Hip Injuries in Athletes

INOVA Sports Medicine Symposium
INOVA Mount Vernon Hospital
Friday June 19, 2015

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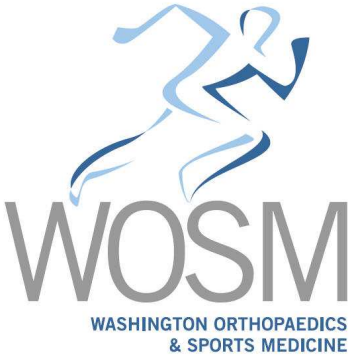
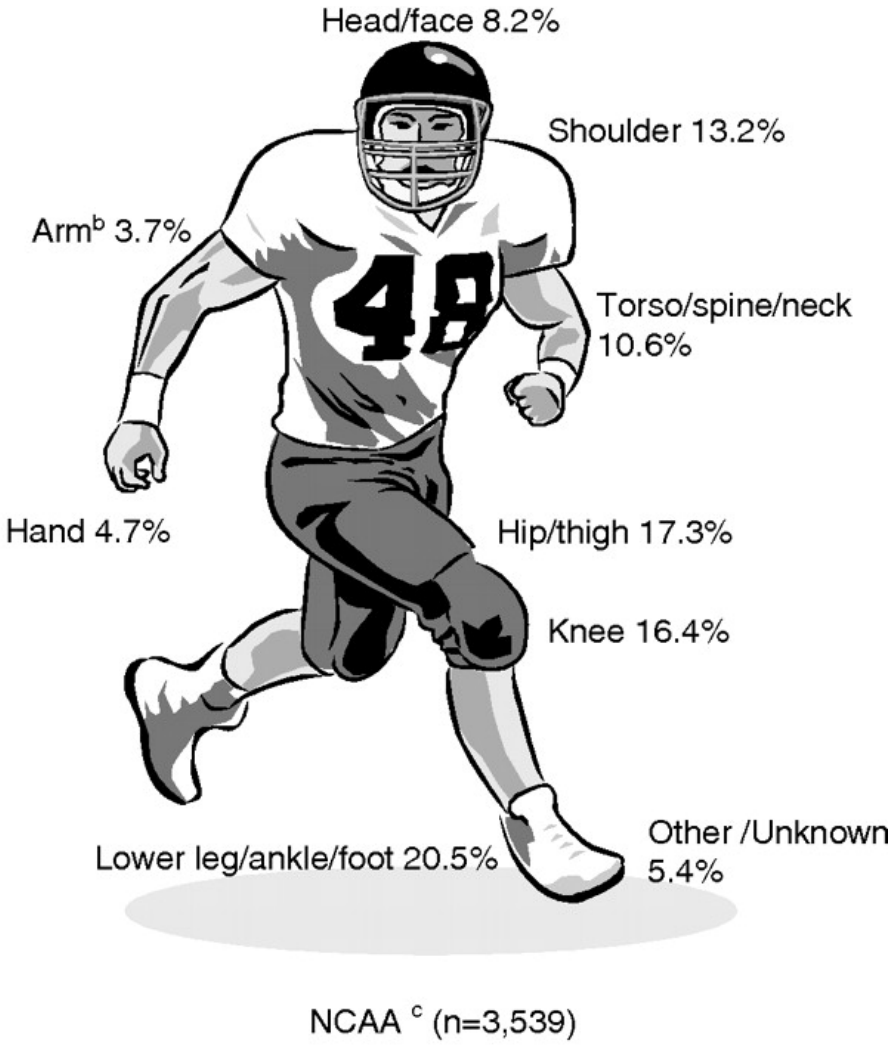


Hip Injuries

- In college athletes, 2nd most common area for injury



Shankar et al. Am J Sports Med. 2007

Hip Injuries in Athletes

- A large percentage of these injuries are soft tissue injuries that get better with time, therapy, advil, ice, etc.

Hip Injuries in Athletes

- But some of them don’t…
- Some “rub some dirt on it” and keep playing
- Others can’t

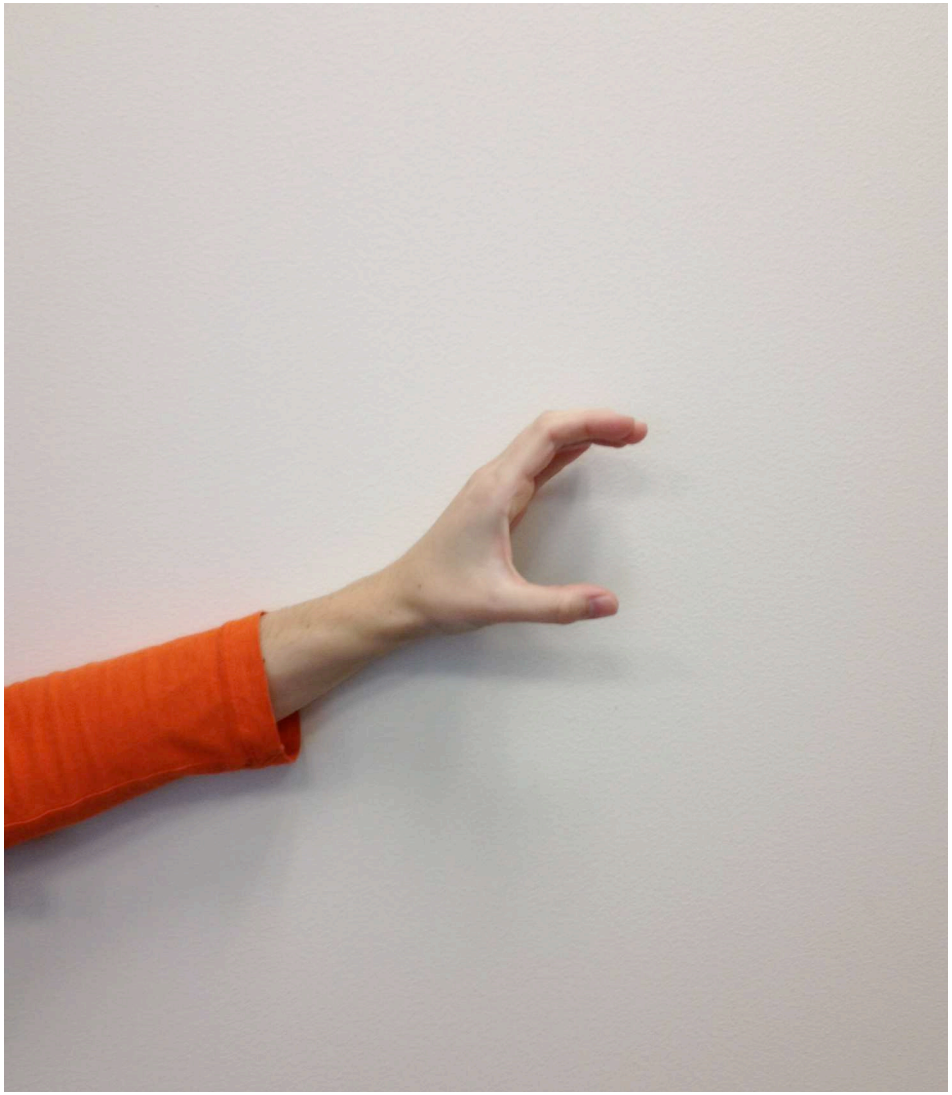
How do I know if it's a hip problem?

- Recurrent injuries or chronic pain around the pelvis
  - Groin pain, Groin pain, Groin pain
  - Buttock pain
  - Trochanteric bursitis
  - Hamstring injuries
  - "Sports Hernias"
    - Abdominal wall injuries
    - Groin strains

Typical causes of hip pain

- Twisting/Torqueing
- Running
- Prolonged sitting
  - Plane rides/ long car rides
- Walking uphill
- Getting in/out of car
- Achy night pain?

“C” Sign



Steve

- 37 year old former Division 1 basketball player
- Always had hip pain
- Missed several games
- Diagnoses included: Groin strain, abdominal wall strain, bursitis, tendinitis, etc.

Steve

- Pain all the time
- Pain with sitting
- Can’t exercise
- Pain at night—particularly after exertion
- Aleve around the clock

Jason

- 20 year Division 1 basketball player
- Progressive hip pain for 2 years
- Missed much of sophomore season
- Diagnosis?

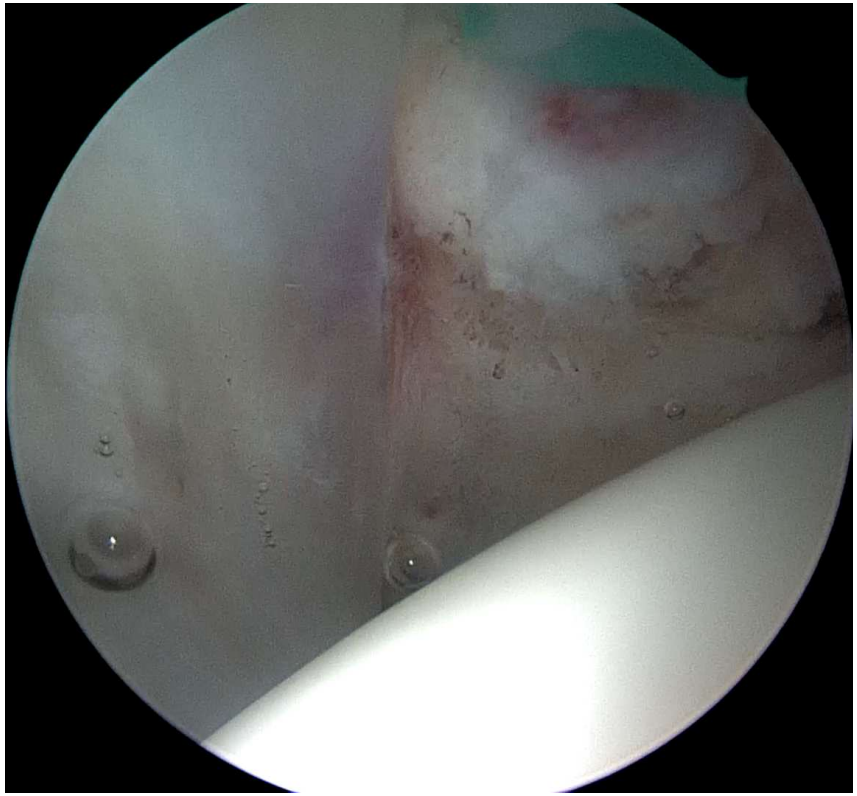
First Hip Arthroscopy: Denmark, 1912

Arthroskopie (2000) 13 : 197–199 © Springer-Verlag 2000

Severin Nordentoft und die Priorität für die Arthroskopie

1912 - Early 2000's

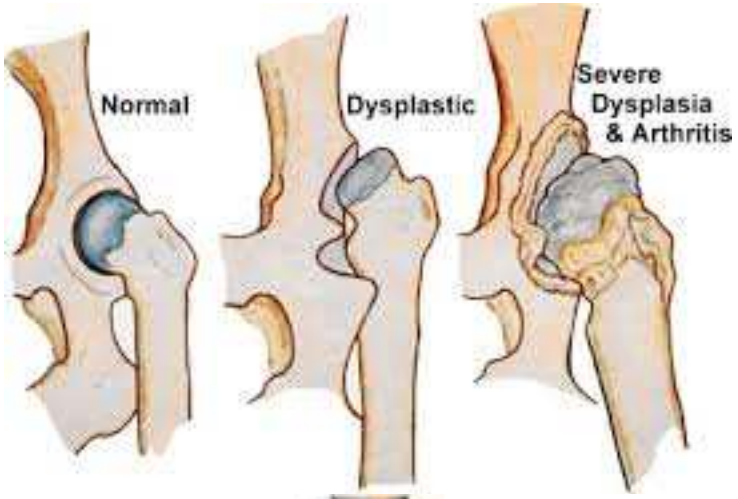
- Arthroscopic surgery of the hip consisted largely of debridement of damaged tissue

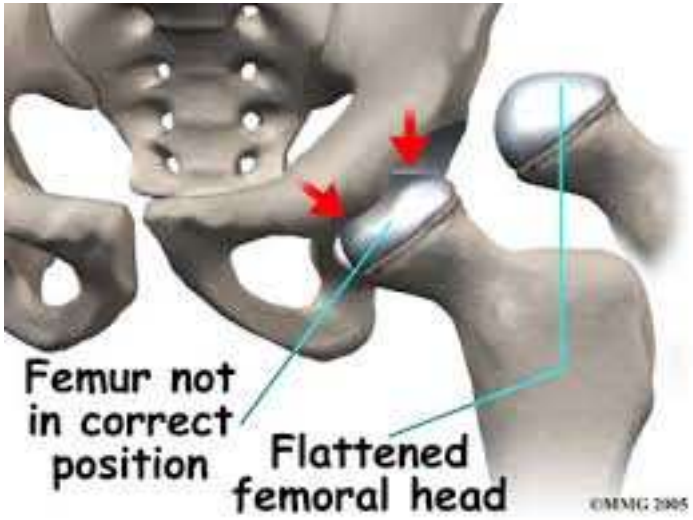


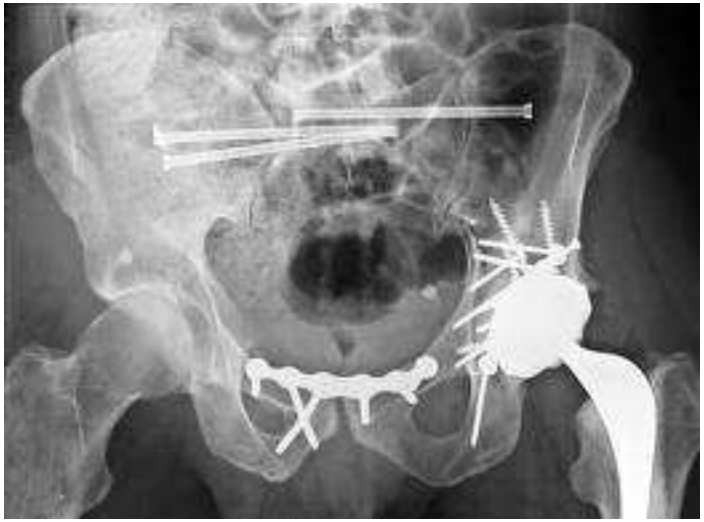
1912 - Early 2000's

- Good results can be achieved with these techniques
- 10 year follow-up paper on series of 52 hip arthroscopies (Byrd *Arthroscopy 2009*)
  - Subset of 18 without arthritis
  - 15 (83%) continued to show substantial improvement
    - Maintained mHHS gain $\geq$ 18 points

Why Do Hips Hurt?



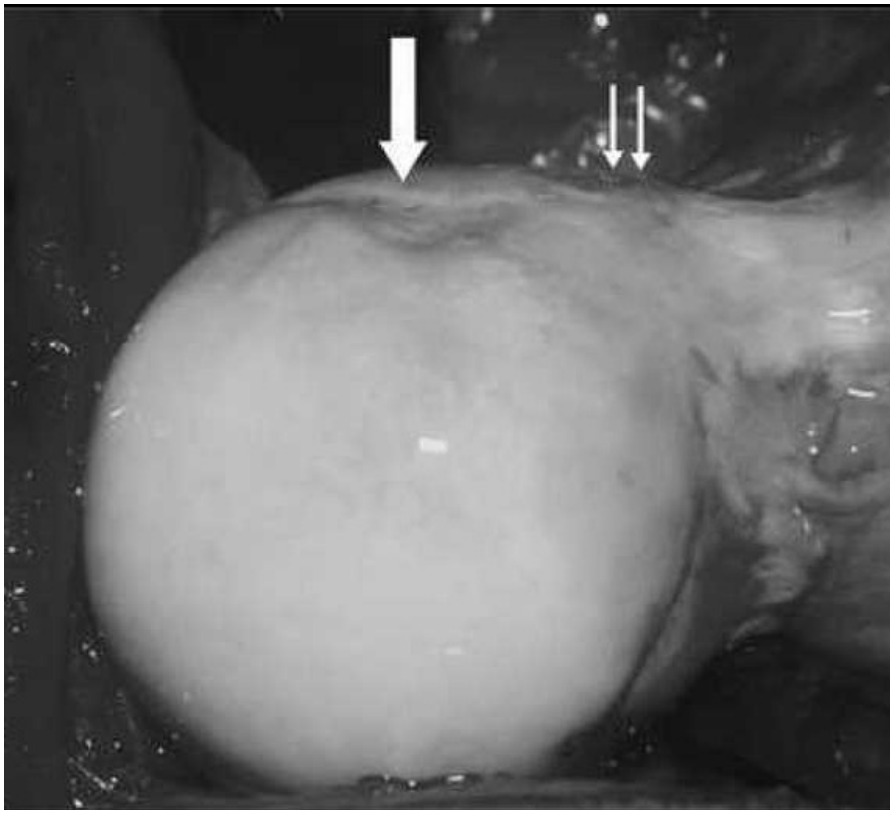




What About "Normal" Hips?

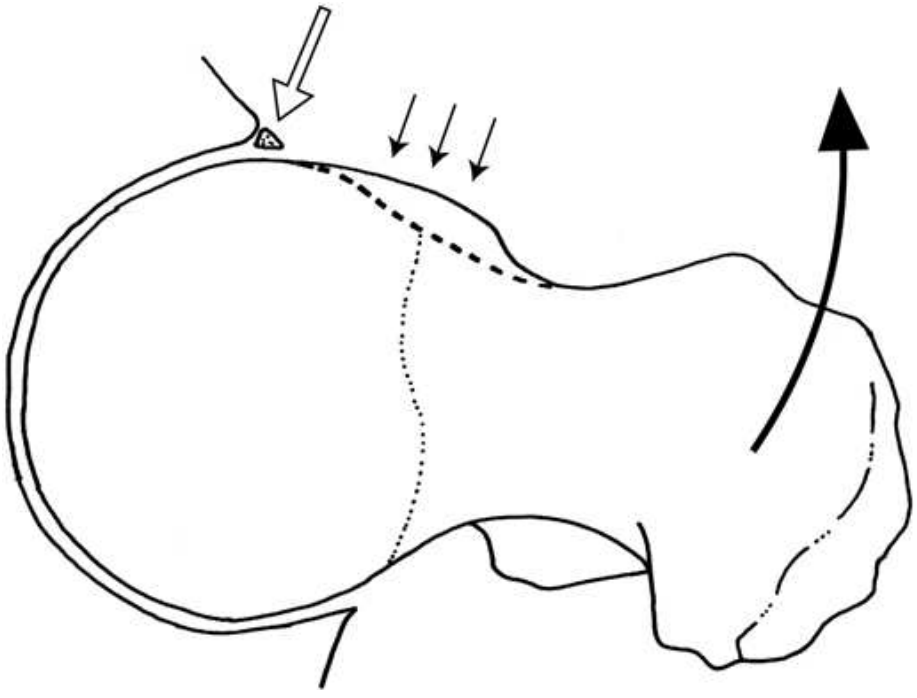
Femoroacetabular Impingement

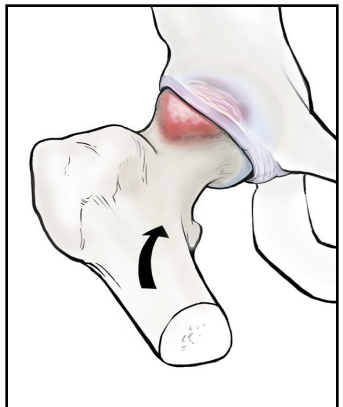
- In 1990's Ganz and colleagues introduced the concept of Femoroacetabular Impingement (FAI) as a cause of hip pain, labral tears, and early osteoarthritis



