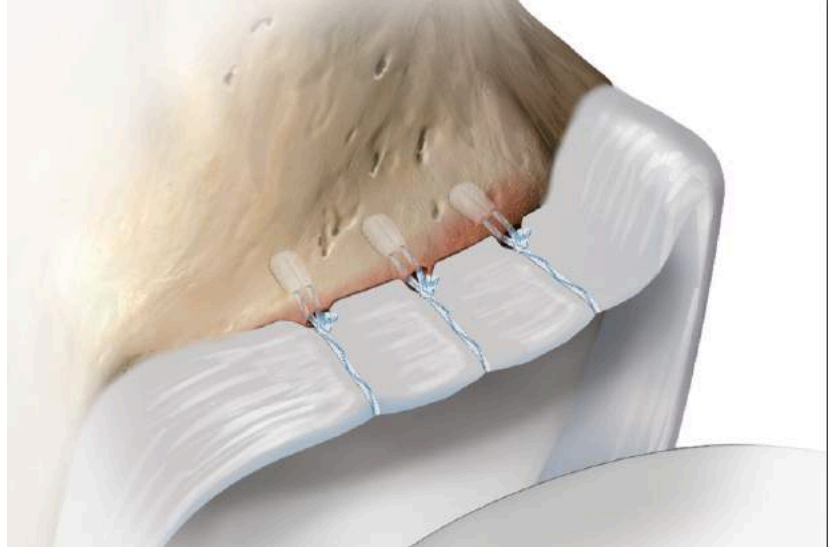
*Domb et al, Arthroscopy 2013*





# FAI – What to do?

- Labral Treatment
- Femoroplasty
- Acetabuloplasty
- Microfracture yes/no?
- Capsular repair vs release

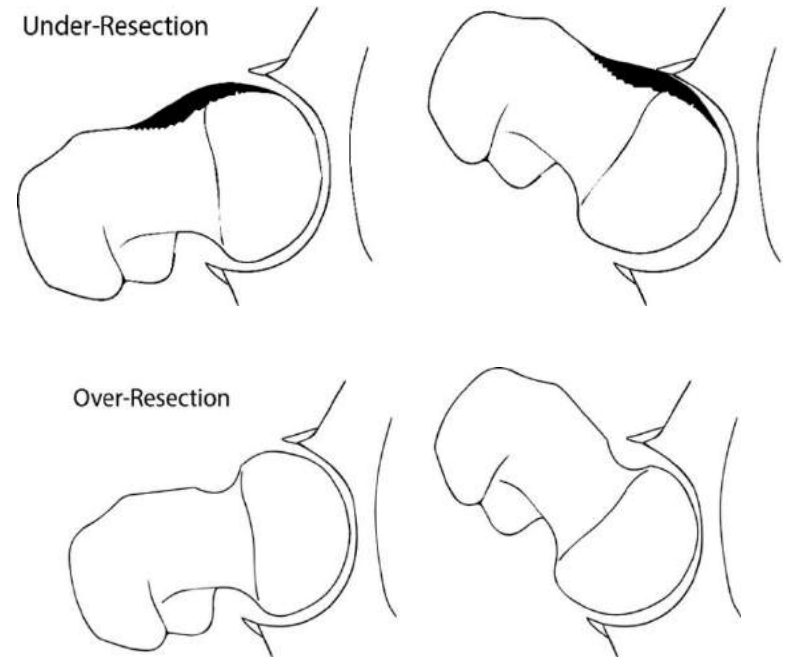




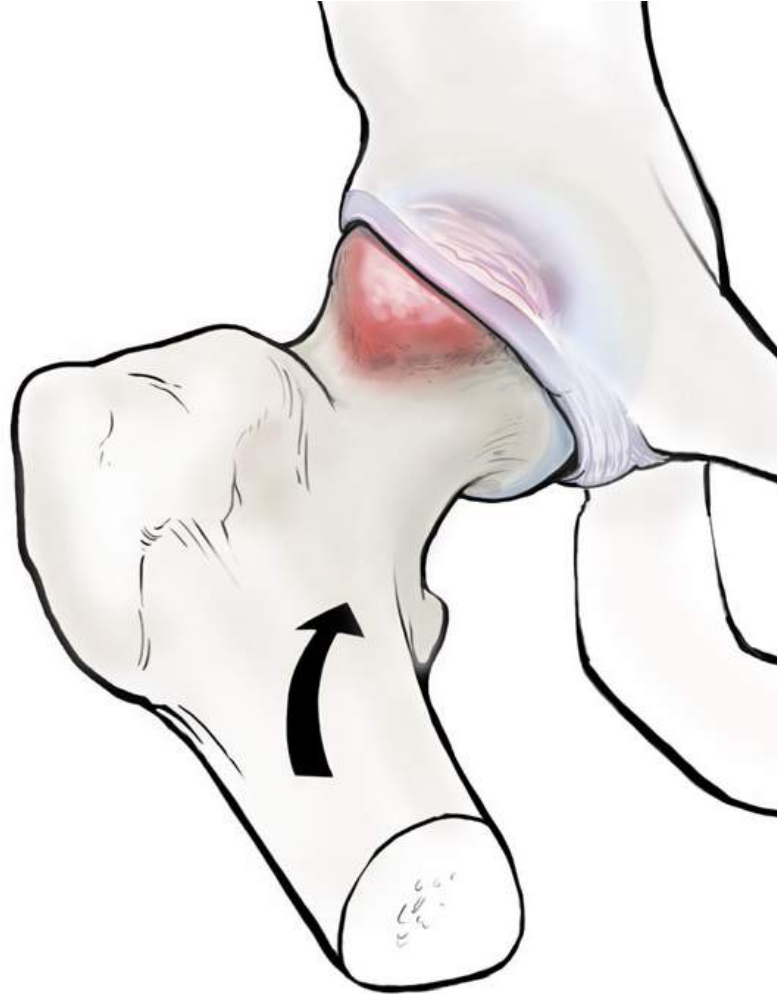
# In Search of the Spherical Femoroplasty:

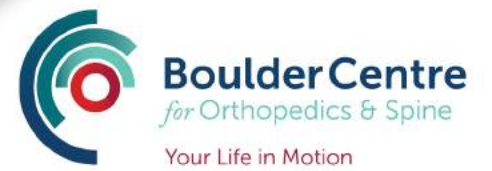
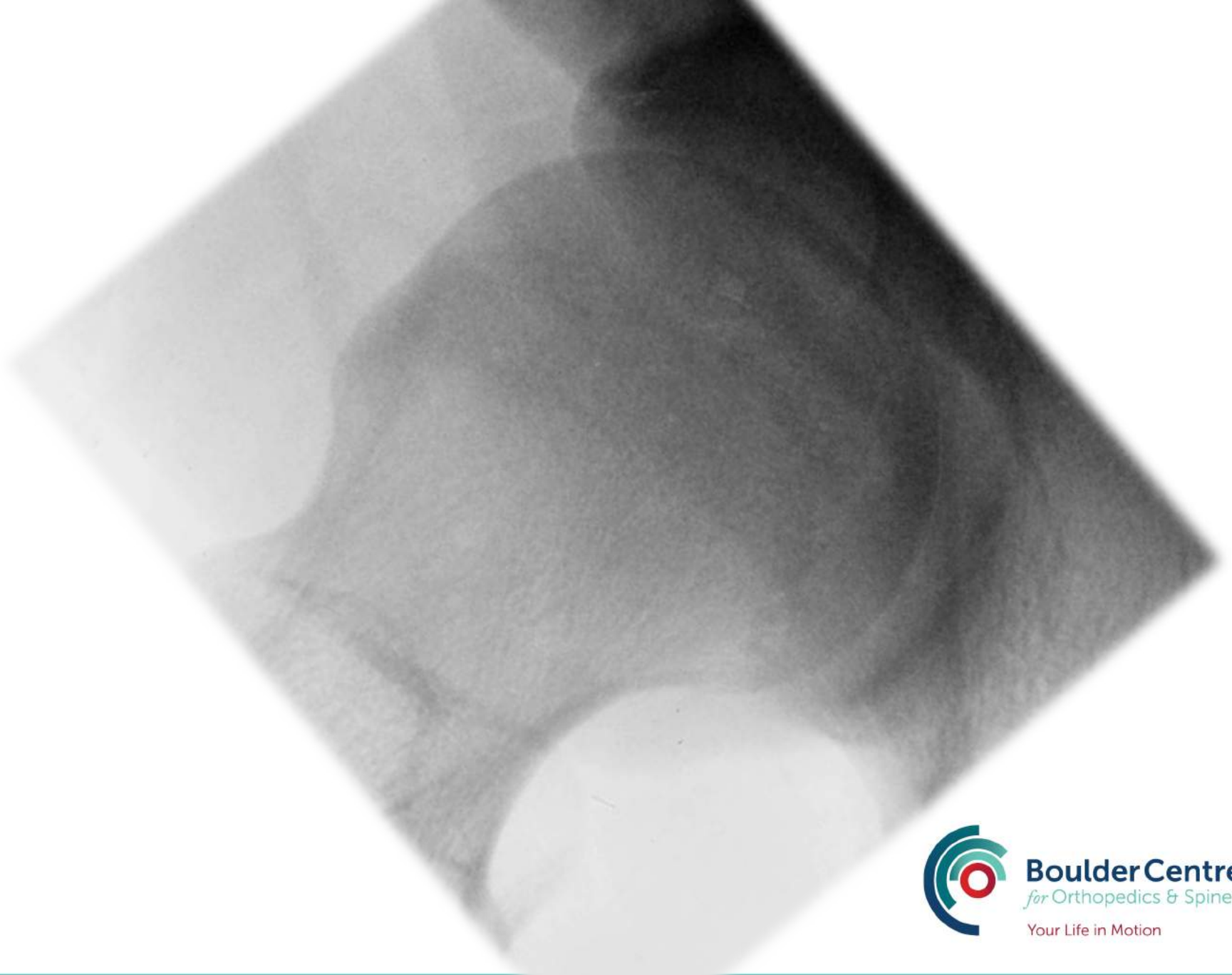
*Cam OVER-resection leads to inferior functional scores before and after revision hip arthroscopy* Mansor et al, AJSM

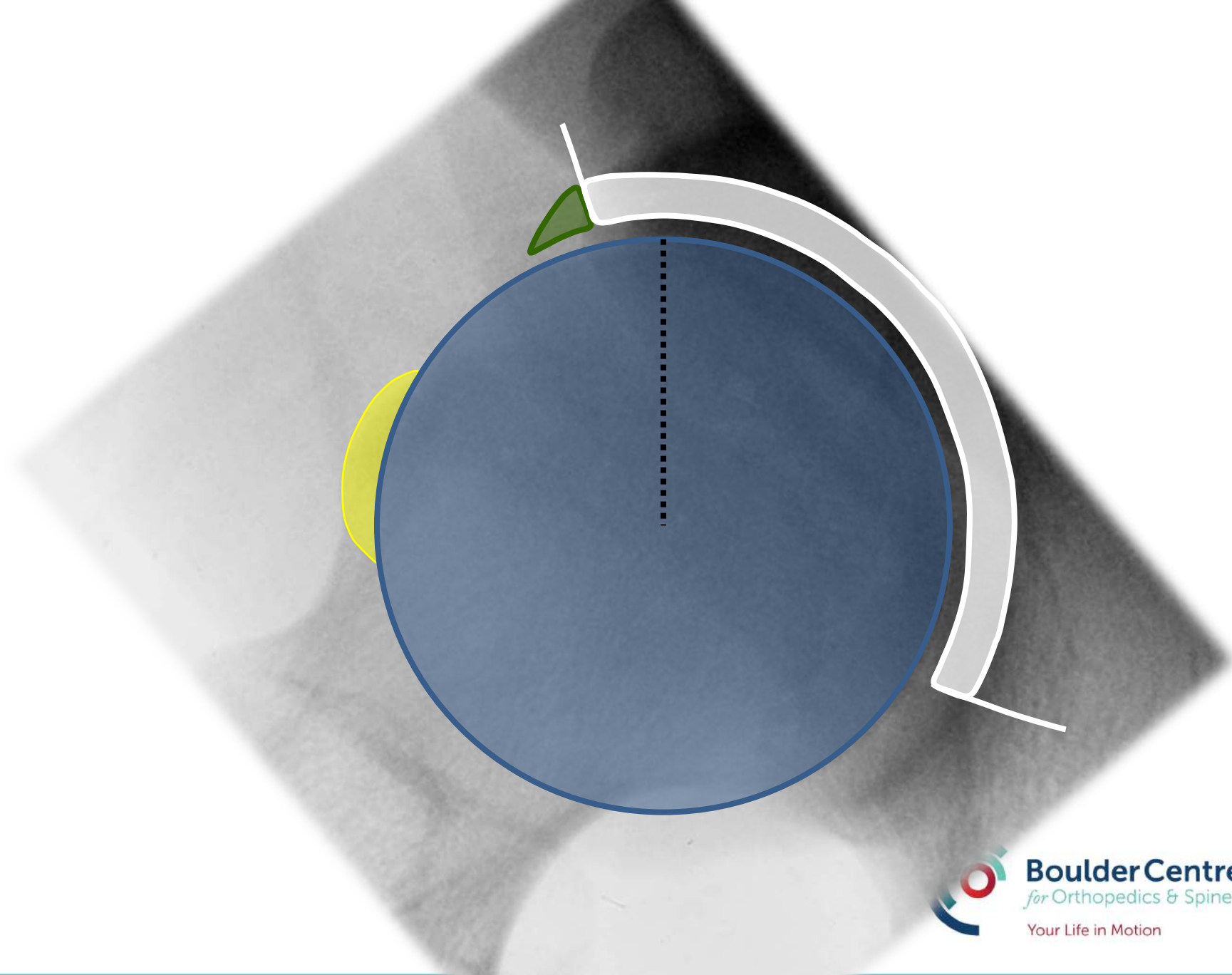
- The labral seal is responsible for the chondroprotective fluid dynamics of the hip
- Under-resection may result in residual FAI
- Over-resection may disrupt the labral seal

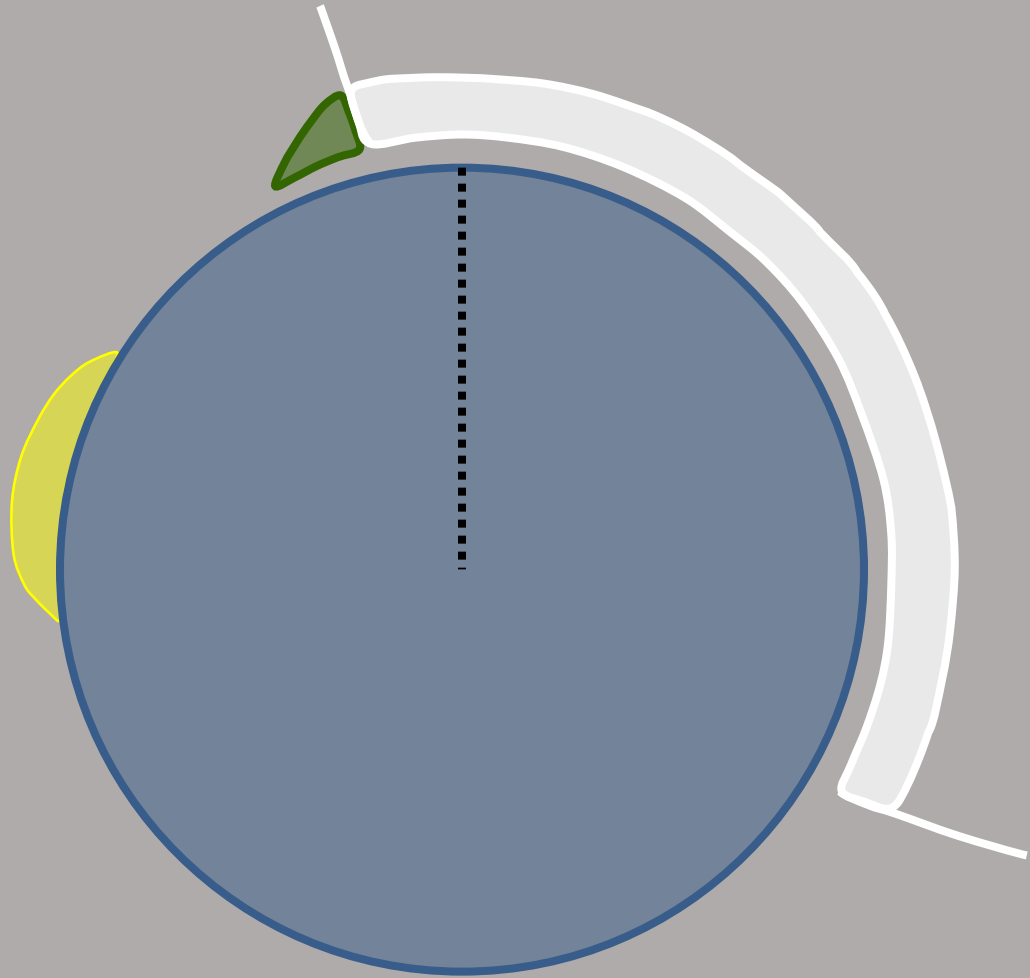


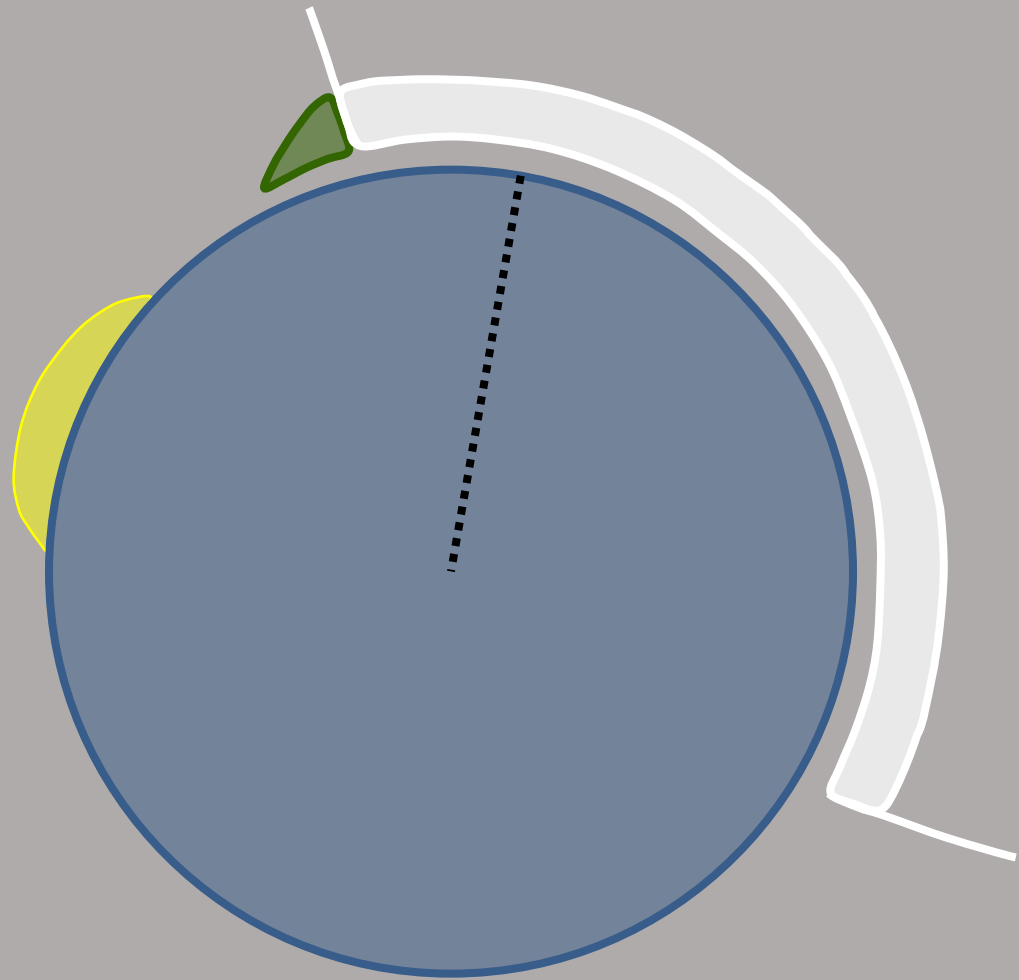
# Under-resection: *Residual Cam impingement*

