Arthroscopy Course Knee

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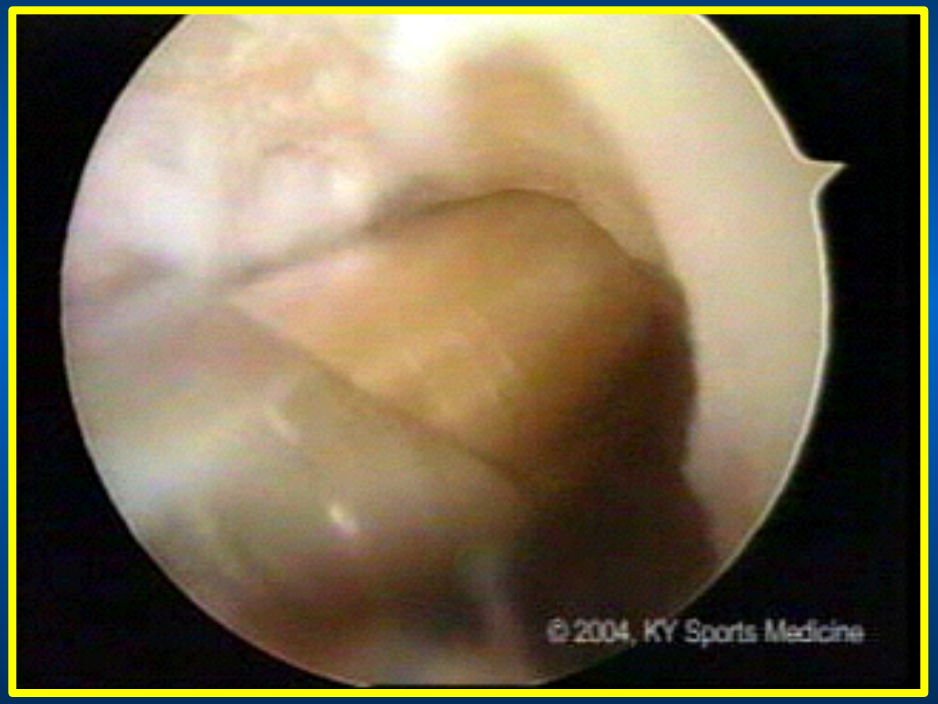
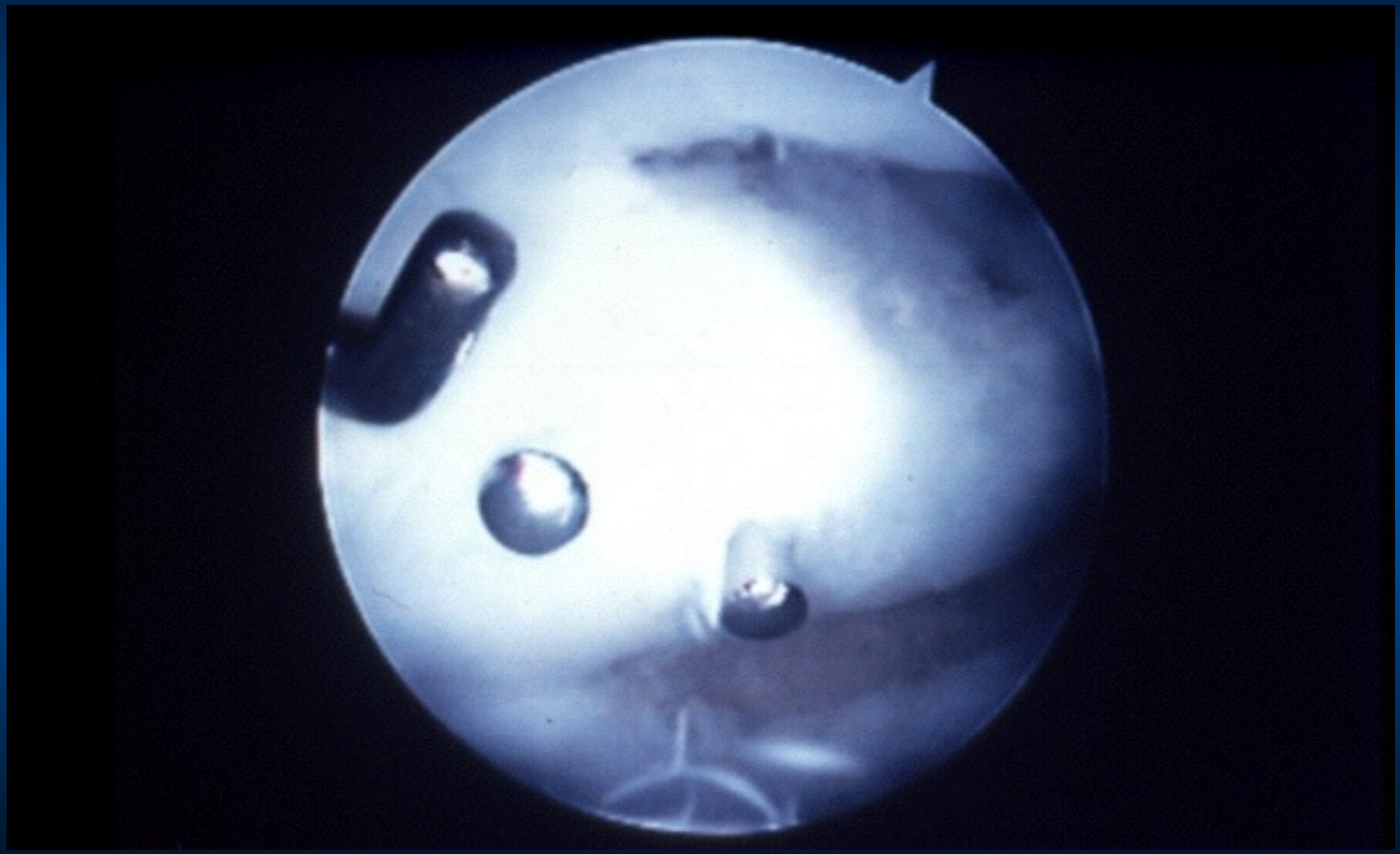
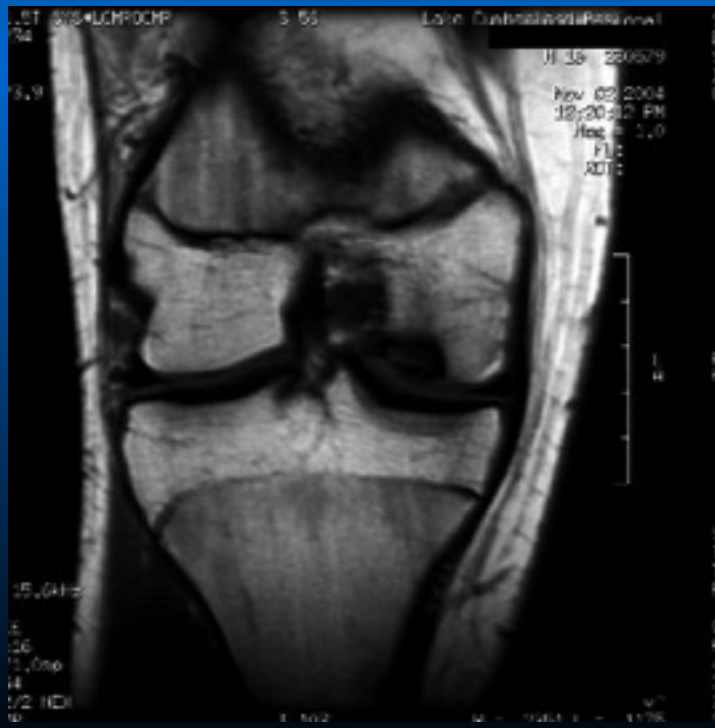
Knee Arthroscopy

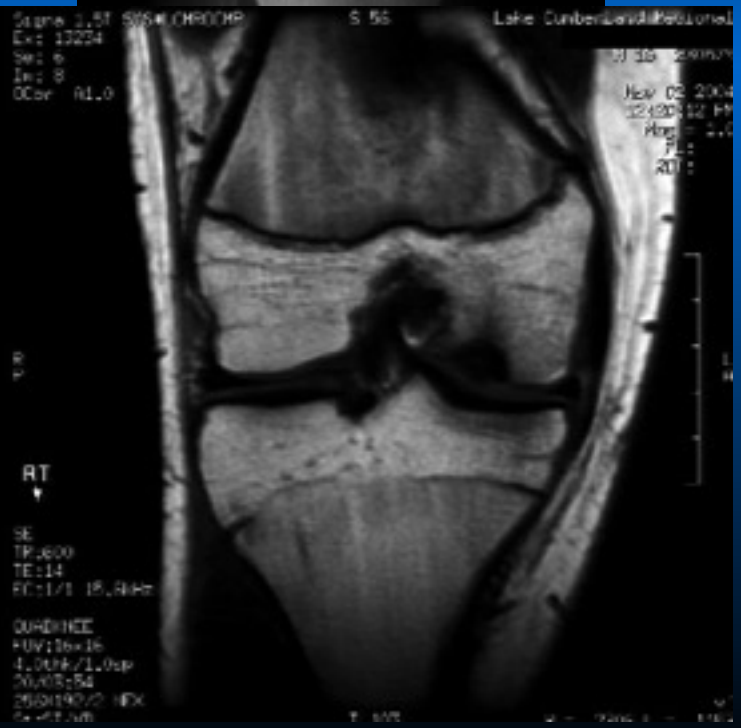


Knee
Effusion

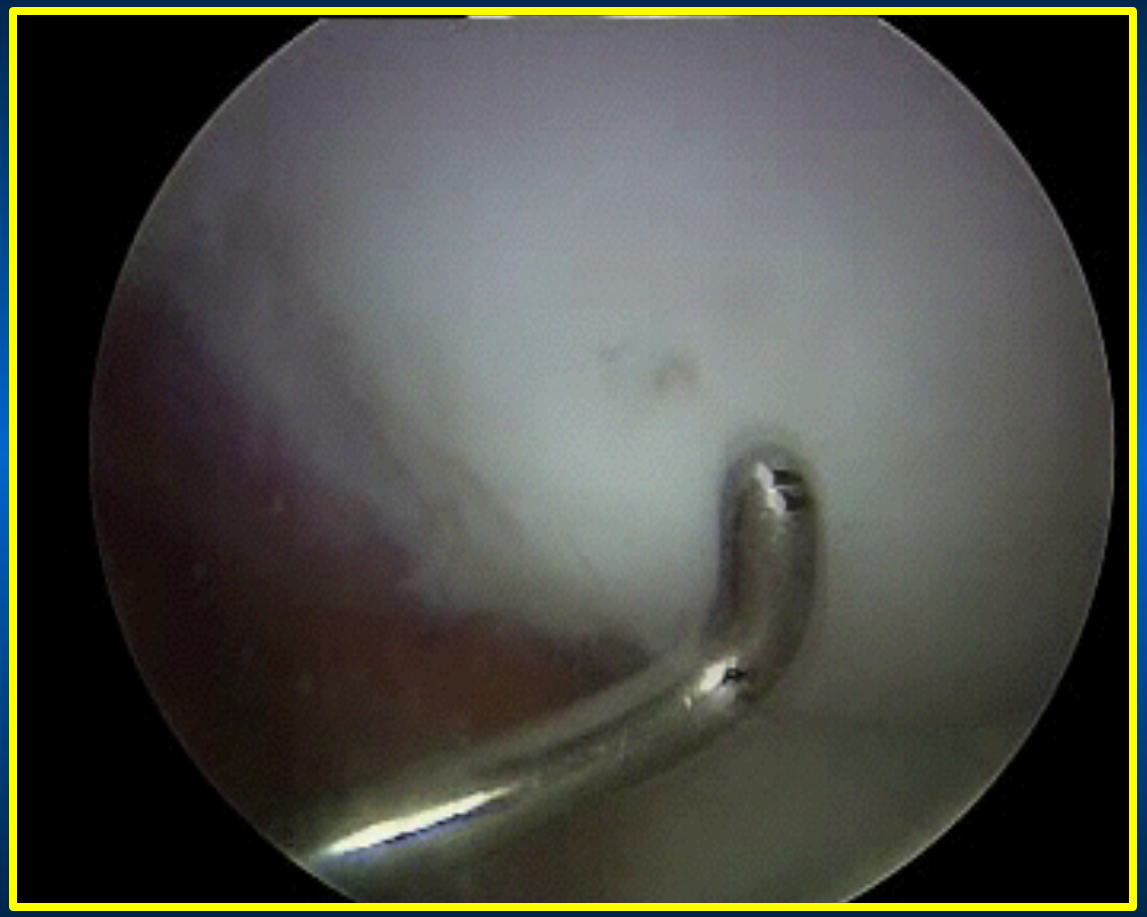
OCD Then



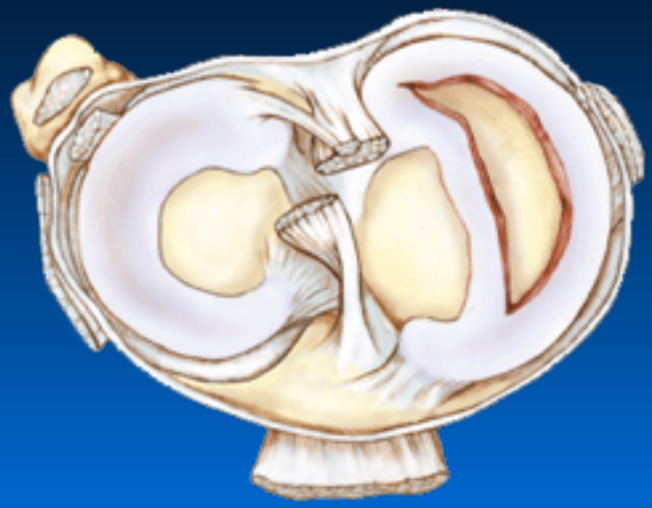




OCD Now



Meniscal Tears



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Meniscus Function

- Shock absorption
- Decreasing loads on articular cartilage
- Stabilization
- Joint lubrication
- Distribution of load
  - Extension: 50%
  - Flexion: 90%

Physical Exam

- Loss of Terminal extension/flexion
- Positive Bounce Home Test
- Positive McMurray's Test
- Lateral can have localized cyst
- Medial posterior "Bakers" cyst usually not palpable-may have fullness

Normal Knee Exam Tests

Bounce Home

Normal Knee Exam Tests

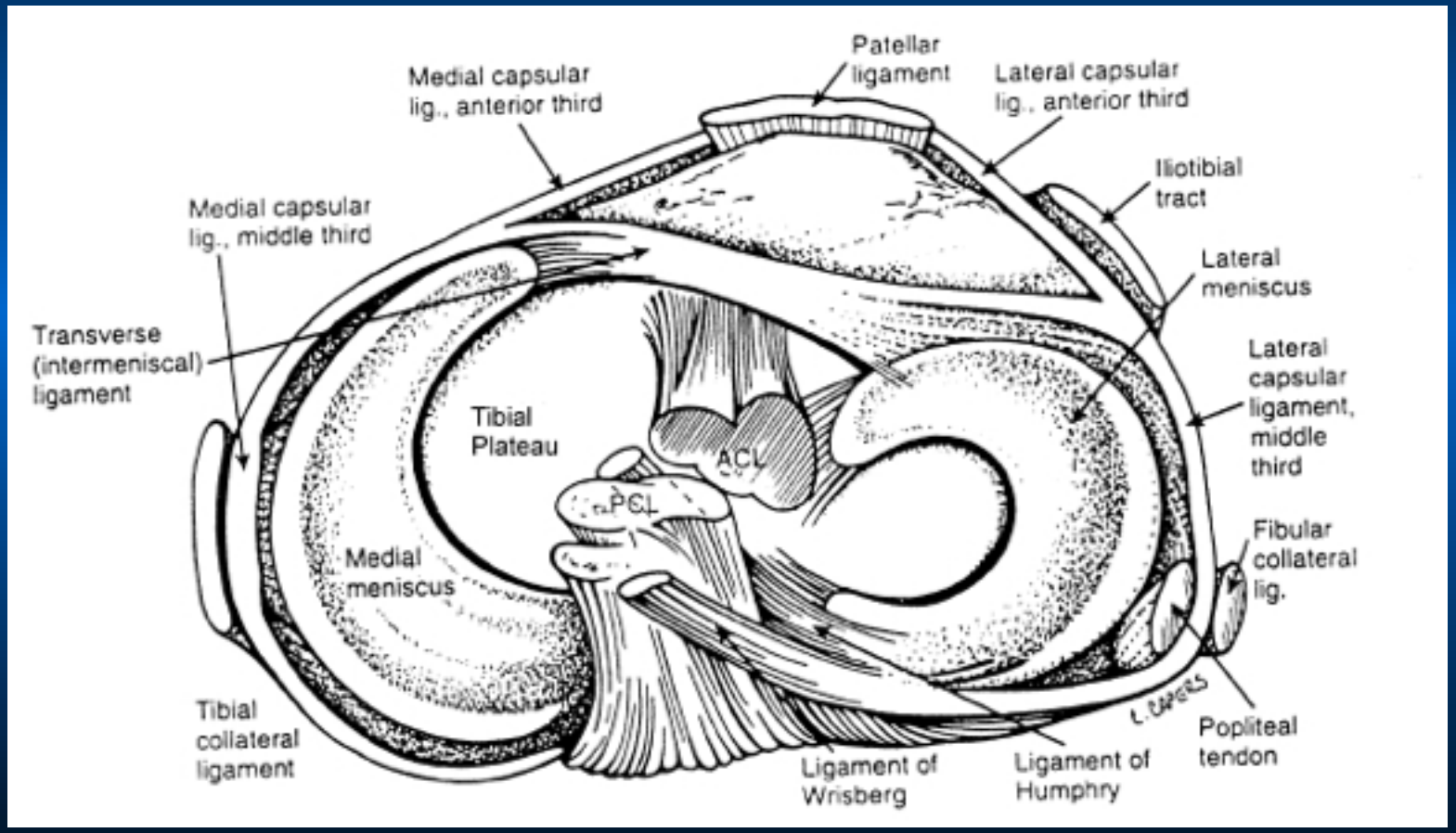
IT Band — Lateral Joint Line
Prox Tib-Fib Mobility — Peroneal Nerve

Normal Exam Tests

McMurray's — MMT — LMT

Anatomy

- Avascular, aneural, asymptomatic, therefore, a problem to treat
- Medial more peripherally attached; lateral mobile, more C-shaped



Perrin DH. The injured athlete, Philadelphia: Lippincott-Raven, 1999, Fig. 15.16, p. 361.