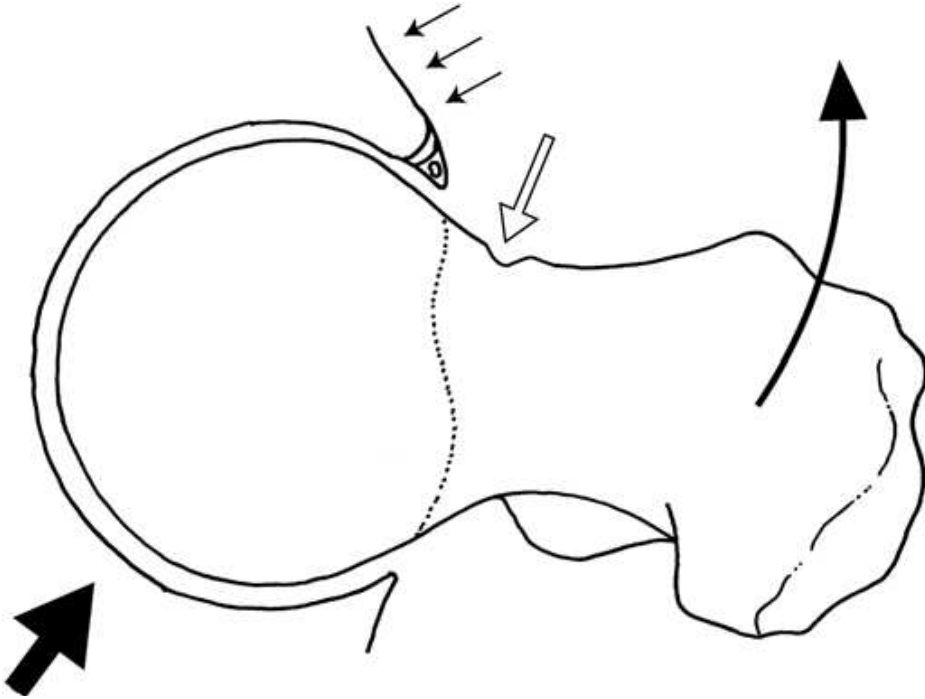
(Ganz et al. *Clin Orthop Rel Res* 2003)

Femoroacetabular Impingement





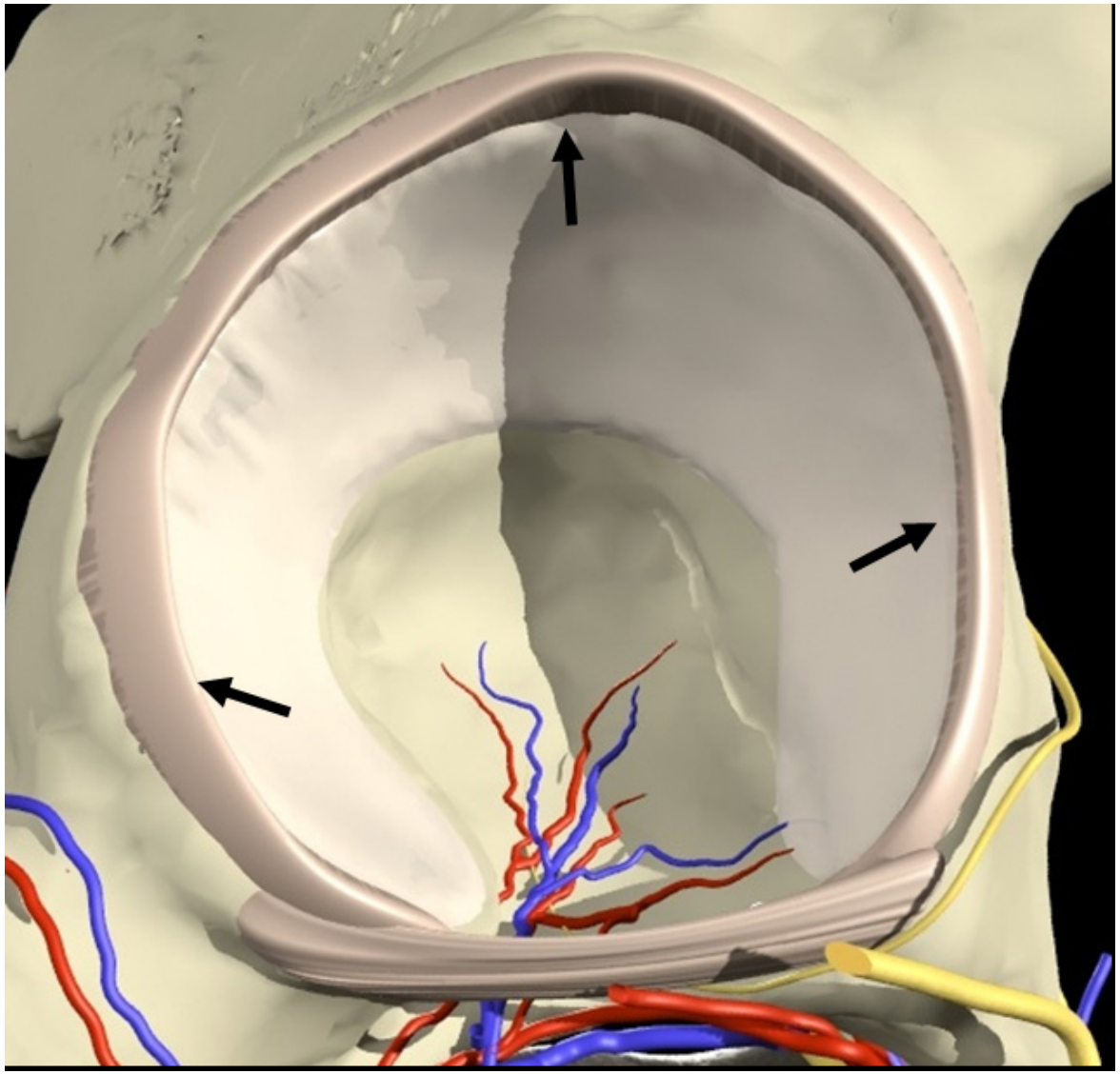
CAM



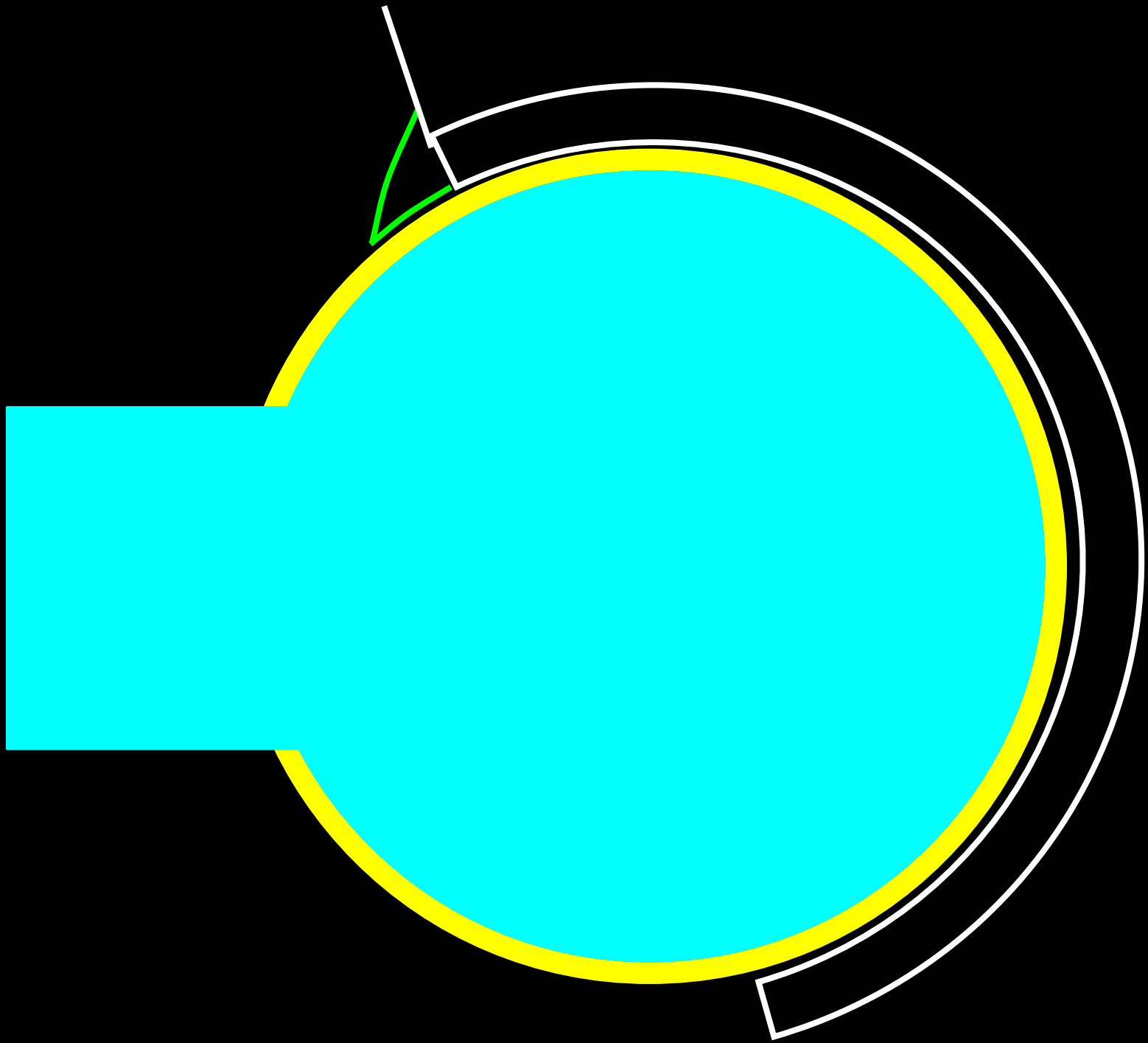
Pincer

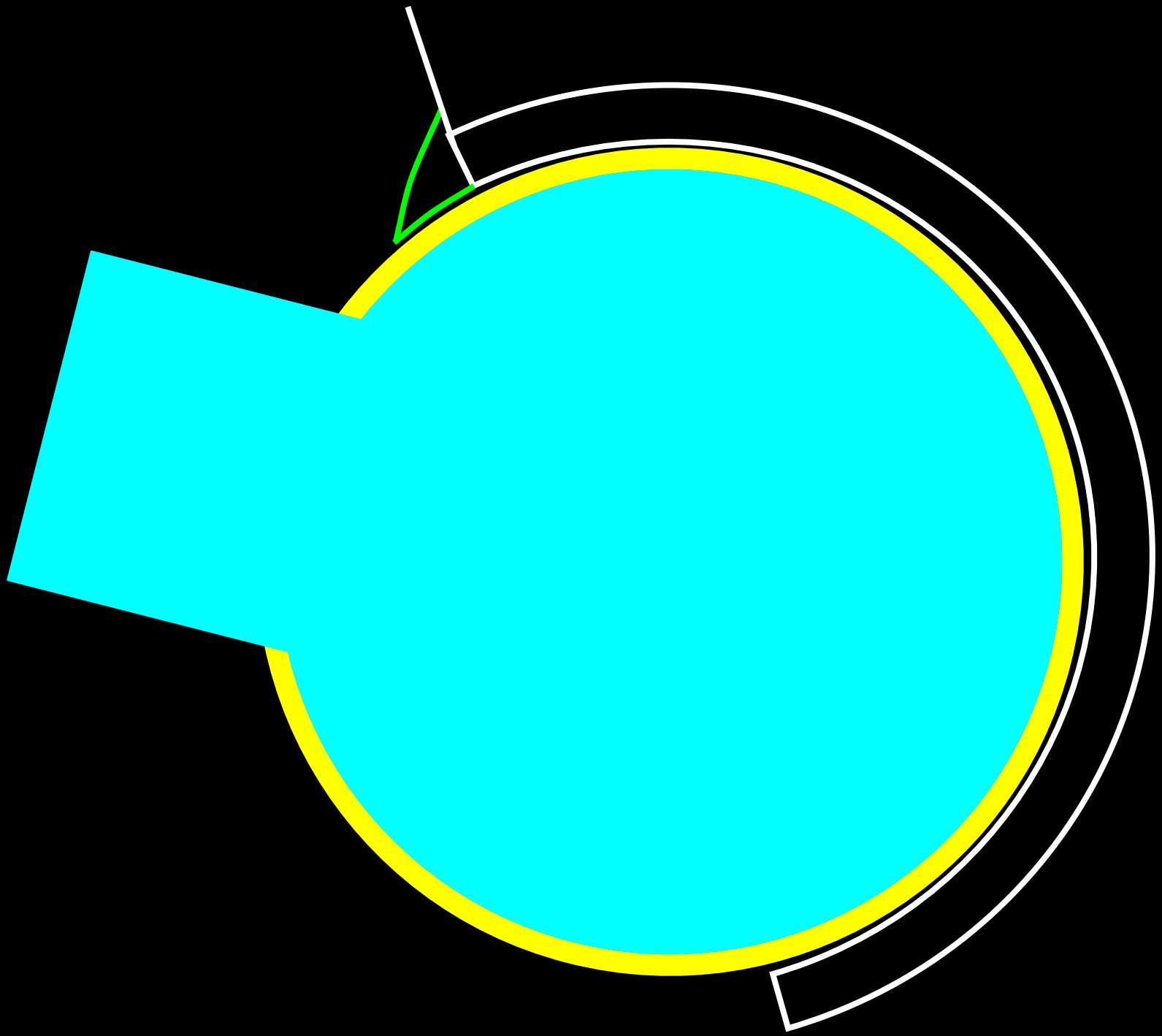
Espinosa et al J Bone Joint Surg 2006; 88-A: 225-239