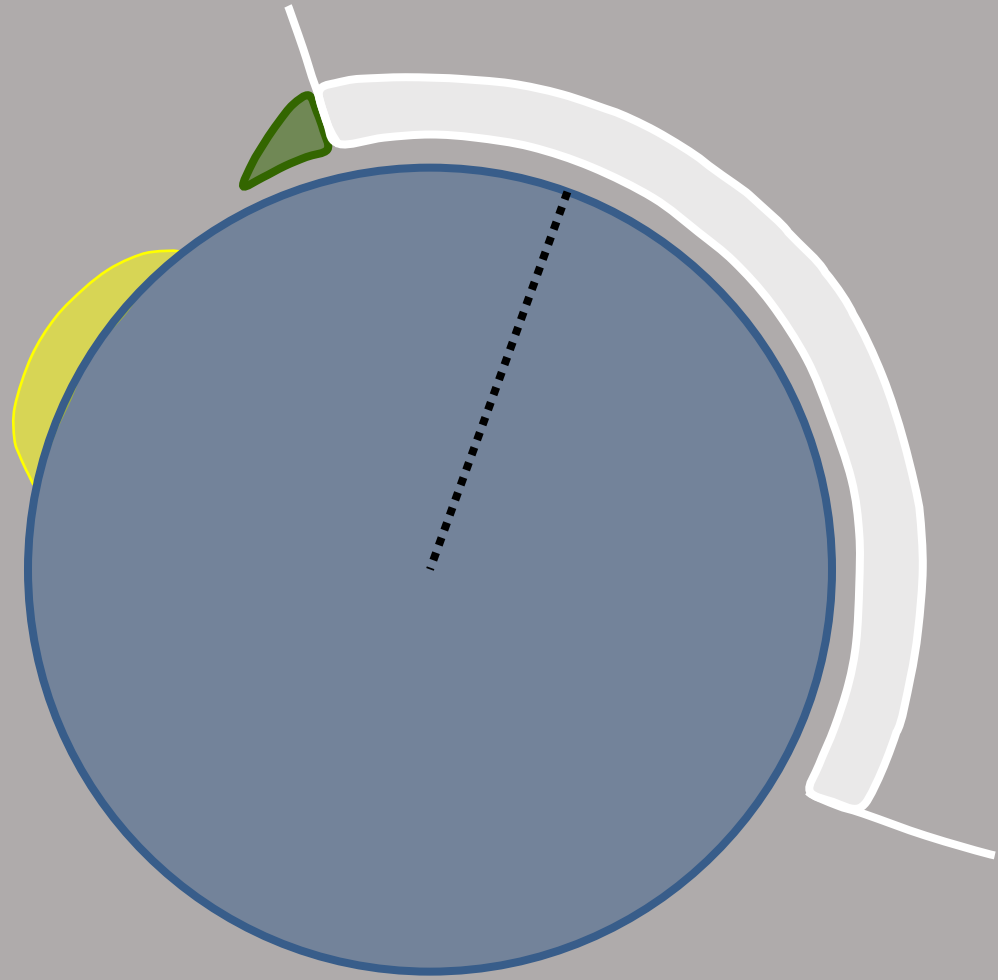




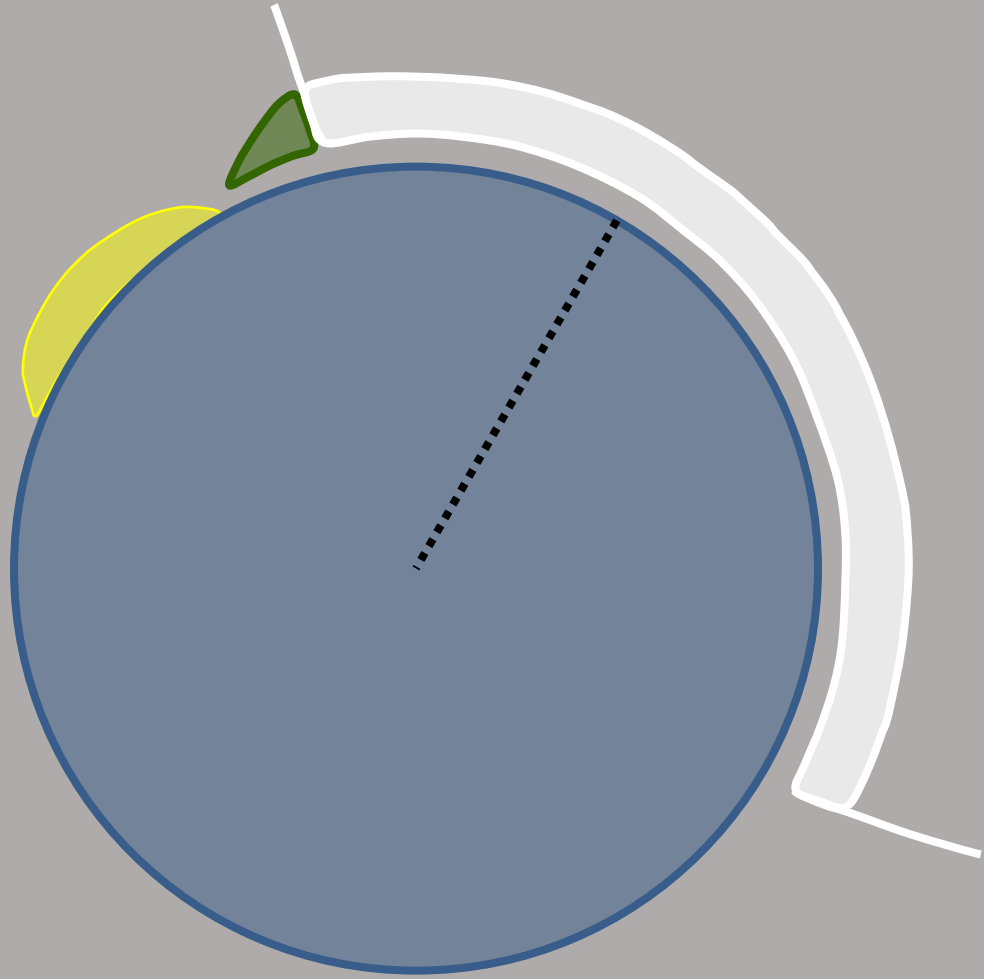


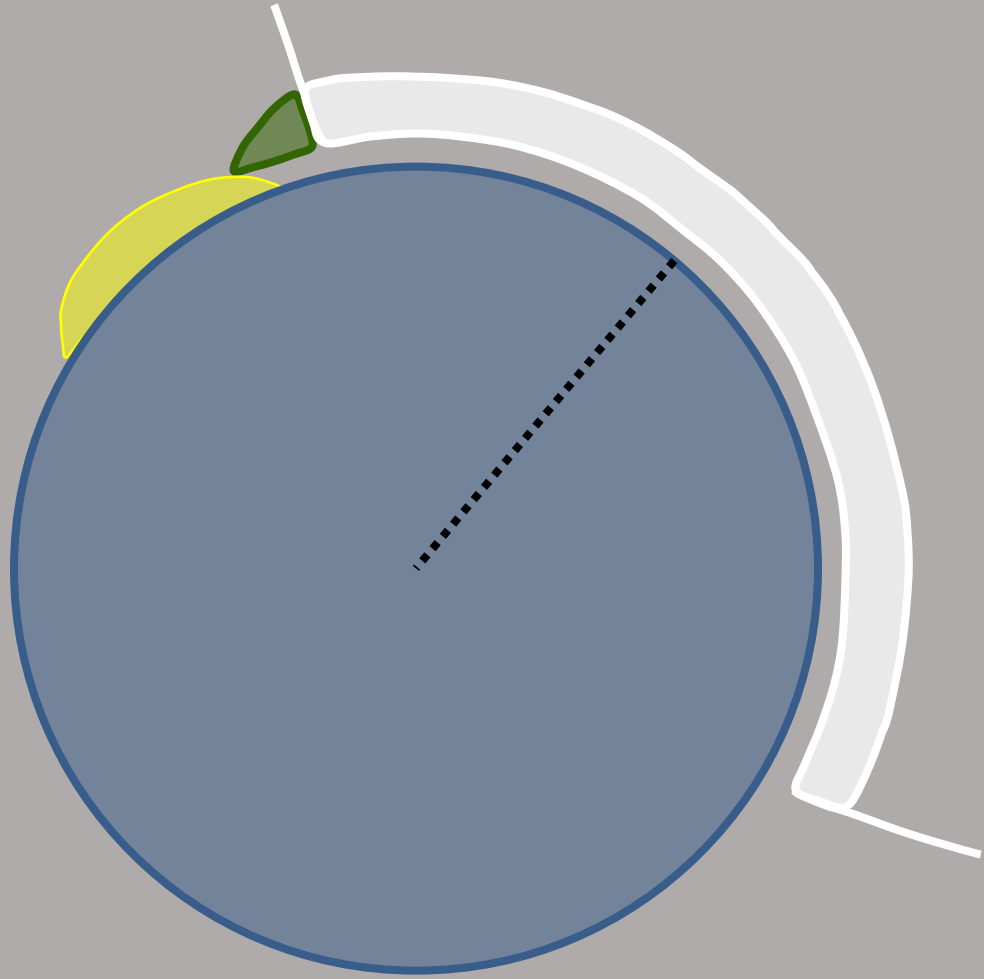


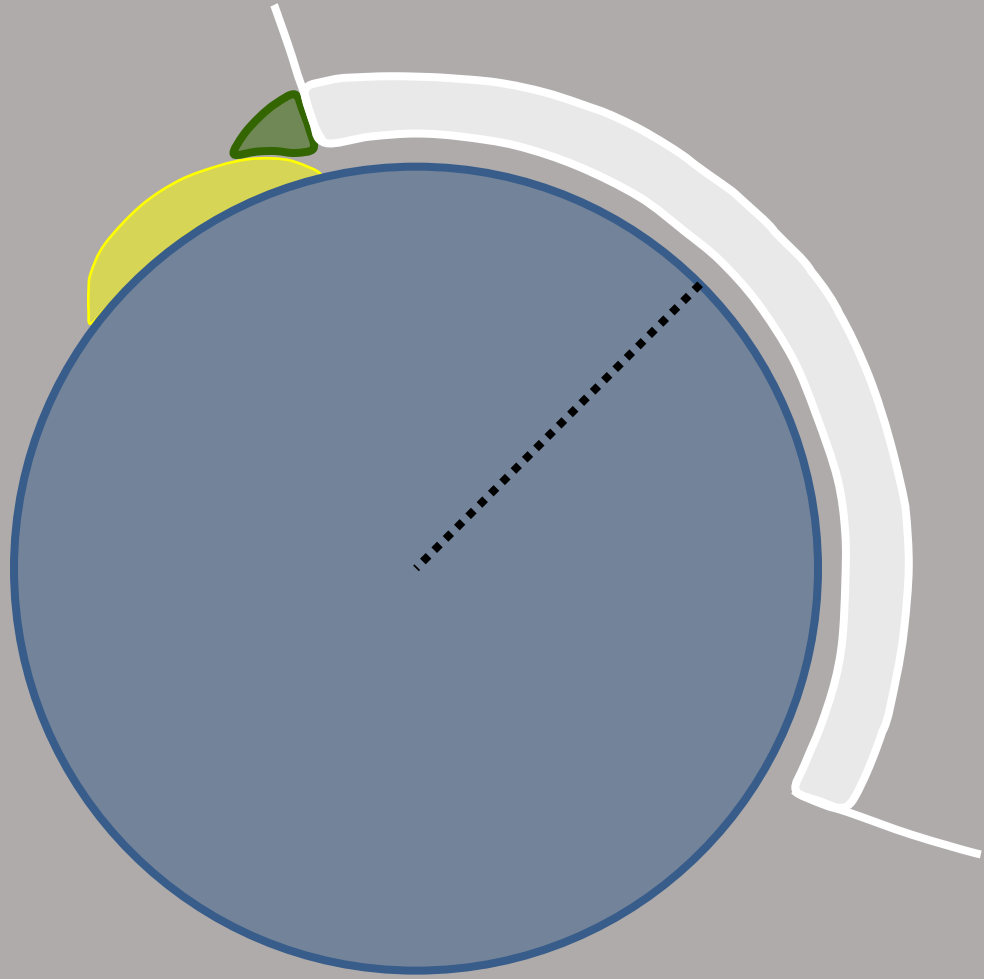


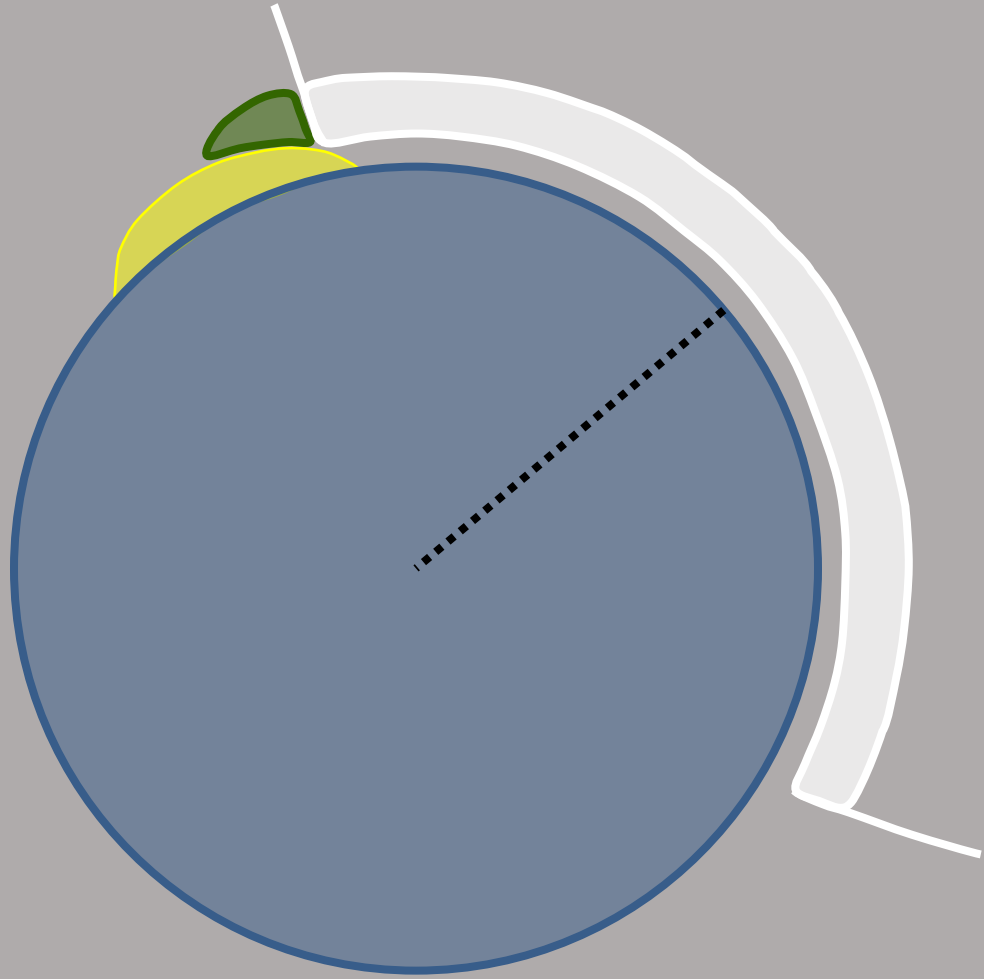


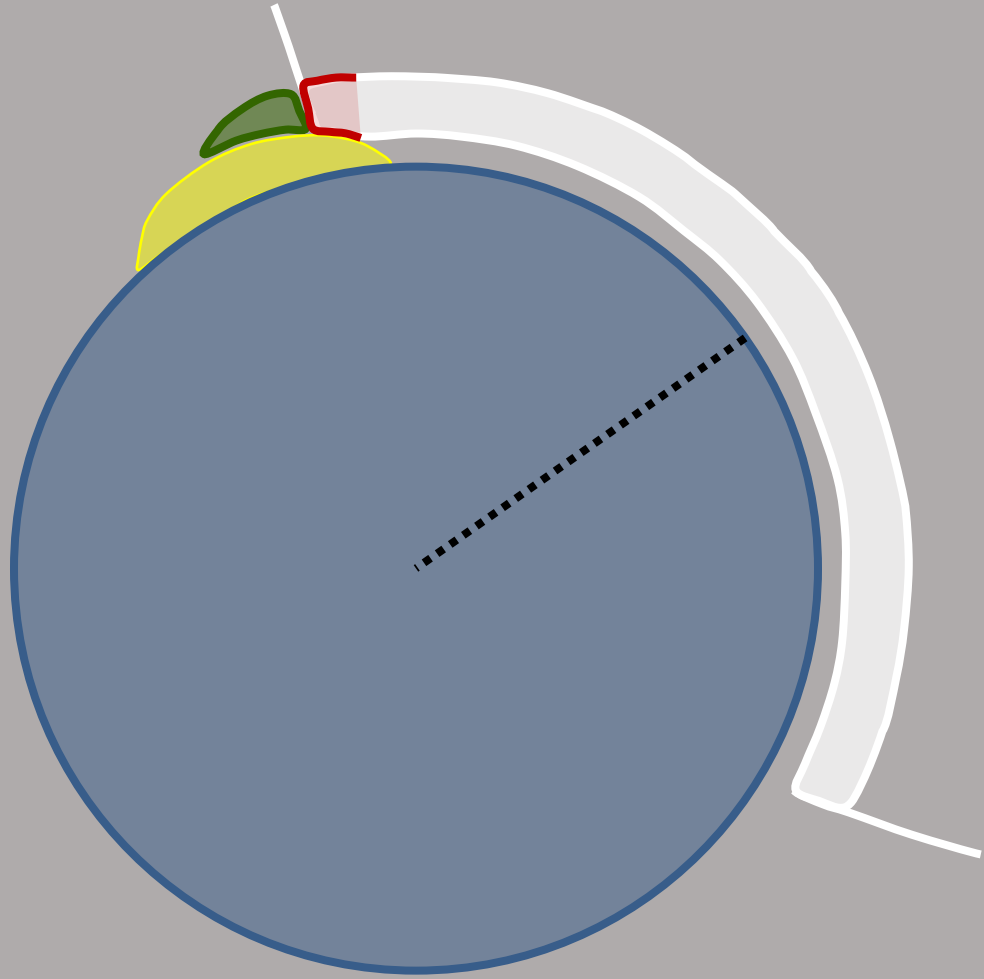


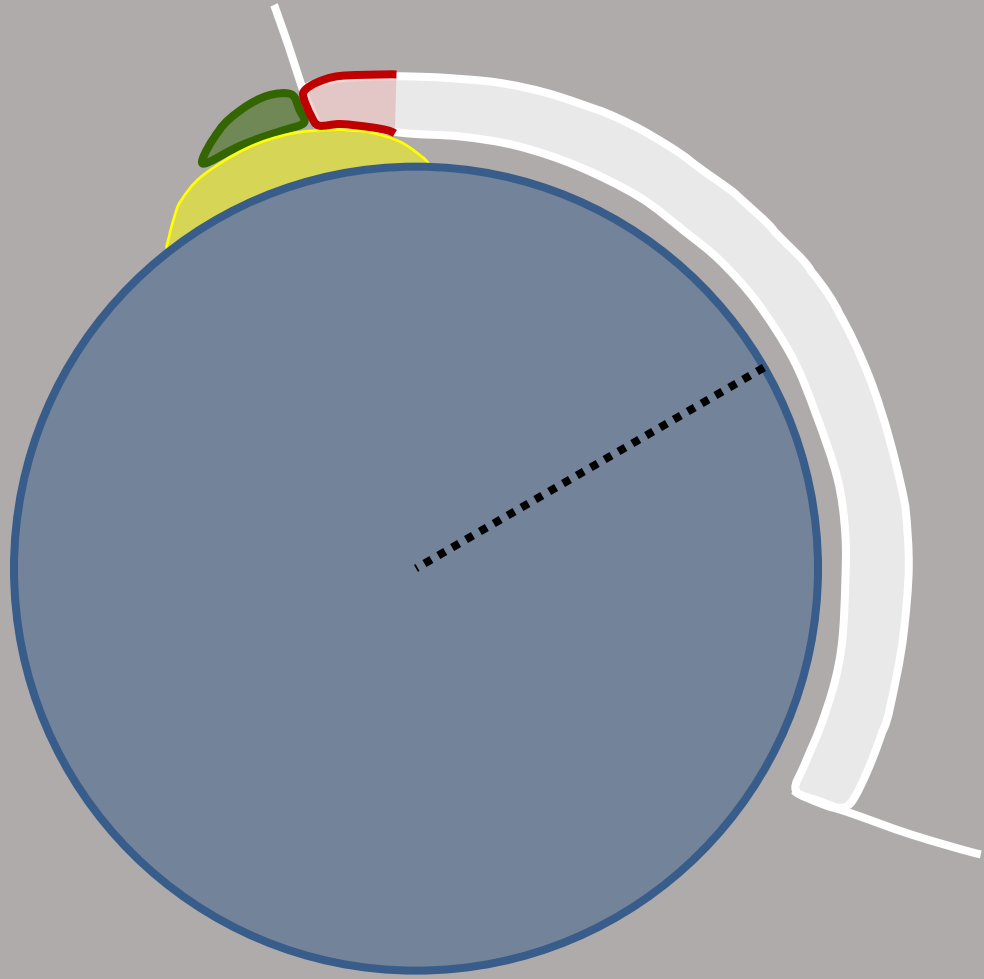