Diagnosis

- High school / college athletes:
  - Bucket-handle meniscus tears exist
  - Need to be fixed if locking, clicking symptoms
- Due to uniqueness of blood supply and tissue, a small window of successful repair exists.
  - Must err on early arthroscopy

Function

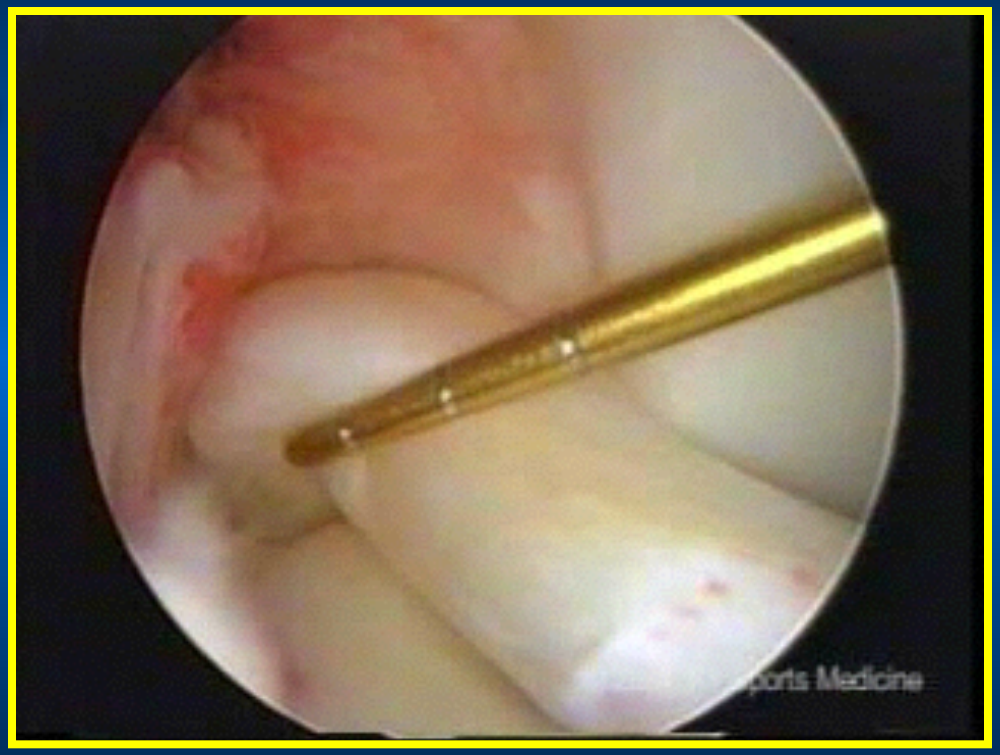
- Amazing the level of play and minimal knee dysfunction with bucket handle tear
- A knee with displaced bucket-handle will straighten out – just try general anesthesia

Cases

- Isolated
  - Meniscectomy
    - Document amount
      - Out 2 - 4 weeks
  - Meniscal repair
      - Out 4 – 6 months
- Isolated bucket-handle tear
  - Lateral heal better than medial
- If ACL tear significantly higher, rate of healing lateral still greater medial
- Surgical techniques
  - Sutures
    - Outside-in / Inside-out / All inside
  - Devices
    - Smith-Nephew / Miteck

27 YO Male

- Tore ACL three years previously, falling out of a bunk bed
- Now, inability to fully extend or trust knee



27 YO Male

- ACL tear; Complex bucket-handle x2 med meniscus stuck in notch 95% partial subtotal med meniscectomy. Chronic severe ALRI. Post ½ lat men tear 50% removed.

Principles of Meniscectomy

- Resect as little tissue as possible
- Avoid injury to articular cartilage
- Visualize well and probe after resection of the meniscus
- Leave stable rim
- Estimate amount of meniscus removed
- Document articular cartilage chondromalacic changes

Classification of Meniscal Tears

- Zones of vascularity
  - Red, red-white, white
- Zone of position on tibia by thirds:
  - Anterior, Mid, Posterior
- Quality of tissue
- Size of tear
- Associated cyst
- Pattern
  - Vertical vs. Horizontal
  - Radial
  - Flap
  - Horizontal
  - Complex

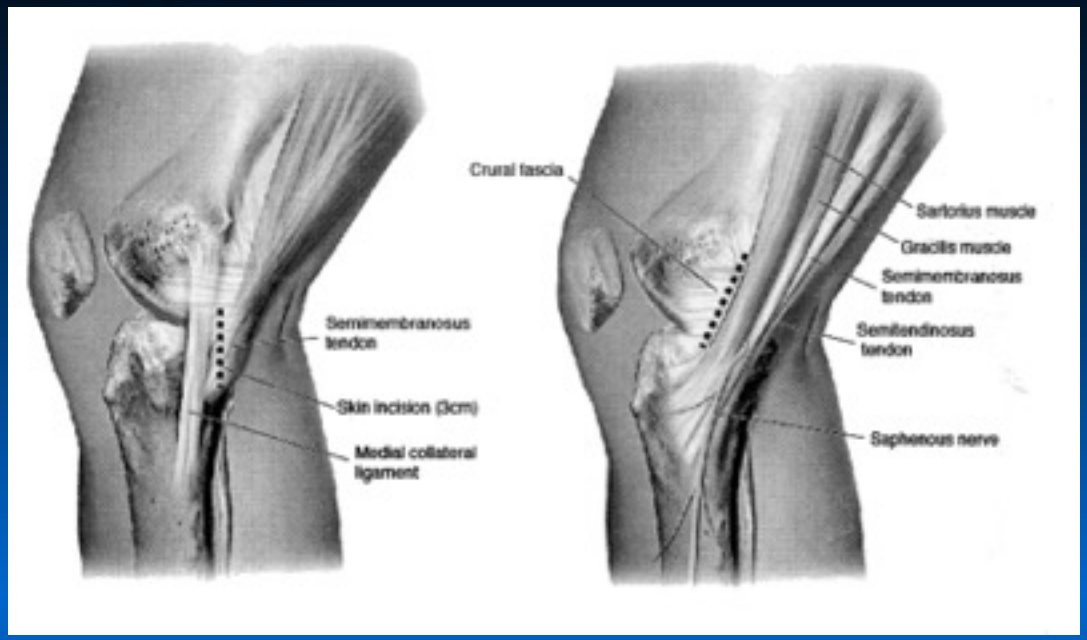
Treatment of Meniscal Tears

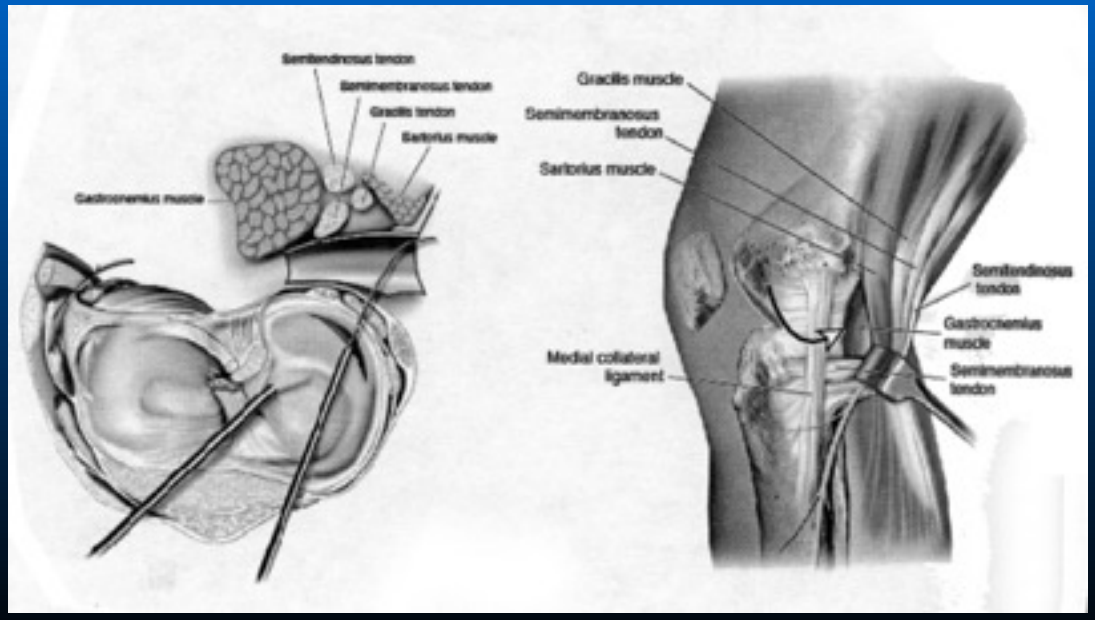
- Repair the meniscus if possible
  - Better rates of repair if acute injury or with acute ACL tear
- Save as much meniscal tissue as possible
- Repair all but white zones
- Best suture orientation: vertical mattress
- Now most repairs all inside with devices
- Know how to do an inside-out with sutures
- I use absorbable 2-0 PDS with single curved cannula system

Principles of Meniscus Repair

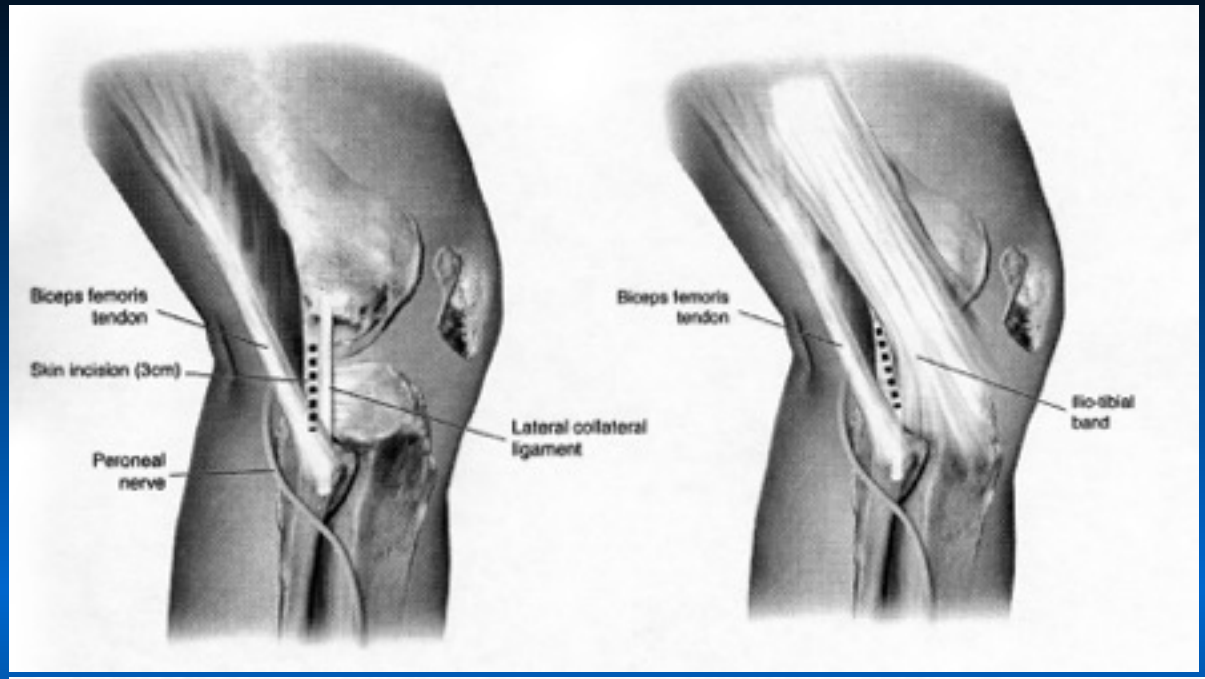
- Visualize tear pattern well
- Prepare peripheral bed to increase vascularity
  - Needling vs. Trephination
- Choice of device vs. sutures
- Suture orientation
  - Vertical vs. Horizontal
  - Simple vs. Mattress

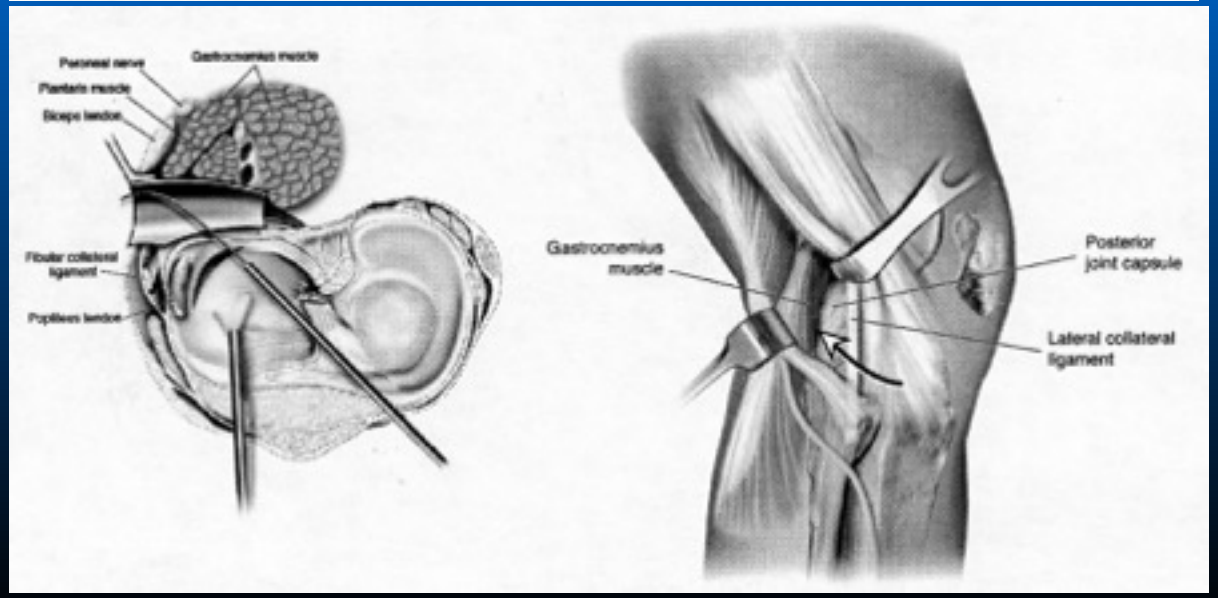
Posteromedial Approach



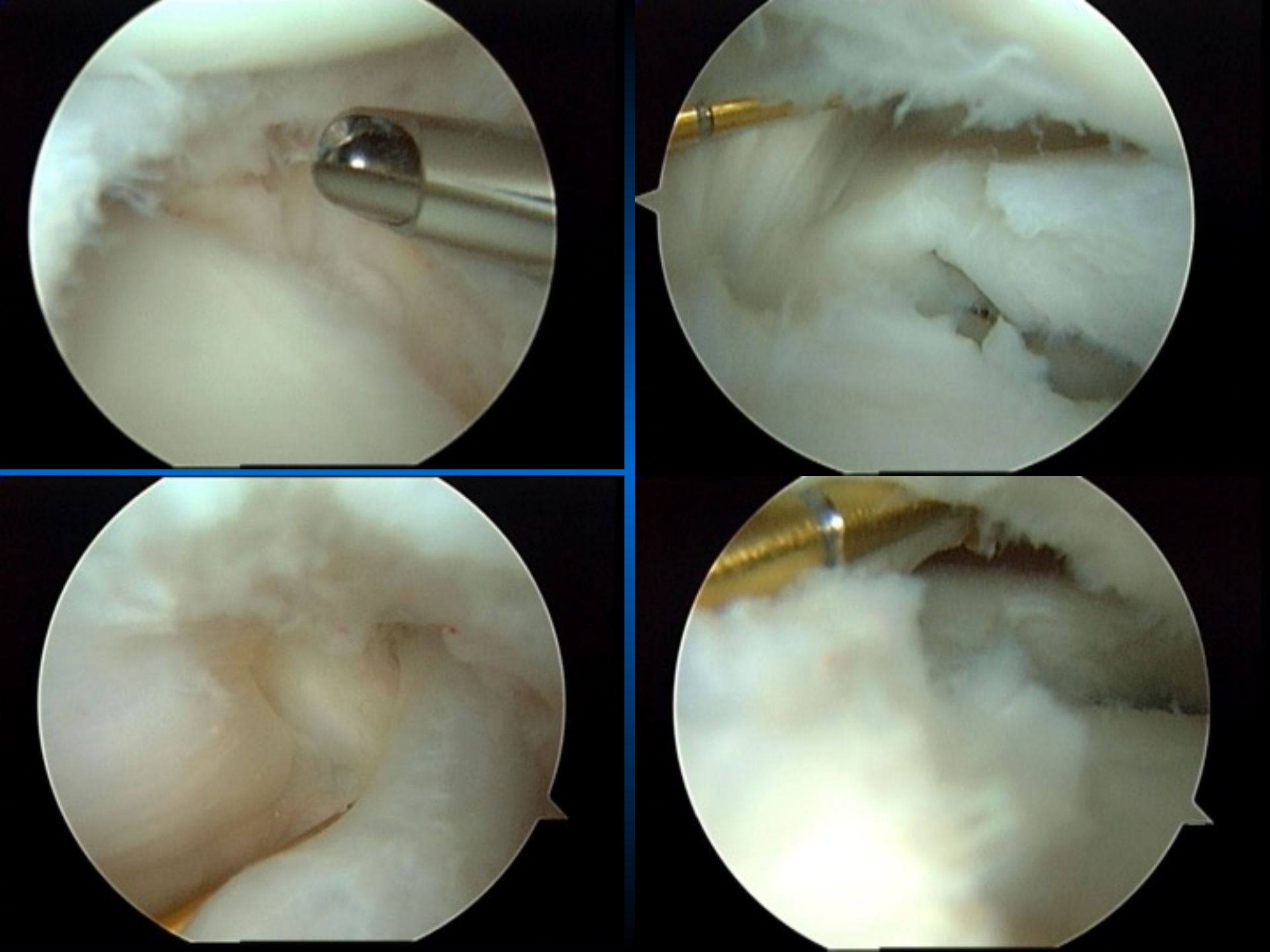


Posterolateral Approach





4 YO c/o “clunking” left knee



Discoid meniscus

- Questions:
  - Does repair work?
  - Do we need new classification system?
    - Arthroscopic
    - MRI
- In my experience, rarely repairable
  - Unstable, bad meniscal tissue requires meniscectomy