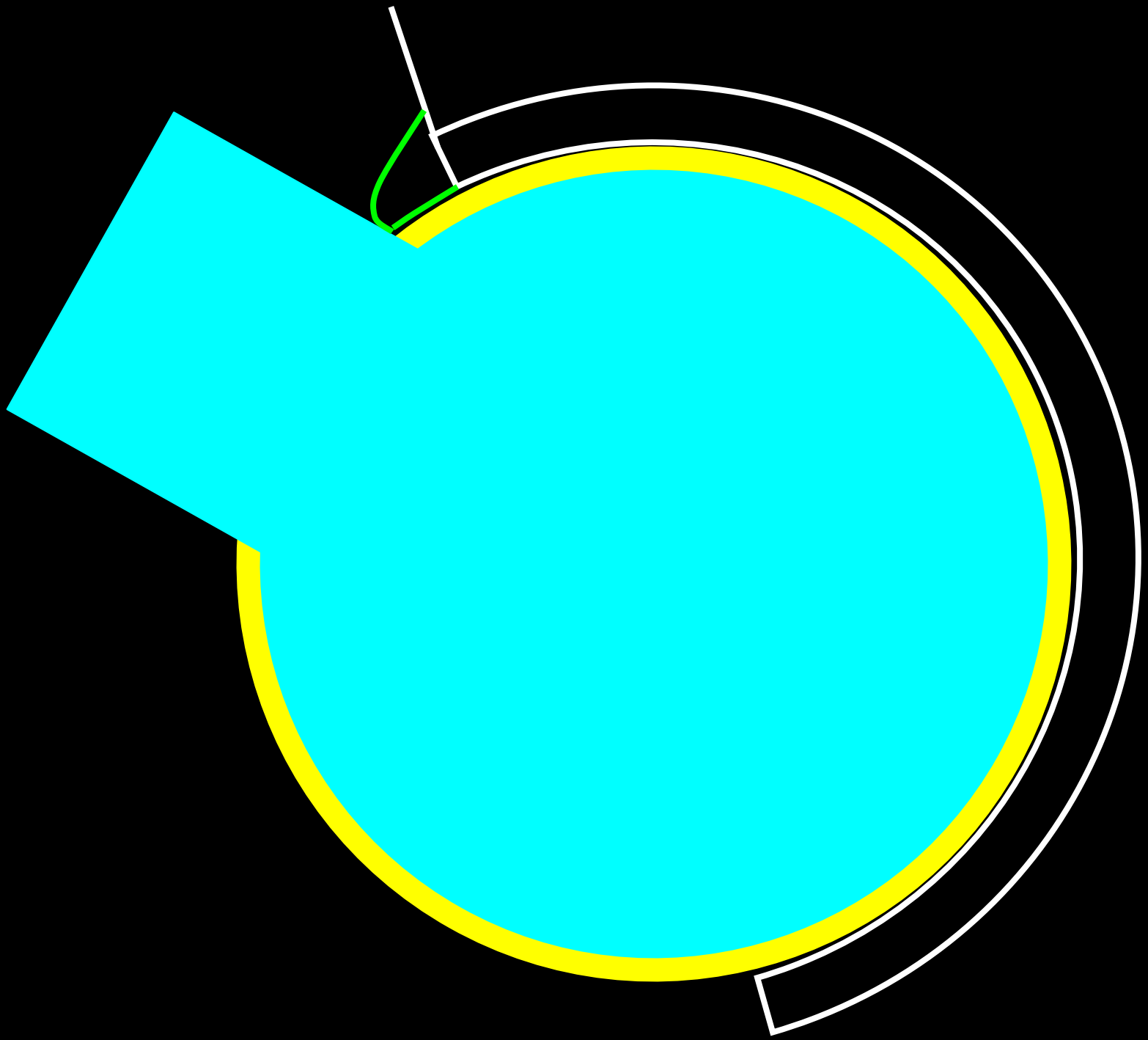
Acetabular Labrum

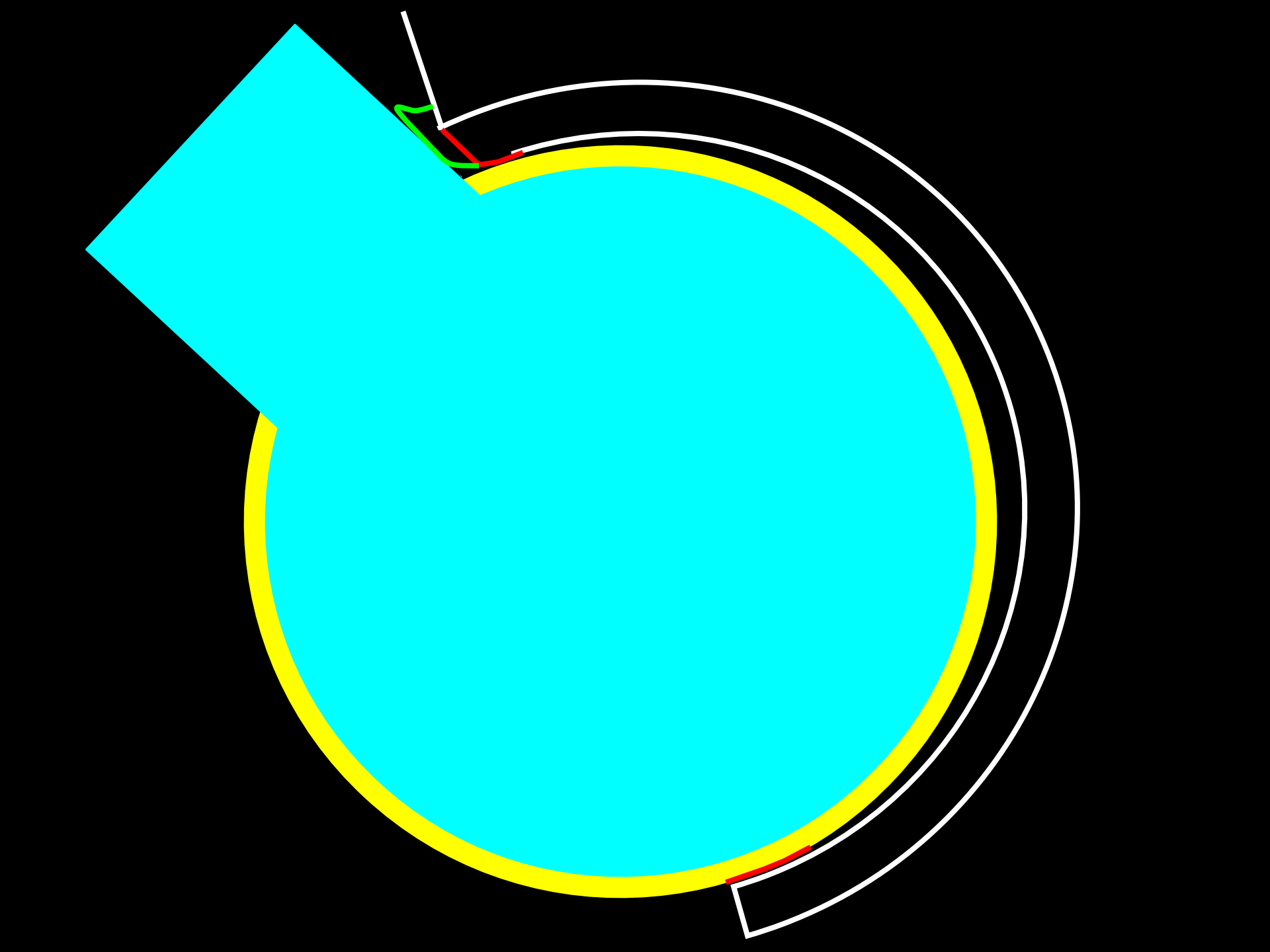


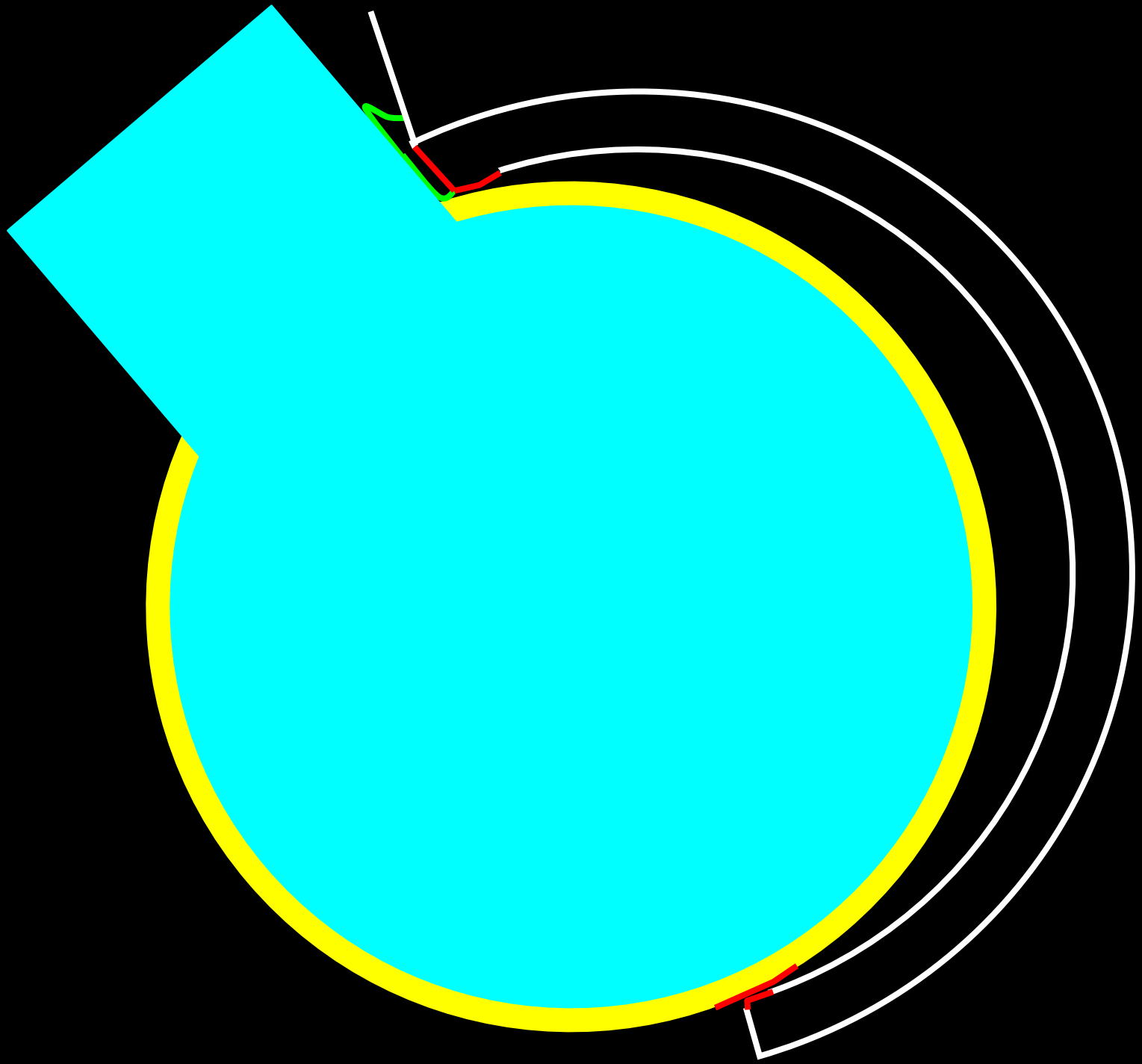
FAI: *Pincer Type*

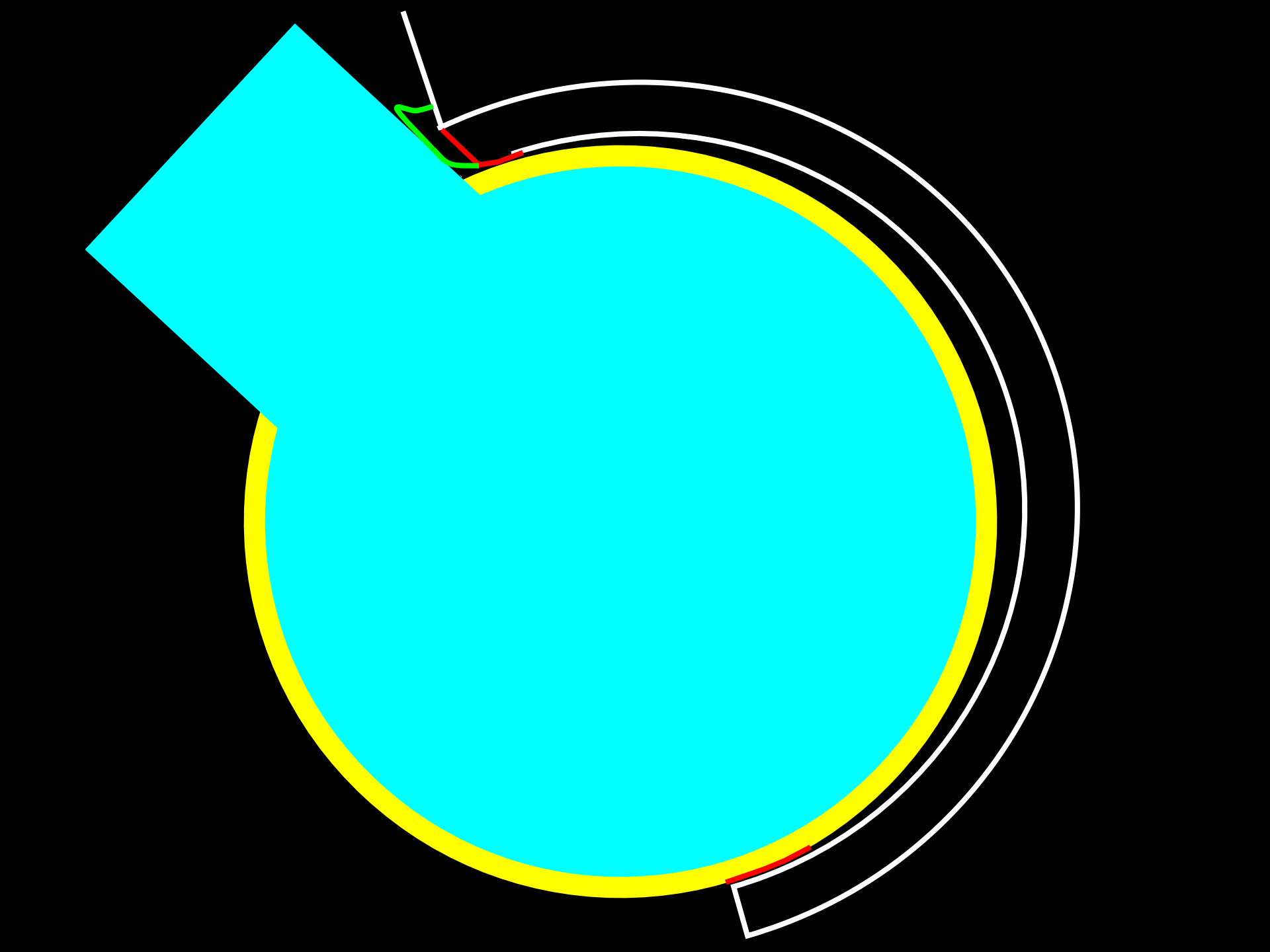


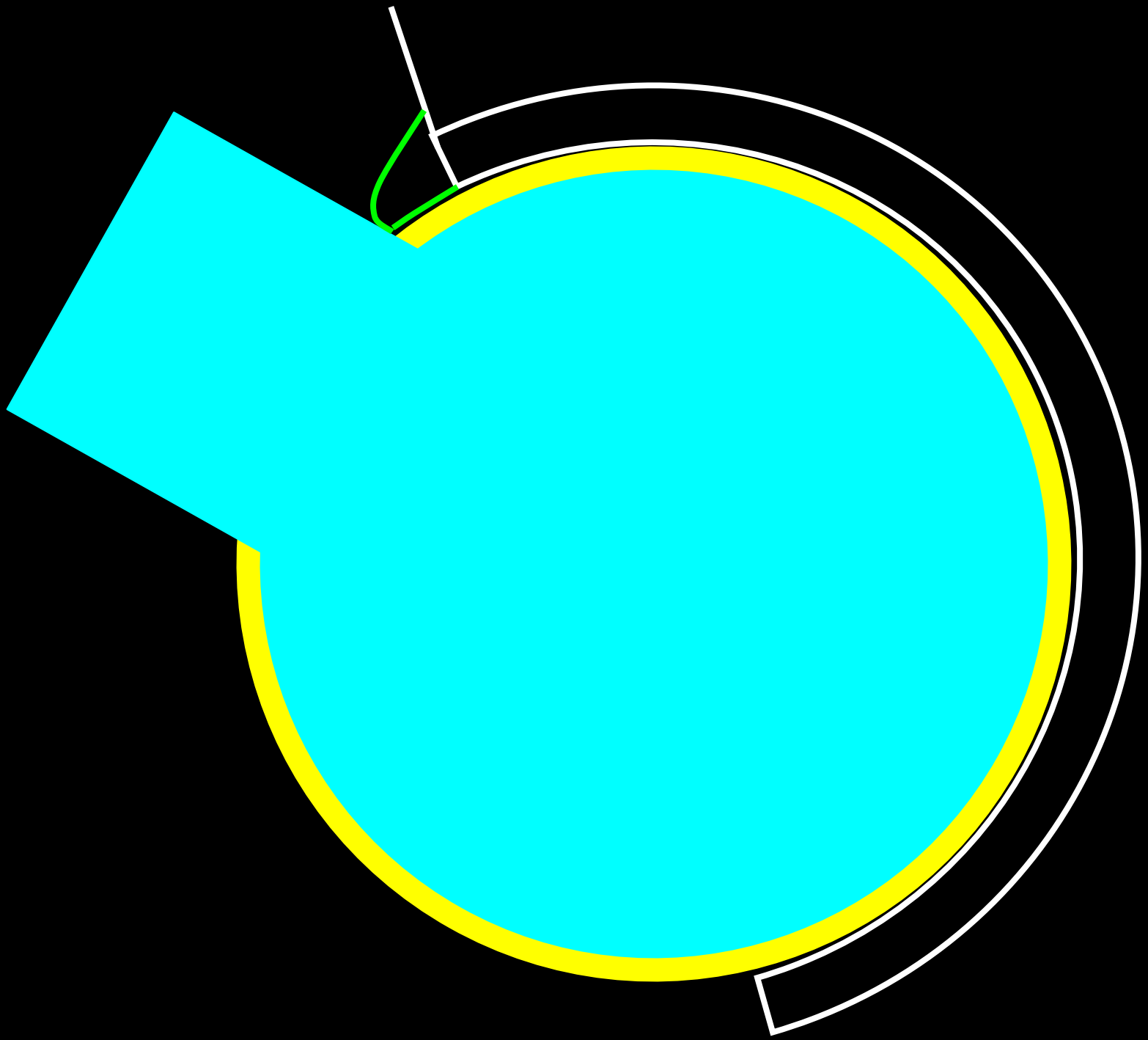


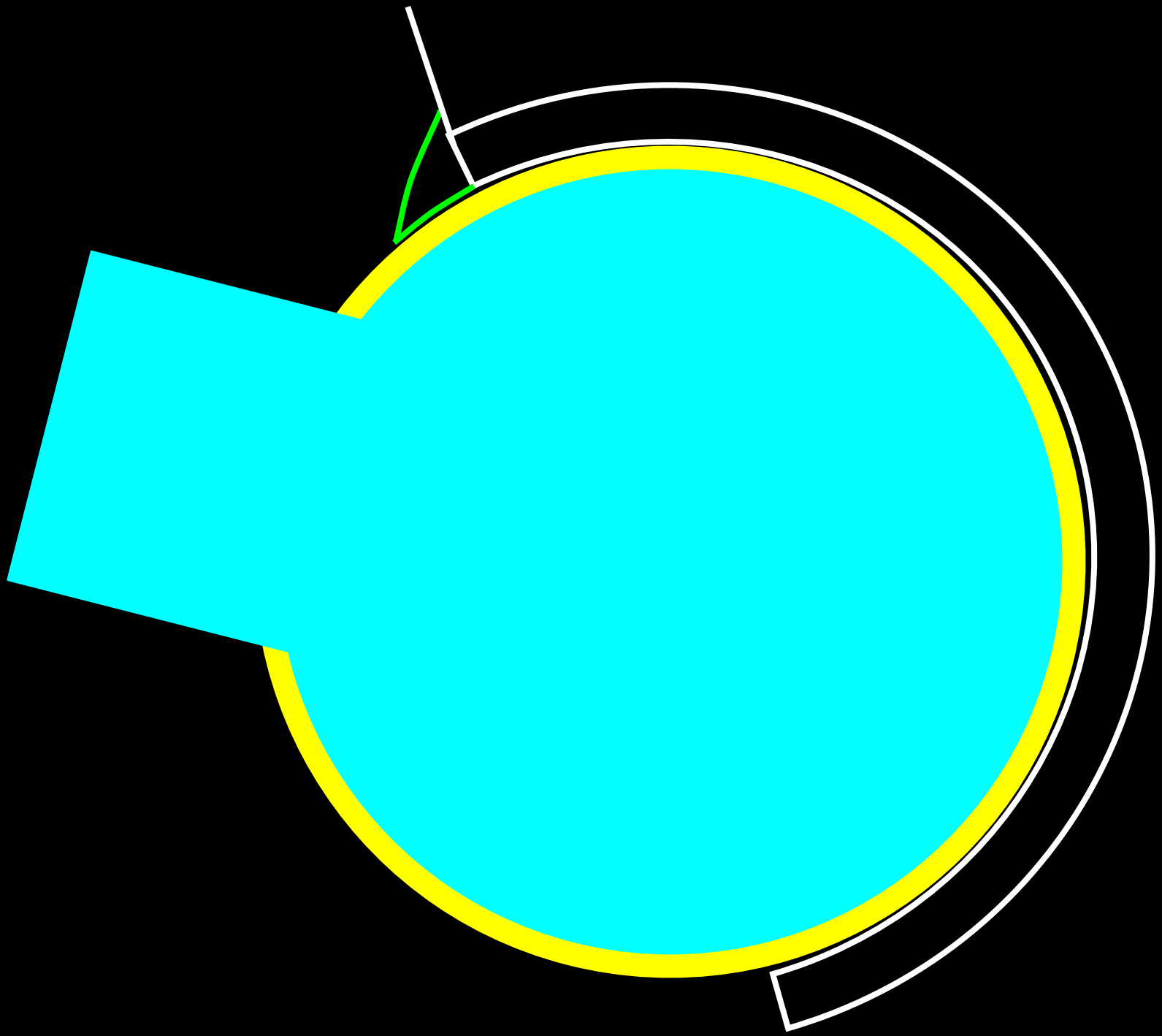




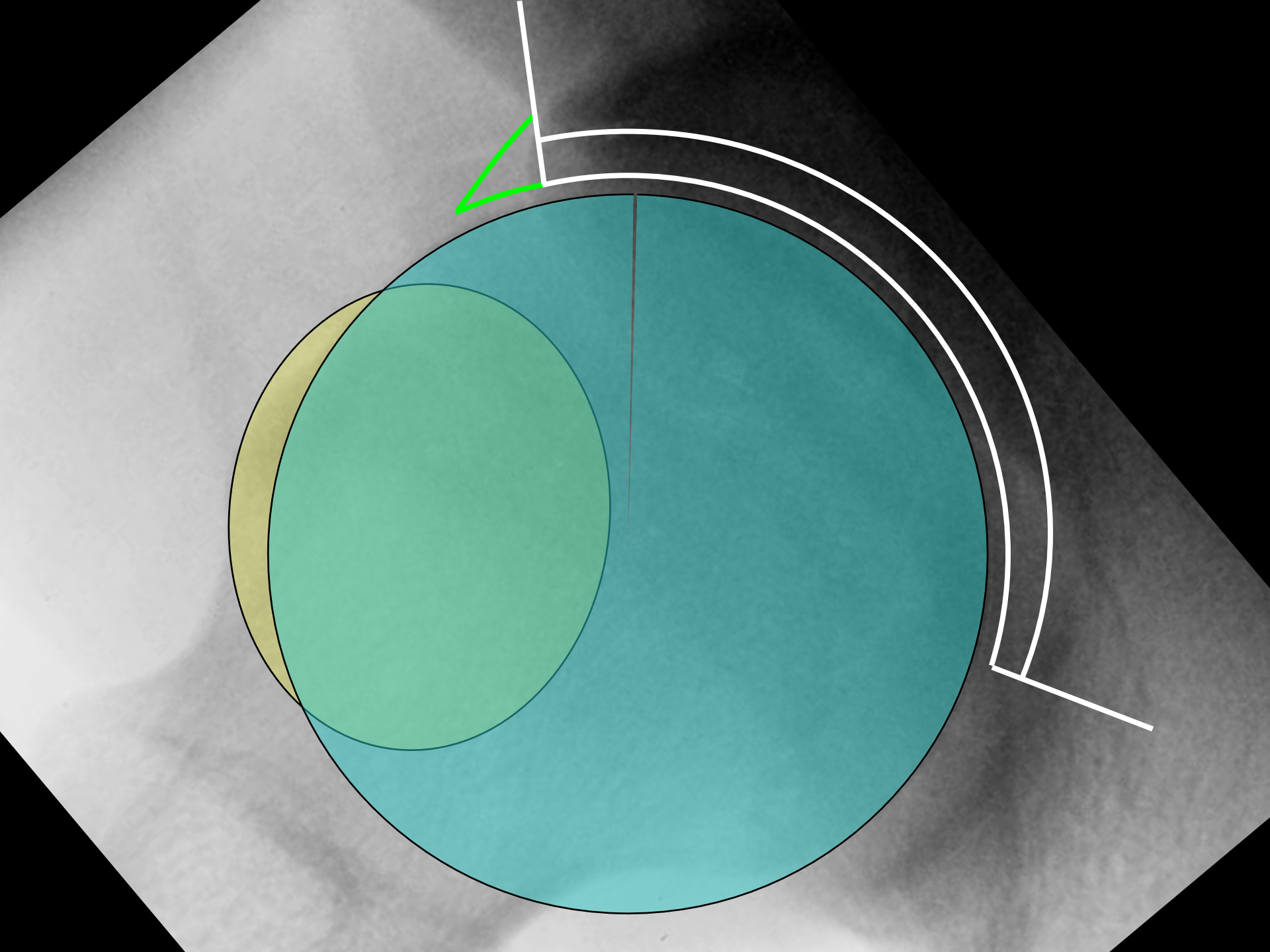


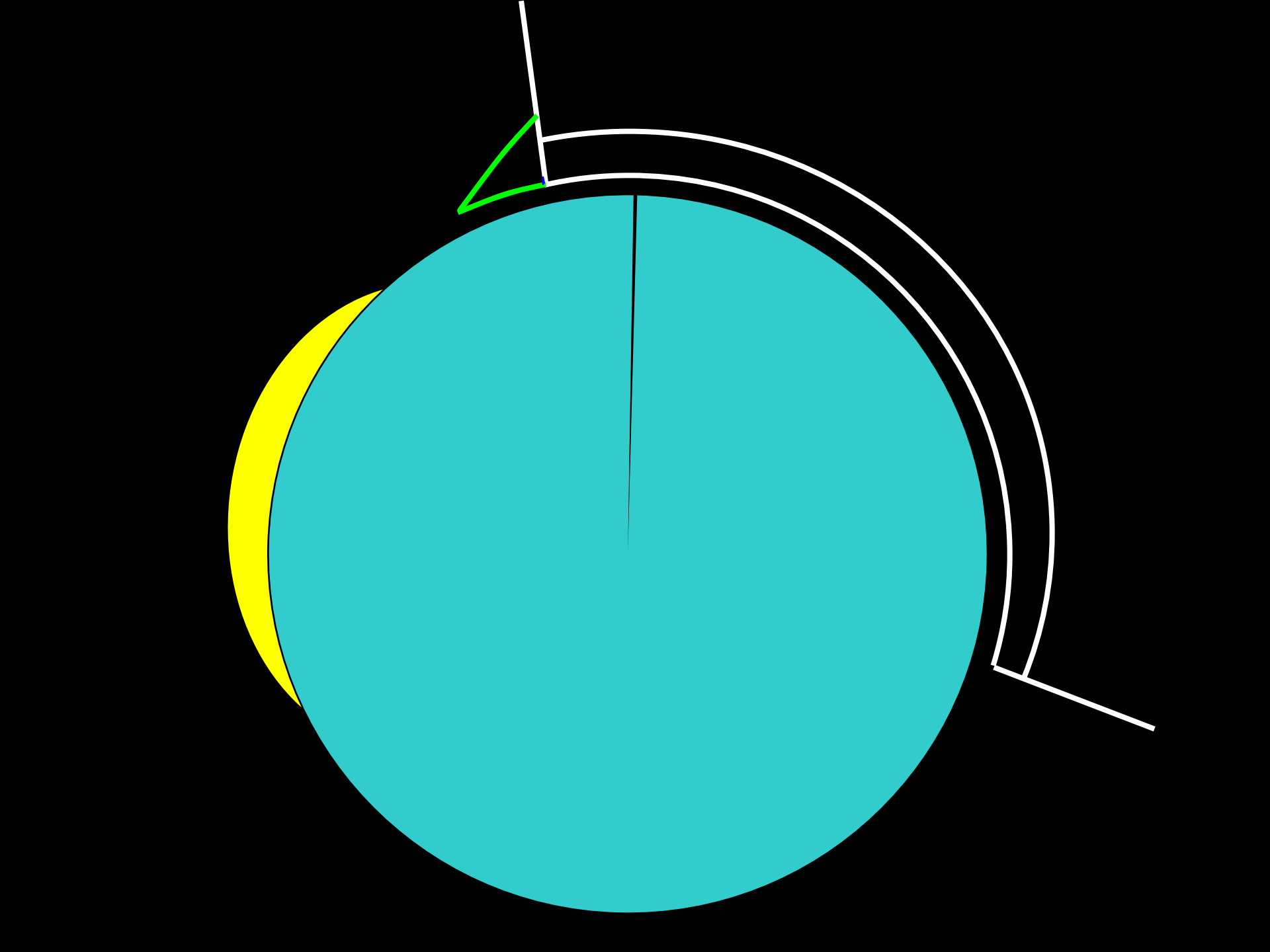


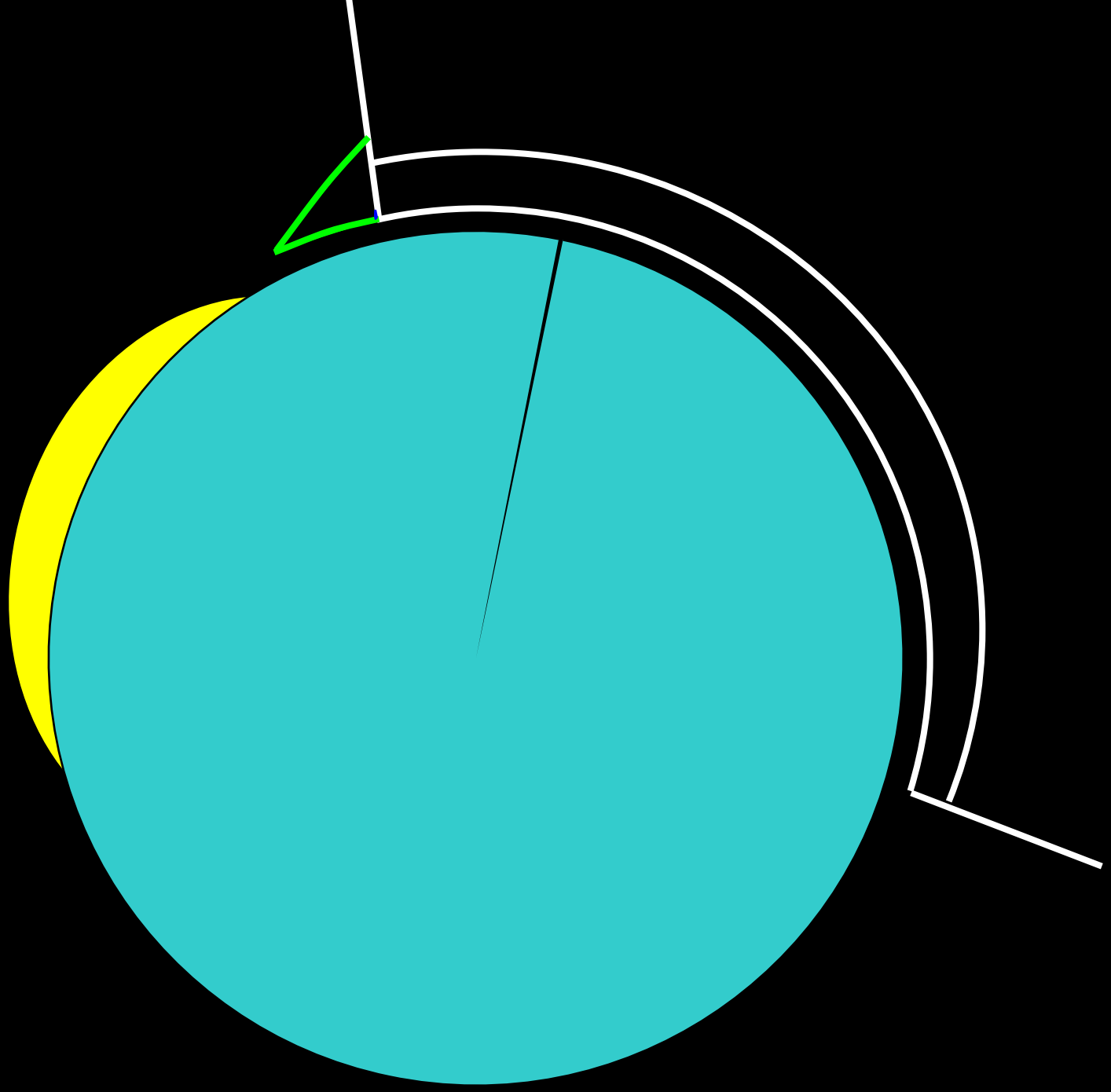


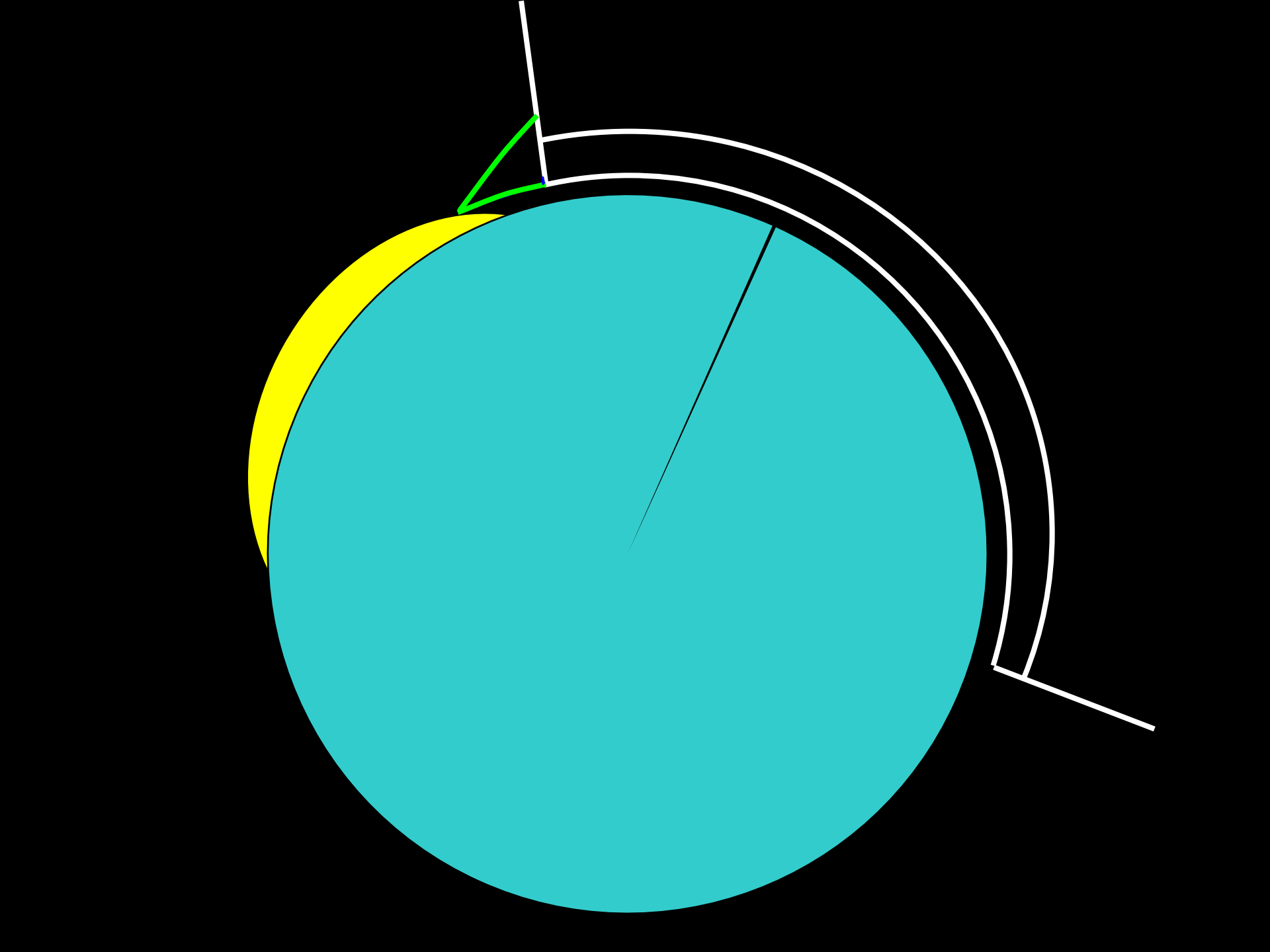