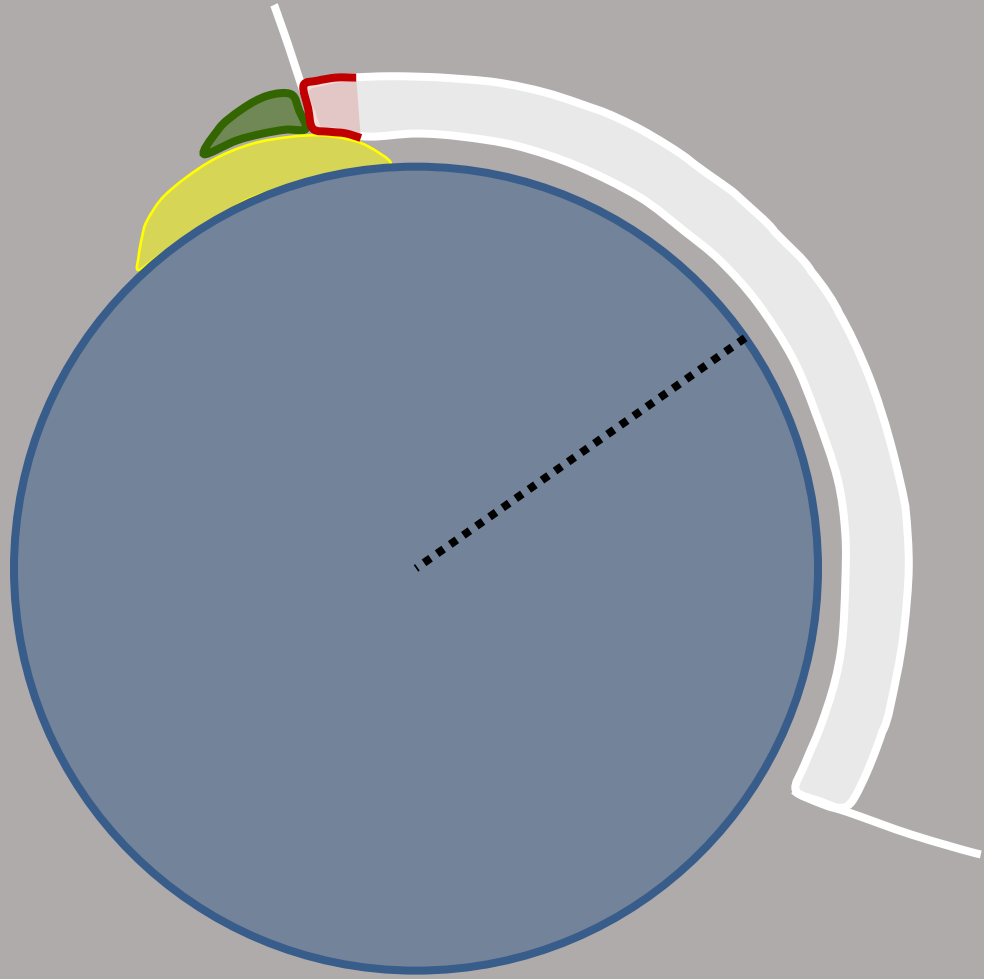




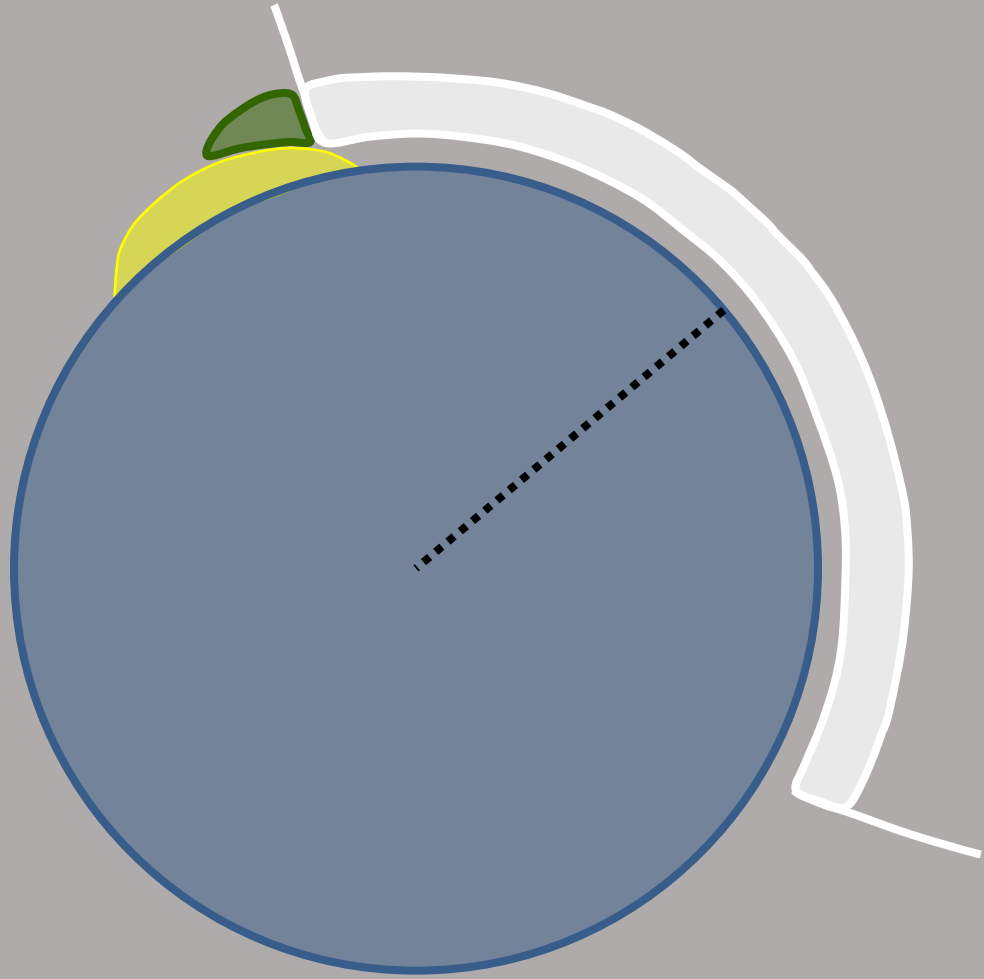


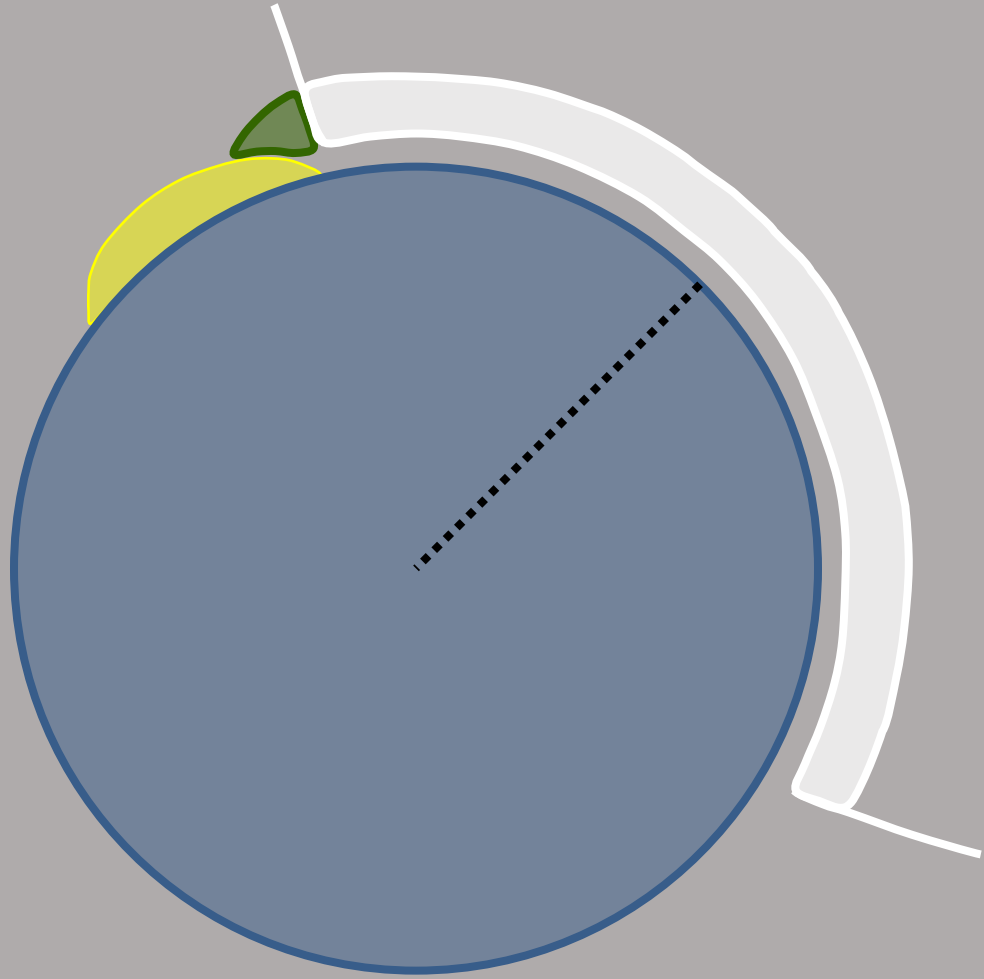


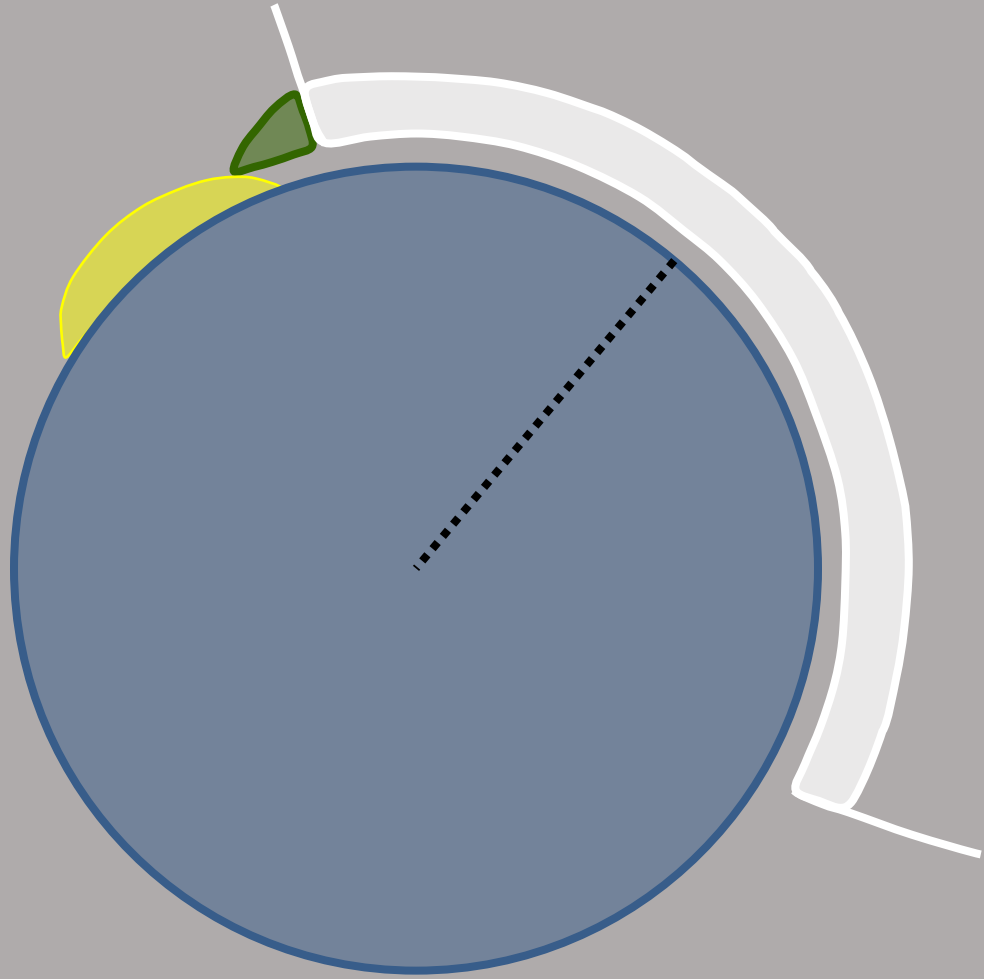


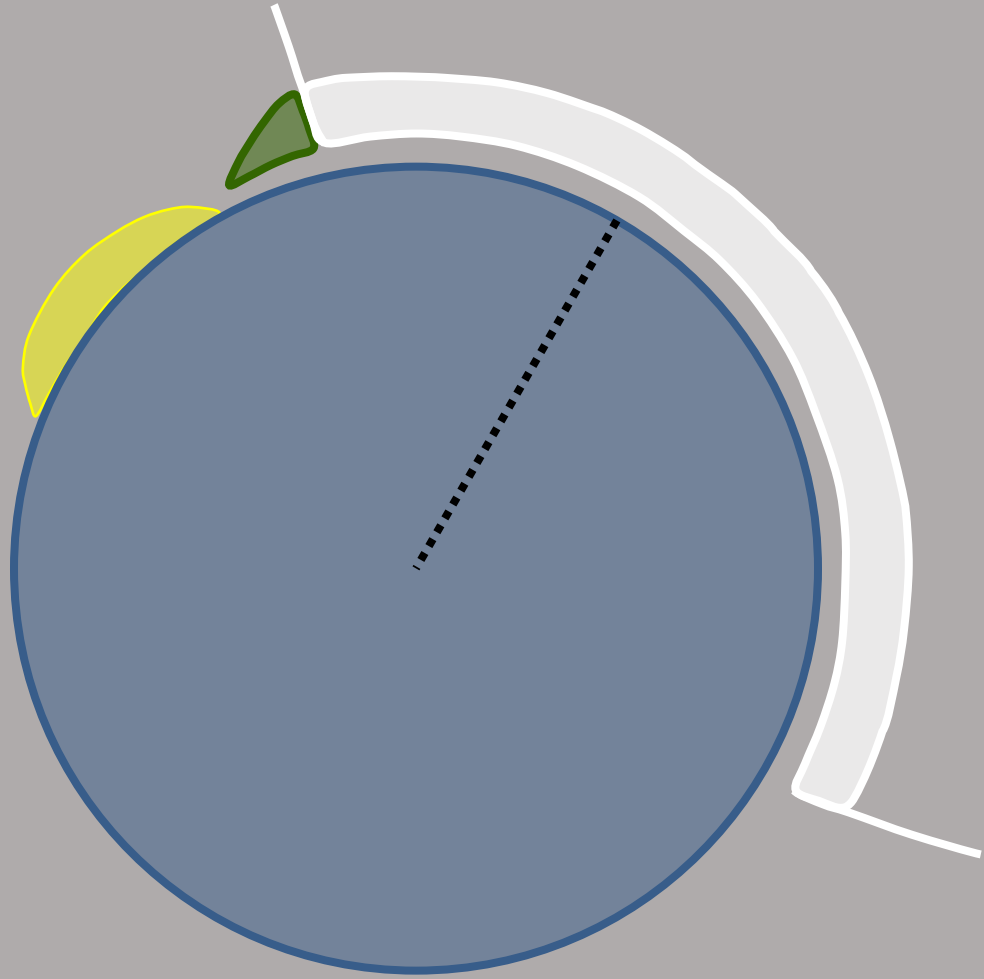


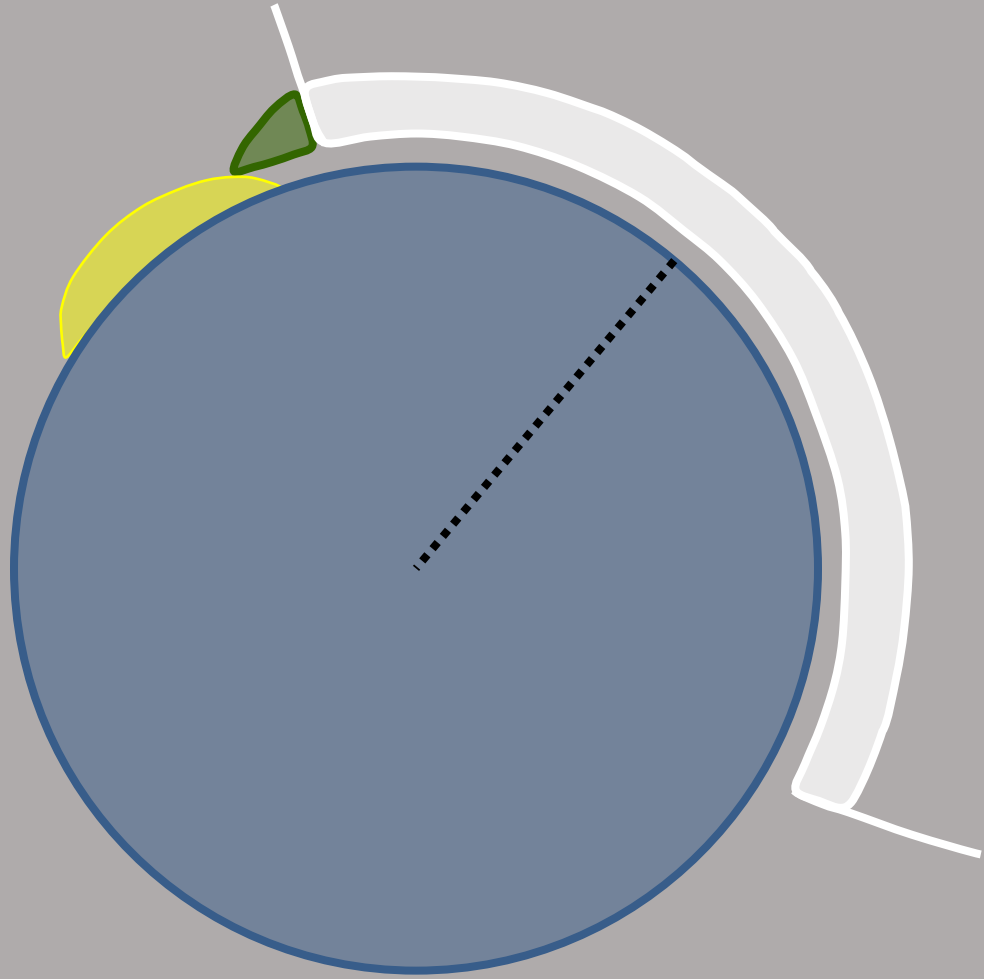