10 YO Male

- Injured Right knee doing kicks in martial arts

[Monkey had no name]

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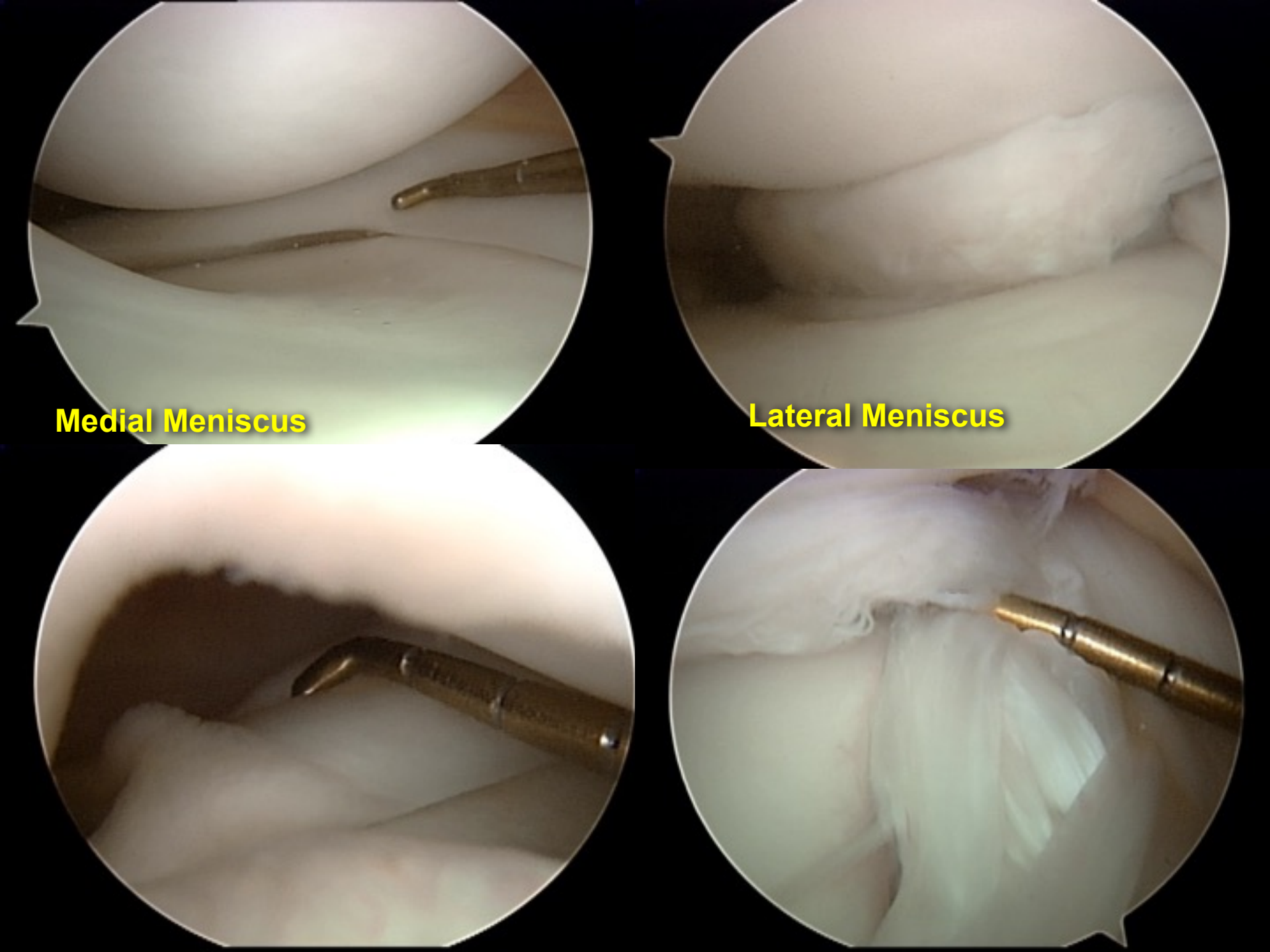
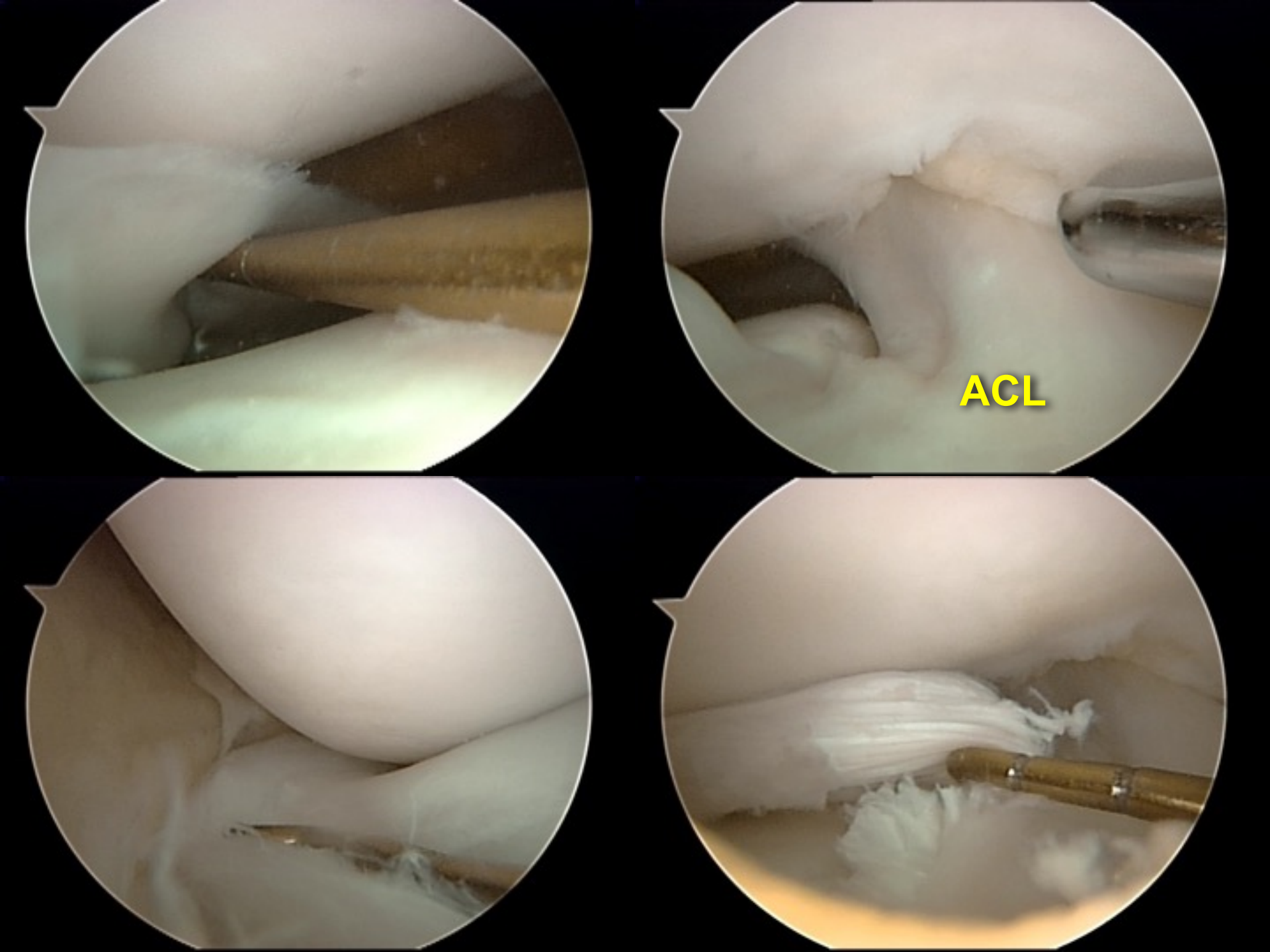
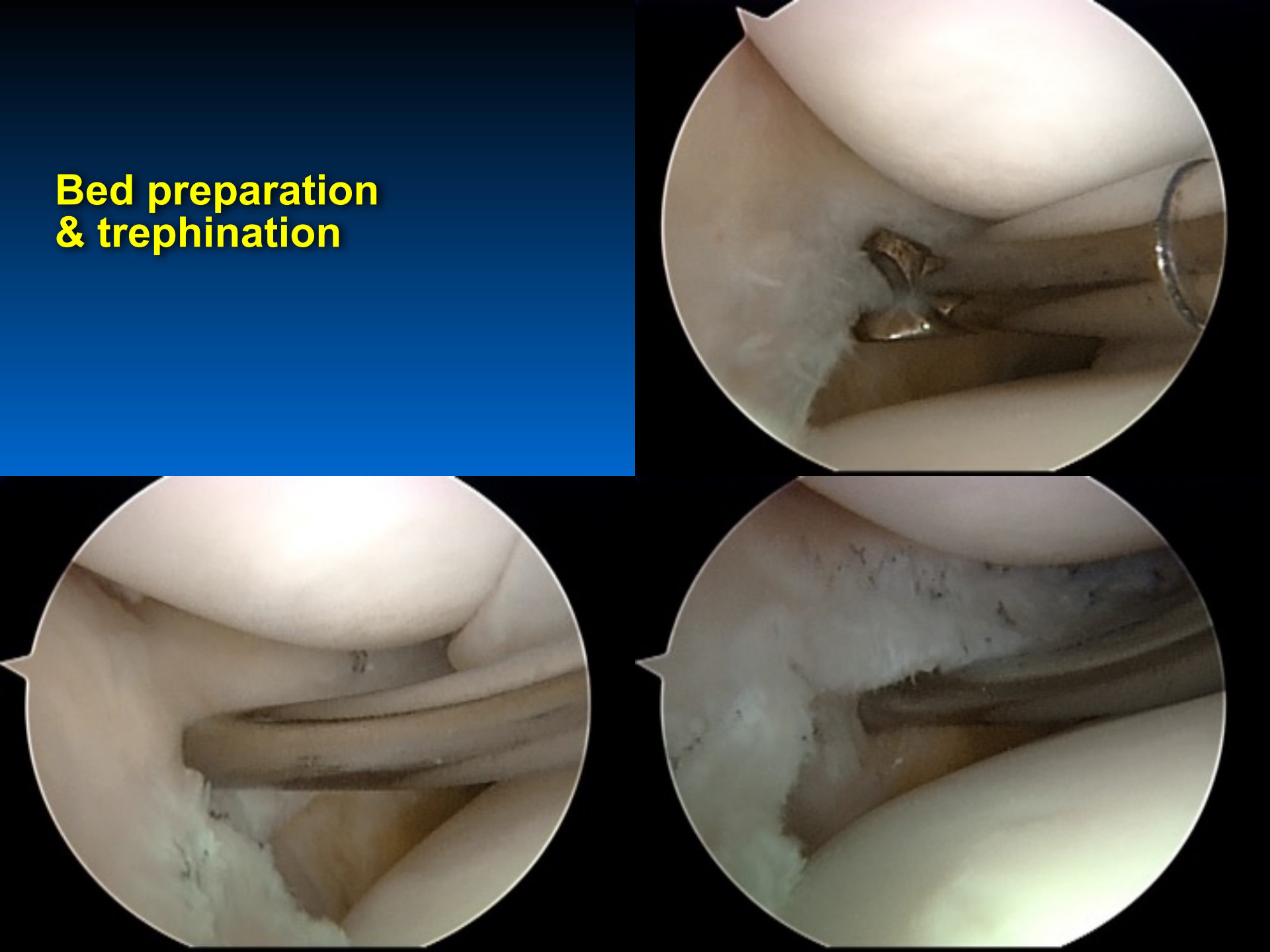
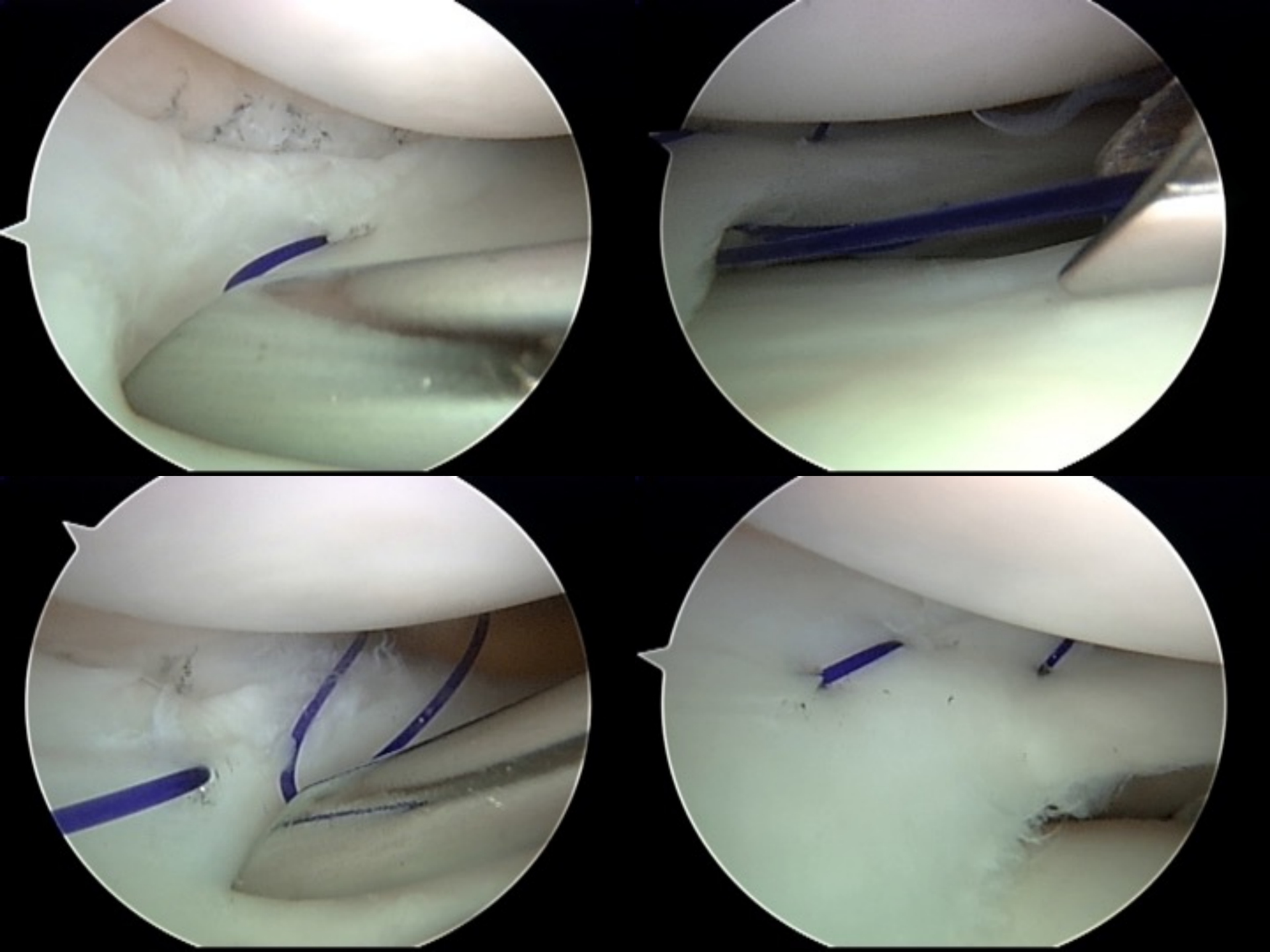