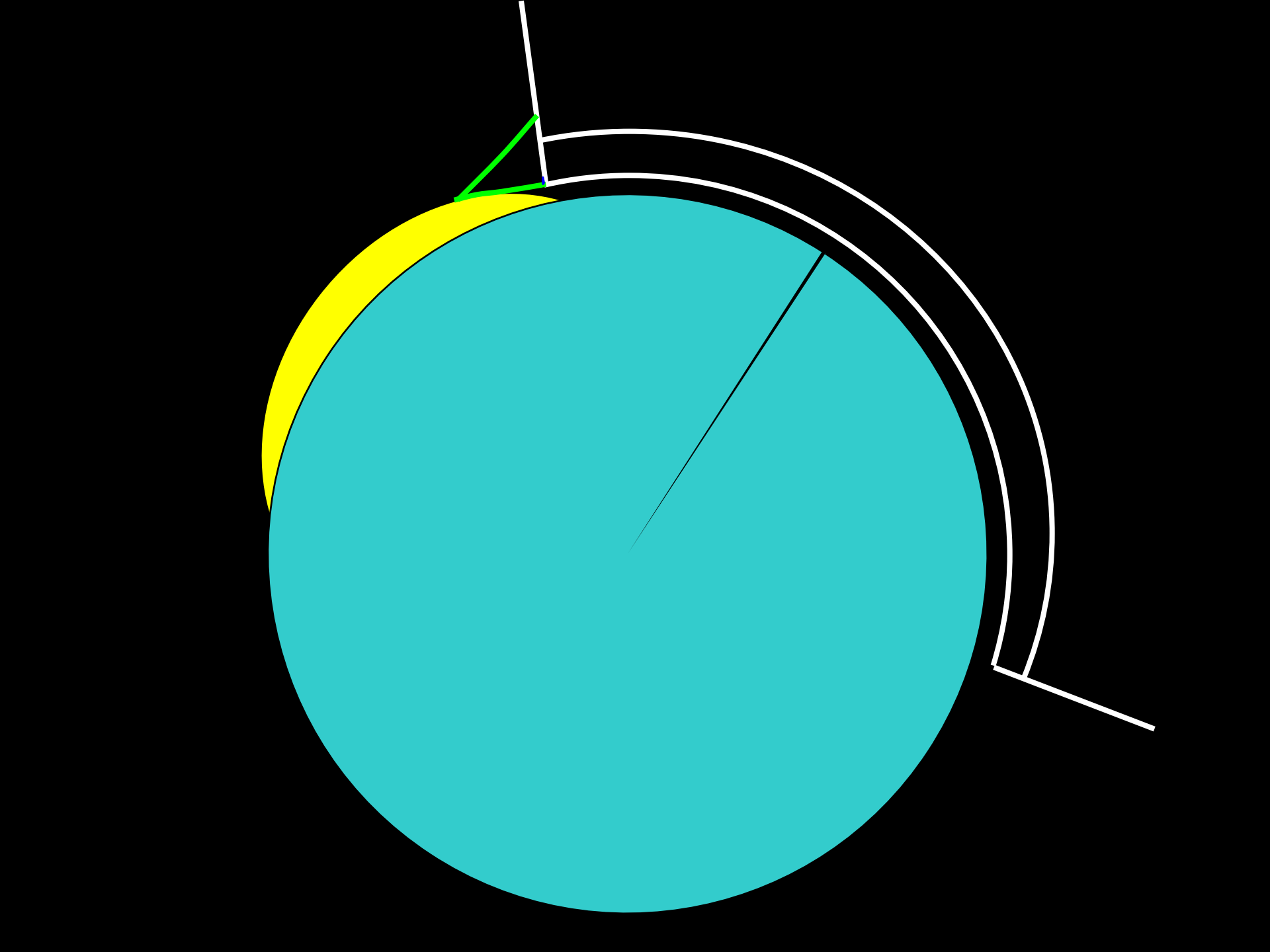
FAI: *Cam Type*

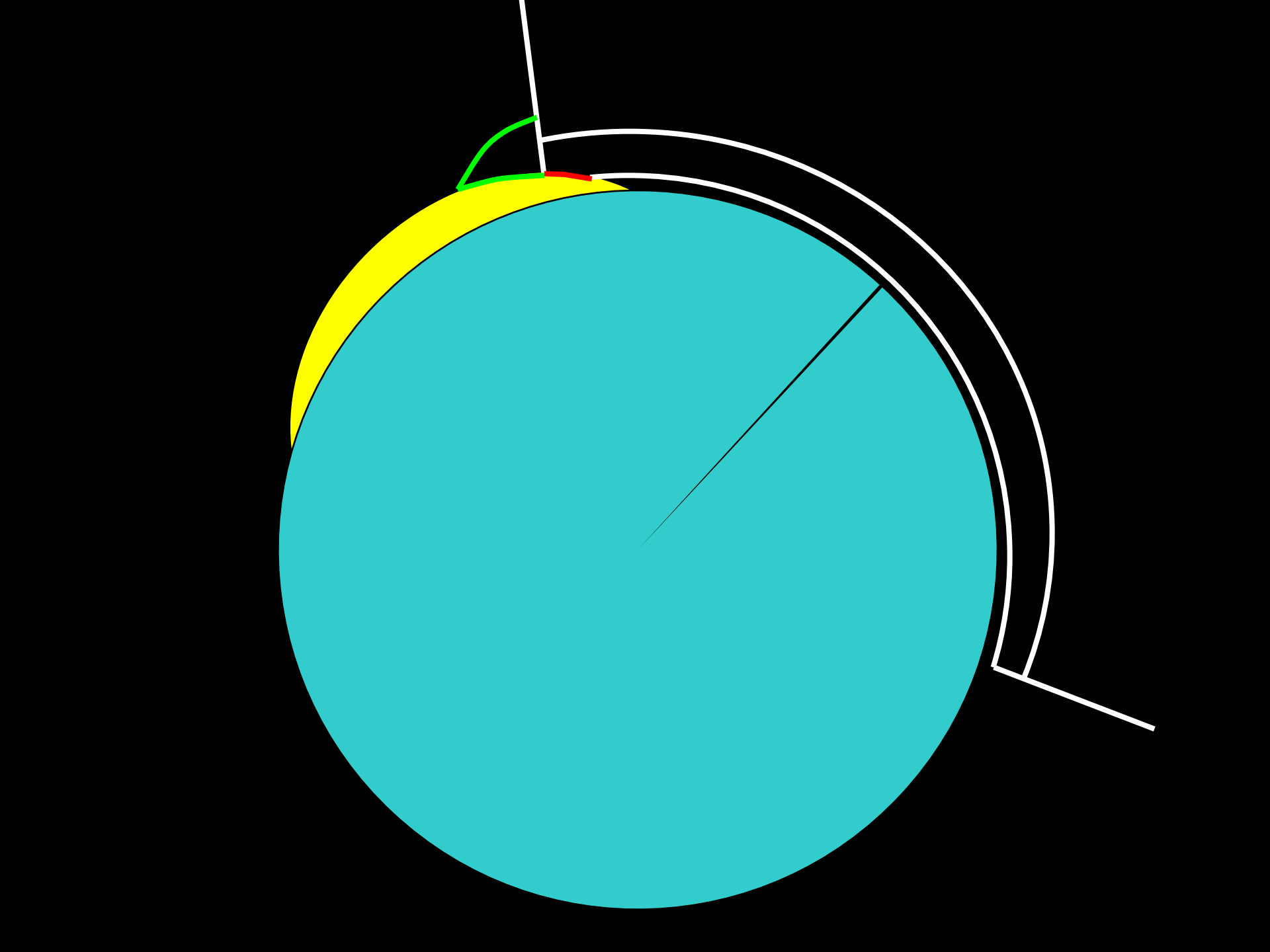


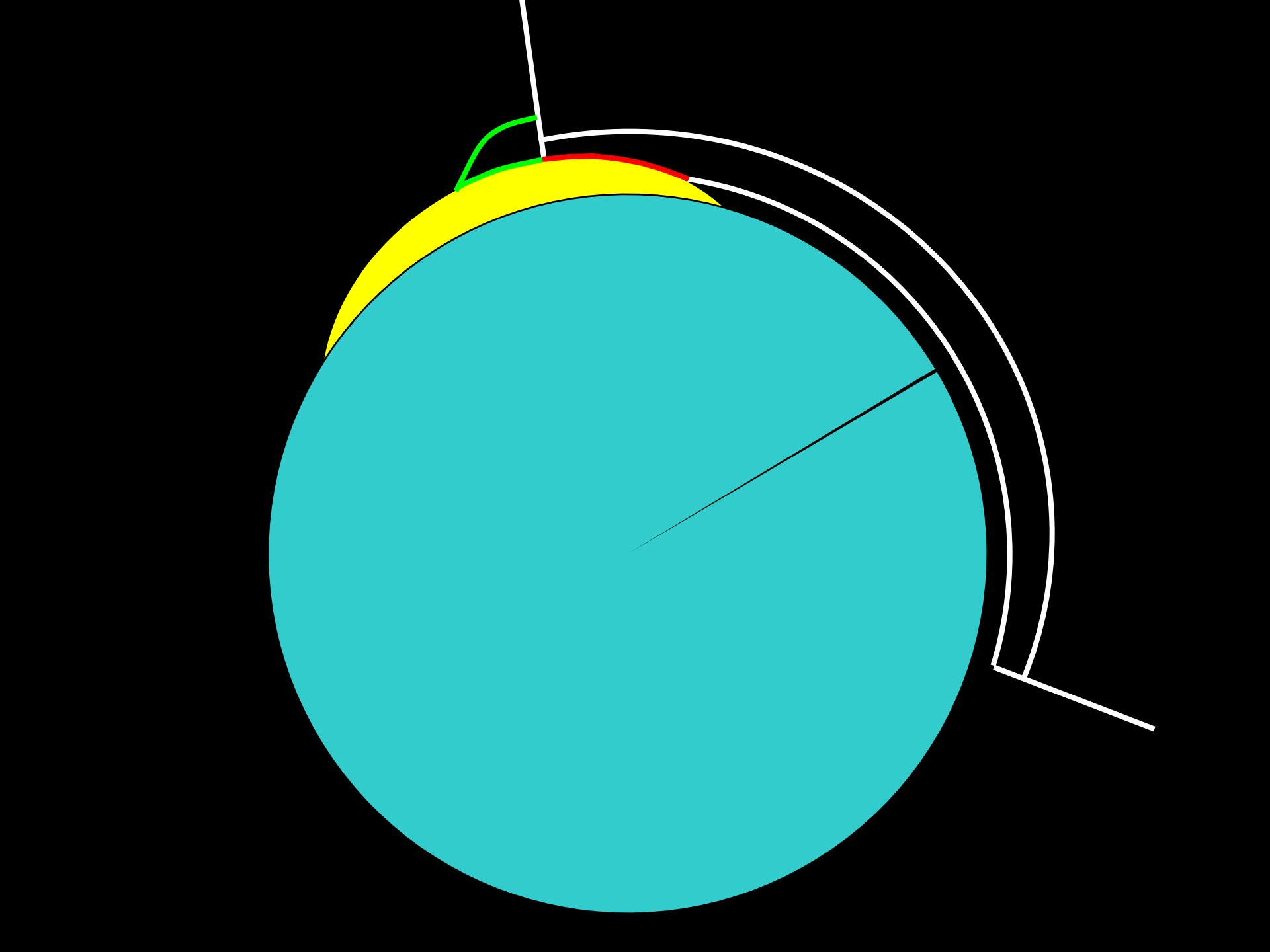


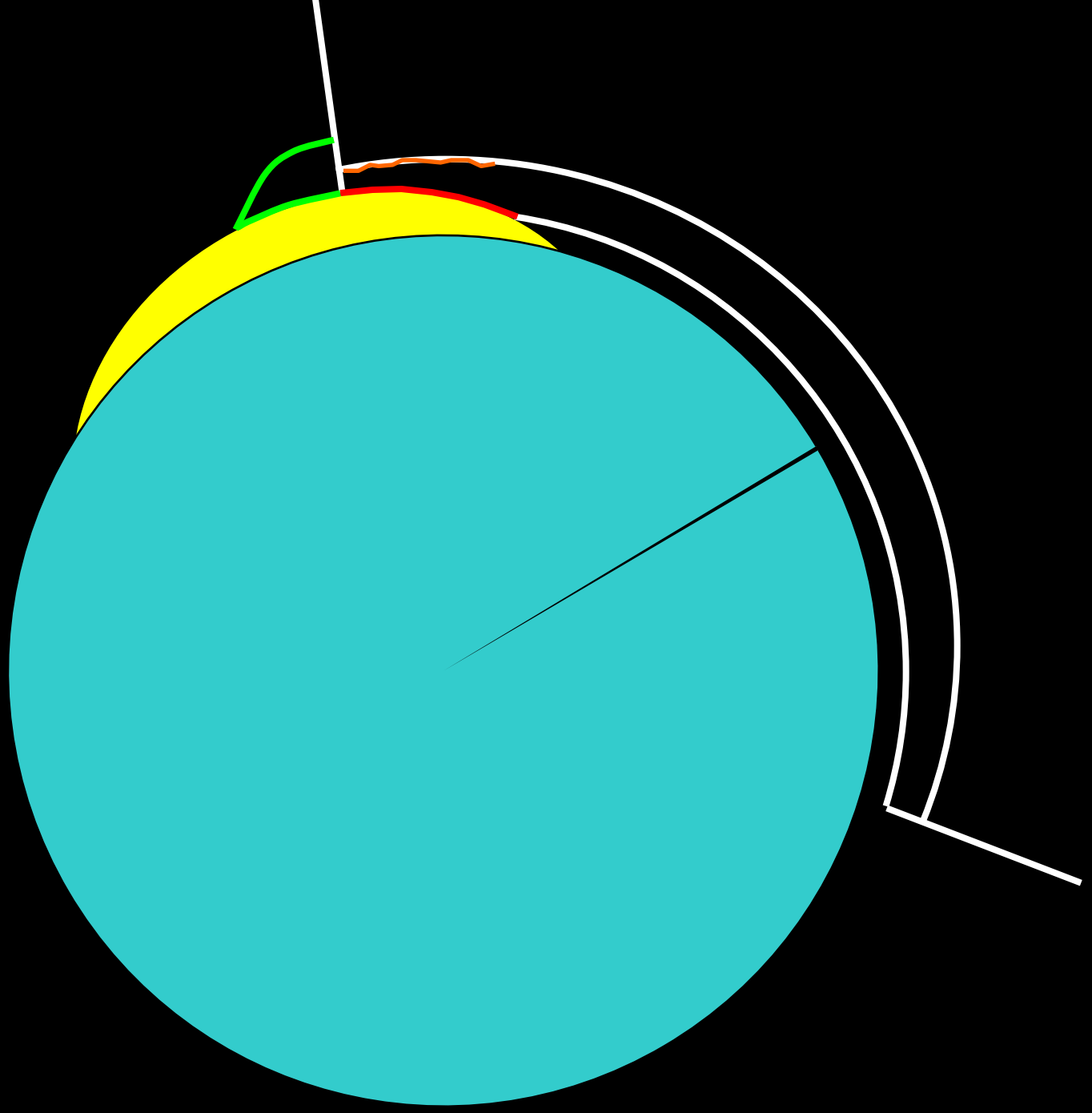


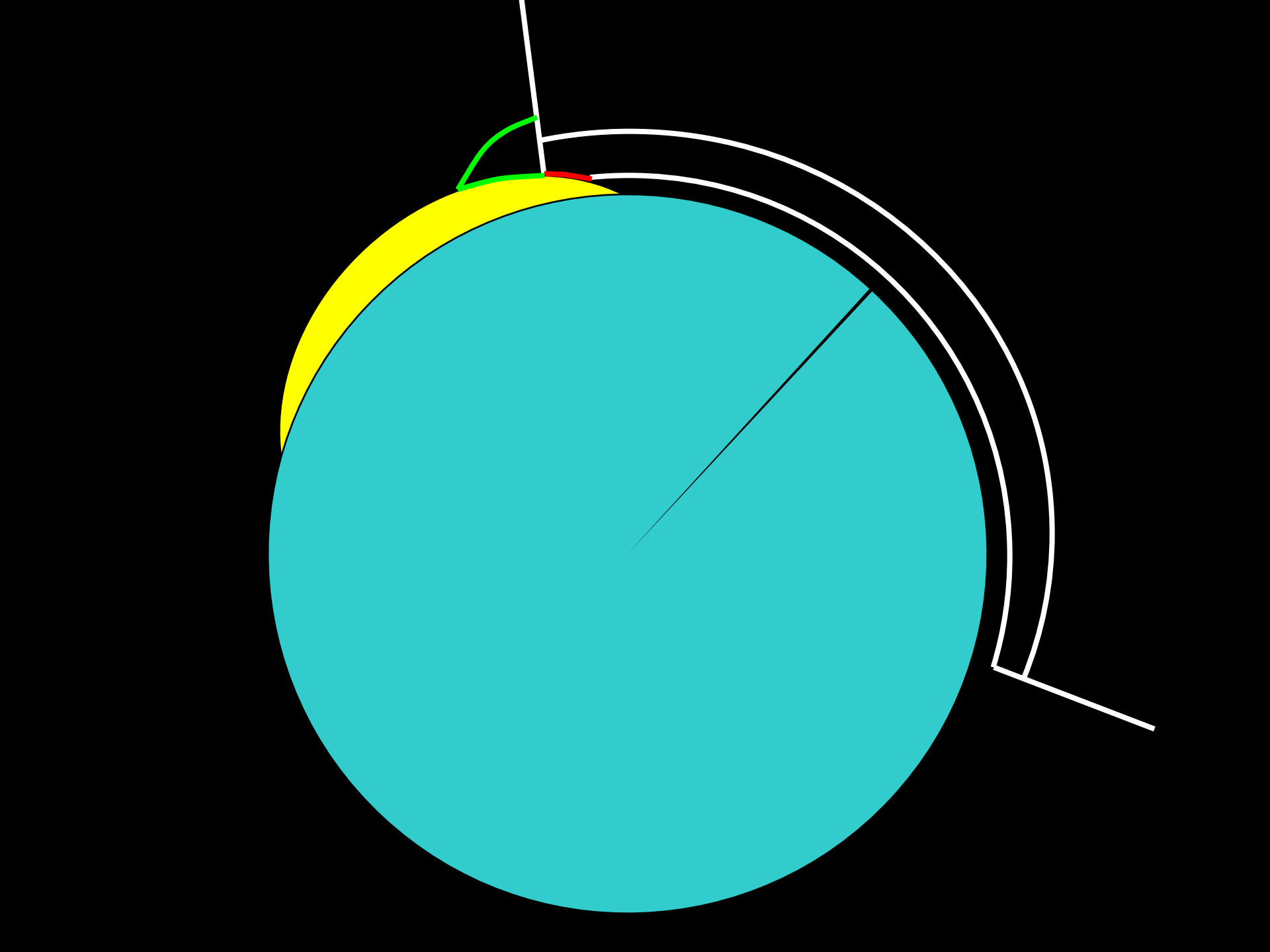


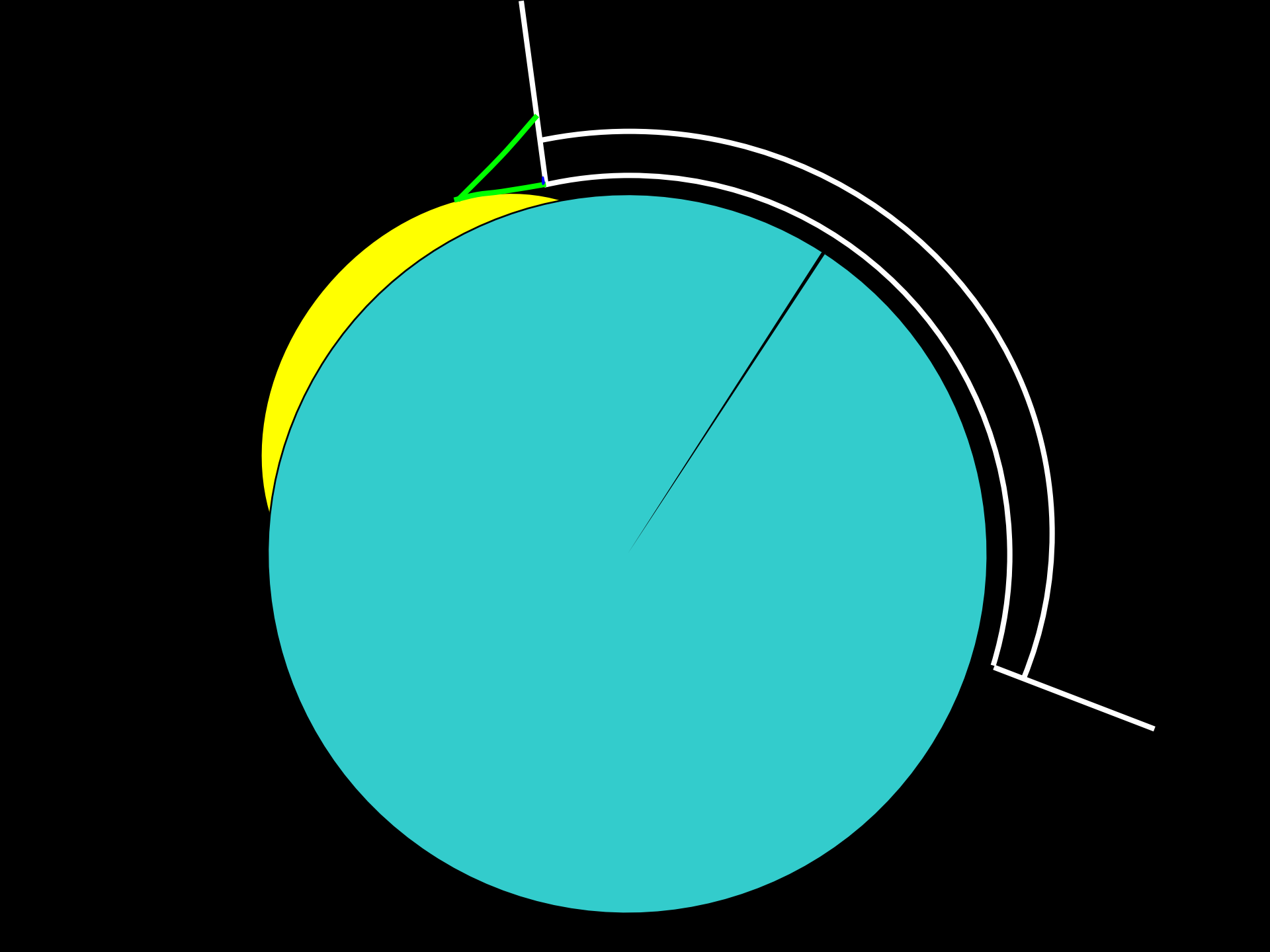


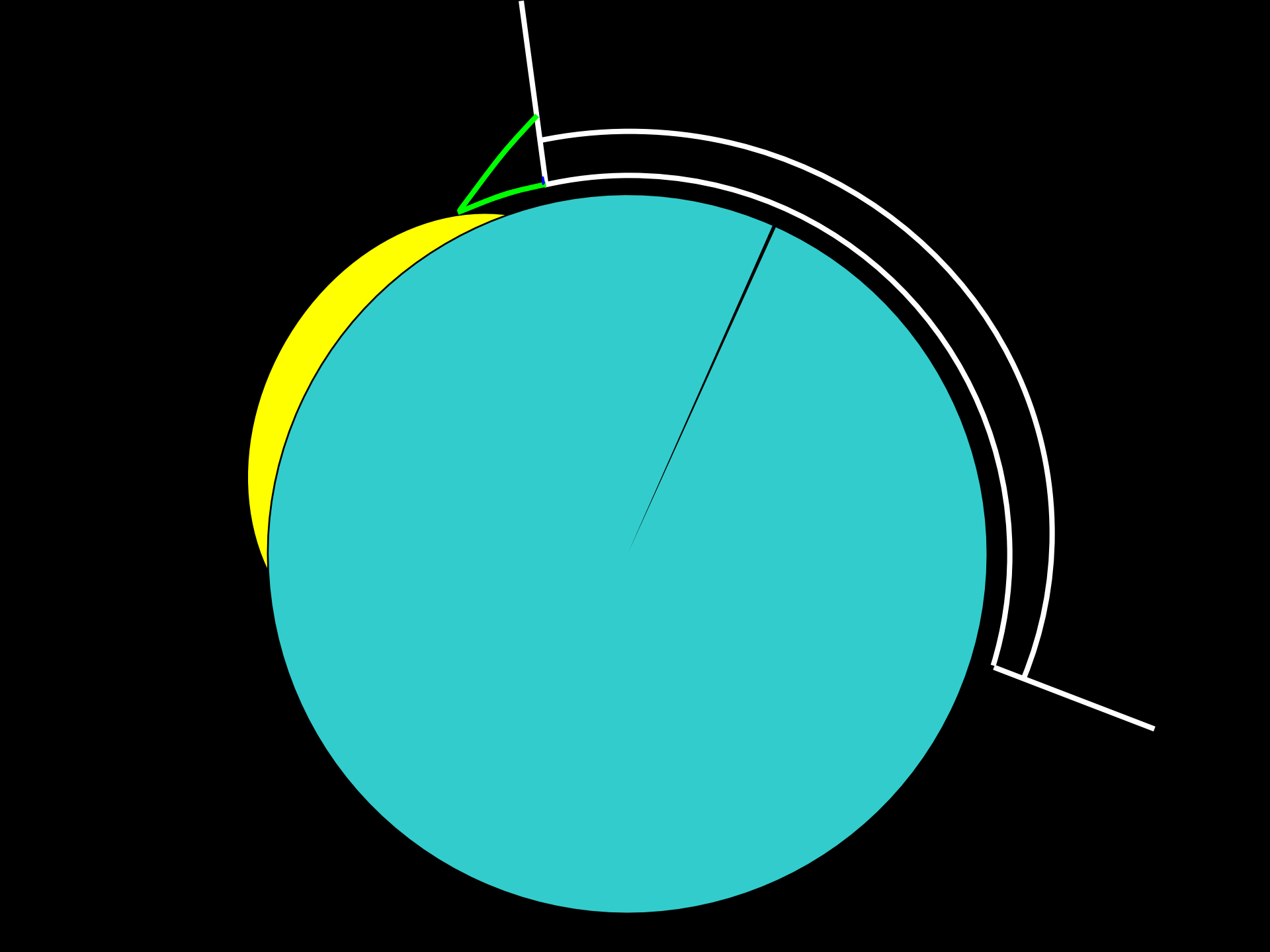


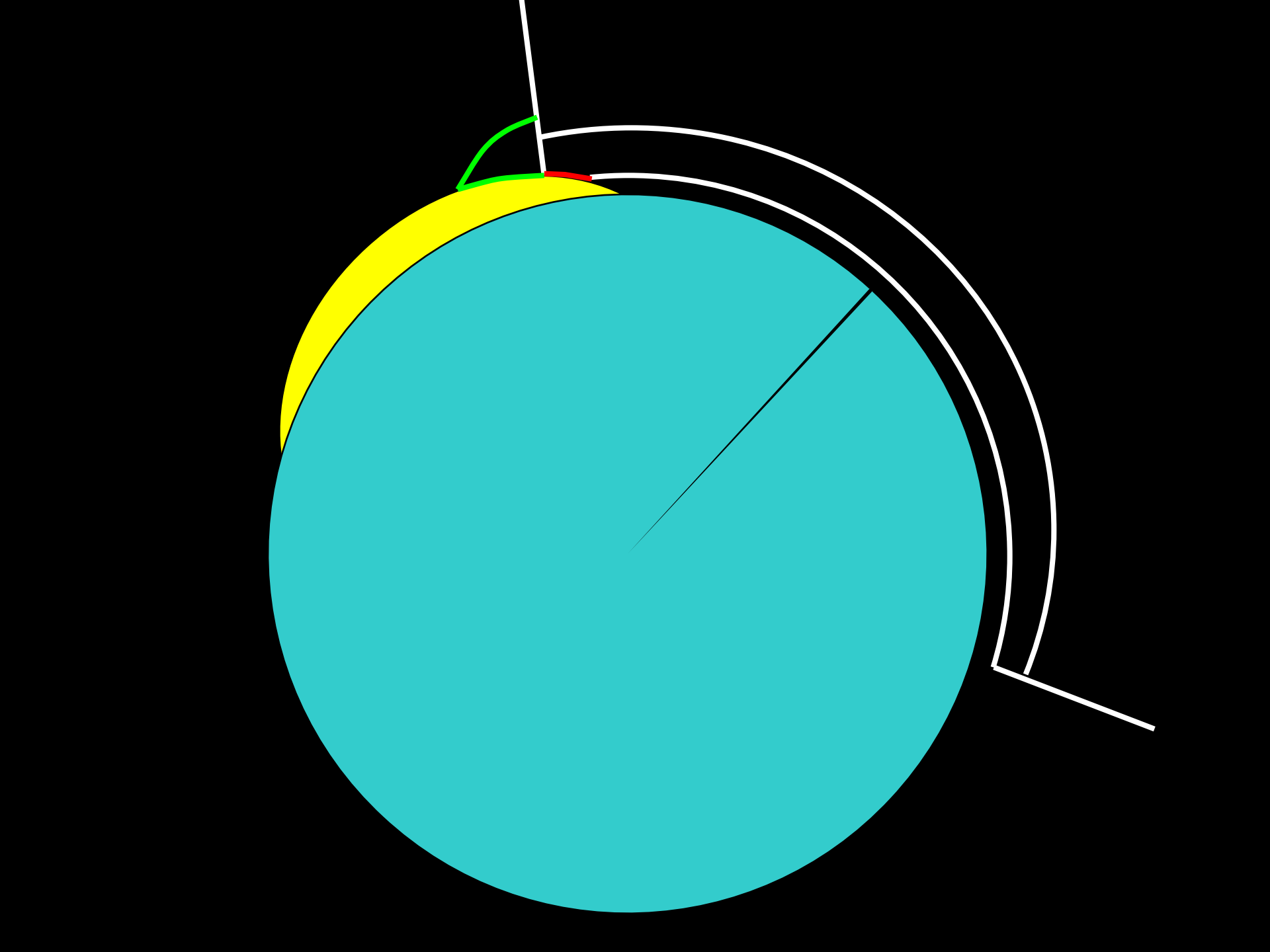


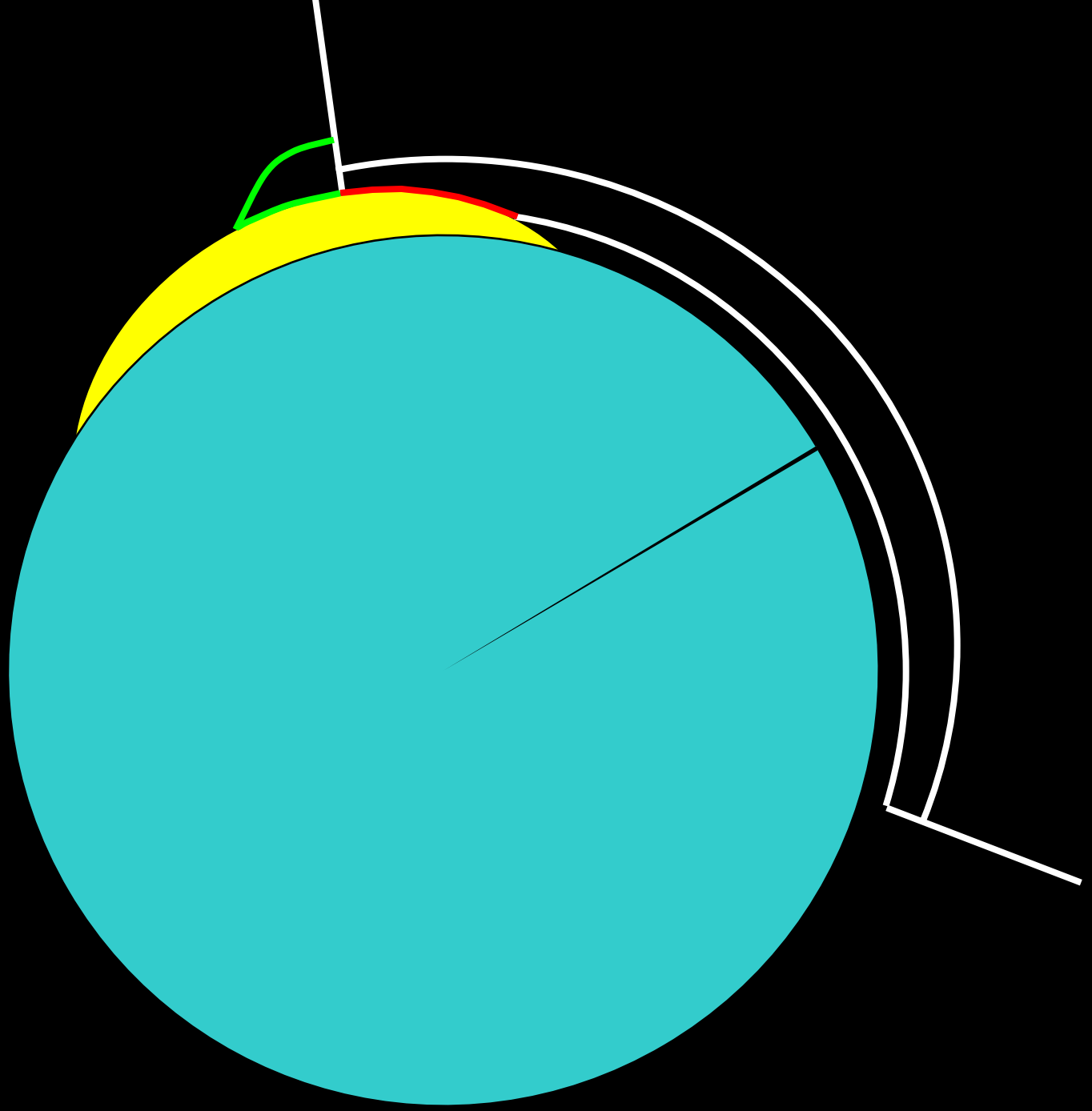


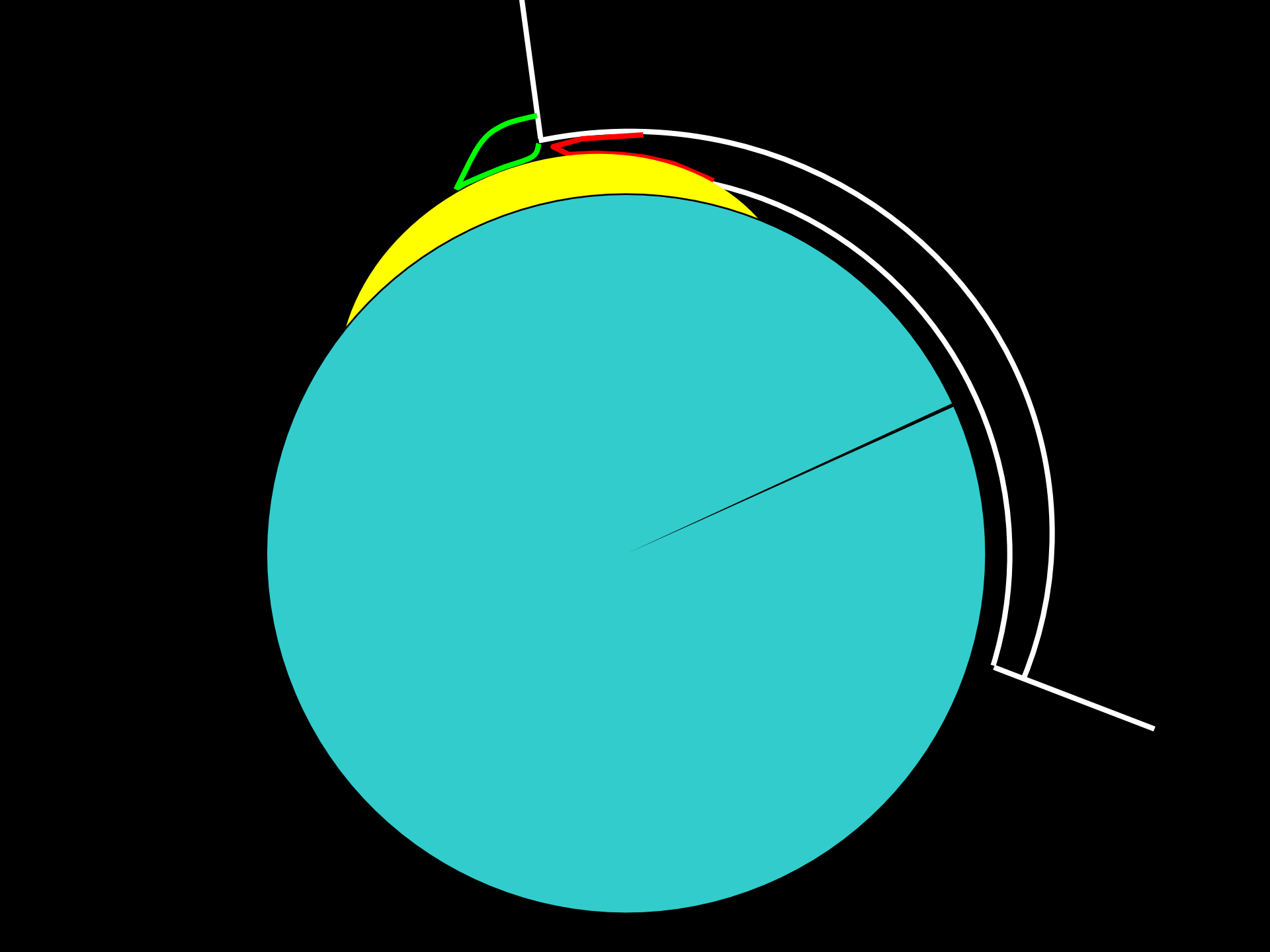