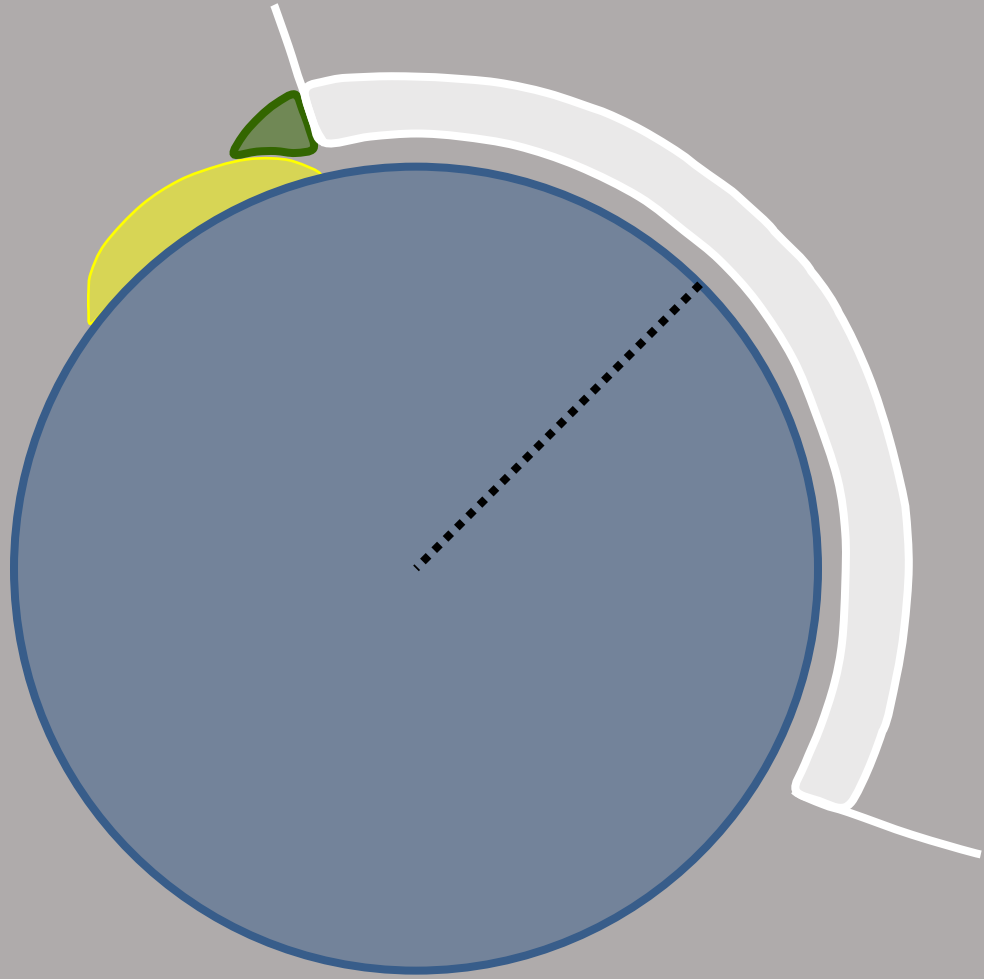


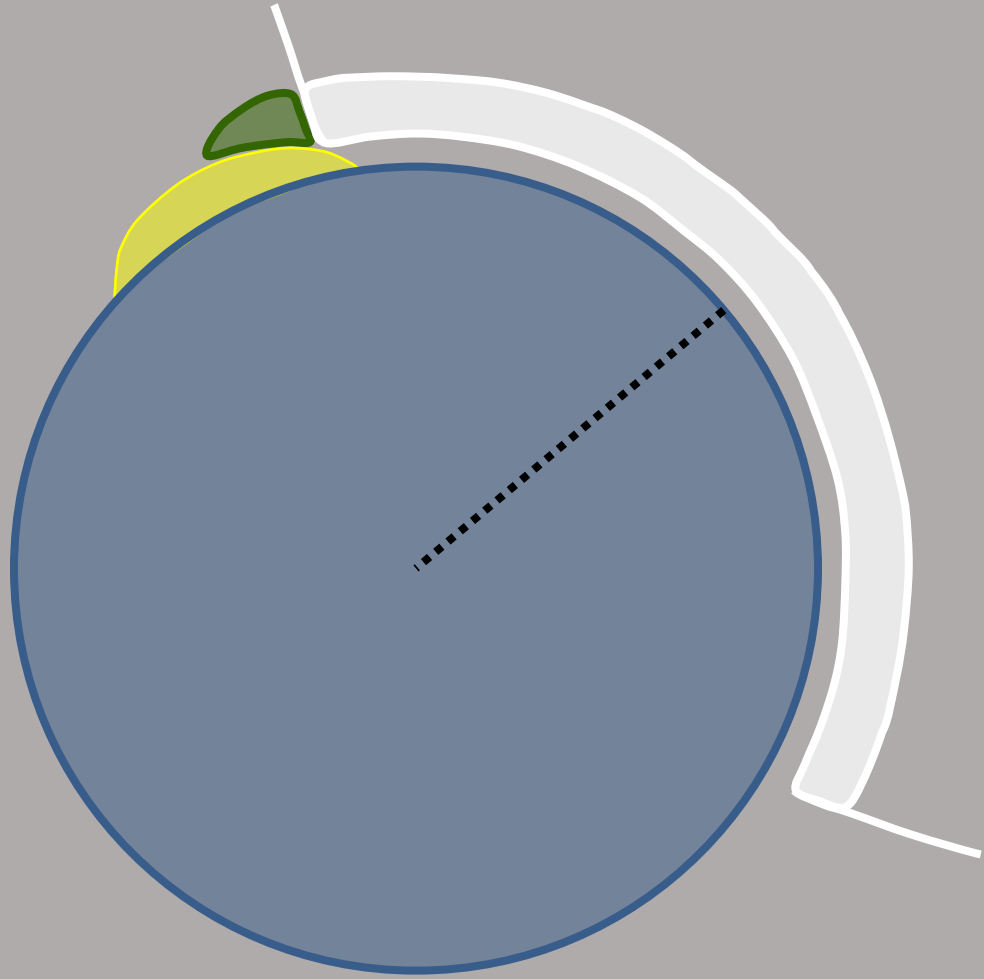




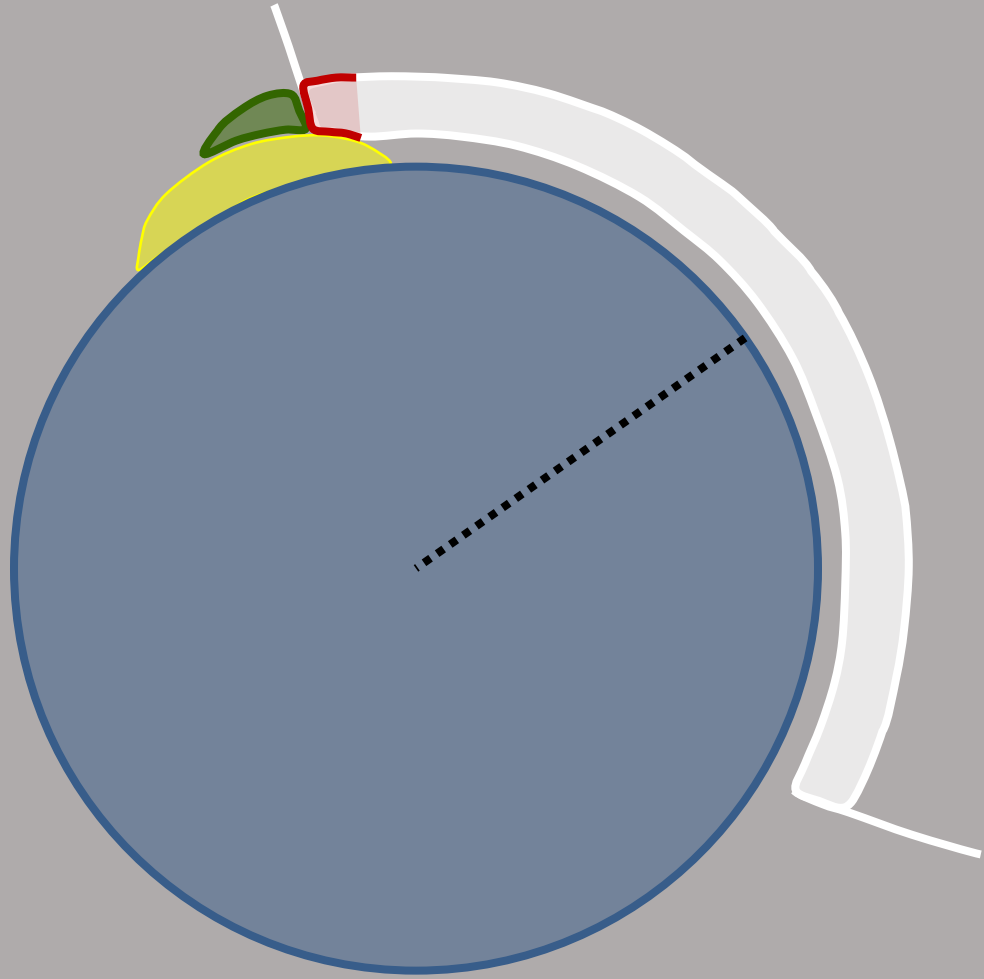


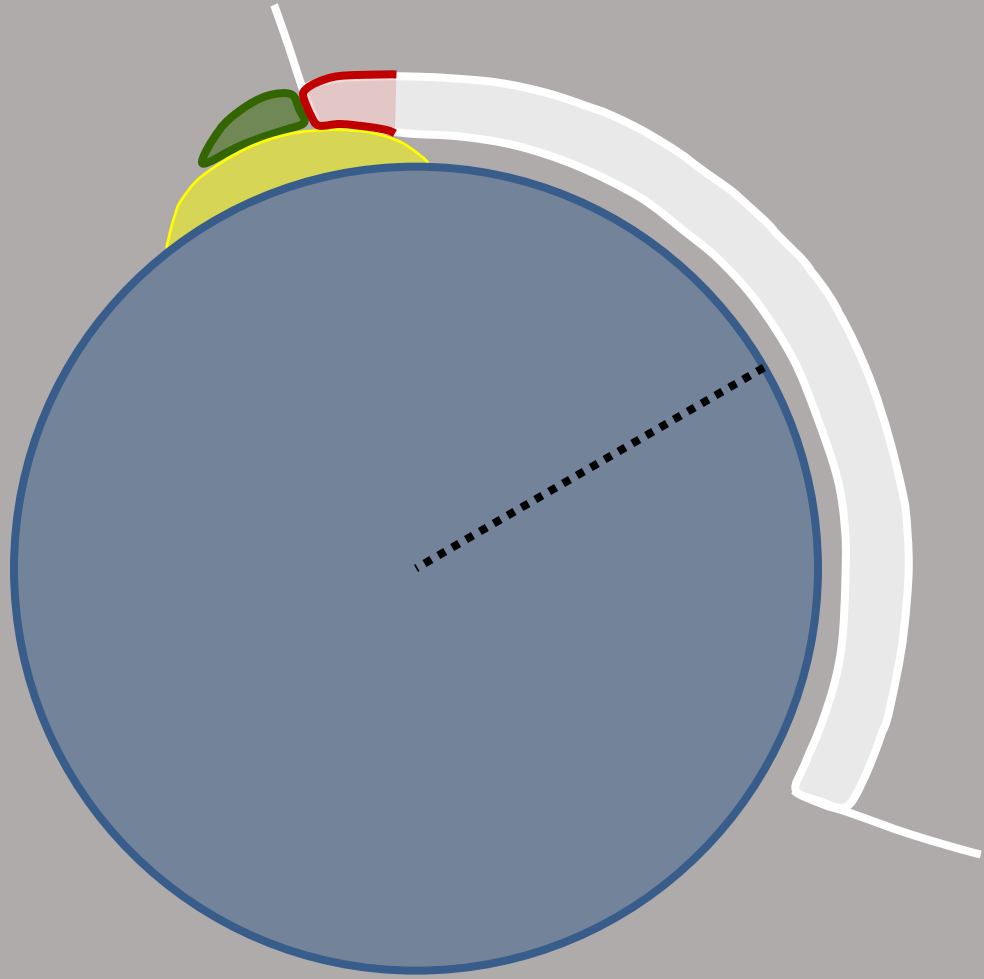




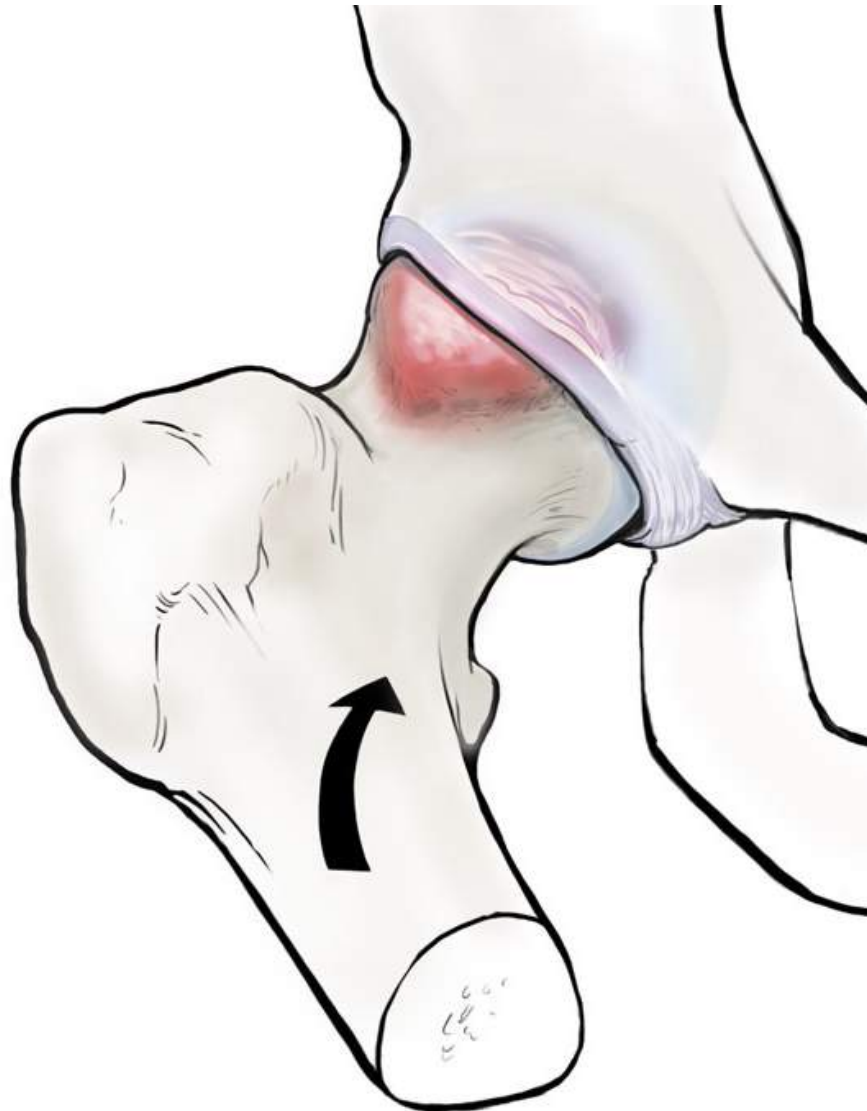


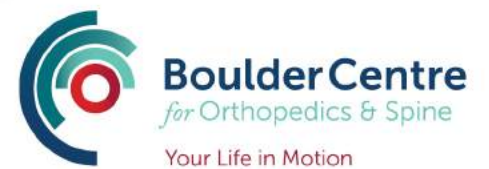
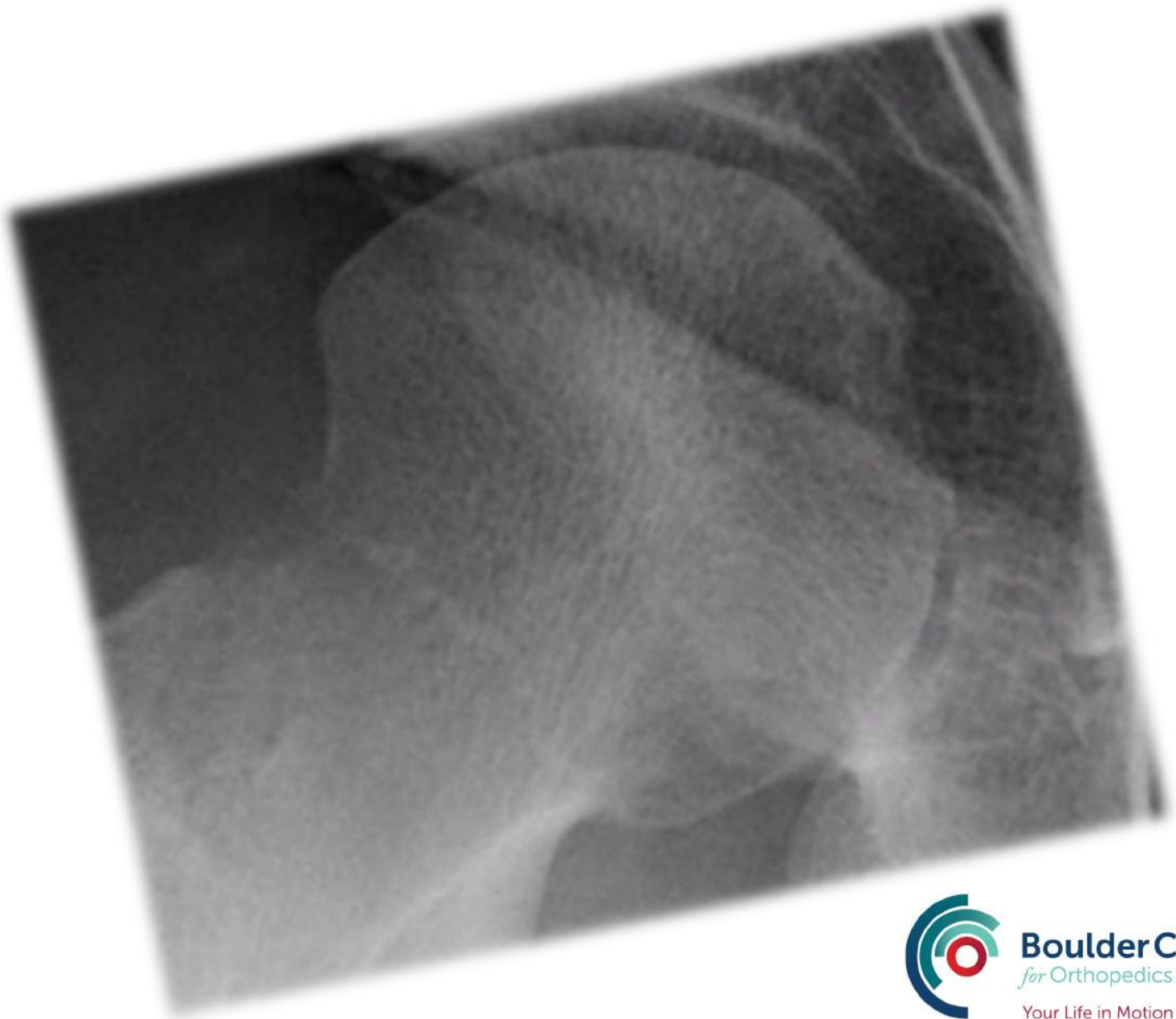