Medial Meniscus
Lateral Meniscus

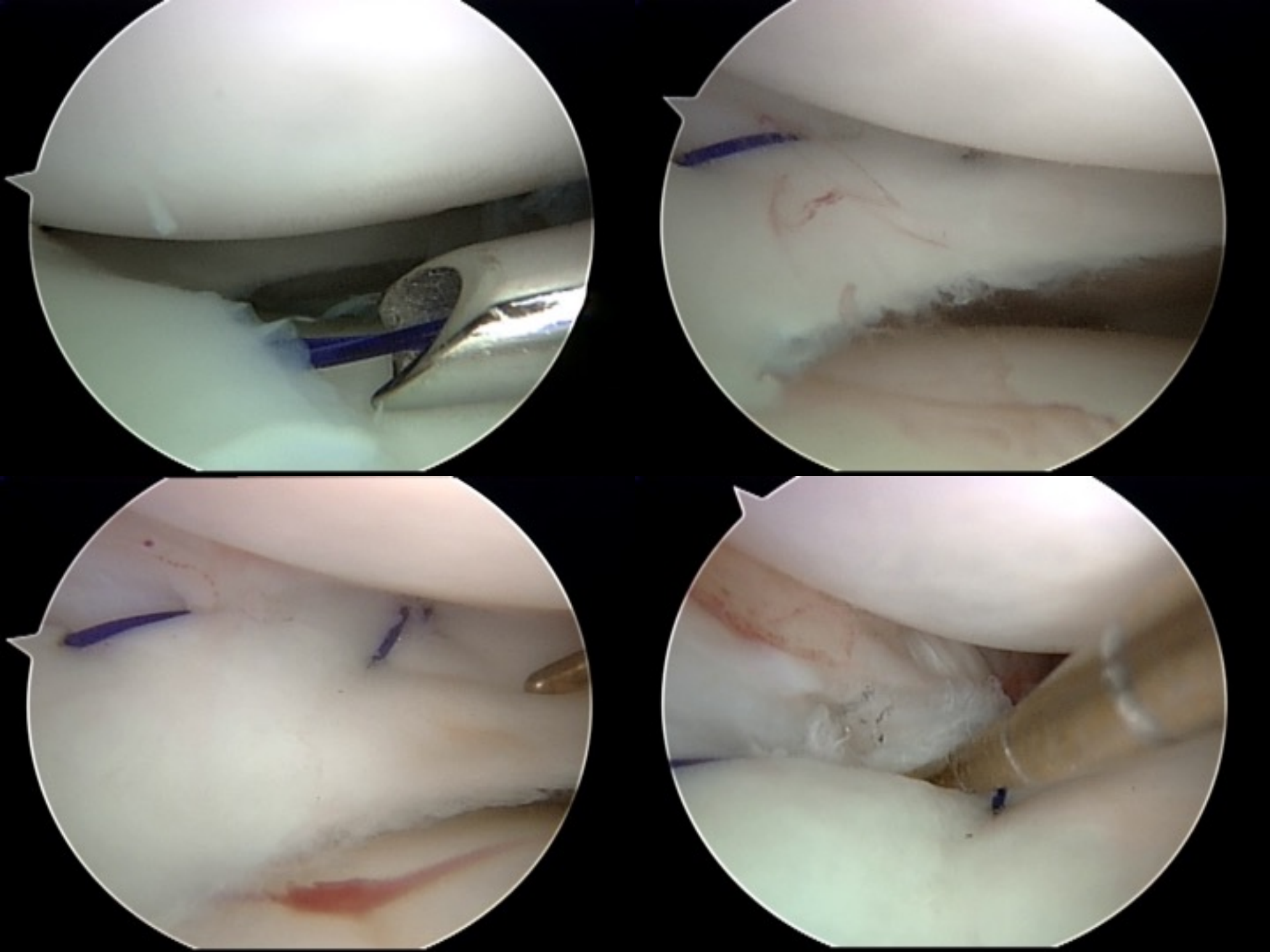

ACL

Bed preparation & trephination

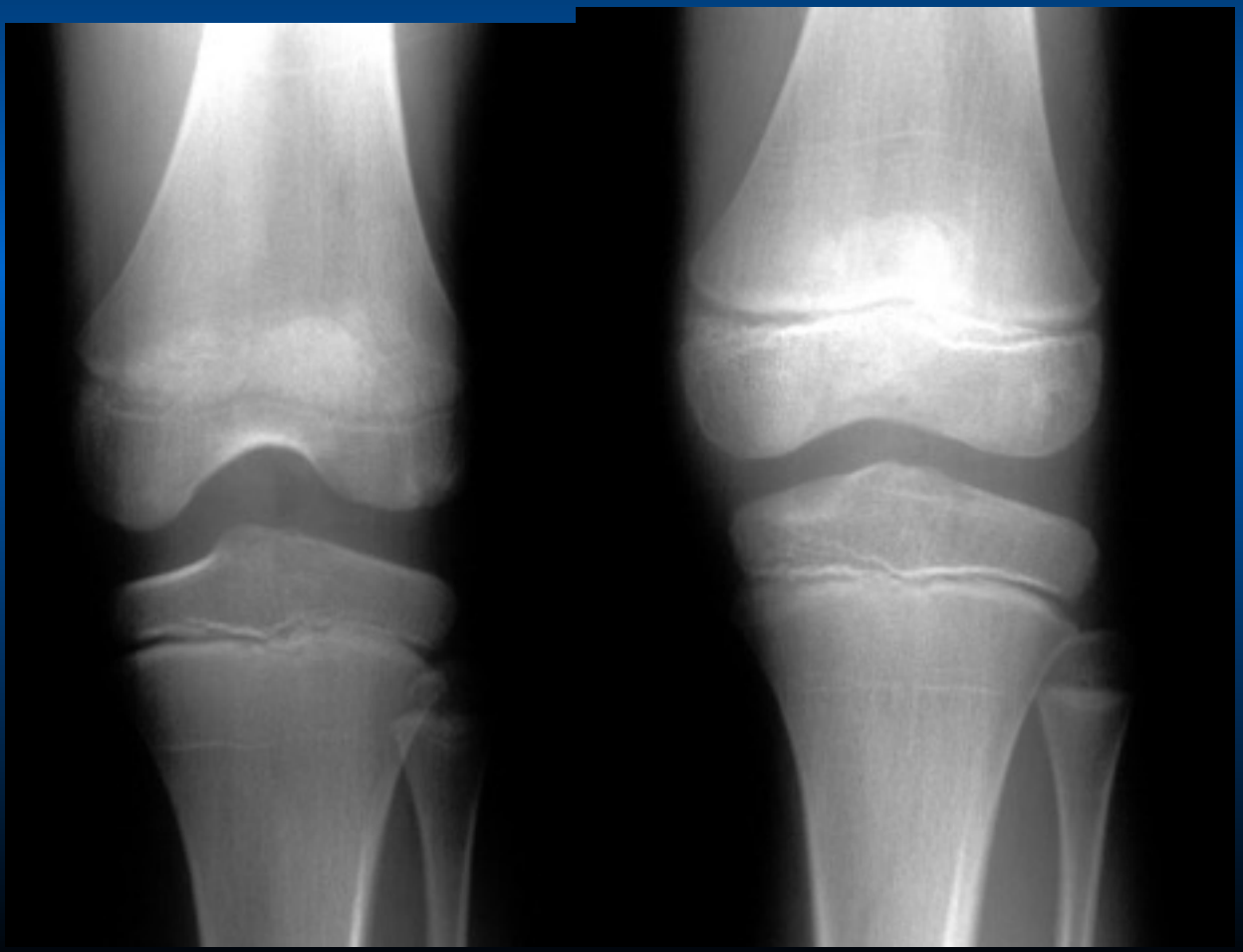




Modified open inside-out repair



9.9 YO Male injured left knee playing soccer



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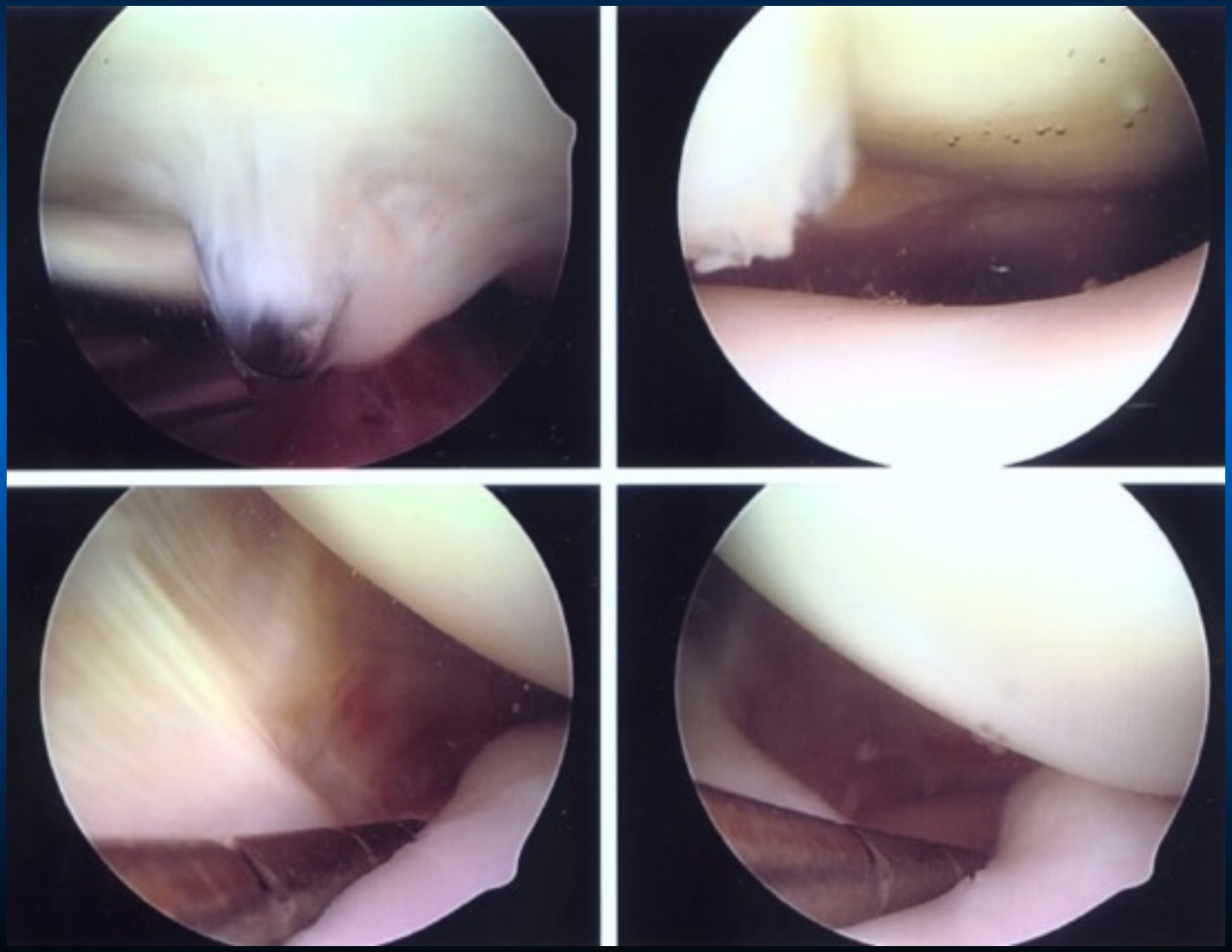
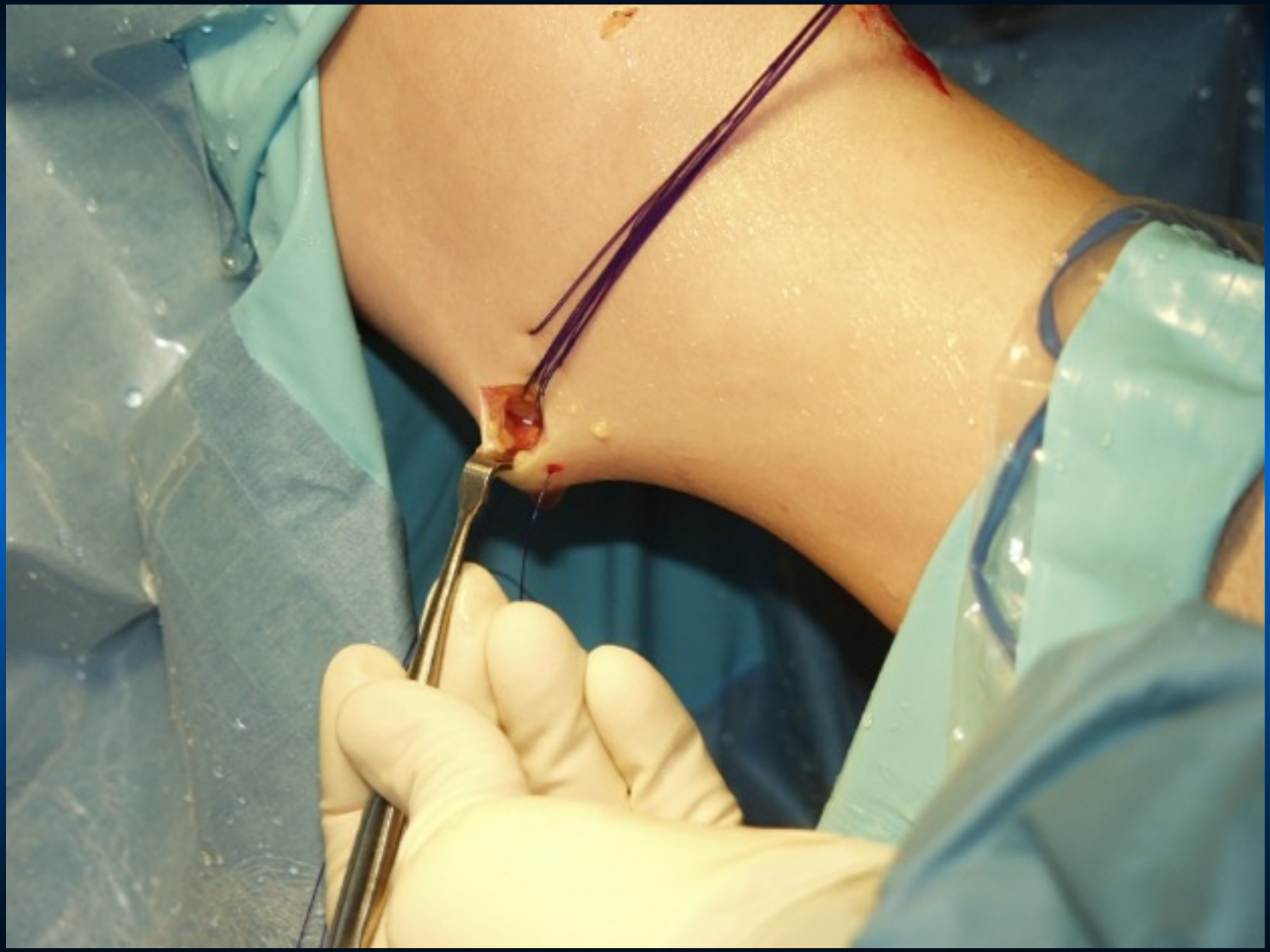
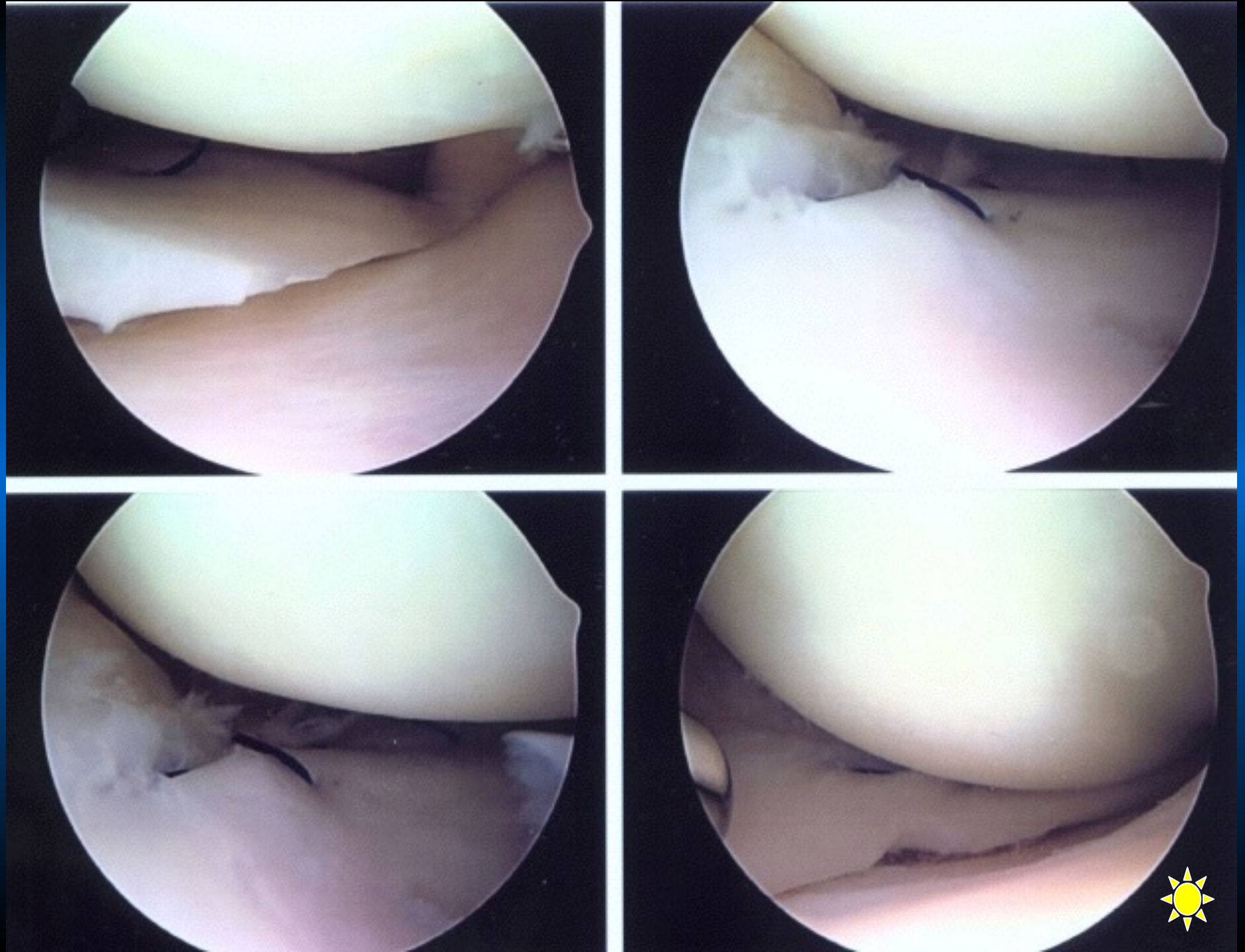
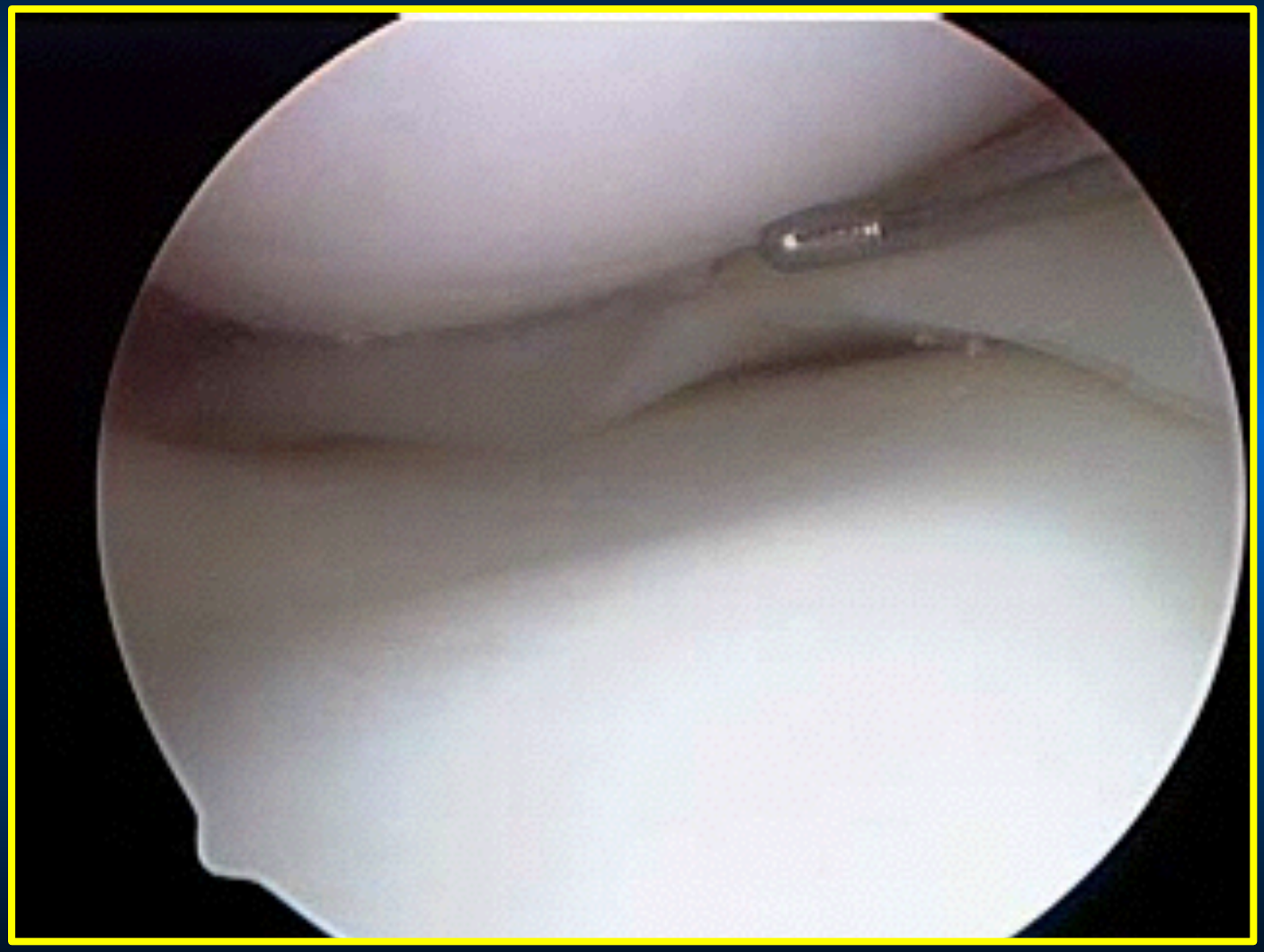
Medial meniscus repair, left knee (acute posterior horn MMT), w/ PDS x7