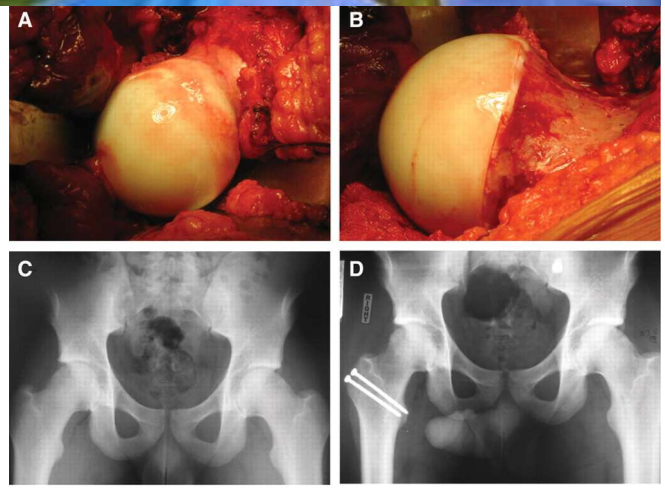








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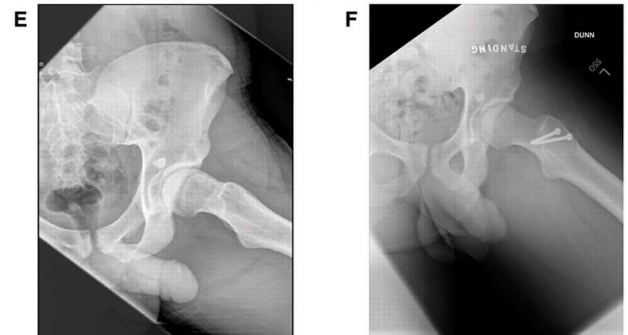
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STANDING
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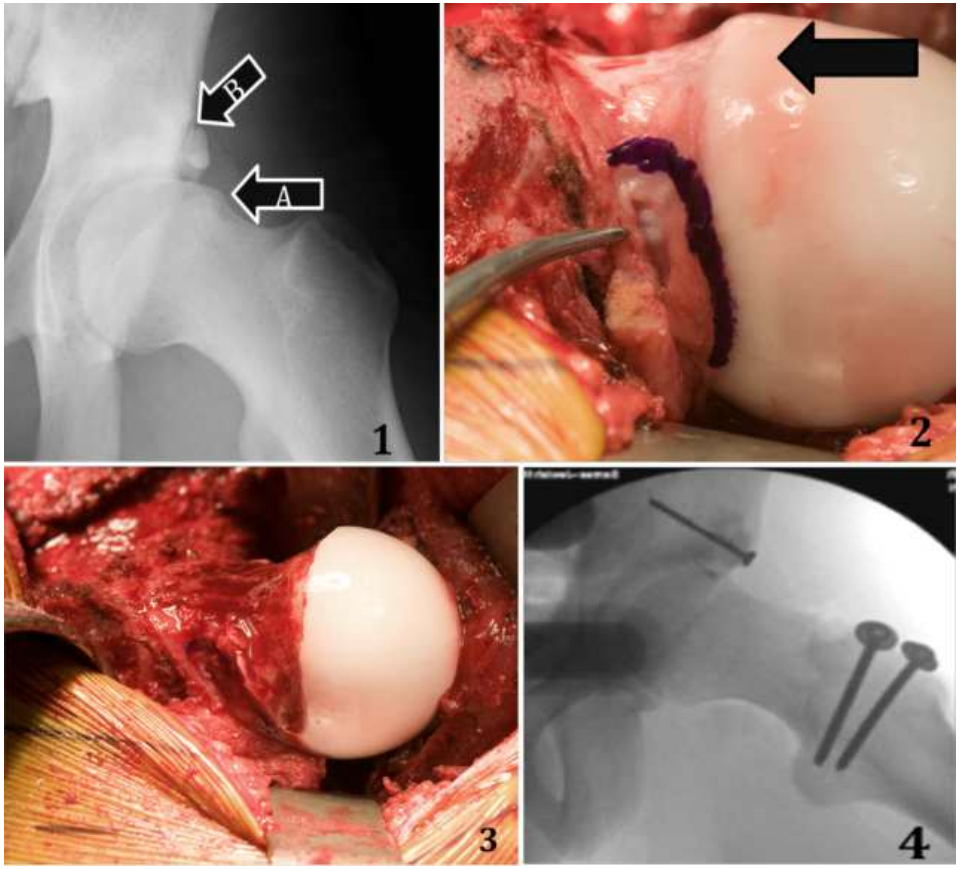
B
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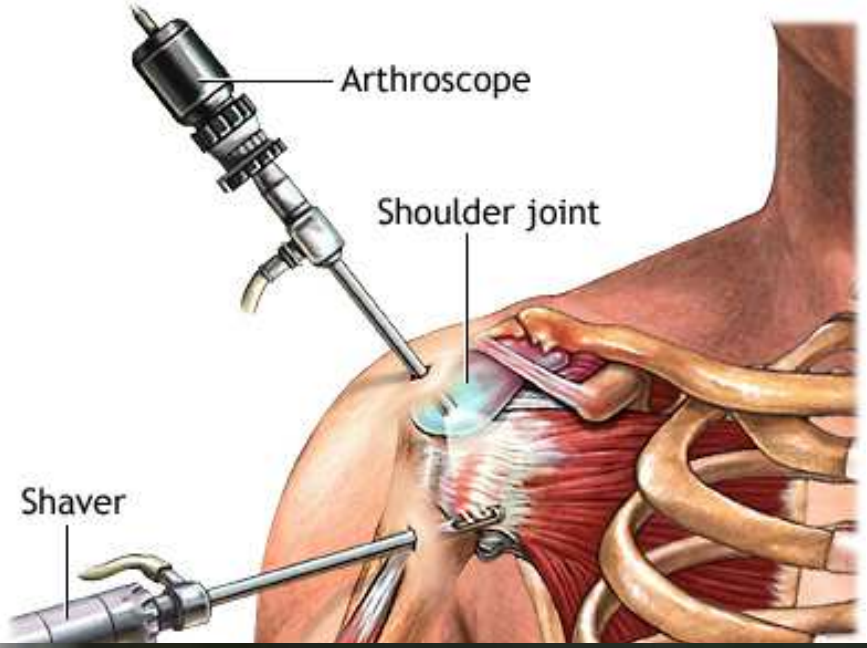
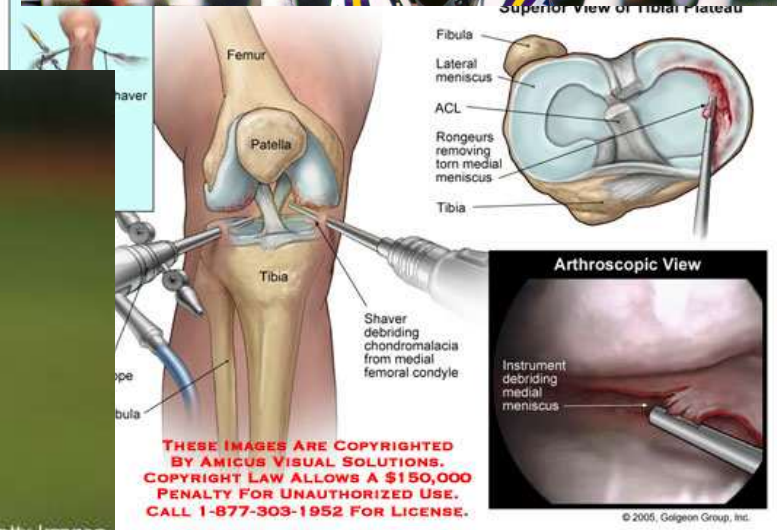