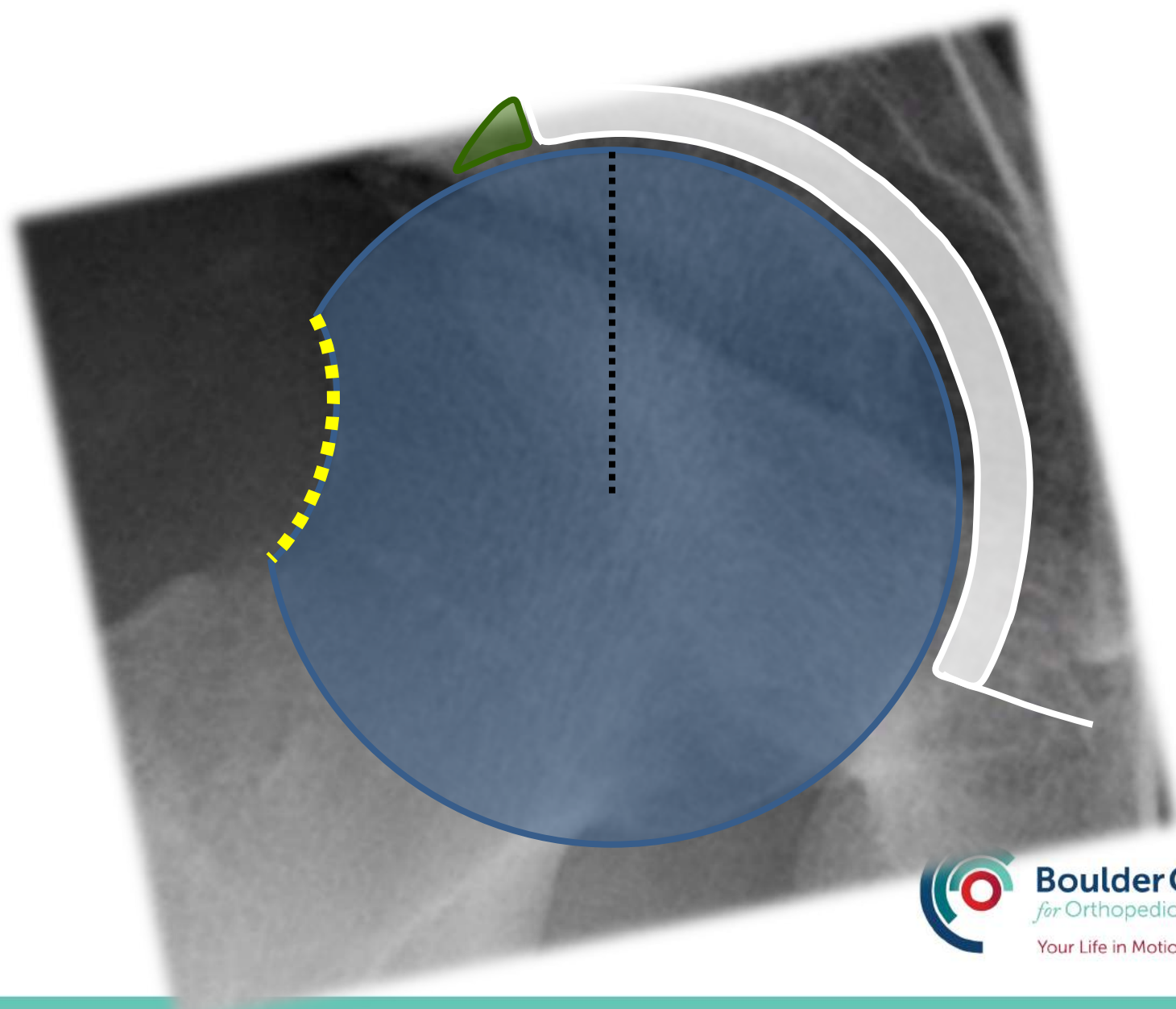


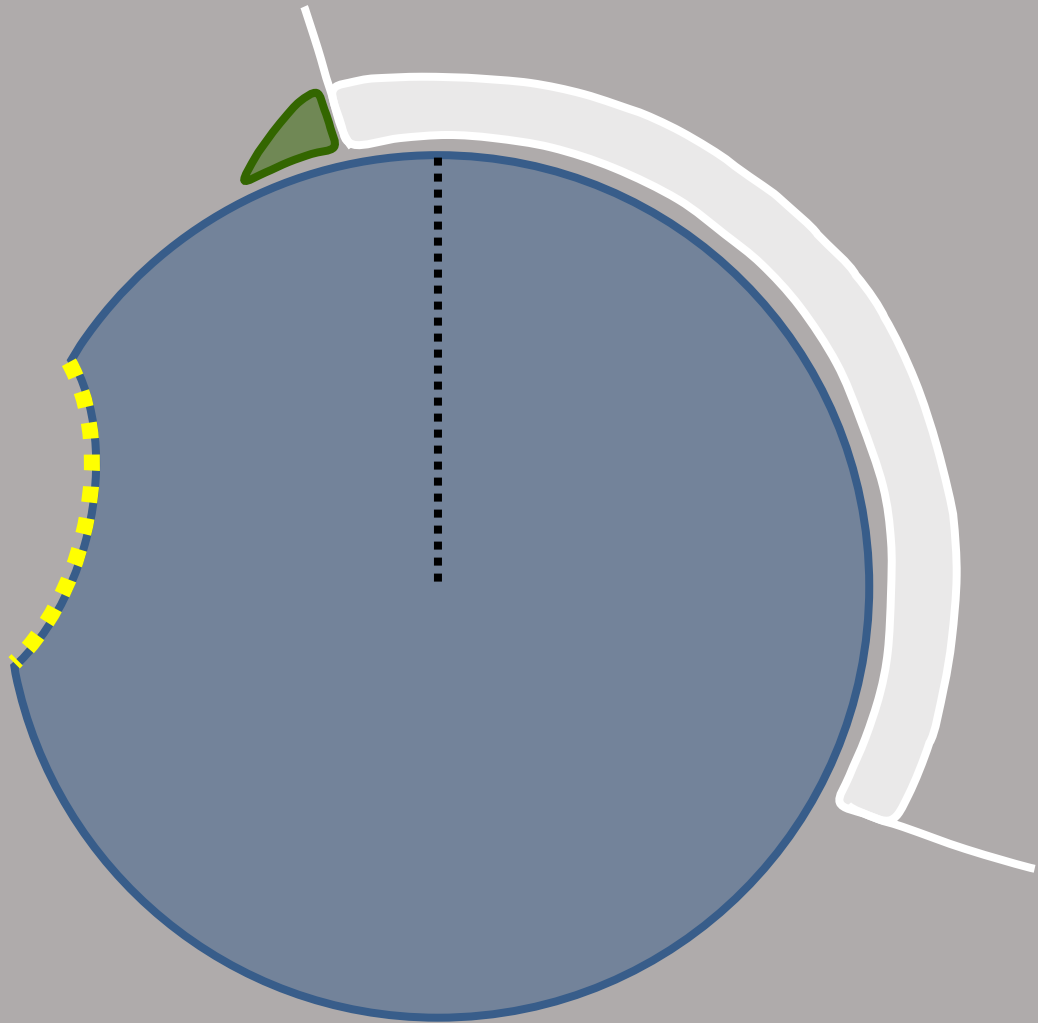


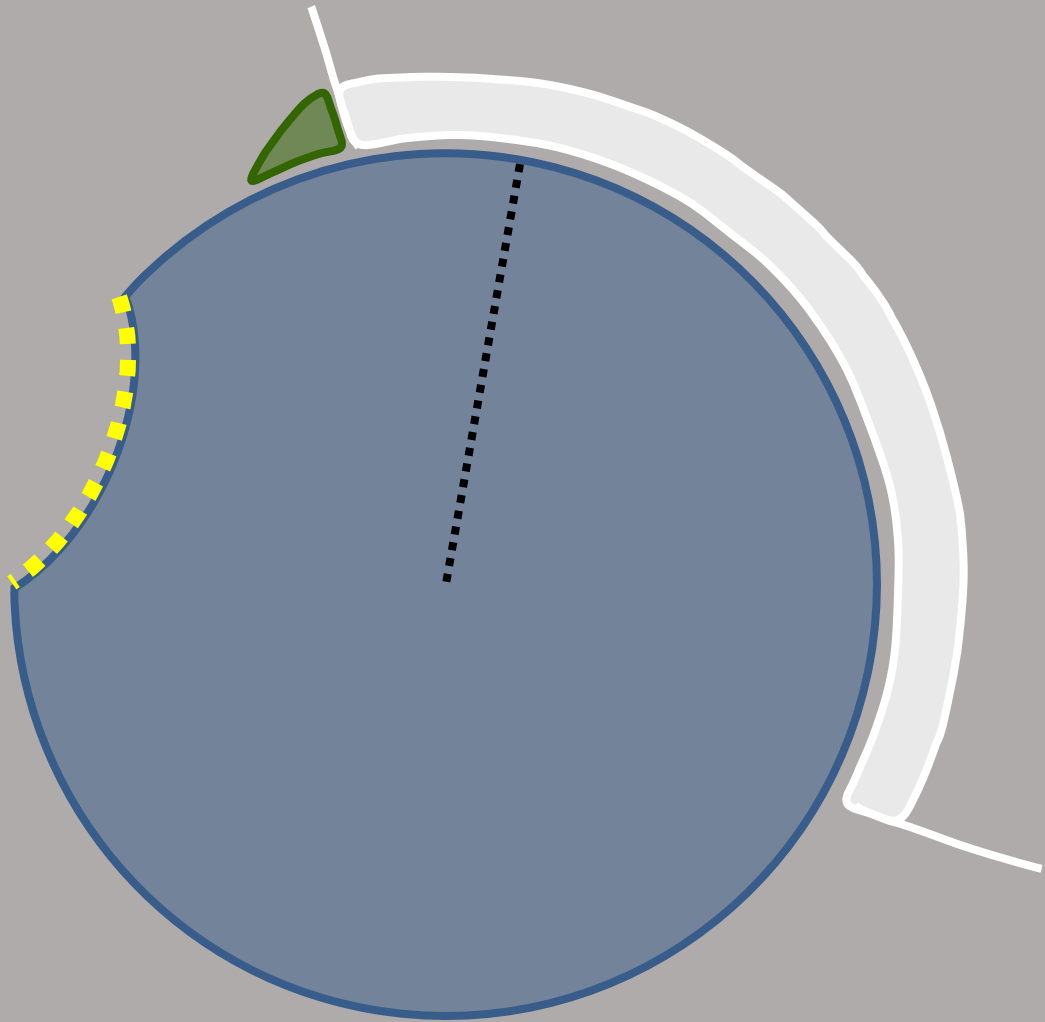
# Over-resection: *Breaking the labral seal*