Medial Meniscus Repair Technique



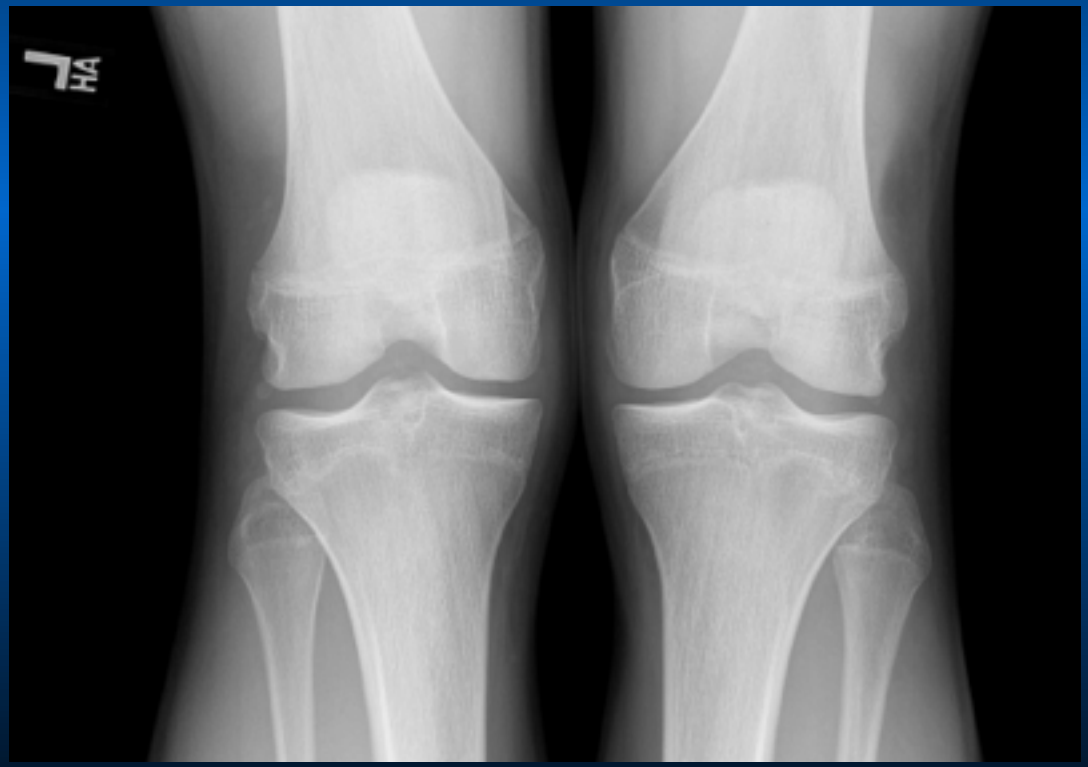
16 YO Male, Football Athlete

- Injured left knee when he was sandwiched in between two larger players during summer practice
- Complains of pain medial, catching, locking sensation. Injury occurred eight months prior to presentation.
- He did play through the season, symptoms worsened.

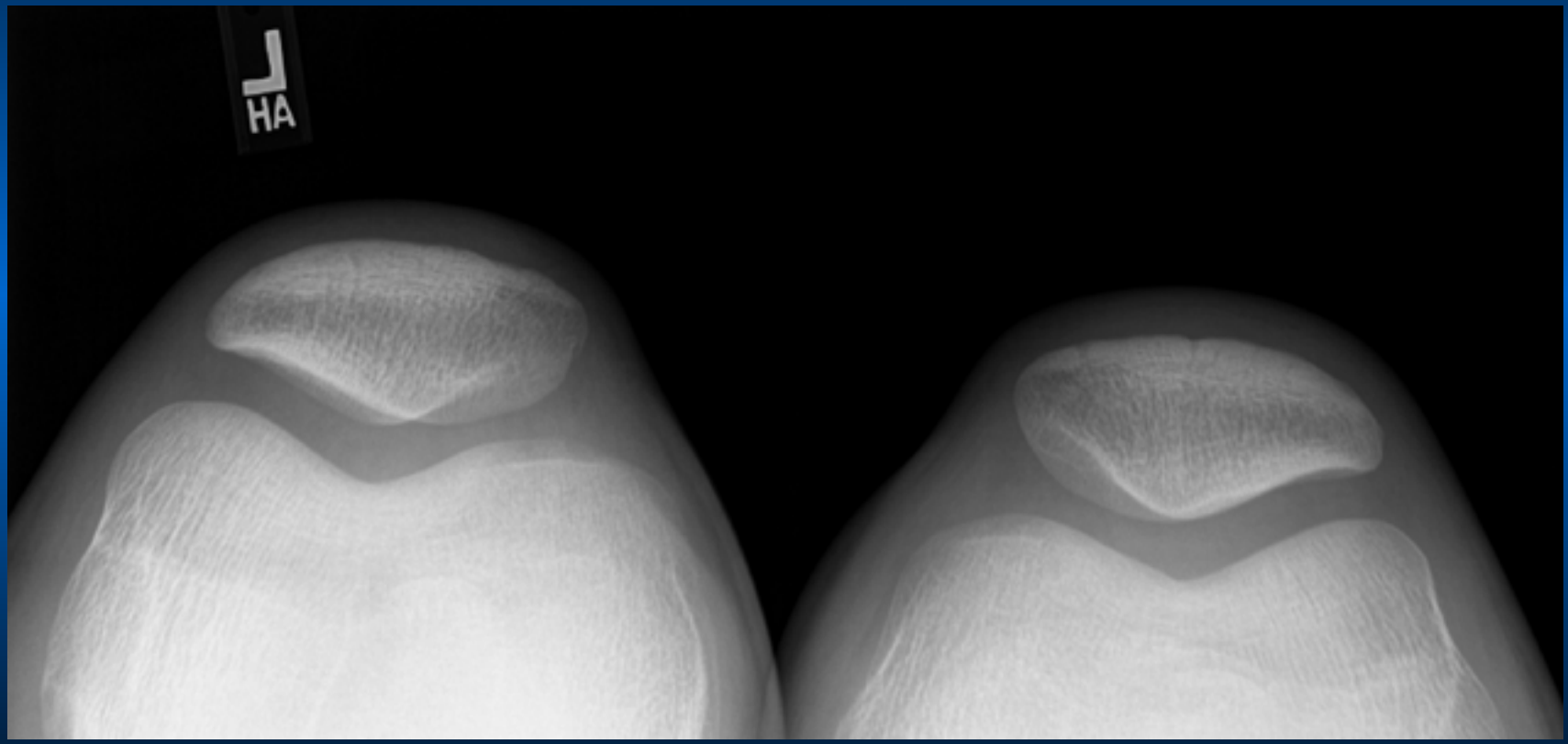
PE

- Height: 74 inches
- Weight: 179 pounds
- LEFT KNEE:
  - Loss of 5° extension and flexion (5-135°).
  - Positive bounce home test medially.
  - Positive McMurray's test with pain posteromedially in hyperflexion, tibial external rotation.

Plain radiographs
Symmetrical femorotibial alignment 7°.
Closing epiphyseal plates. Small fabella.

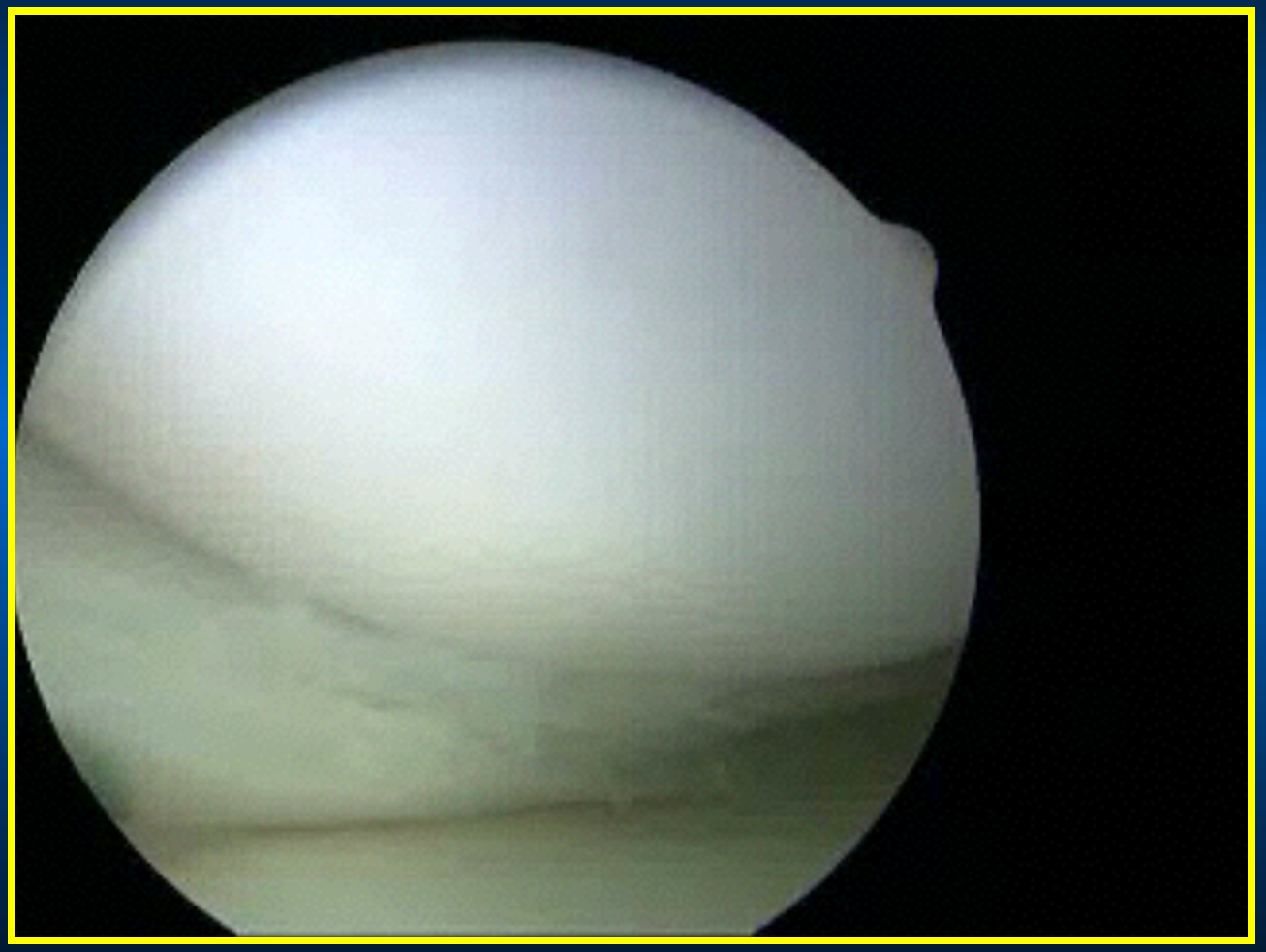


Plain radiographs



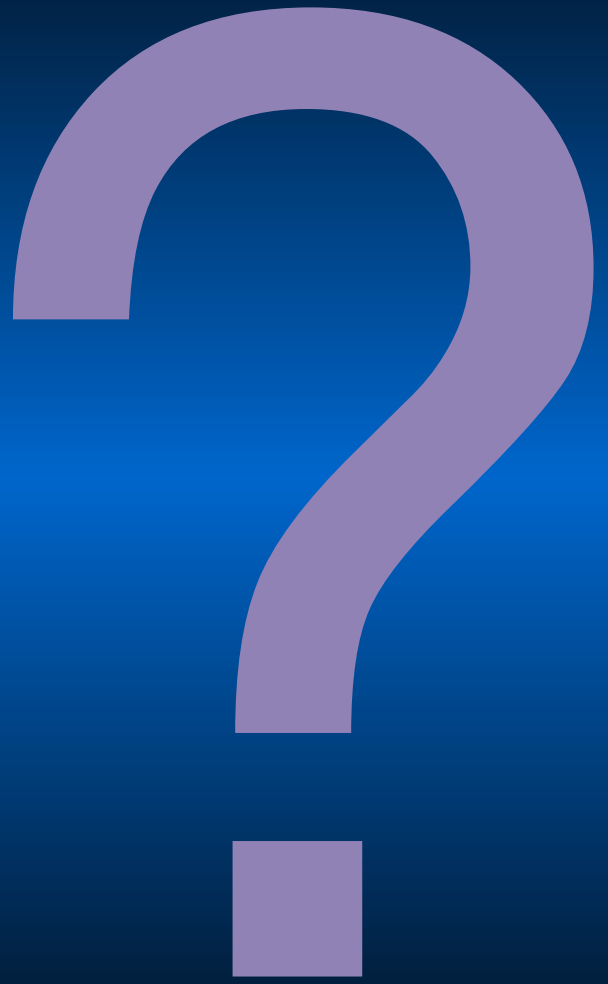
MRI:
Horizontal posterior third tibial-sided medial meniscus tear.
ACL, PCL normal.
Articular cartilage normal.

Arthroscopy: Probing

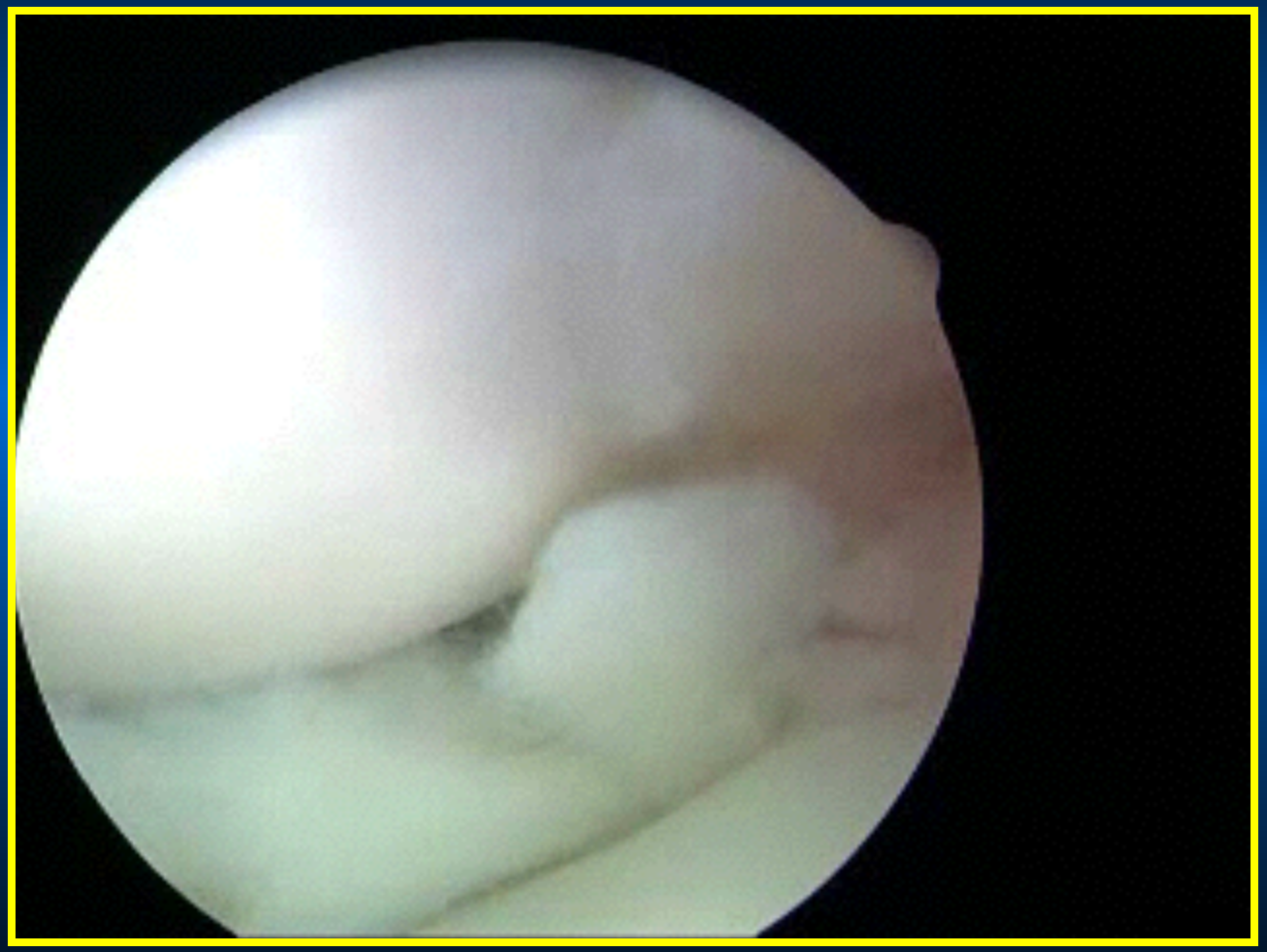


What treatment?