4

Meanwhile…


Arthroscope
Shoulder joint
Shaver

80

RED
Getty Images


Femur
Patella
Tibia
Fibula
Lateral meniscus
ACL
Rongeurs removing torn medial meniscus
Tibia
Shaver debriding chondromalacia from medial femoral condyle
Arthroscopic View
Instrument debriding medial meniscus
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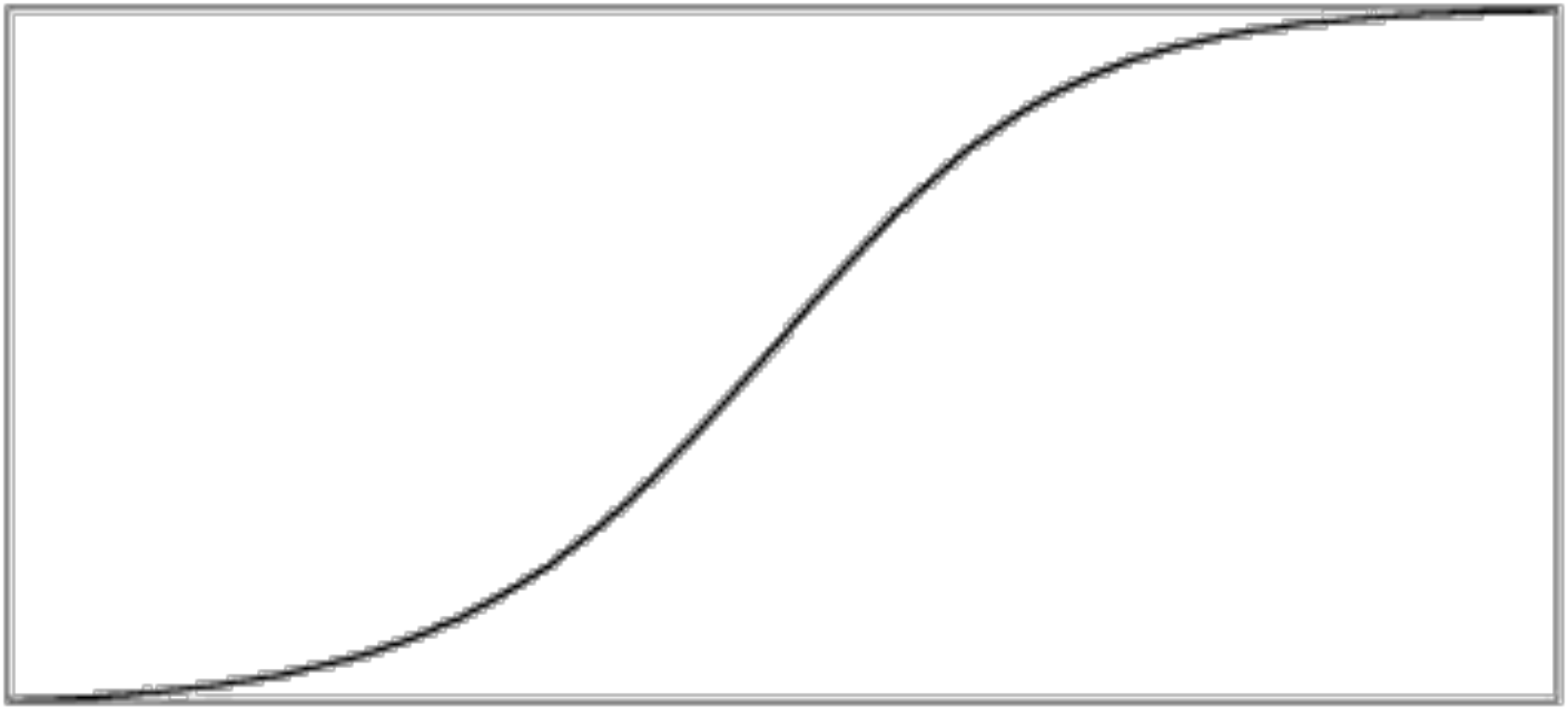
Progress



1912 *Steve* Mid 2000's Now

How do we treat this?