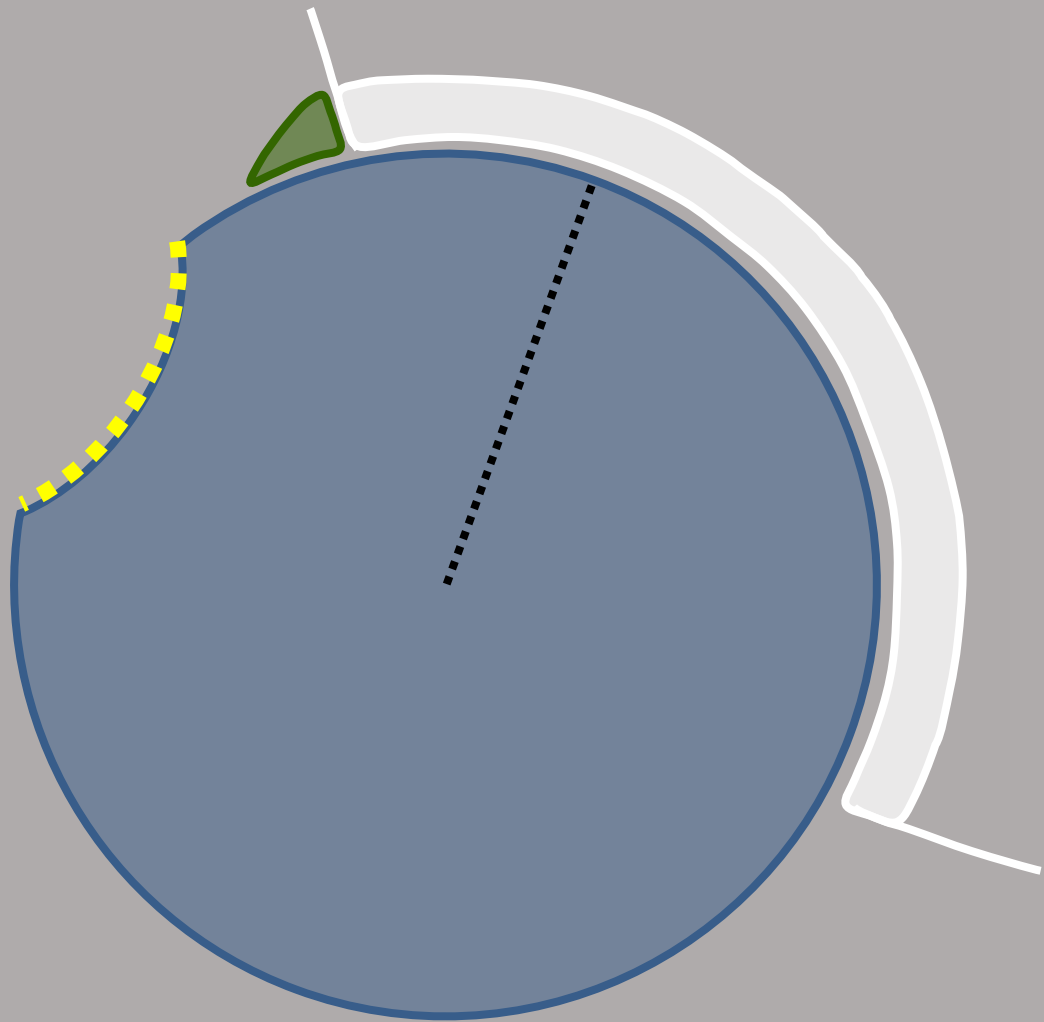




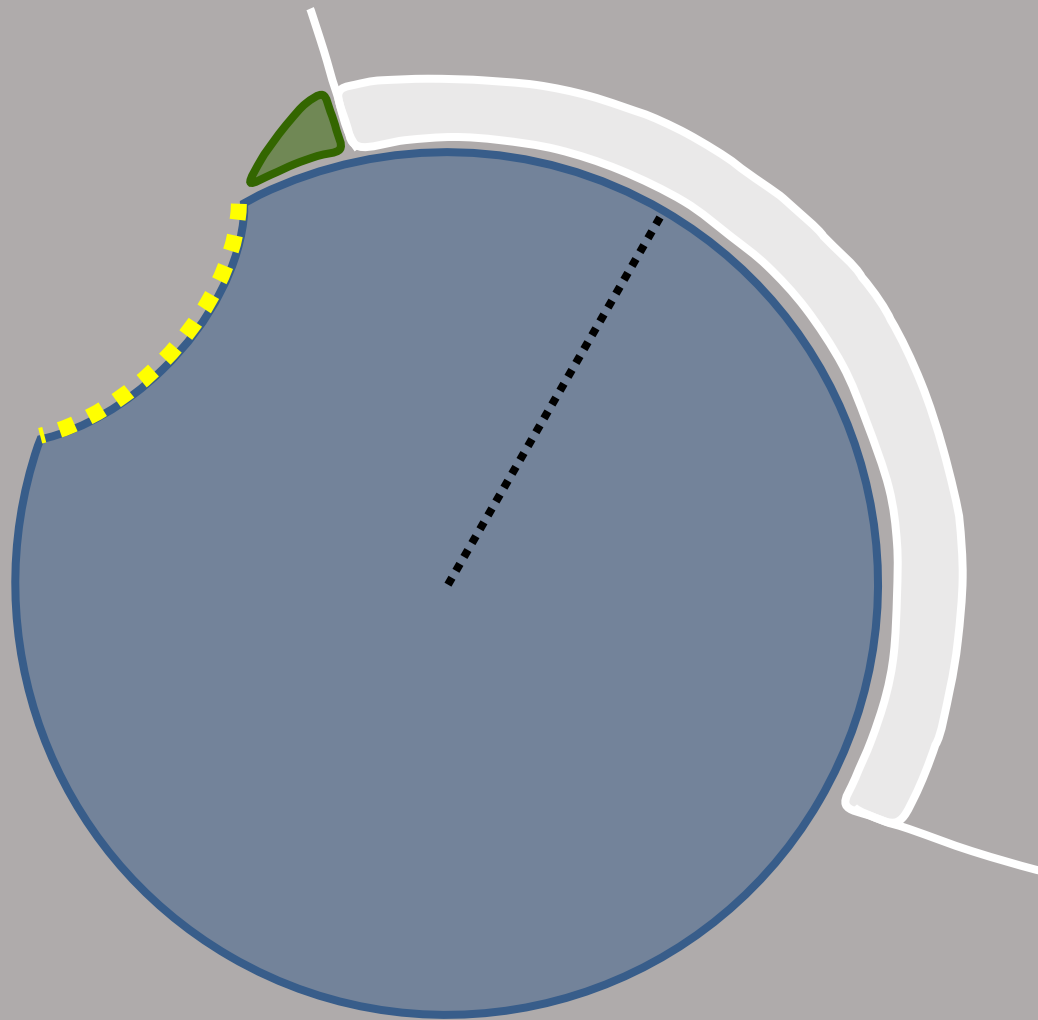


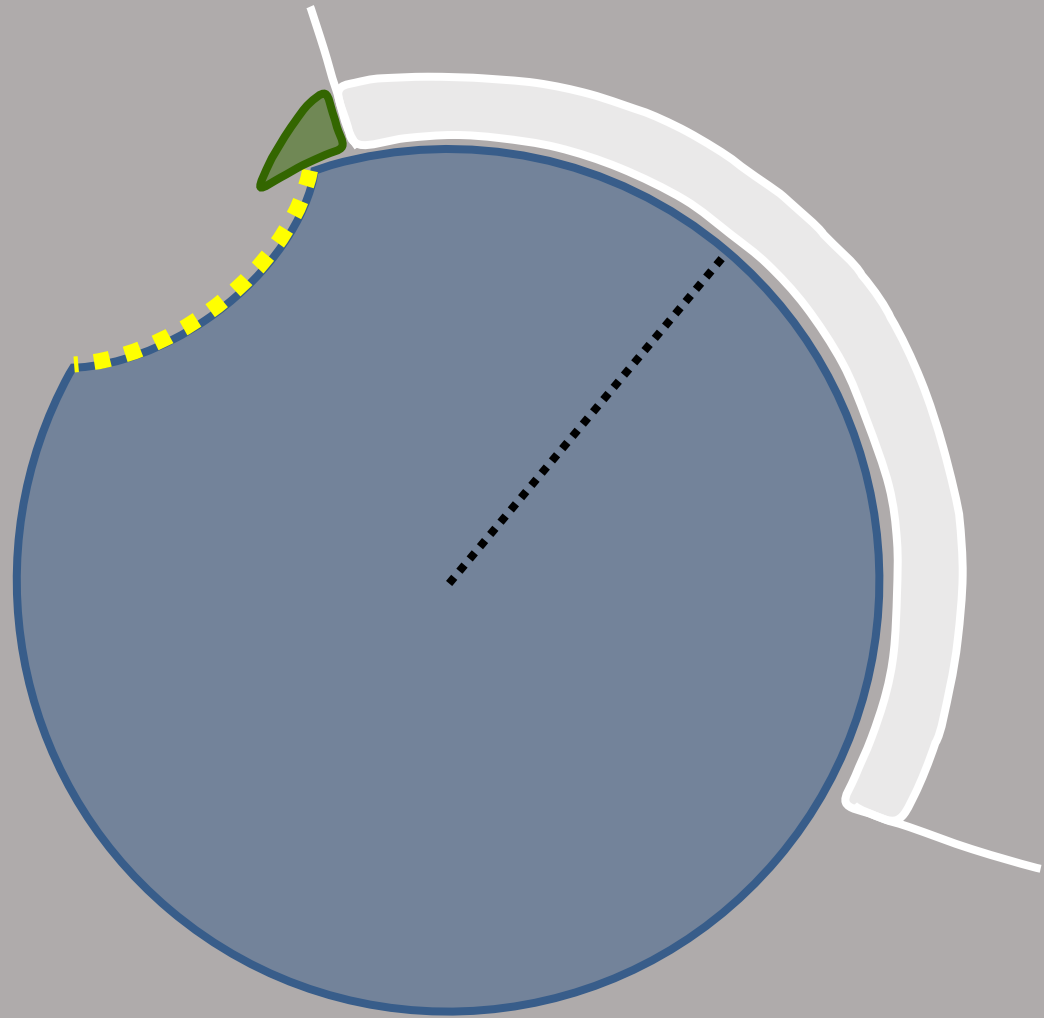


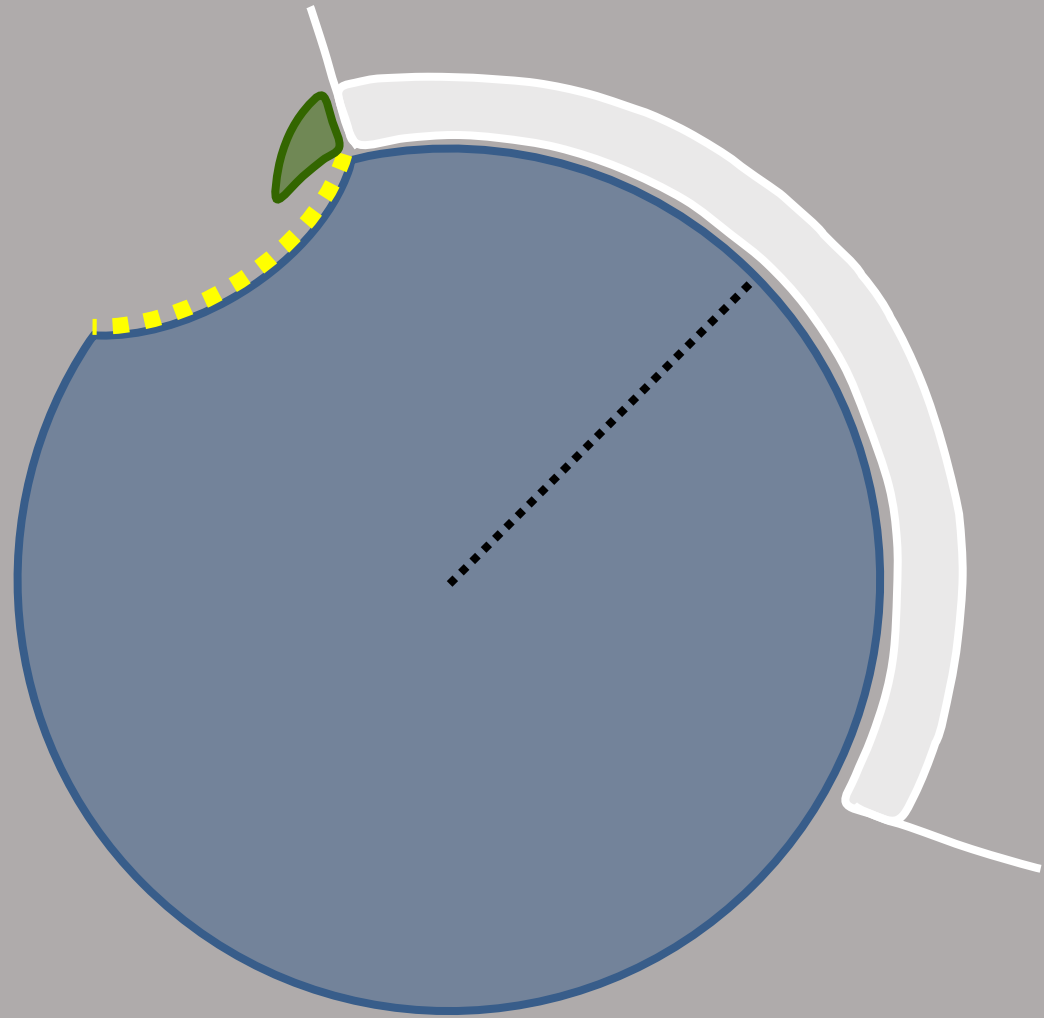


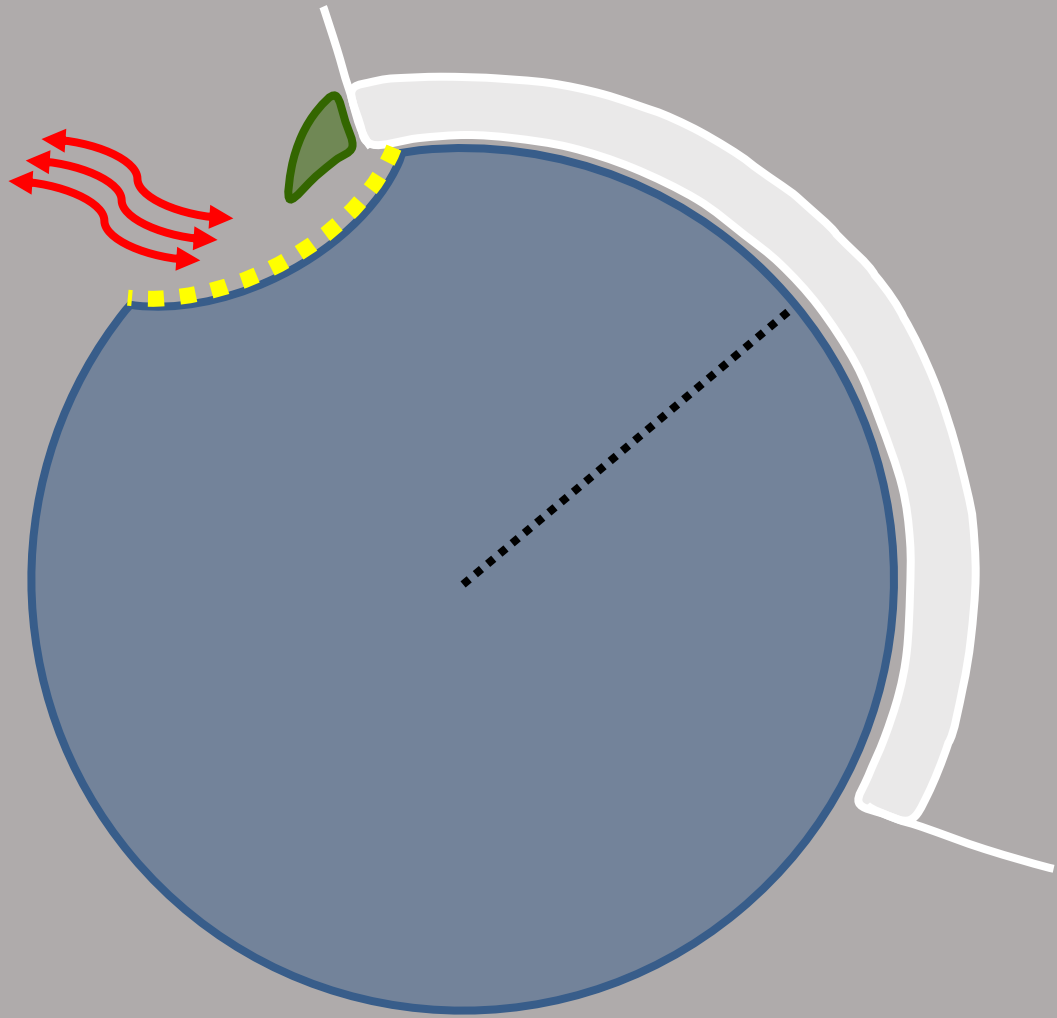


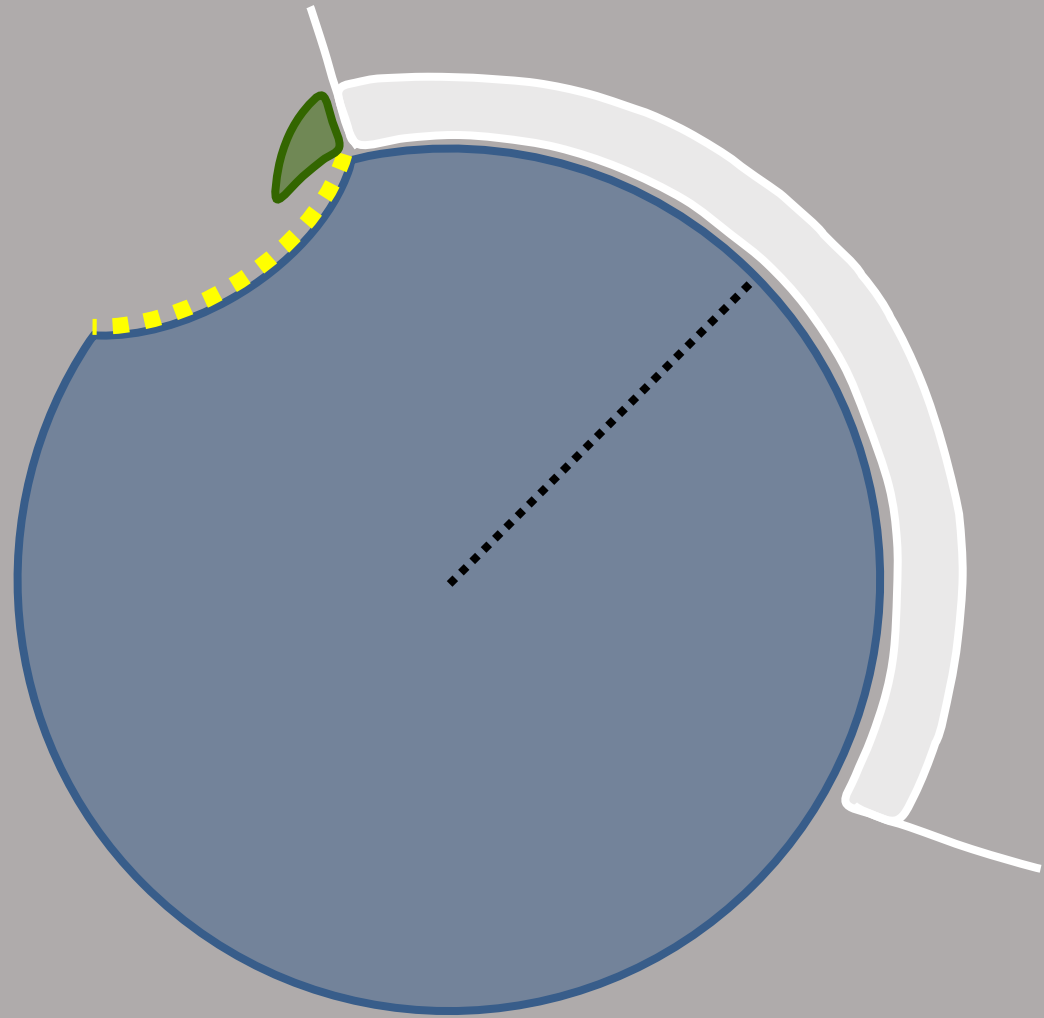


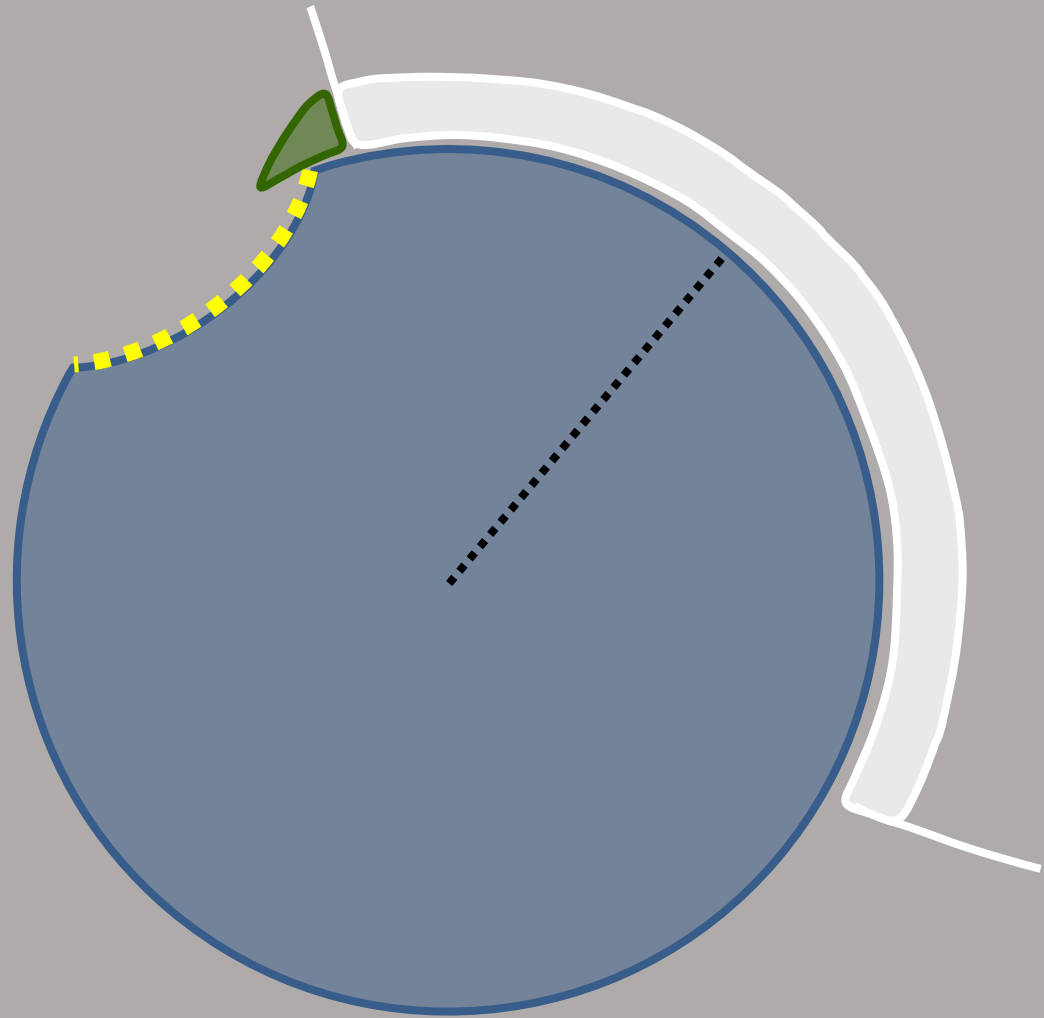


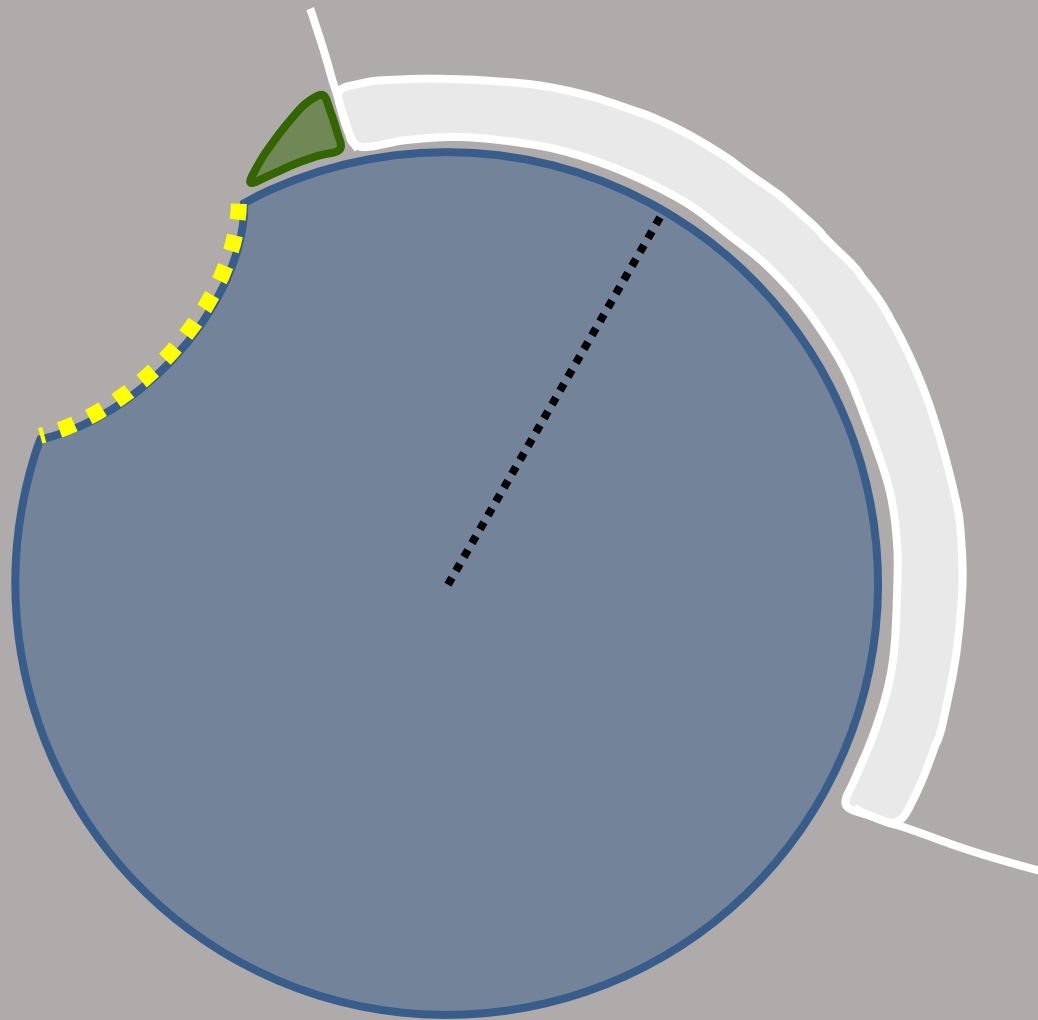


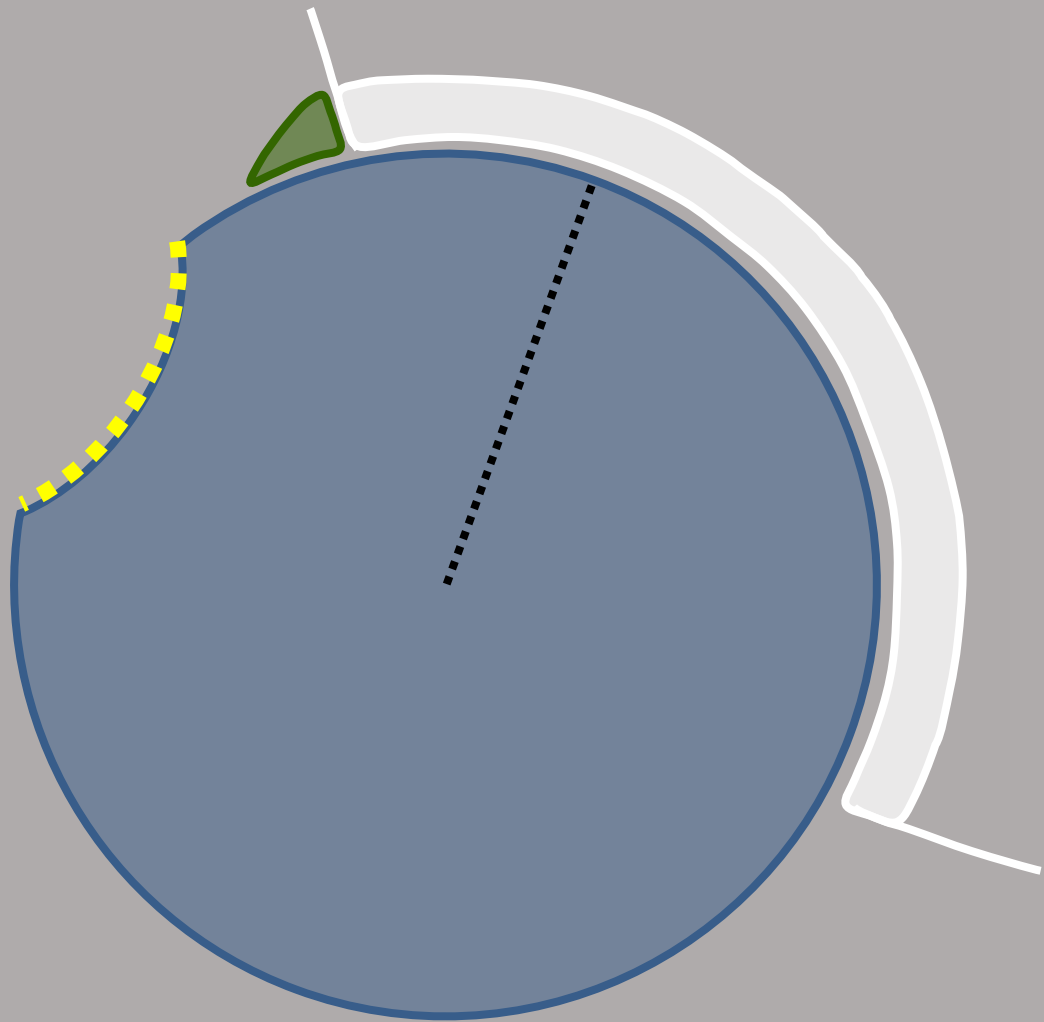




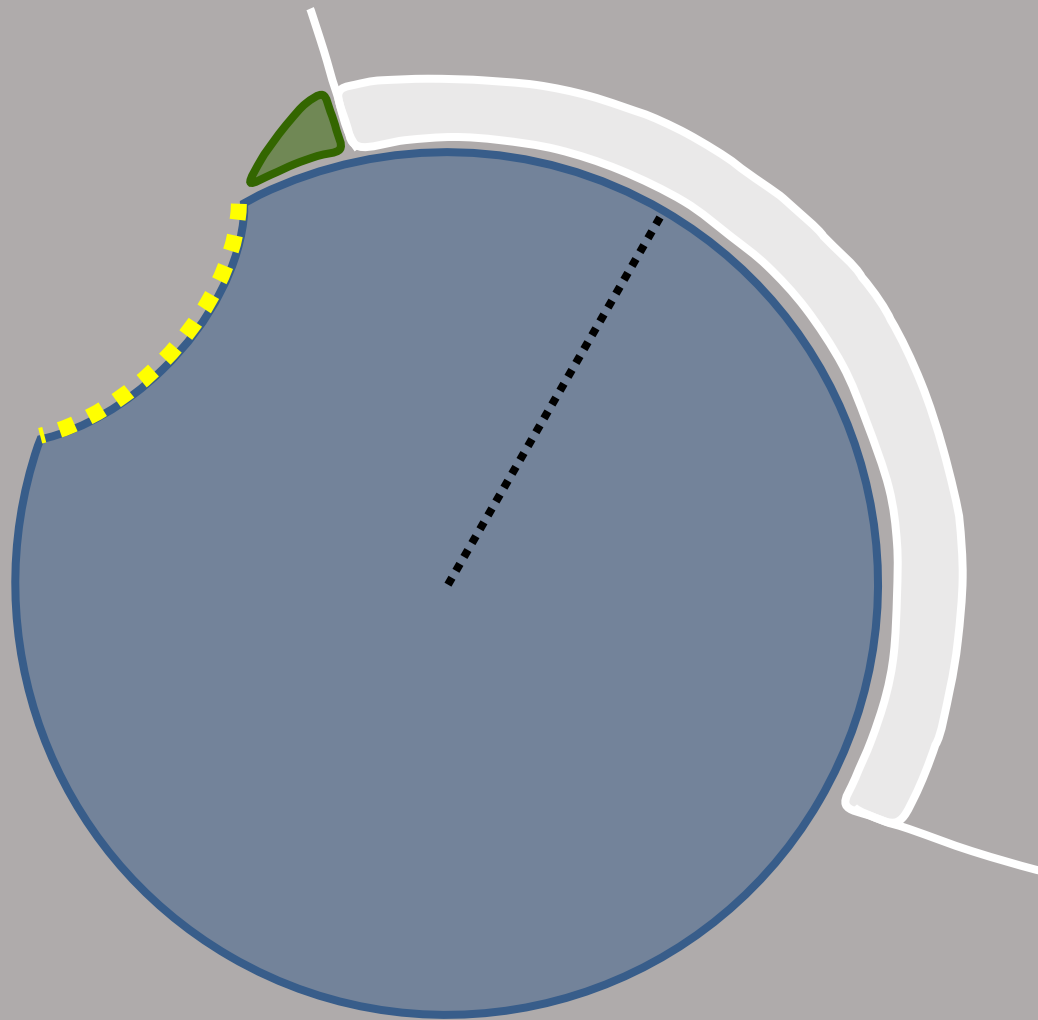


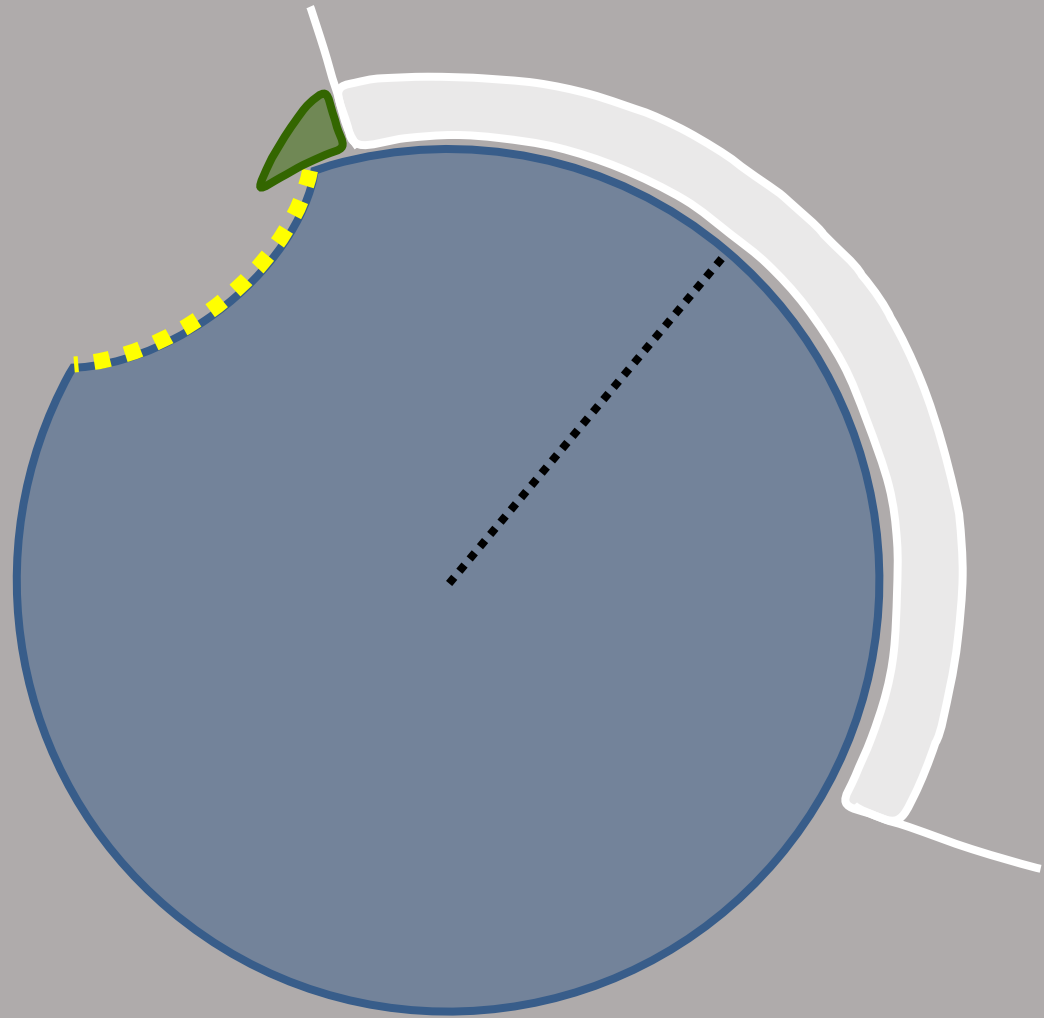