- Repair vs. Resection



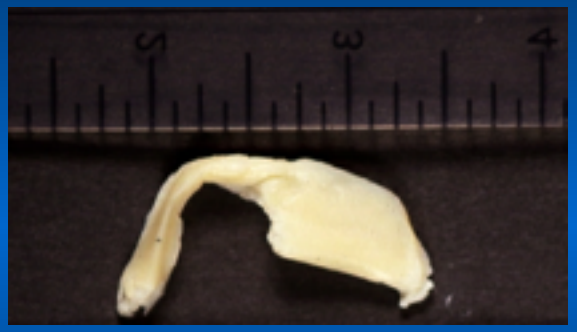
Arthroscopy: Adult pattern MMT, complex, not repairable



- Save the whale!

- Save the meniscus if at all possible . . .

  Always, no exceptions!

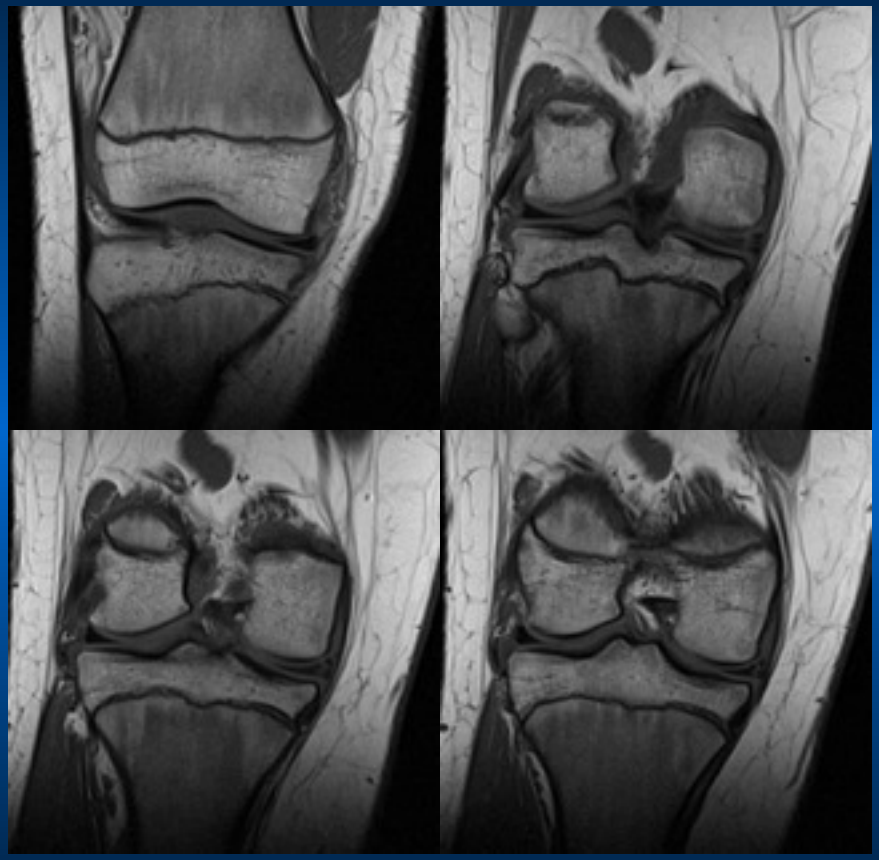


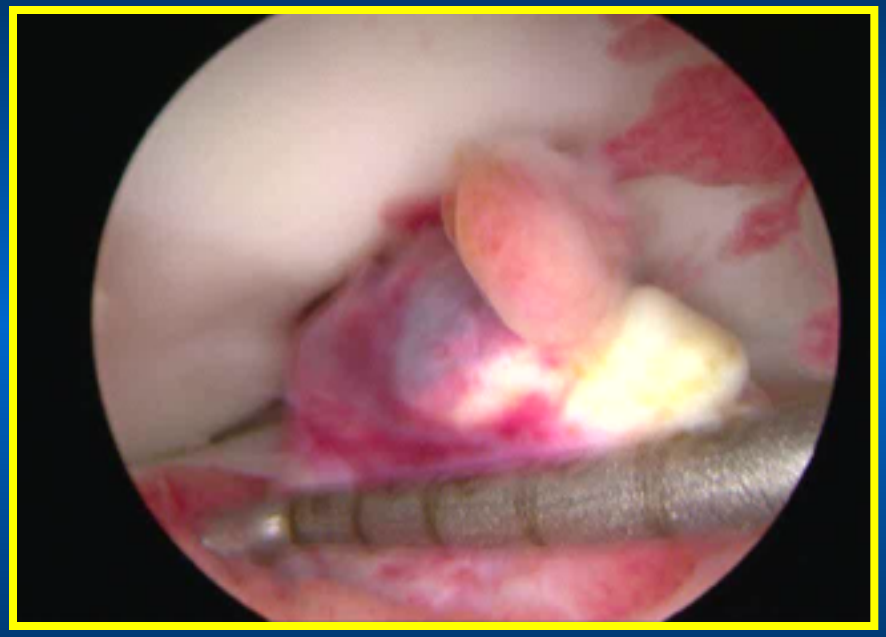
- Watch out!

12 YO Female

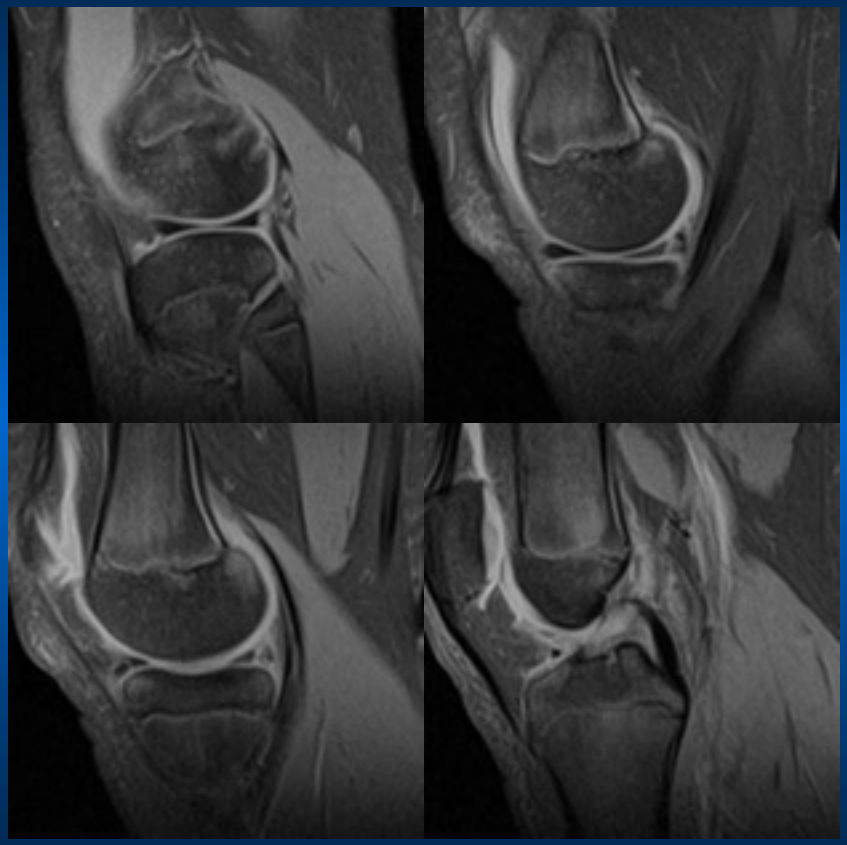
- Basketball and soccer athlete
- Injured right knee landing awkwardly in basketball six weeks previously
- 14-months postmenarchal
- PE:
  - HT: 5’ 3” WT: 179 lbs.
  - Right knee Lachman positive, Pivot Shift positive
  - ROM 0 – 130
- MRI:
  - Posterior horn MMT
  - ACL tear