Correcting Cam Impingement

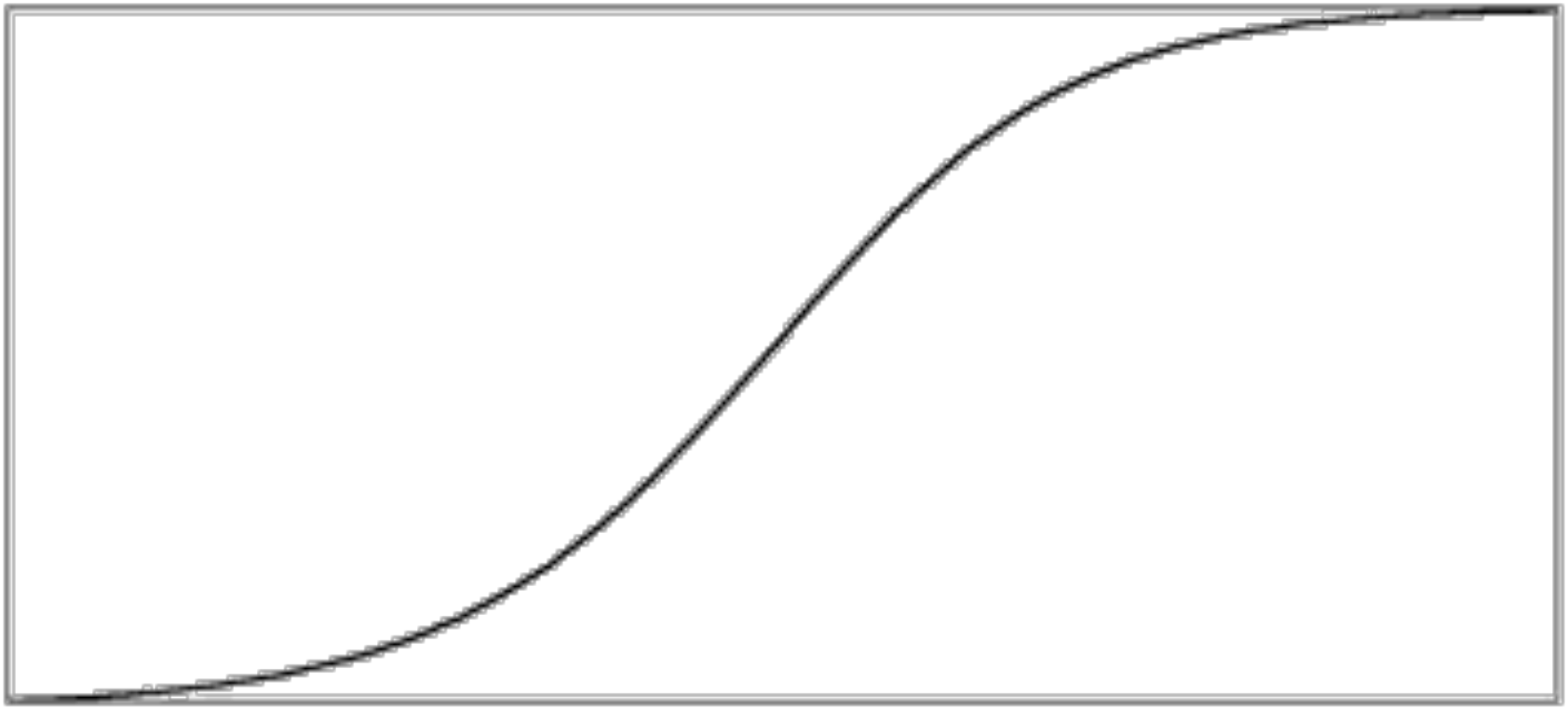
Andrew B. Wolff, MD

Washington Orthopaedics and Sports Medicine

www.andrewwolffmd.com

www.wosm.com

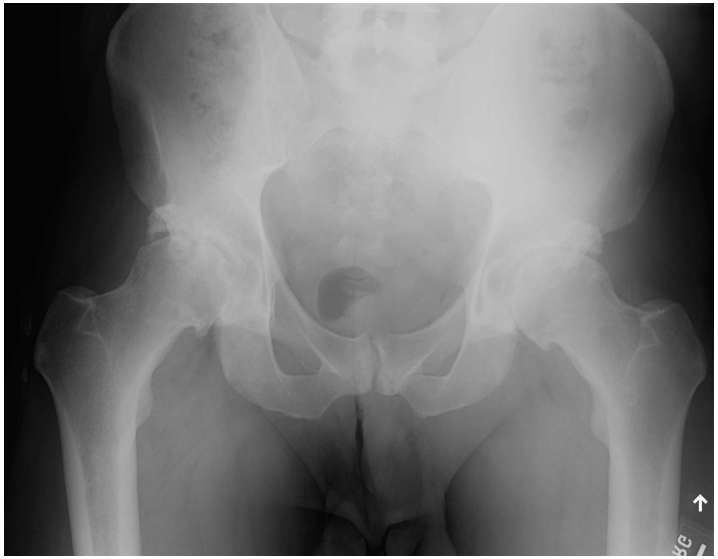
Progress

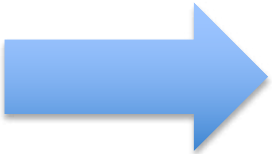


Jason

1912 *Steve* Mid 2000's Now

Steve





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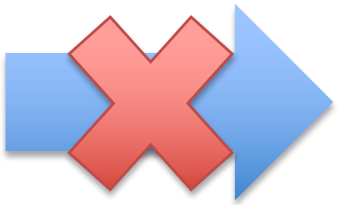
Hospital for Special Surgery
S-Val

Jason

Jason

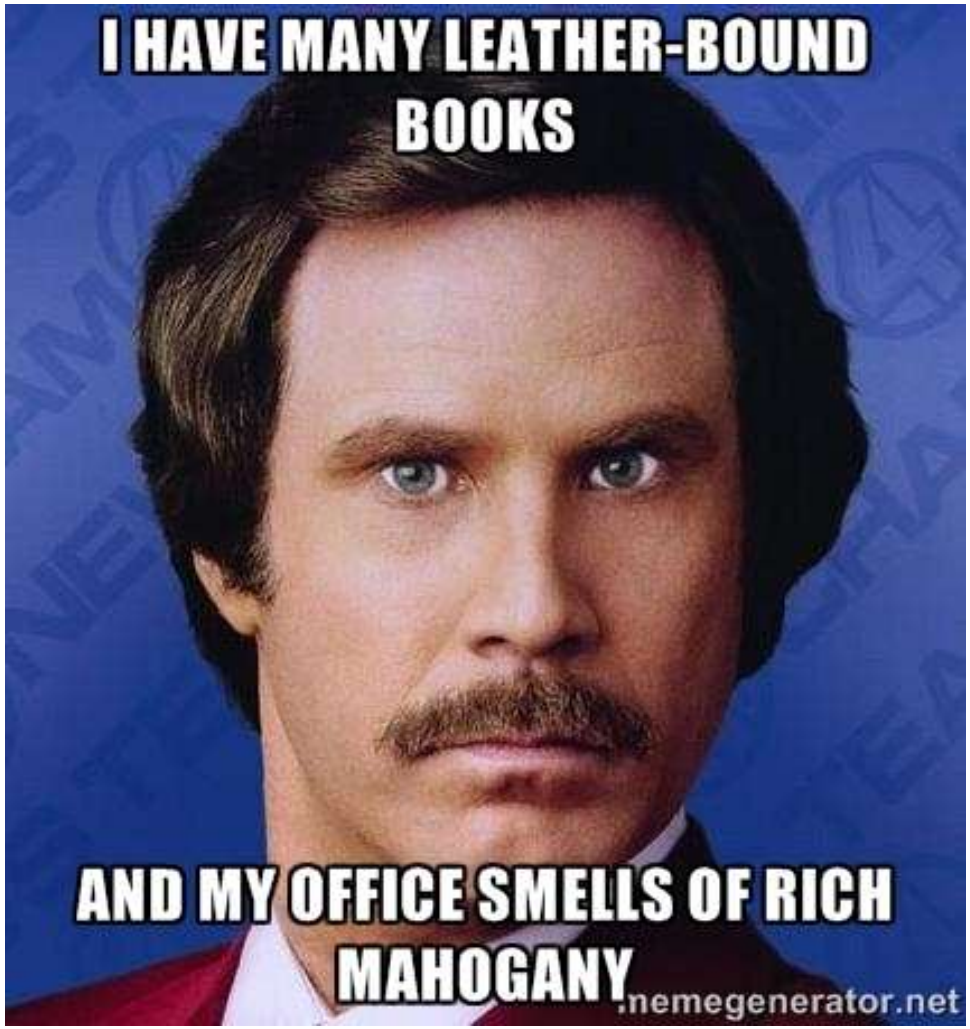
Jason & Steve



The Last Decade

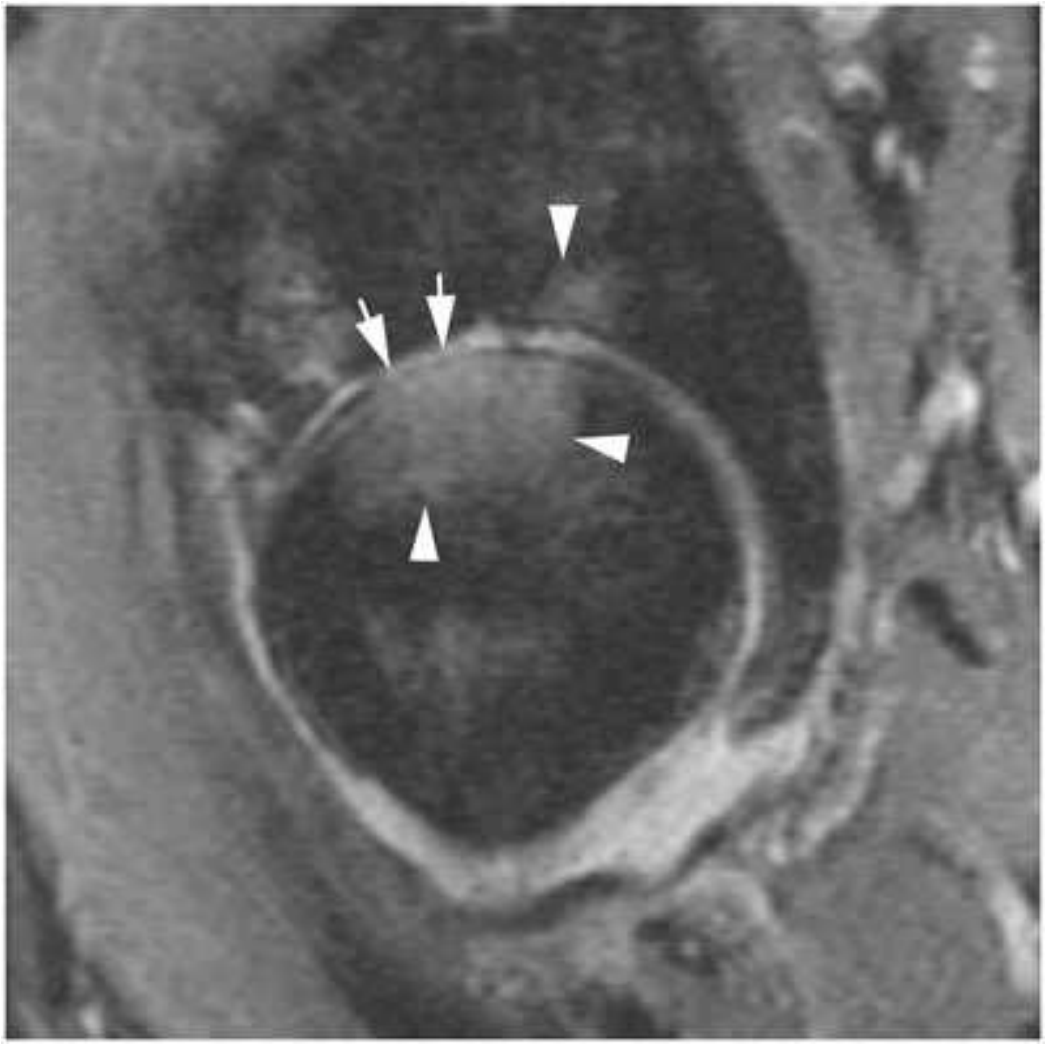
- Synergistic growth in understanding of problems affecting the hip and pelvis and our ability to treat these conditions through both open and endoscopic approaches

What have we learned?



Arthritis

- Don’t scope it.
- Inject and Replace.
- Get good advanced imaging.



Dysplasia

- Don’t scope it alone.
- Cannot correct significant bony instability with soft tissue procedures
  - Led to development of combined approach
  - Collaboration between open and arthroscopic surgeries/surgeons

“New” Diagnoses and Approaches

- Endoscopic Treatment of Tears of the Gluteus Medius and Minimus

- Endoscopic Treatment of snapping hips

“New” Diagnoses and Approaches

- Deep Gluteal Space
  - Piriformis syndrome
  - Sciatic Nerve entrapment
  - Ischiofemoral impingement
  - Hamstring

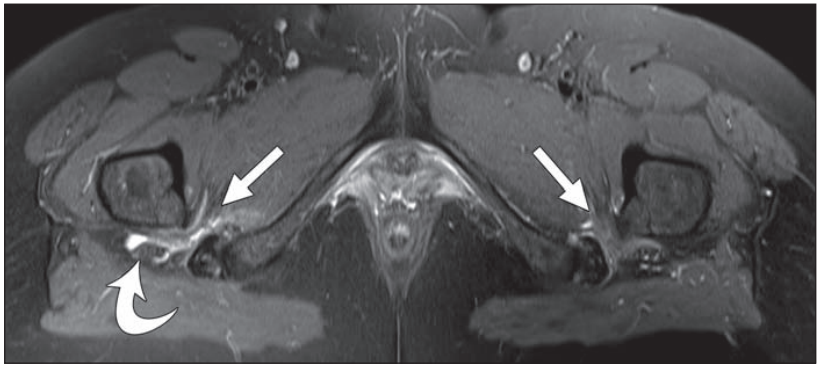


Fig. 2—49-year-old woman with severe right hip pain and snapping sensation for several years. Axial T2-weighted fat-suppressed MR image of both hips shows severe edema and partial tear of right quadratus femoris and moderate edema on left (*straight arrows*). There is bursalike formation surrounding right sciatic nerve (*curved arrow*). This patient had no symptoms on left.

TABLE 1: Results of Statistical Analyses of Nine Affected Subjects (12 Hips) and 10 Control Subjects (11 Hips)

Measurement[a]	Affected Subjects (mm)	Control Subjects (mm)	*p*	Cutoff (mm)[b]	Sensitivity (%)	Specificity (%)
Ischiofemoral space	13 ± 5	23 ± 8	0.002	≤ 17	83	82
Quadratus femoris space	7 ± 3	12 ± 4	0.002	≤ 8	83	82

Note—Ischiofemoral space is smallest distance between lateral cortex of ischial tuberosity and medial cortex of lesser trochanter. Quadratus femoris space is smallest distance between superolateral surface of hamstring tendons and posteromedial surface of iliopsoas tendon or lesser trochanter. Measurements are mean ± SD.

[a]Obtained from axial MR images through lesser trochanter.

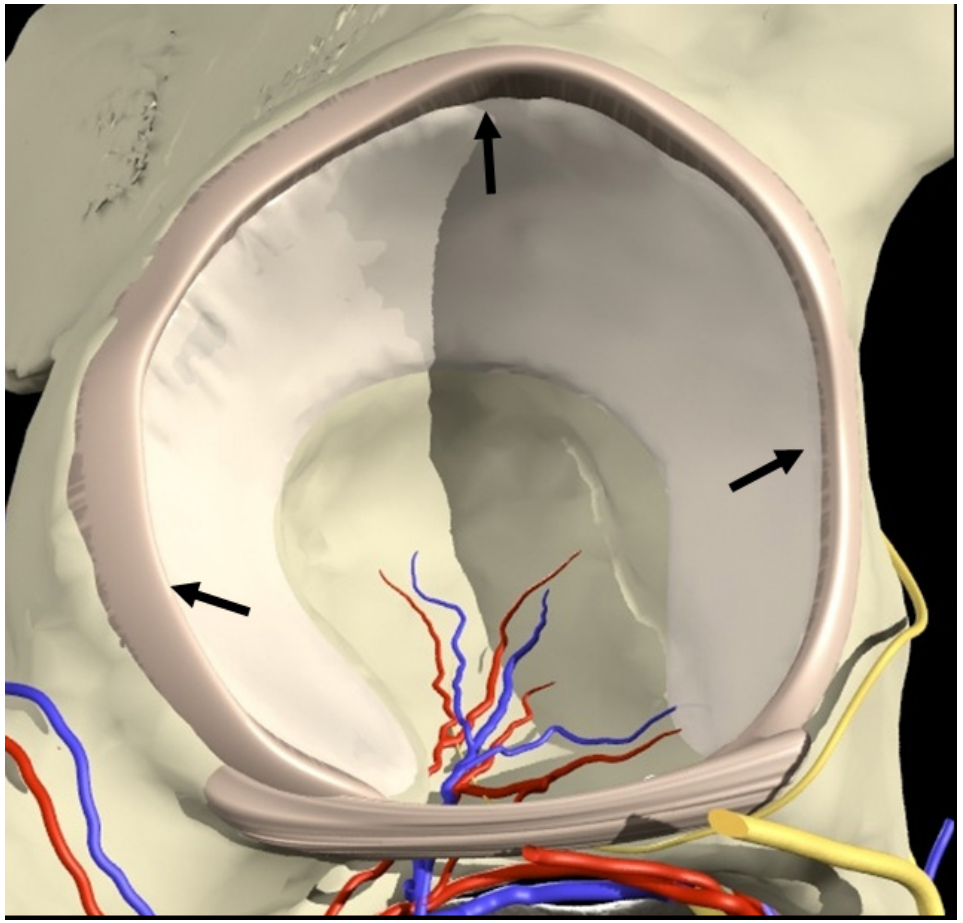
[b]Calculated for highest sensitivity and specificity.

“New” Diagnoses and Approaches

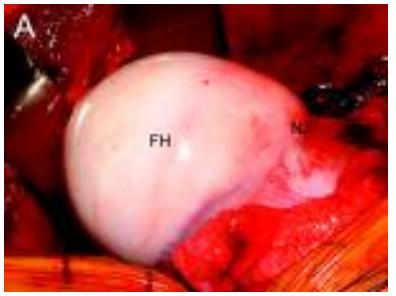
- Extra-articular impingement
  - Subspinous
  - Trochanteric/Pelvic
  - Ischiofemoral

Acetabular Labrum

- We've learned to appreciate it.
- Espinosa N, Rothenfluh DA,Beck M, Ganz R, Leunig M. Treatment of femoro-acetabular impingement: Preliminary results of labral re- fixation. *J Bone Joint Surg Am* 2006;88:925-935.



Labral Repair



- Ganz et al. JBJS 2006
  - Open dislocation with pincer and CAM bone resection
    - Group I: Labral resection(20 patients)
      - 2 years
        - » 28% excellent/48% good/20% moderate/4% poor
    - Group II: Labral repair(32 patients)
      - 2 years
        - » 80% excellent/14% good/6% moderate
    - Significantly more osteoarthritis in Group I than Group II.
      - P=0.009

Espinosa N. et al. *J Bone Joint Surg Am* 2006;88:925-935.

Labral Repair

- Larson et al. Arthroscopy 2009
  - Arthroscopic approach with pincer or combined pincer and CAM type impingement.
    - Mean age 31y/o(I)/27y/o(II)
    - Group I(36 patients) mean f/u 21.4 months
      - Labral debridement
      - HHS 88.9
      - 66.7% excellent
    - Group II(39 patients) mean f/u 16.5 months
      - Labral repair
      - HHS 94.3
      - 89.7% excellent

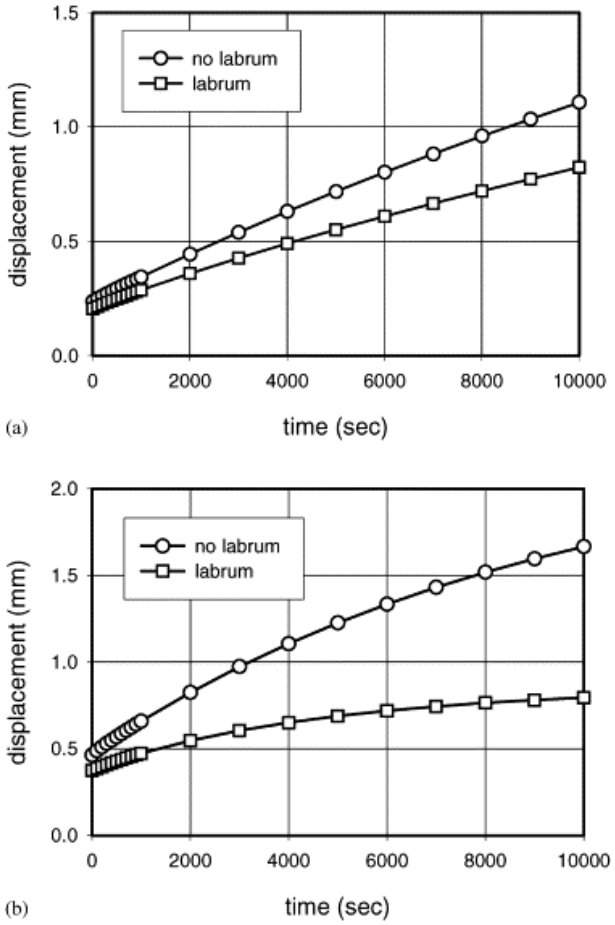
Labral Repair

- Larson et al. AJSM 2012
  - Arthroscopic approach with pincer or combined pincer and CAM type impingement.
    - Mean age 31y/o(I)/27y/o(II)
    - Group I(36 patients) mean f/u 3.5 yrs
    - Labral debridement
      - HHS 88.9
      - 68% good to excellent
    - Group II(39 patients) mean f/u 16.5 months
      - Labral repair
      - HHS 94.3
      - 92% good to excellent
  - Repair patients significantly better HHS, SF-12, VAS

The Labrum

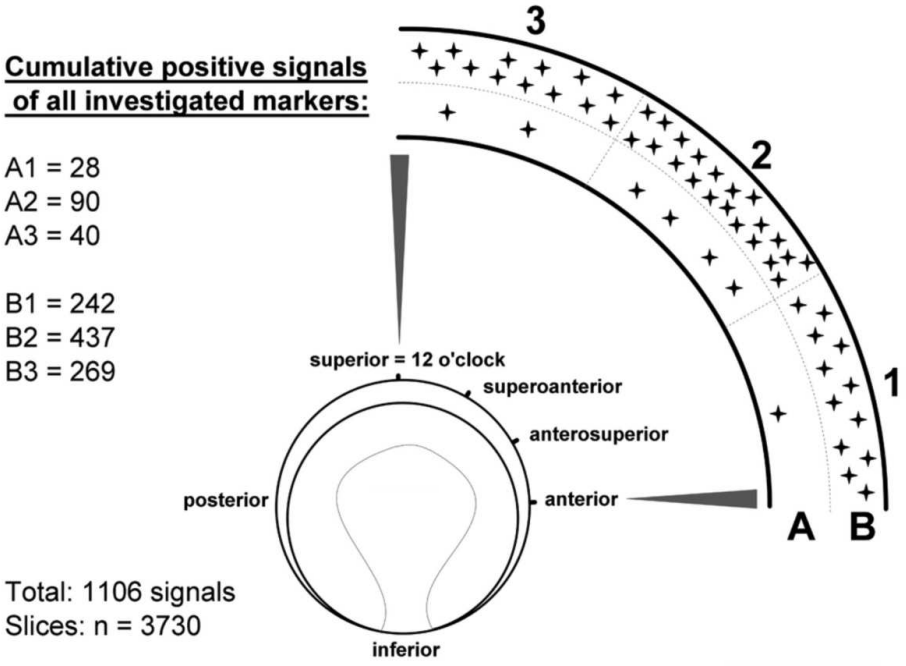
- “The labrum acts like a seal that prevents fluid loss from the joint and protects the articular cartilage”
- “The cartilage layers compress approximately 40% quicker if the labrum is removed.”