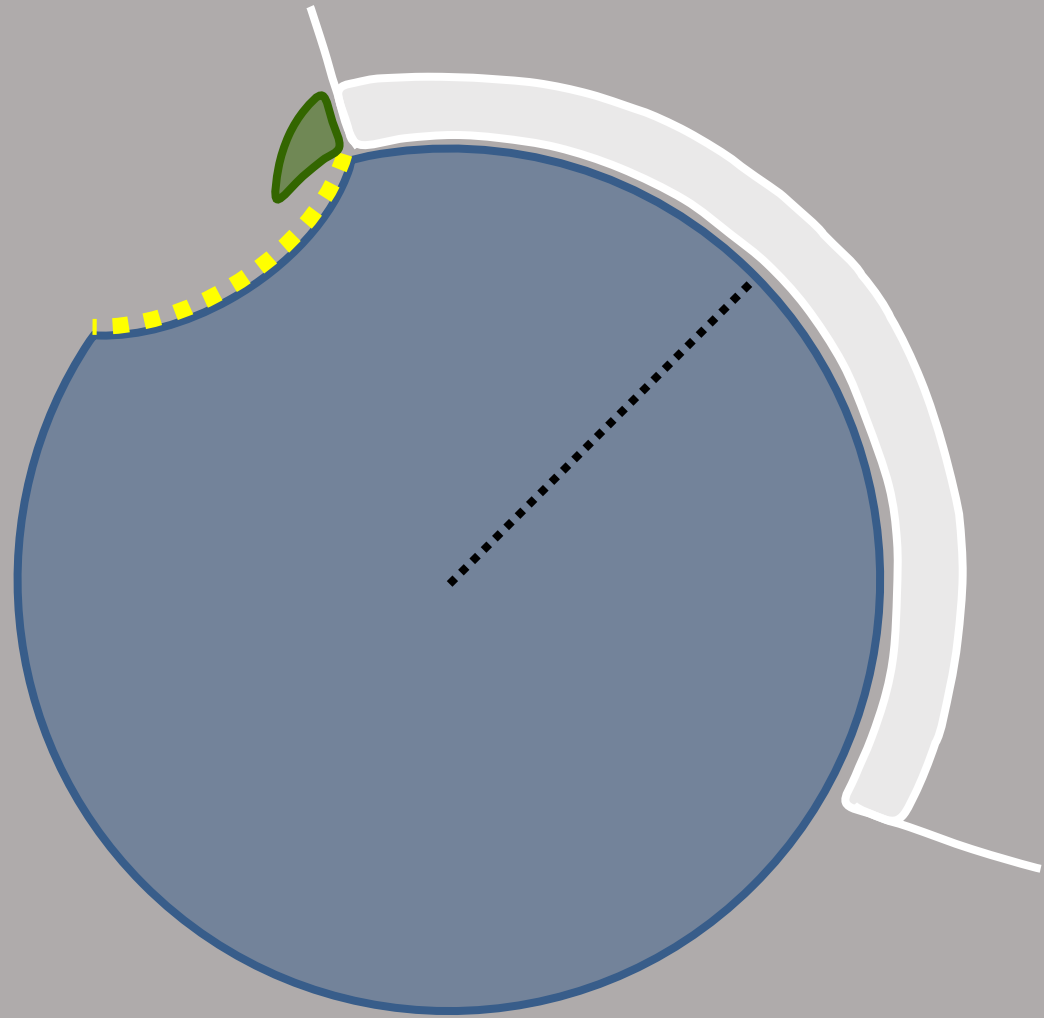


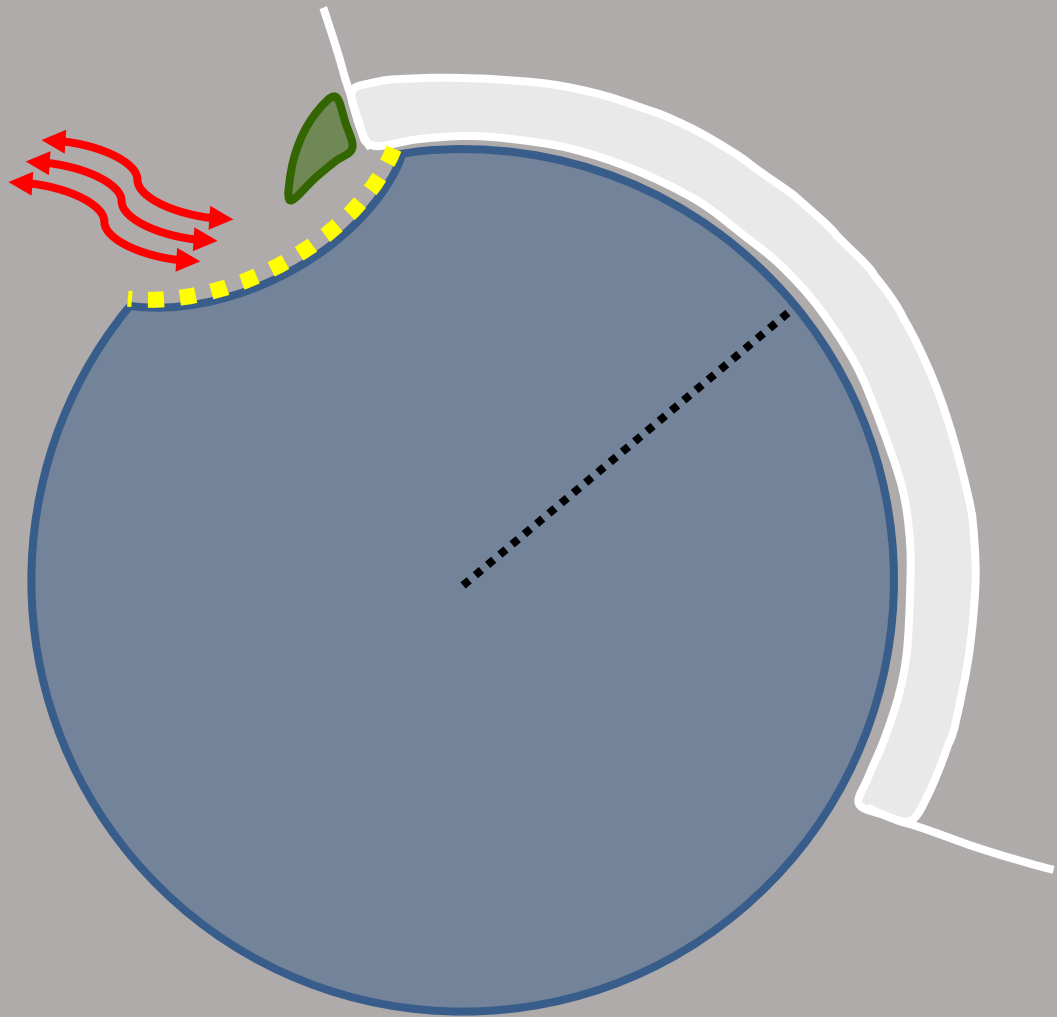








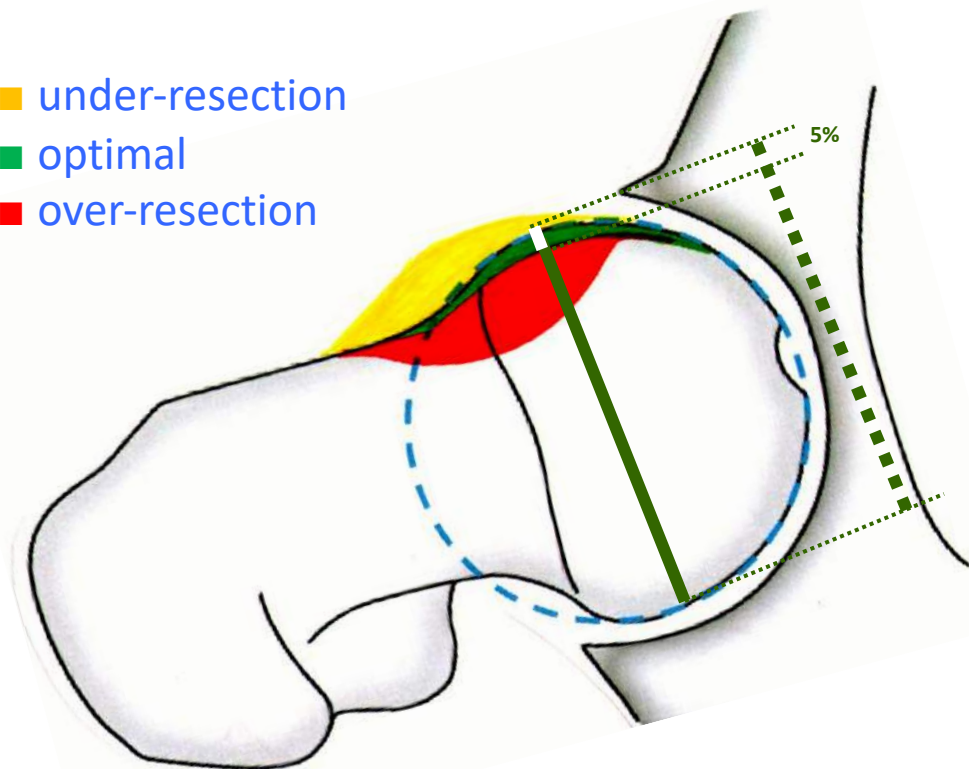




# Results: Over- vs. Under-Resection

- Cam **Over-resection** (>5%) predicts inferior clinical outcome measures compared to **Under-resection** in this population
- **Over-resection** predicts inferior outcomes after revision hip arthroscopy and higher rates of conversion to THA
- **Over-resection** should be avoided