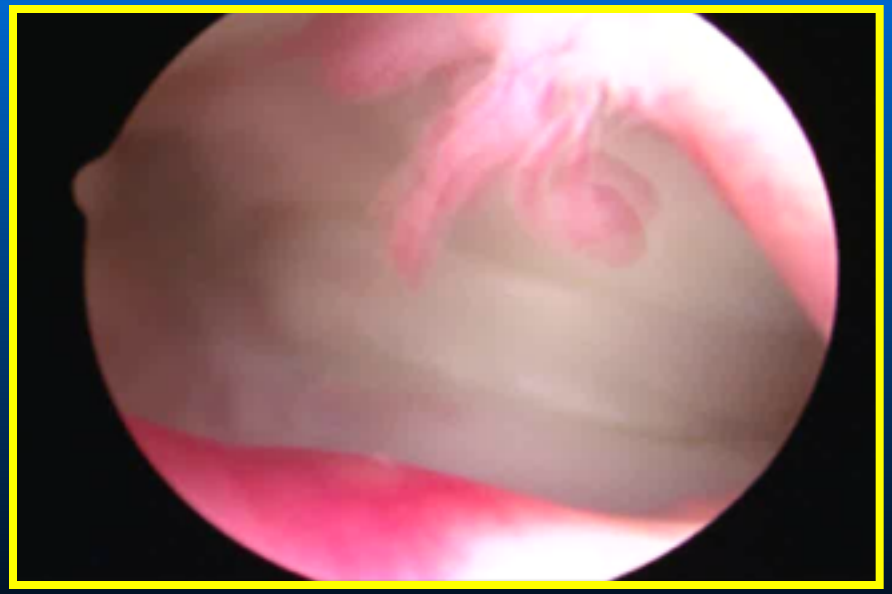
MRI Cor T1



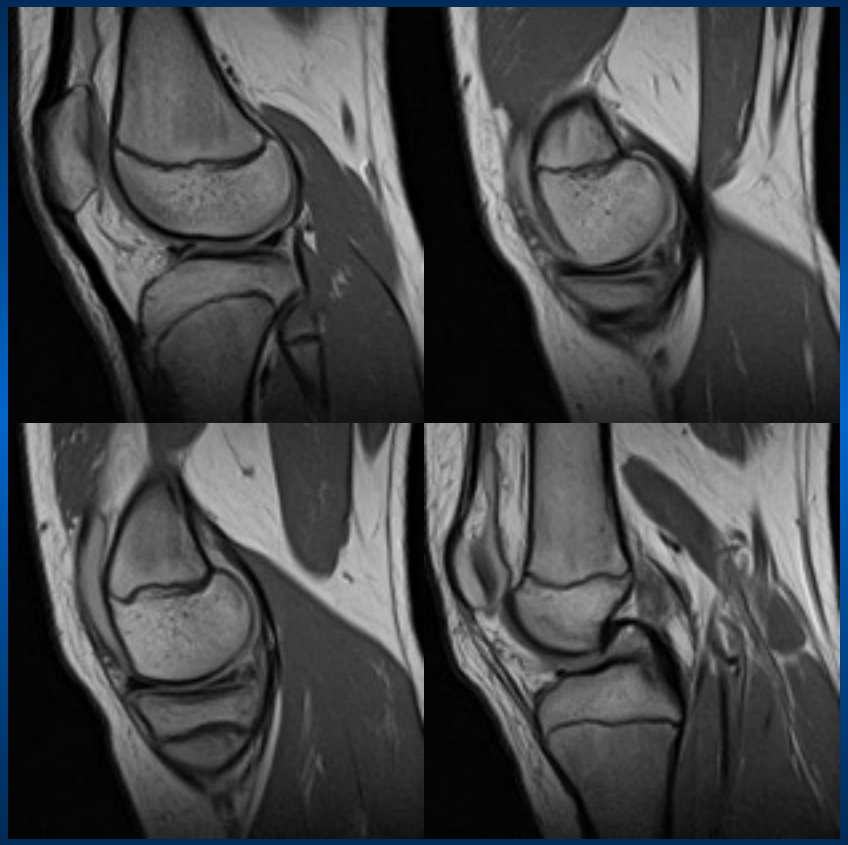


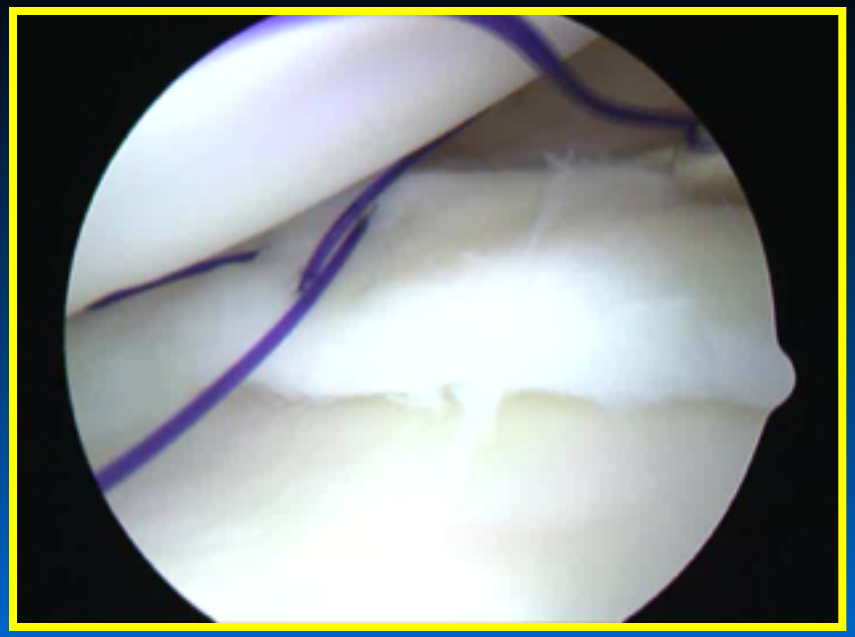
MRI Sag SE PD

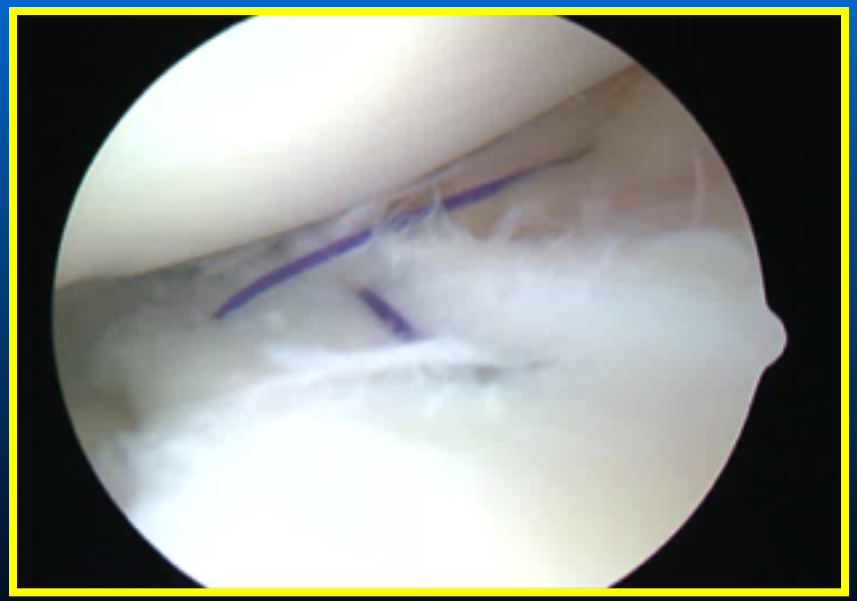




MRI Sag PD ACL

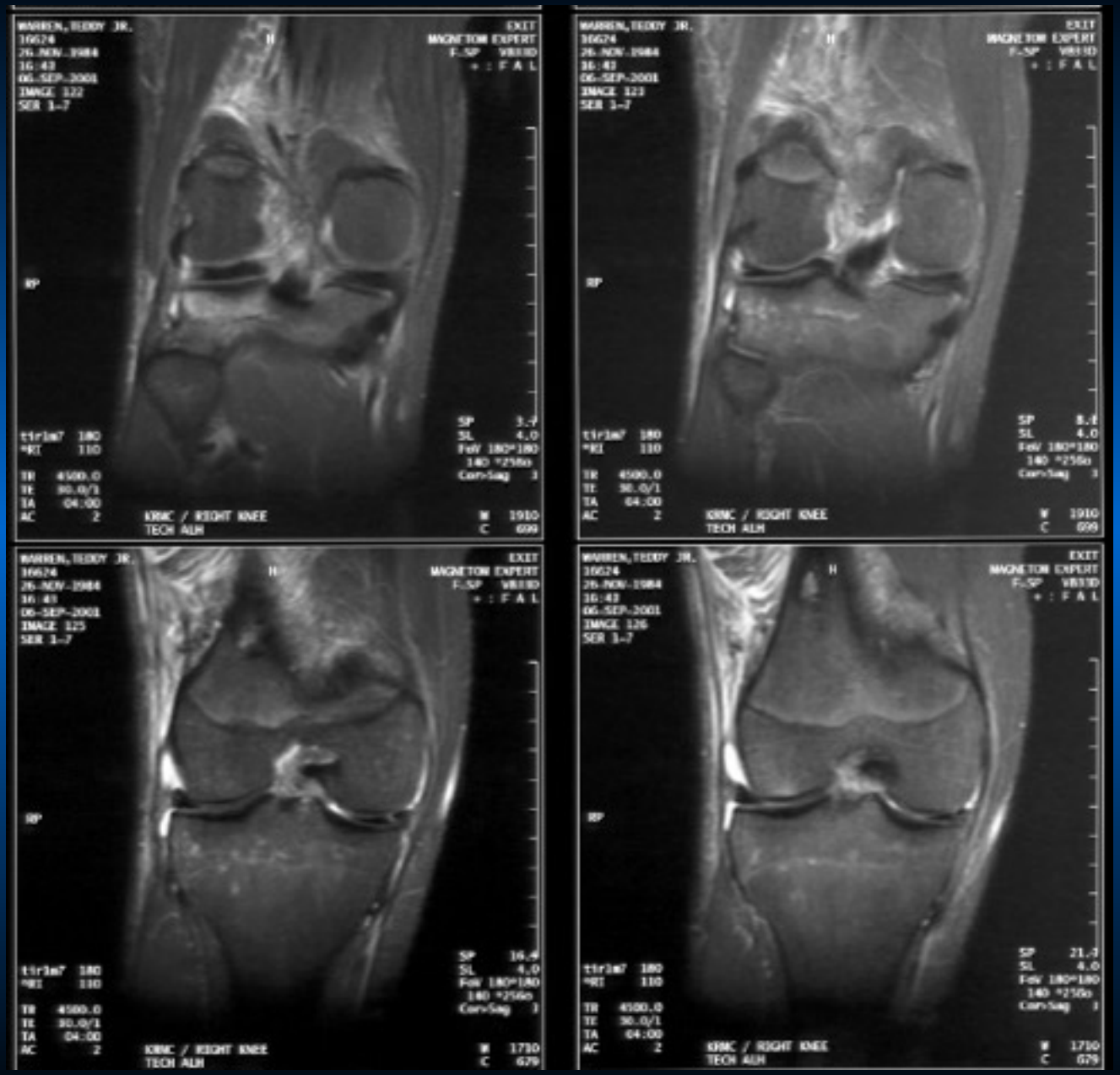




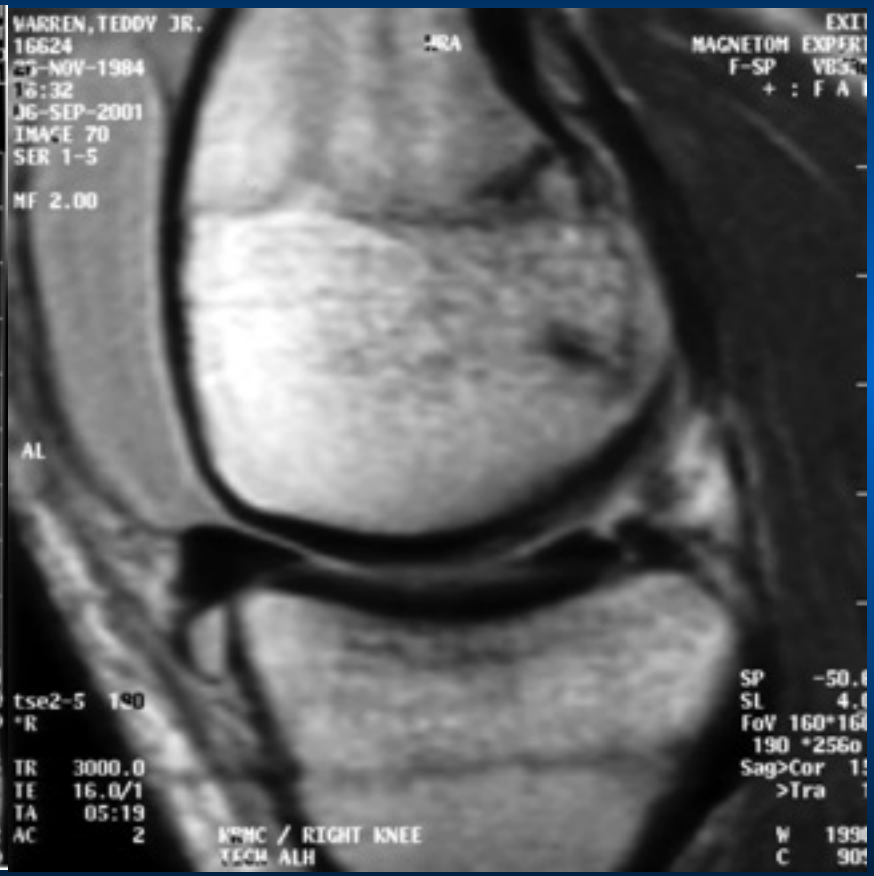


16 YOWM

- Slipped while playing football
- PE and MRI: ACL, medial & lateral meniscus tears


WARREN,TEDDY JR.
16624
26-NOV-1984
16:43
06-SEP-2001
IMAGE 122
SER 1-7
EXIT
MAGNETOM EXPERT
RP
KRMC / RIGHT KNEE
TECH ALH
WARREN,TEDDY JR.
16624
26-NOV-1984
16:43
06-SEP-2001
IMAGE 123
SER 1-7
EXIT
MAGNETOM EXPERT
RP
KRMC / RIGHT KNEE
TECH ALH
WARREN,TEDDY JR.
16624
26-NOV-1984
16:43
06-SEP-2001
IMAGE 125
SER 1-7
EXIT
MAGNETOM EXPERT
RP
KRMC / RIGHT KNEE
TECH ALH
WARREN,TEDDY JR.
16624
26-NOV-1984
16:43
06-SEP-2001
IMAGE 126
SER 1-7
EXIT
MAGNETOM EXPERT
RP
KRMC / RIGHT KNEE
TECH ALH

16624
26-NOV-1984
16:32
06-SEP-2001
IMAGE 68
SER 1-5
HRA
AL
tse2-5 180
*R
TR 3000.0
TE 16.0/1
TA 05:19
AC 2
KRMC / RIGHT KNEE
TECH ALH
SP
SL
FoV 160*
190 *256
Sag>Cor
>Tra
W 1982
C 1030


VARREN,TEDDY JR.
16624
-NOV-1984
16:32
06-SEP-2001
IMAGE 70
SER 1-5
MF 2.00
HRA
AL
tse2-5 180
*R
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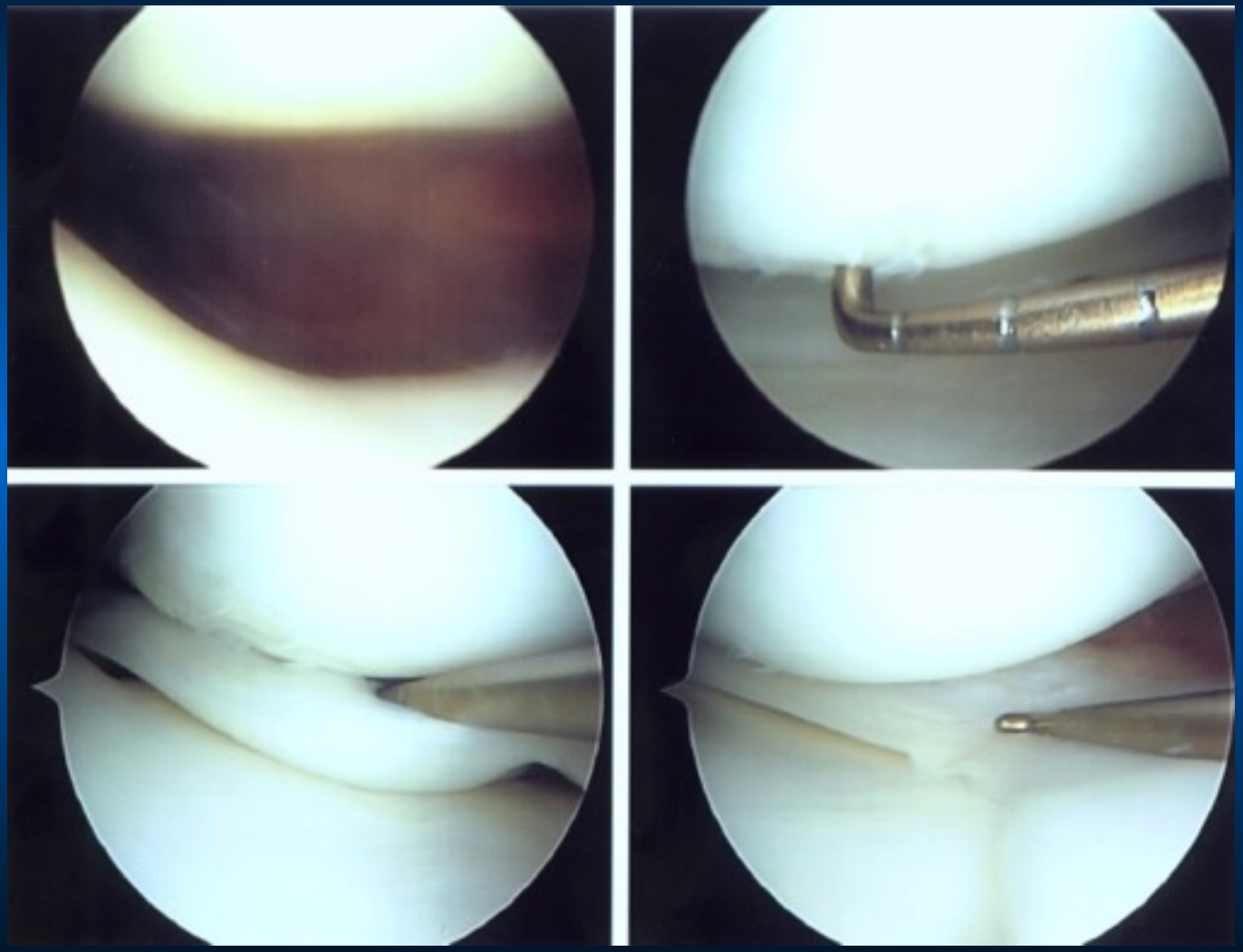
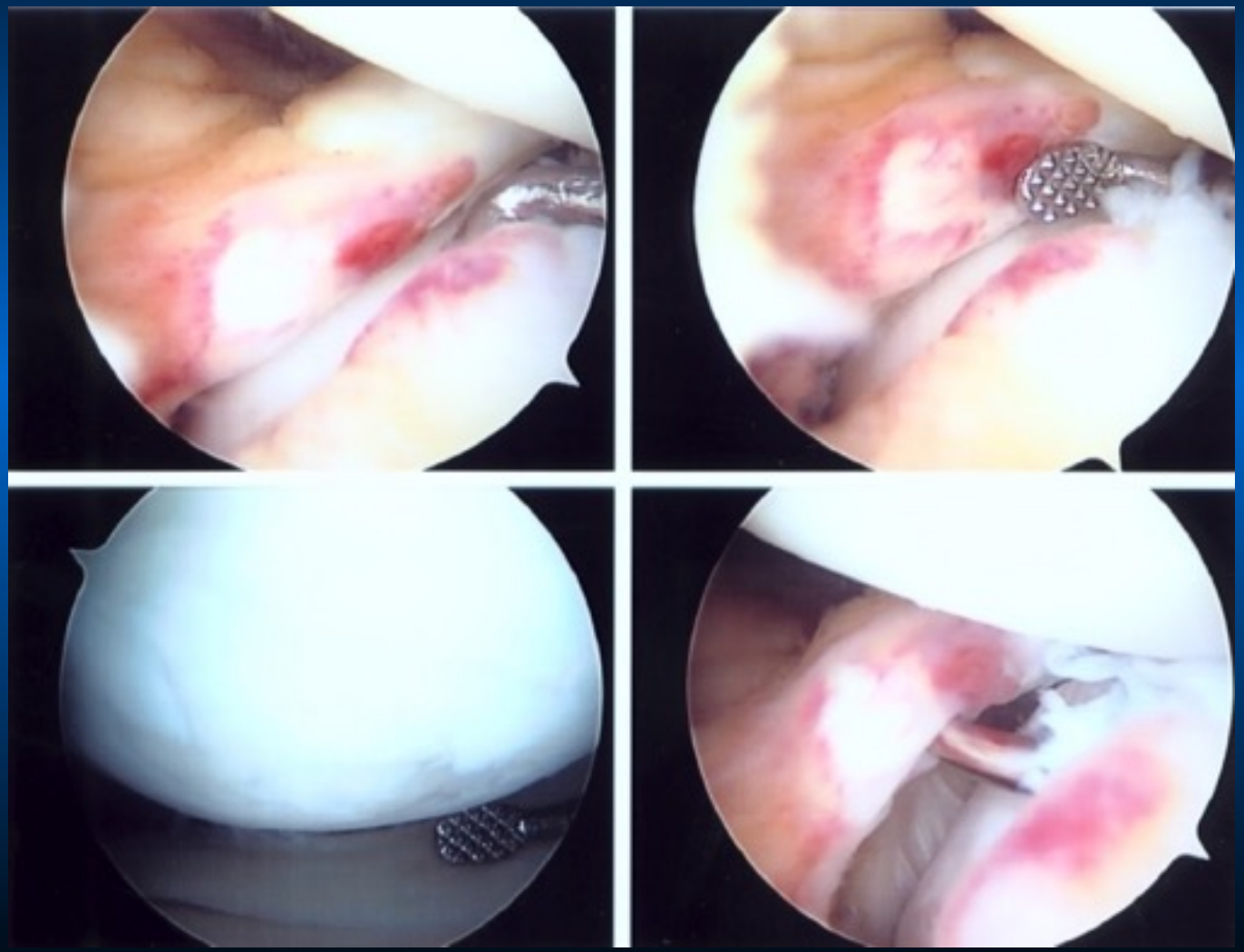
AC 2
SP
SL
FoV 160*
190 *256
Sag>Cor
>Tra