Ferguson et al. *J Biomech* 2000 and 2003.



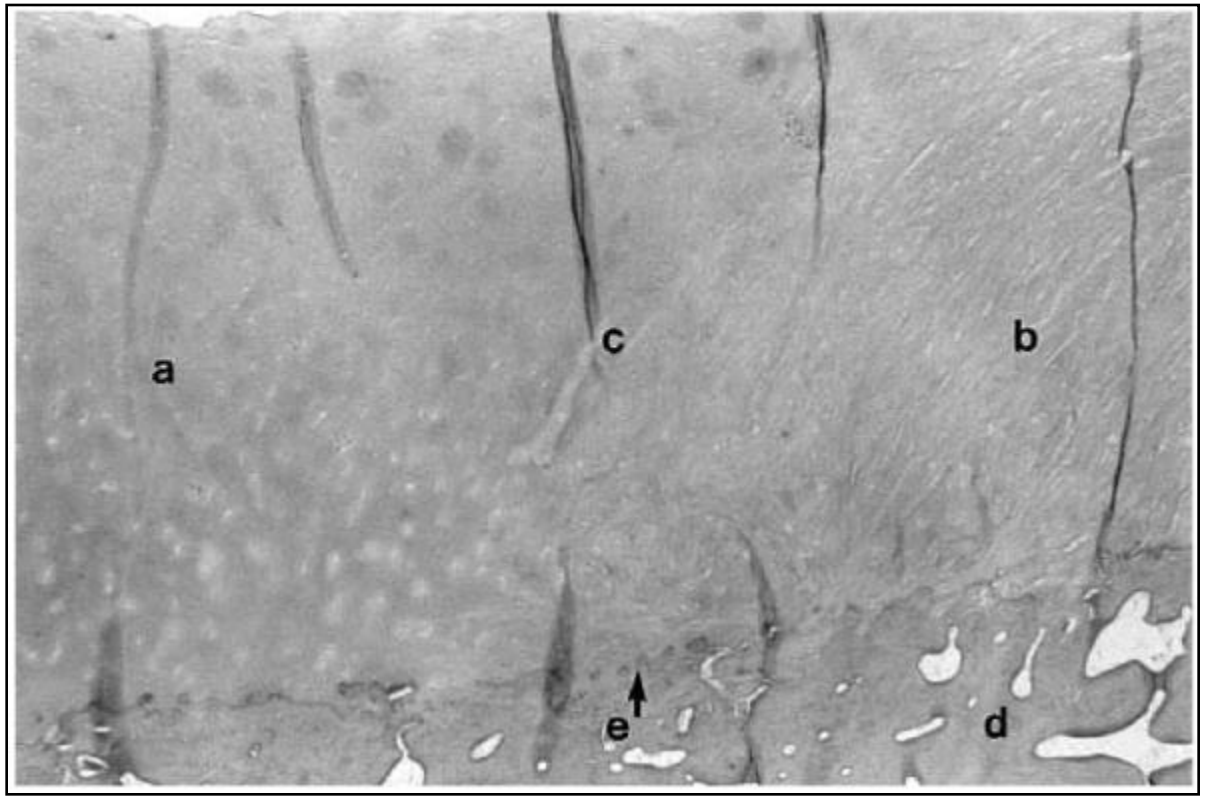
The Labrum

- “Within the labrum, pain-associated free nerve ending expression was located predominantly at its base, decreasing in the periphery.”



Haversath et al. *JBJS-Br* 2013.

Labral Histology

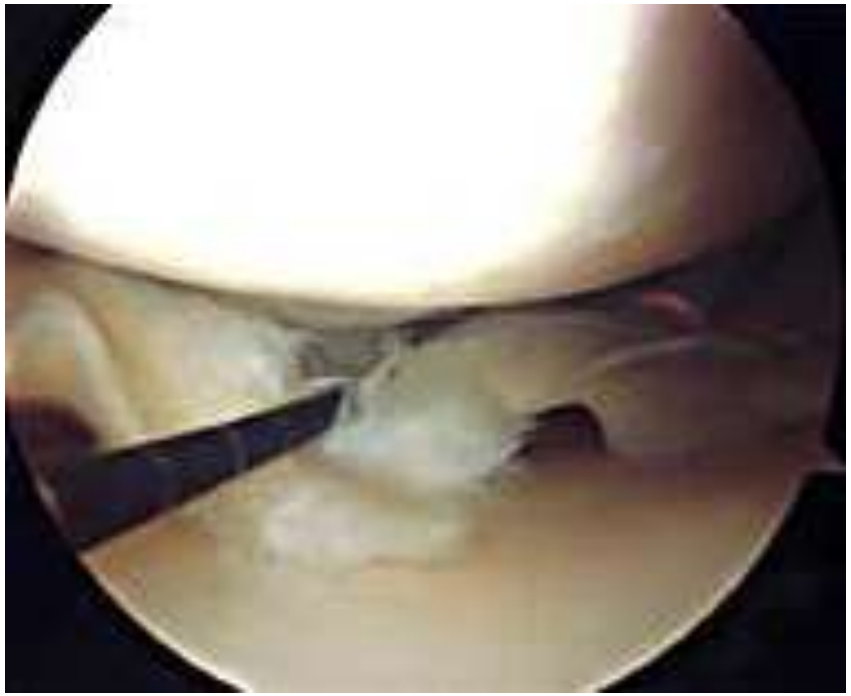


Anatomy, Histologic Features, and Vascularity of the Adult Acetabular Labrum.
Seldes, Richard; Tan, Virak; Hunt, Jennifer; Katz, Mark; Winiarsky, Raz; Fitzgerald, Robert

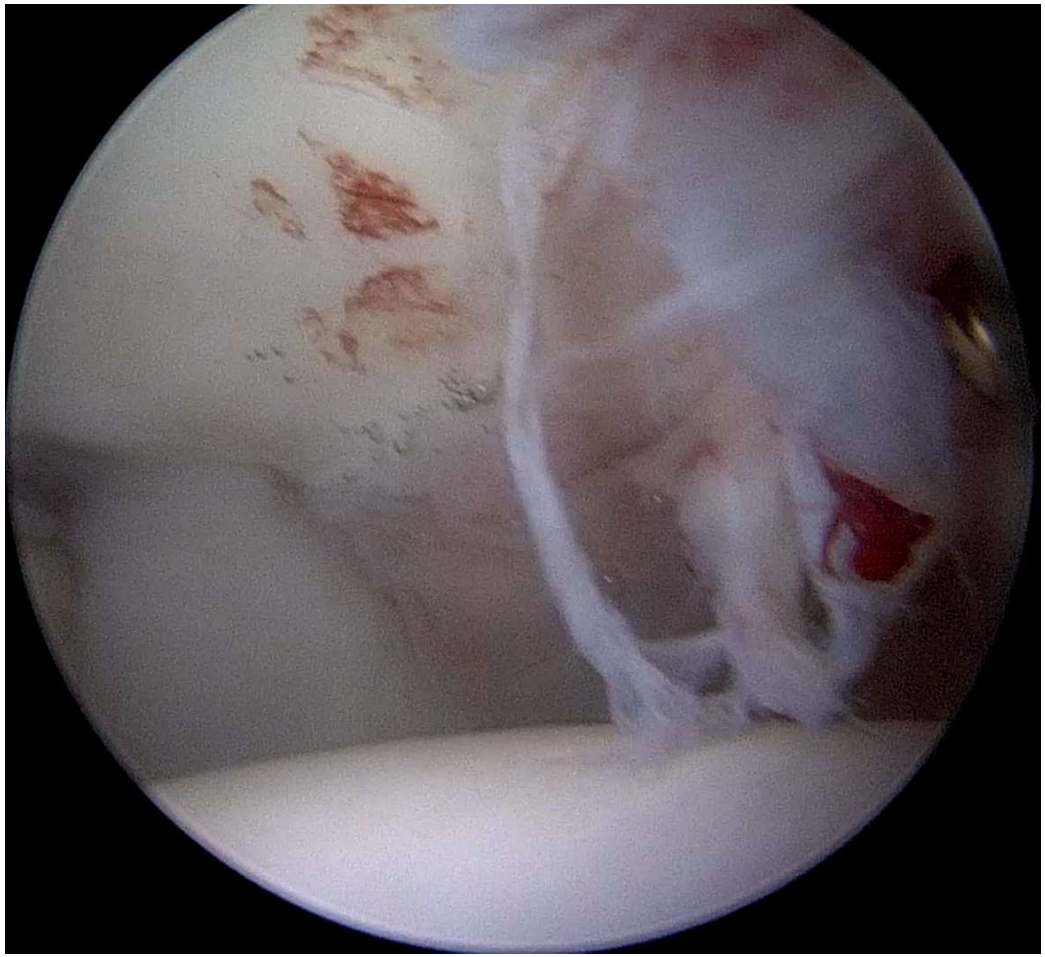
Clinical Orthopaedics & Related Research. 382:232-240, January 2001.

Fig 2. Photomicrograph of labrum attachment (B) to bony acetabulum (D) and transition zone (C) between labrum and articular cartilage (A). Tidemark zone is visible (E) (Stain, hematoxylin and eosin; magnification, x10).

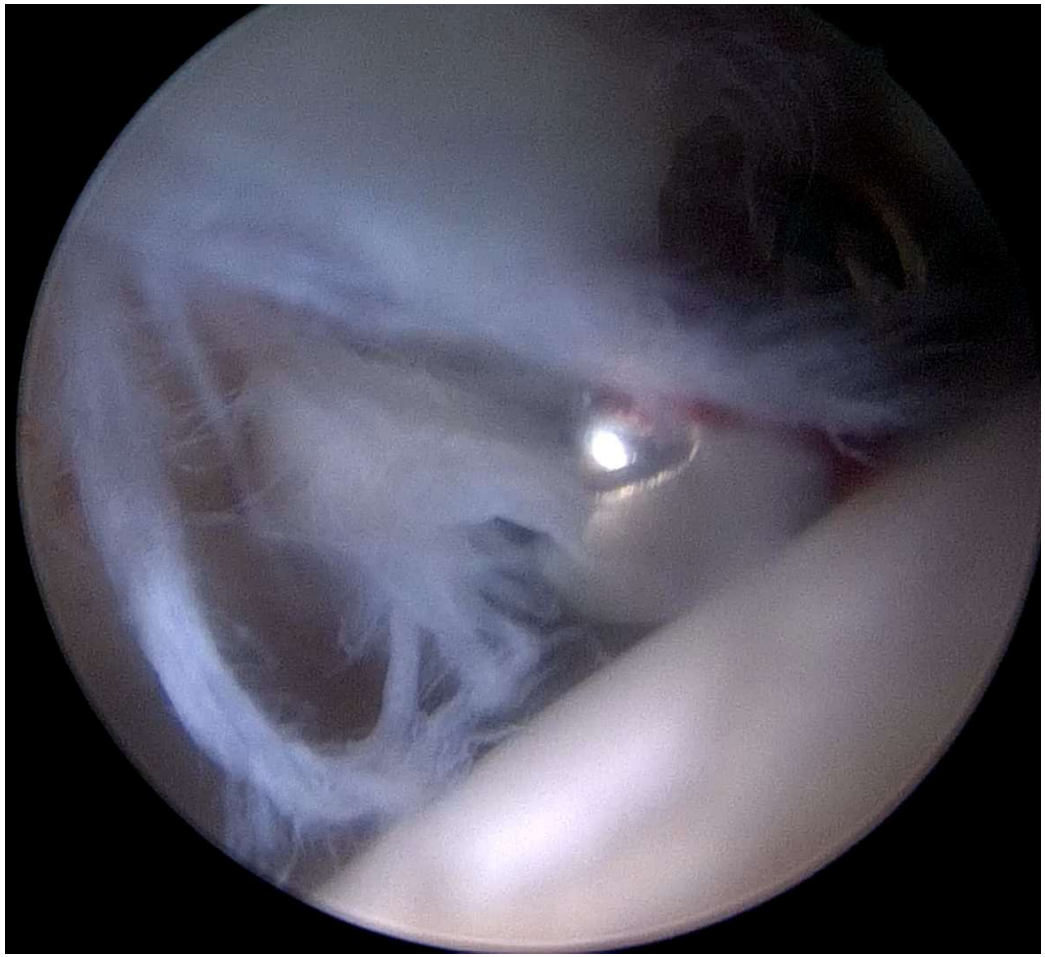
Would you repair this?

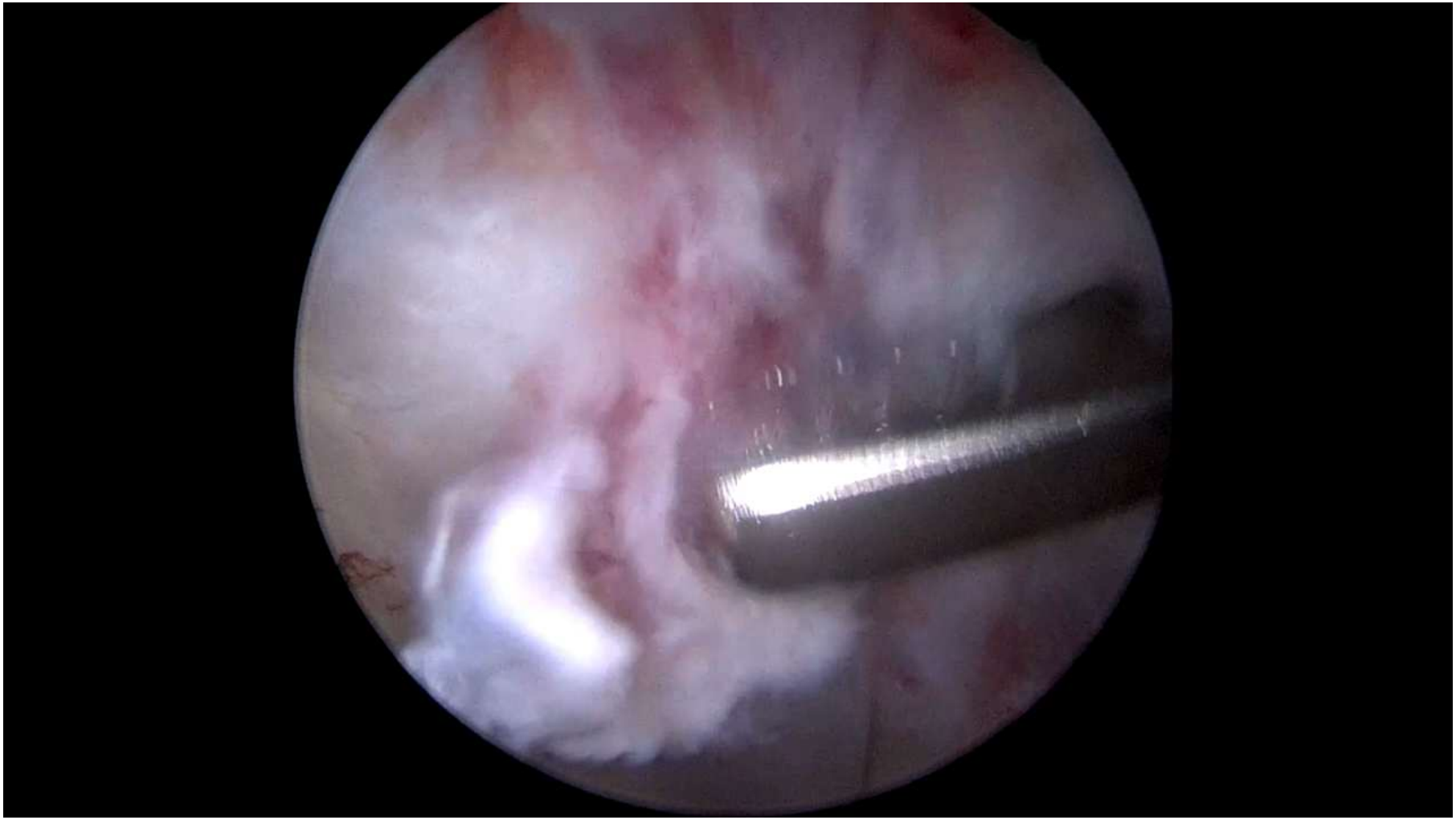


Should we repair this?



What about now?





Evidence

- Review of 5 studies; total 128 patients
- "…hip labrum reconstruction is a new technique that shows short- term improvement in patient-reported outcomes and functional scores post-operatively. The main indication for reconstruction was a deficient labrum due to previous surgical excision or irreparable tears in young patients with no significant arthritis."

Ayeni et al. *Knee Surg Sports Traum Arthros* 2014

Personal experience

- Began in revisions
  - Good results
  - But don’t know what it was that helped
- Started doing increasingly in primary cases over the past several years
- Have now performed over 600

Personal experience

- *Circumferential Labral Reconstruction: 1 year follow-up.* Submitted International Society for Hip Arthroscopy meeeting September 2015 Cambridge, England
  - 56 circumferential reconstructions compared to 40 repairs with lesser severity of damage
  - The mean Pain VAS score decreased from 4.06 preoperatively to 1.46 postoperatively (P=0.0002), IHOT-12 scores increased from 41.46 to 66.51 (P=0.006), and mHHS increased from 53.81 to 75.31 (P=0.0017). The SF-12 survey exhibited an increase from 36.57 to 46.34 (P=0.014), HOS-ADL scores increased from 59.94 to 82.93 (P=0.005), and HOS-SSS scores increased from 34.33 to 52.17 (P=0.09). Reconstructions of labra with moderate to severe complexity of tearing or labral deficiency were found to have no statistically significant difference in patient reported outcome measures from labral repairs of mild tears (Pain VAS: P=0.298; HOS-ADL: P=0.659; HOS-SSS: P=0.08; mHHS: P=0.664; IHOT: P=0.284).

Future Direction

- More follow-up data needed
  - Multiple ongoing projects

- True in all of hip arthroscopy and hip preservation
  - Will correction of FAI and labral pathology lead to less OA?

Ongoing Research

- MASH trial
  - Multi-Center Arthroscopic Surgery of the Hip
    - Washington, DC
    - Chicago
    - Philadelphia
    - Pittsburgh
    - Indianapolis
    - Winston-Salem
    - Miami
    - Durham
    - Los Angeles

Anesthesia for Hip Arthroscopy

- Podium presentation at International Society for Hip Arthroscopy Meeting in Rio de Janeiro
- Defines optimal nerve block anesthesia to:
  - Limit narcotic intake
  - Improve pain
  - Speed recovery
  - Enhance safety

Origins of Impingement

- Podium Presentation at American Association of Hip and Knee Surgeons, Dallas, TX
  - Clear association between impingement and hormonal abnormalities in young women
  - Ongoing collaboration with NICHD to further study

HOP Test Multicenter Trial

- Test to assess readiness to return to sport
- Validated tests for knee, none for hip
- Multicenter
  - Washington
  - Rochester
  - Pittsburgh
  - Chicago

Future Direction

- Will see more of a combined approach with open hip surgeons
  - WOSM center for hip preservation
- Ben McArthur, MD

Thank You!

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