- under-resection
- optimal
- over-resection

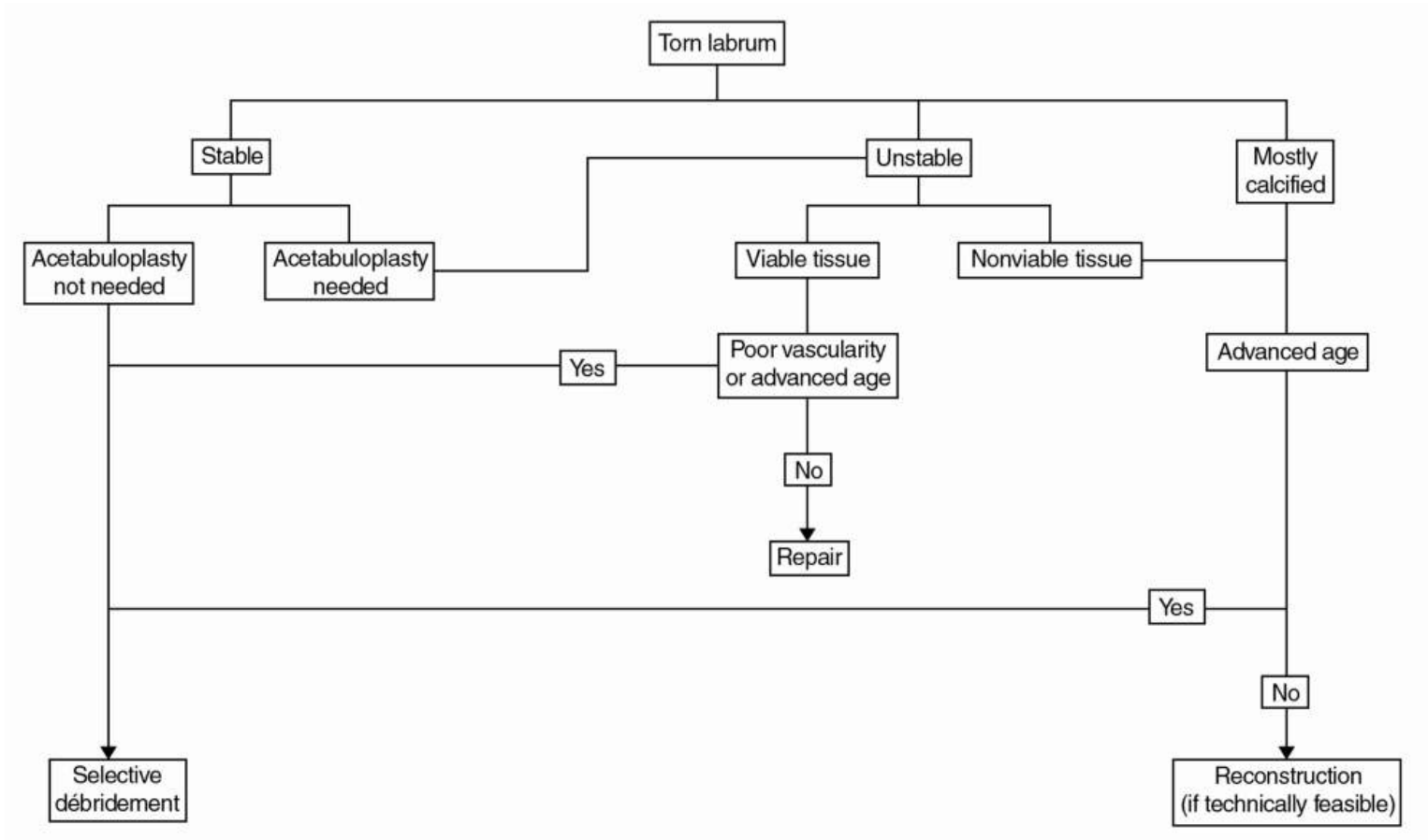


- Mansor et al
- AJSM

$$\frac{\text{depth of over-resection}}{\text{femoral head diameter}} \times 100 = 5\%$$

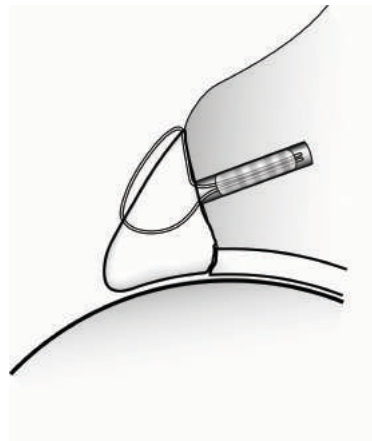
# Correct Surgery

- Goal: Restore the Seal

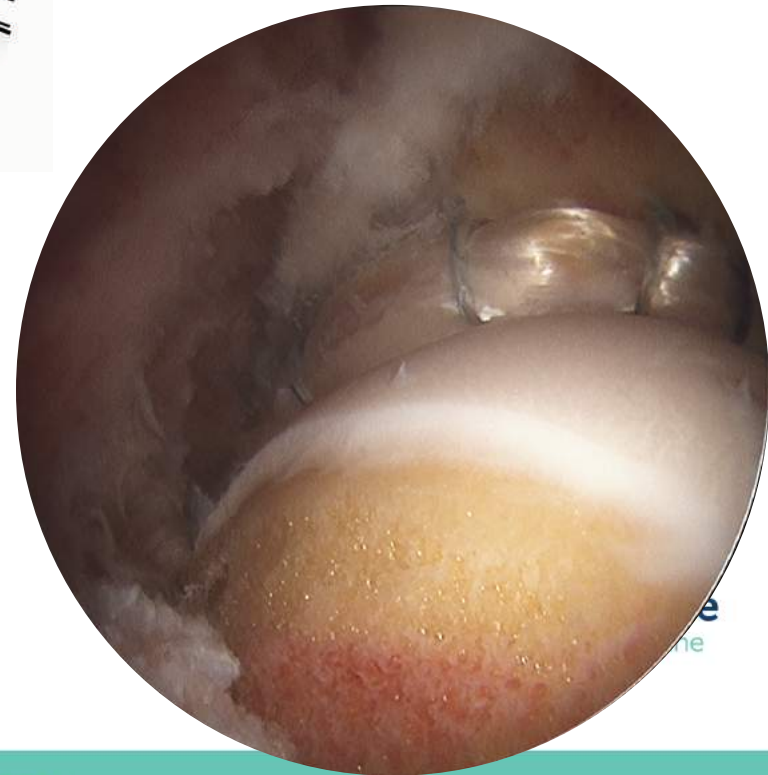


# Anatomic Repair or Reconstruction: RESTORE THE SEAL!

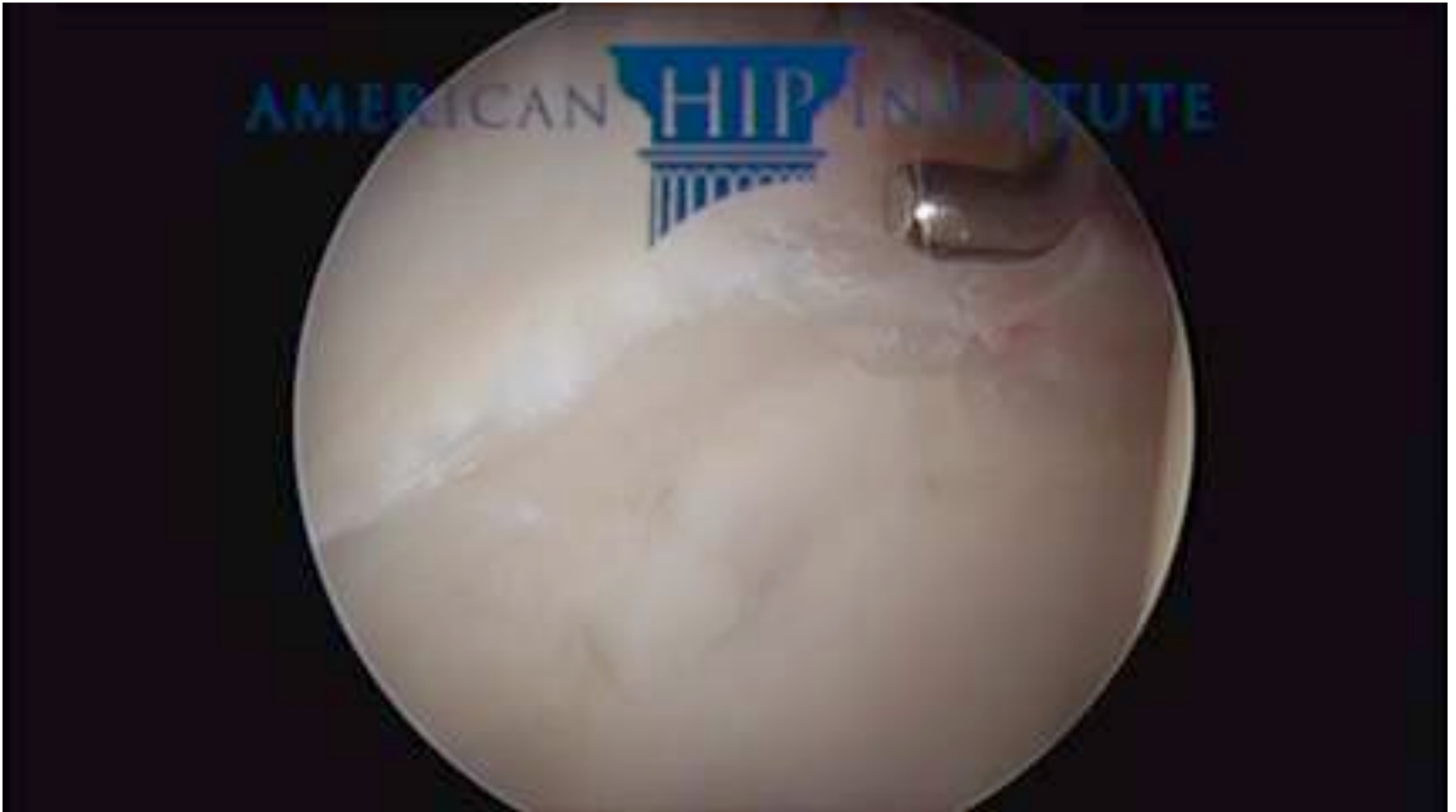
Repair



Reconstruction

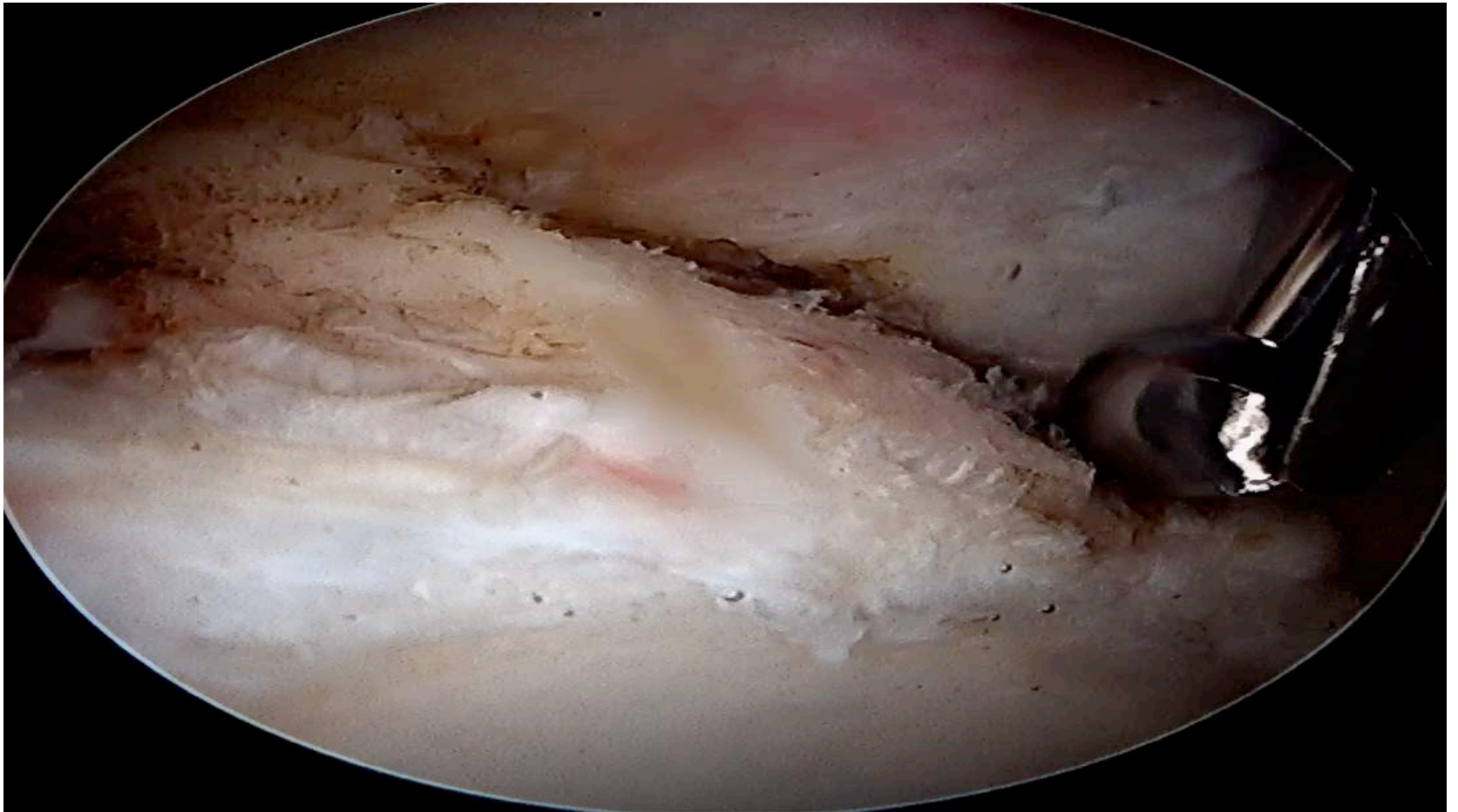


# Hip Arthroscopy Labral Repair





# Hip Arthroscopy Labral Reconstruction w/ Graft



# Outline

- **Correct Patient**
  - Indications for hip arthroscopy
  - Prognosis
- **Correct Surgery**
  - Identify source of pain
    - FAI vs Instability
  - Goal: restore the seal!
- **Correct Time**
  - Non-operative management

# Correct Time

- Non-operative management

- Activity Modification
- PT
- NSAIDs
- Cortisone / Biologics



*Groh MM et al Curr Rev MSK Med. 2009*  
*Aprato A et al, Int Orthop. 2012*

# Hip Health

- Low Impact >> High Impact
  - Hiking, Biking, Swimming better than Running/ Jumping
  - No breast stroke
- The hip is a ball and socket – it has a mechanical end point. Don't try to stretch past it!
  - Good stretch vs. Bad stretch
- Let pain be your guide



# Physical Therapy

## Muscles Crossing the Hip Joint



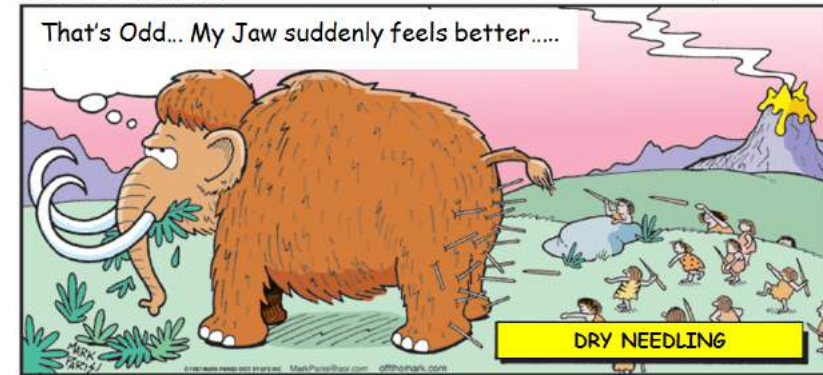
© Posterior superficial and deep view

Figure 11.20d Tortora - PAP 12/e  
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- The ball-and-socket hip joint permits flexion, extension, abduction, adduction, circumduction, and rotation
- The muscles for these movements are most powerful
- Movement of thigh at the hip joint is by muscles anchored to the pelvic girdle – the iliopsoas, tensor fasciae latae and rectus femoris
- Iliopsoas are the iliacus and psoas major
- Quadriceps femoris has 4 heads
  - Rectus femoris crosses hip
  - All insert into quadricep tendon
  - all act to extend the knee
- Adductor muscles
  - bring legs together
  - cross hip joint medially

off the mark.com

by Mark Parisi



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Your Life in Motion



# Nonoperative Management of Femoroacetabular Impingement

## A Prospective Study

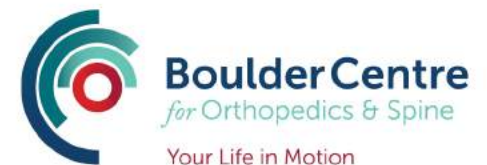
Andrew T. Pennock,<sup>\*†‡§</sup> MD, James D. Bomar,<sup>†</sup> MPH, Kristina P. Johnson,<sup>†‡</sup> ATC, OPA-C,  
Kelly Randich,<sup>†‡</sup> DPT, and Vidyadhar V. Upasani,<sup>†§</sup> MD

*Investigation performed at Rady Children's Hospital, San Diego, California, USA*

- Formalized 6wk PT protocol
- 82% of adolescent patients with FAI can be managed nonoperatively, with significant improvements in outcome scores at a mean follow-up of 2 years

# Injections

- Steroid
  - More efficacious in arthritis, less in FAI (Chandrasekaran et al. JHPS 2015)
- Hyaluronic Acid
  - Not successful in literature or anecdotally
  - Not FDA approved for any joint other than knee
- Biologics
  - No significant evidence to support its use in FAI



# Correct Time

- **WHAT ABOUT FURTHER DELAY IN TREATMENT??**

– Increased duration of symptoms →  
decreased clinical / PRO scores



*Dierkman et al, J Hip Pres, 2017*  
*Domb et al, AJSM, 2018*



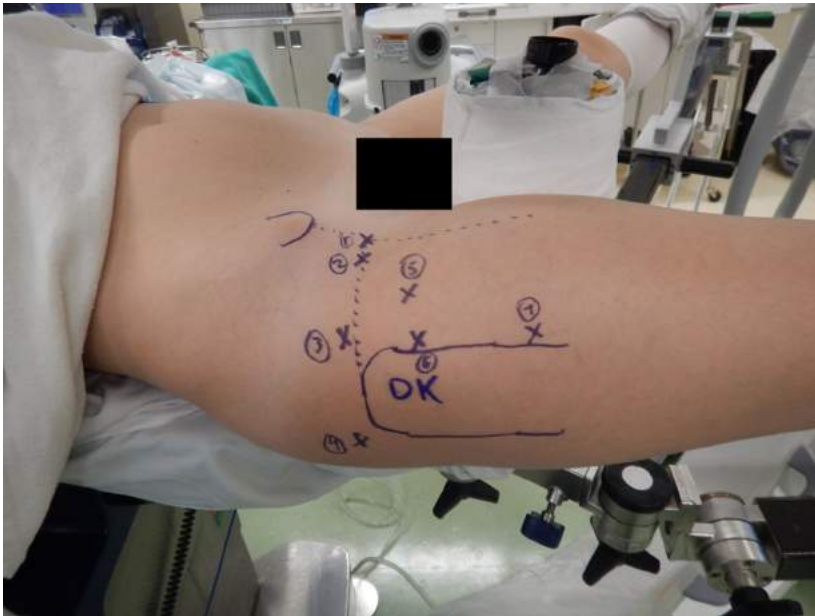


# When Conservative Treatment Fails...



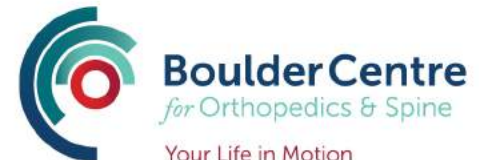
# Hip Preservation/Arthroscopy

- 3-4 “key hole” size incisions
- Traction time limit 90mins
  - 45-75mins



# Recovery from Hip Arthroscopy

- Typical
  - 2 weeks on crutches – 20lb foot-flat weight bearing
  - 2wks with hip abduction brace
  - Begin stationary bike and PT day after surgery
- Occasional (labral reconstruction with tendon graft, gluteus medius repair)
  - 6 weeks of partial weight bearing on crutches with a brace
  - Delay PT for 6wks
- Rare
  - 8 weeks on crutches, but discontinue brace after 2 weeks
  - Delay PT for 6 wks



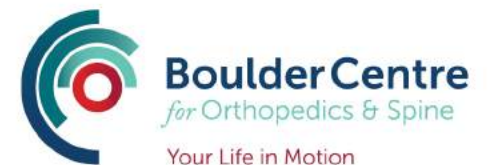
# Conclusions

- Hip arthroscopy in the right indications is safe and demonstrates favorable outcomes
- However!!! Risk factors for failure warrant cautious patient selection
- Must do the correct surgery!





# Thank you!





# Improving Painful Hip Conditions

Austin Chen, MD

Boulder Center for Orthopedics and Spine

303-963-9701



Boulder Community Health