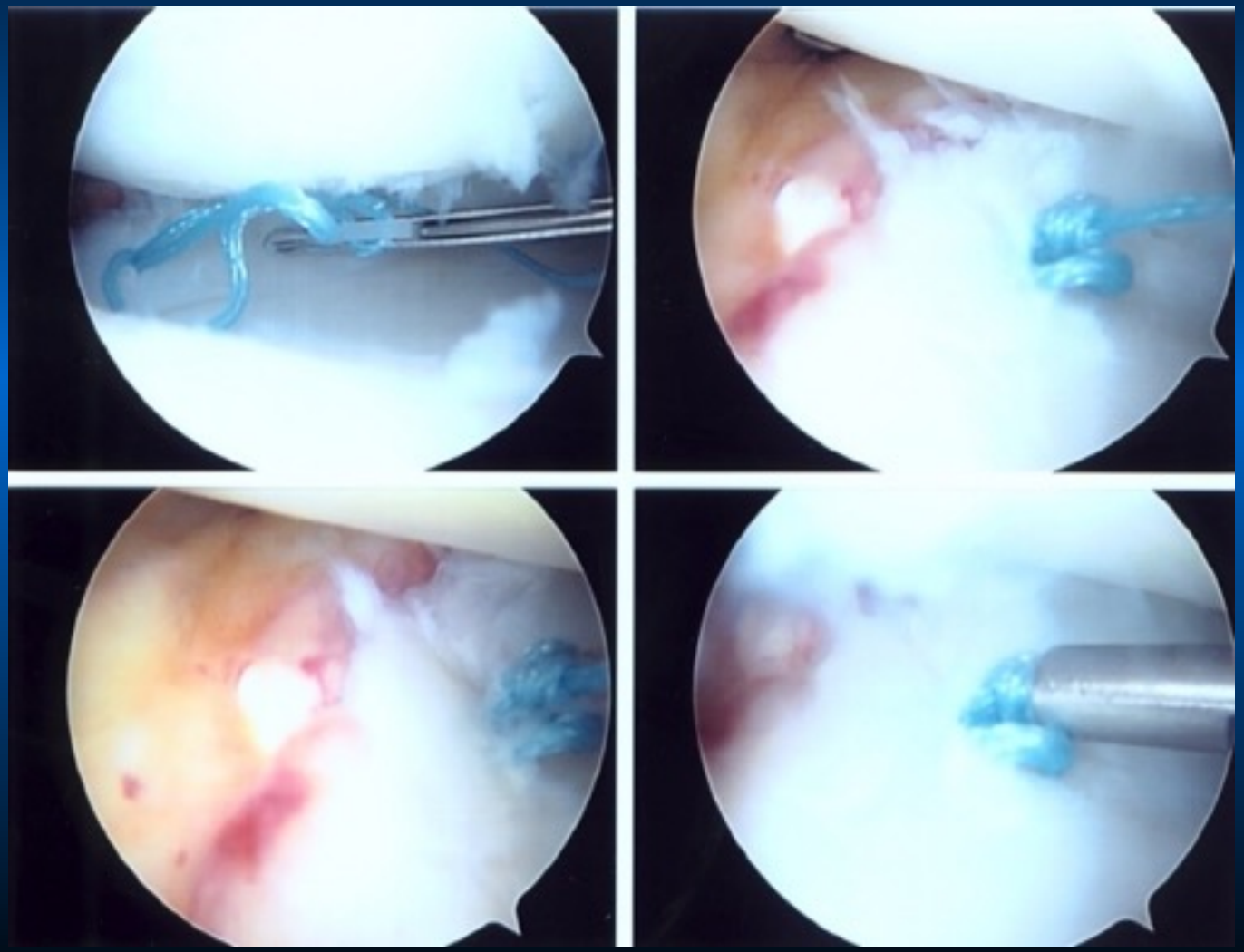
Medial meniscus



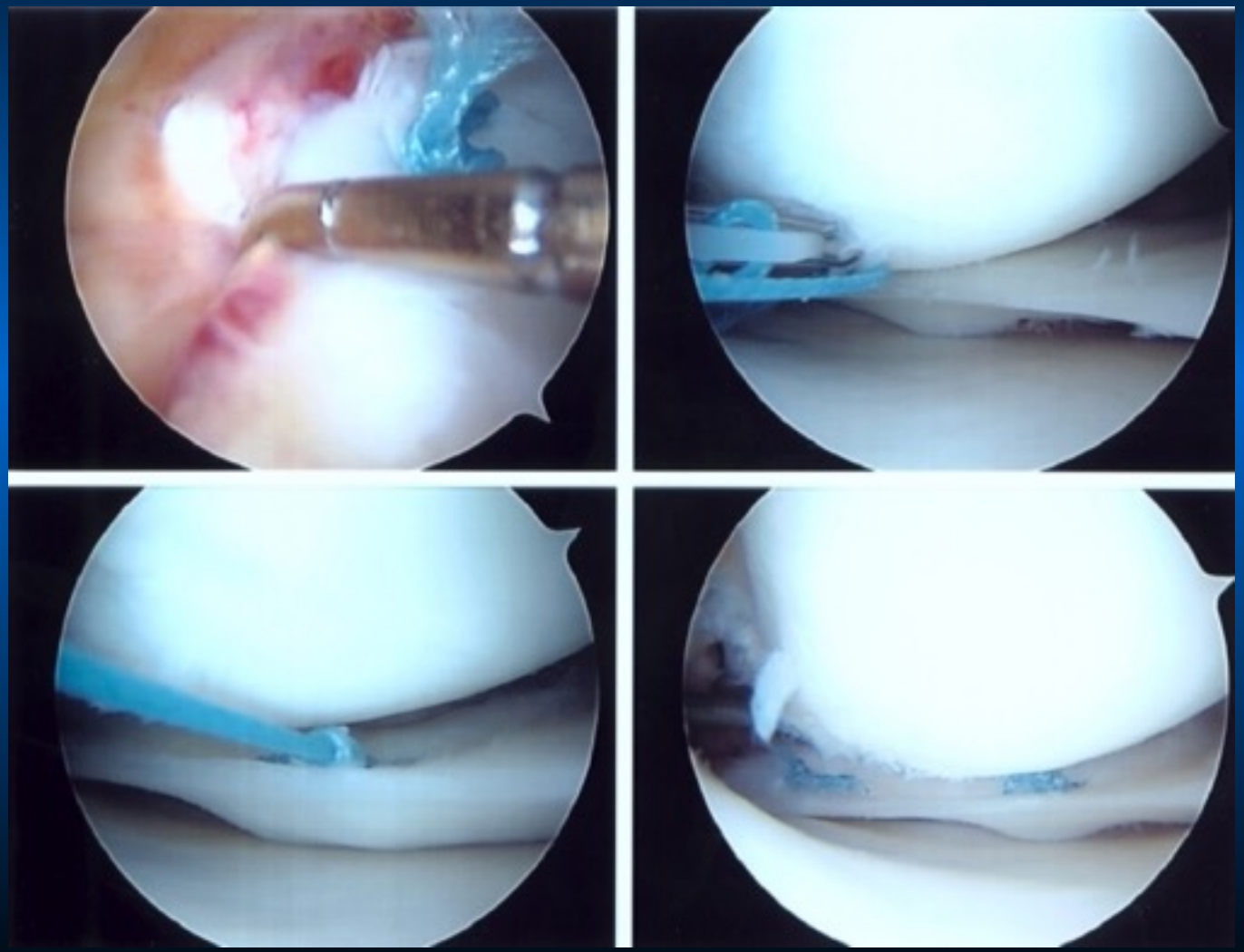
Medial meniscus



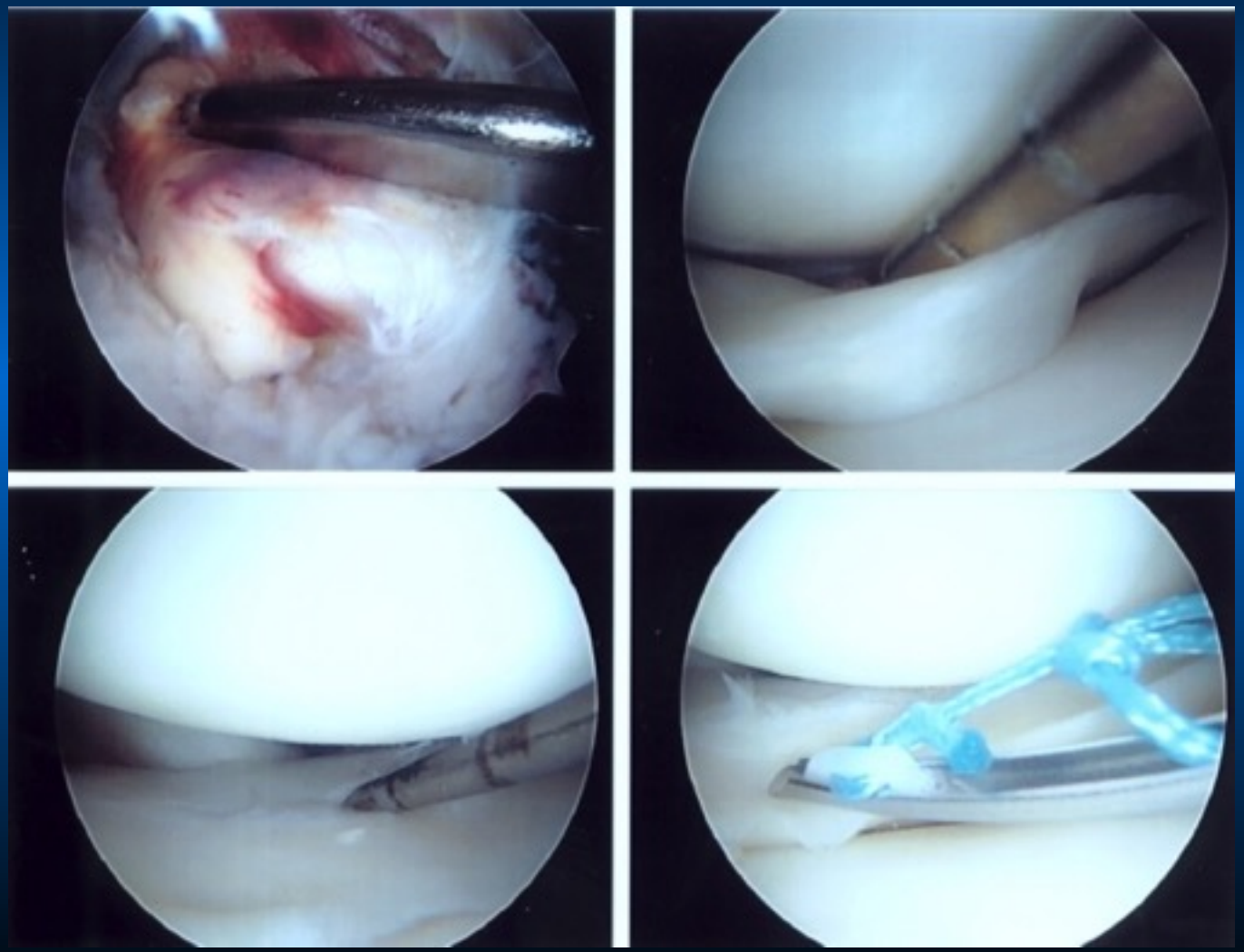
Medial meniscus



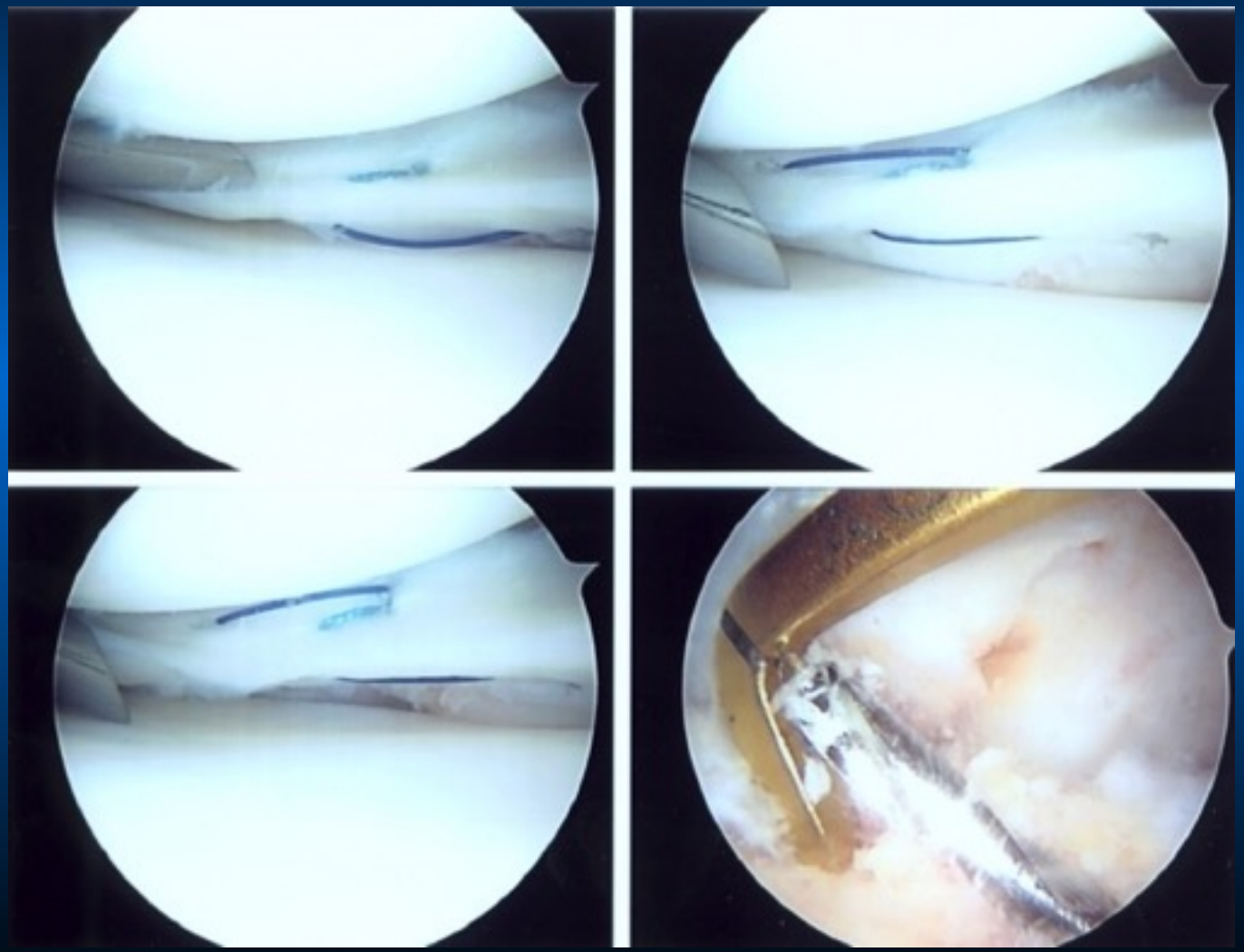
Medial meniscus

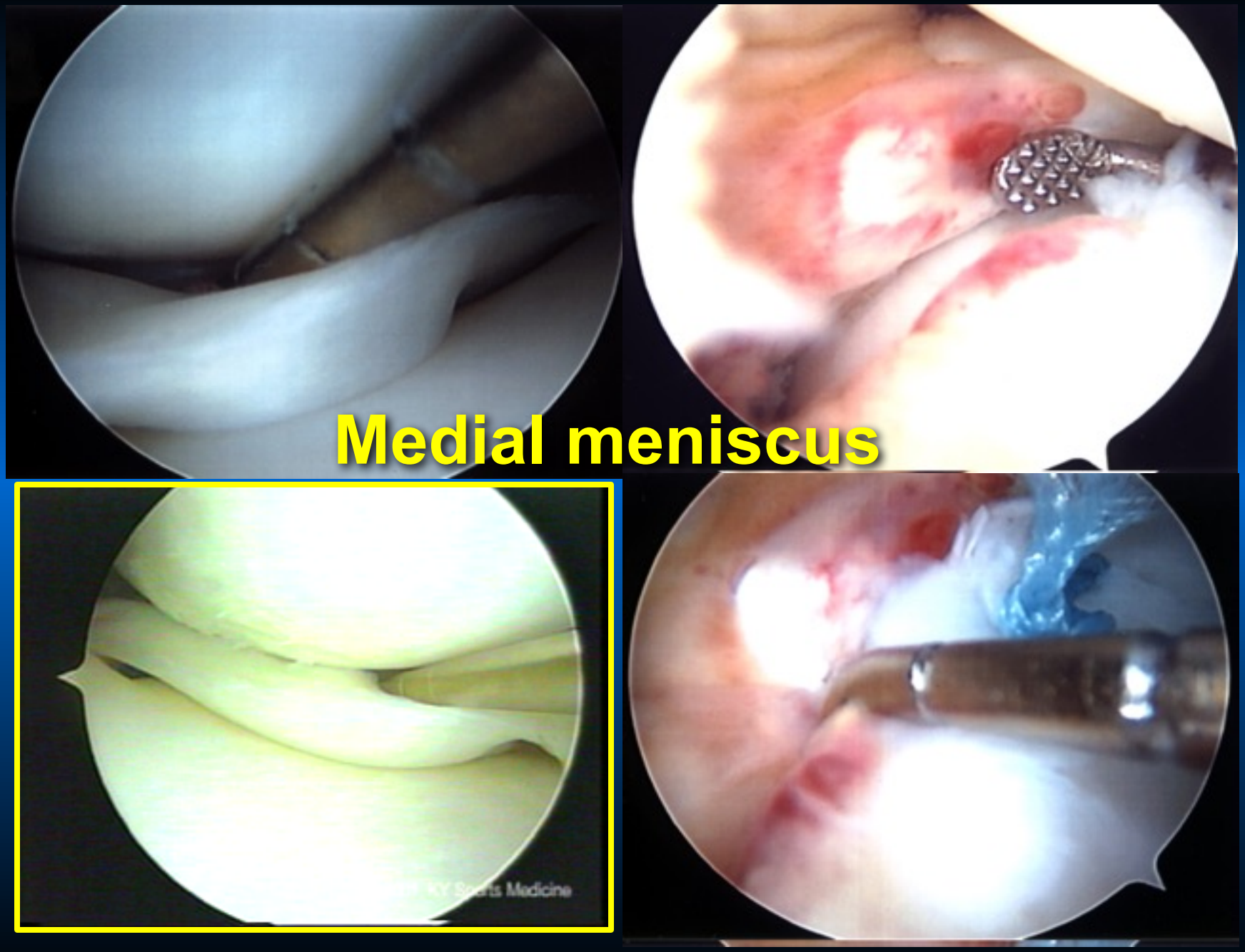


Medial meniscus

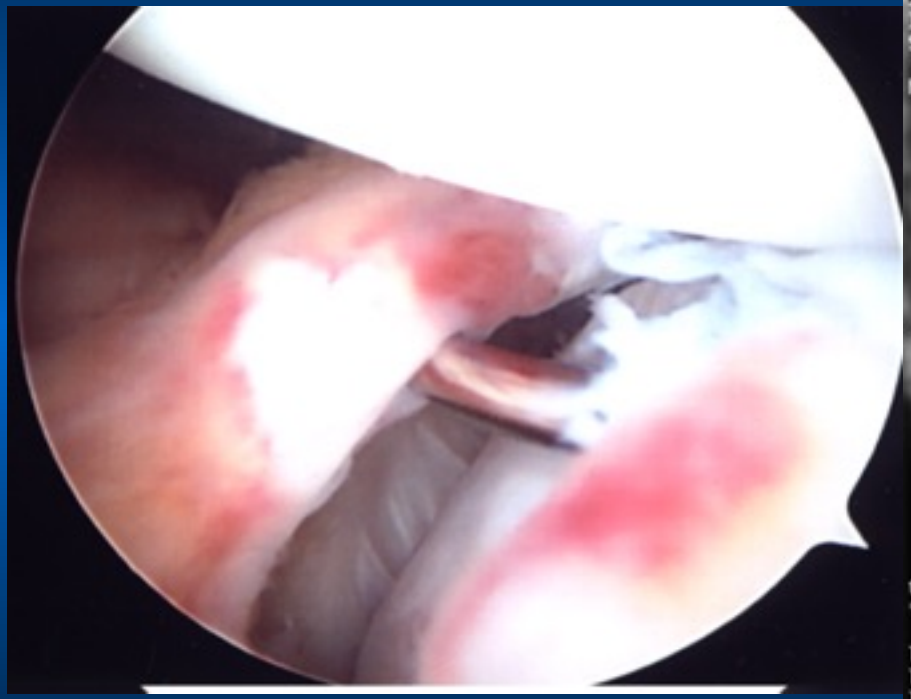


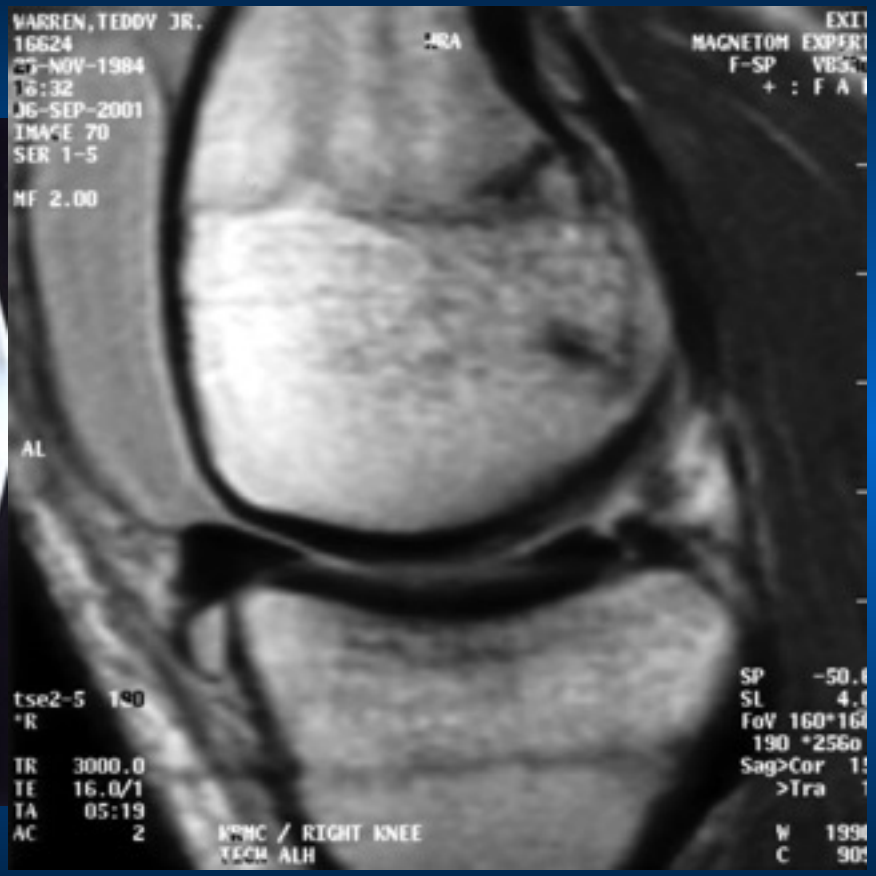
Medial meniscus



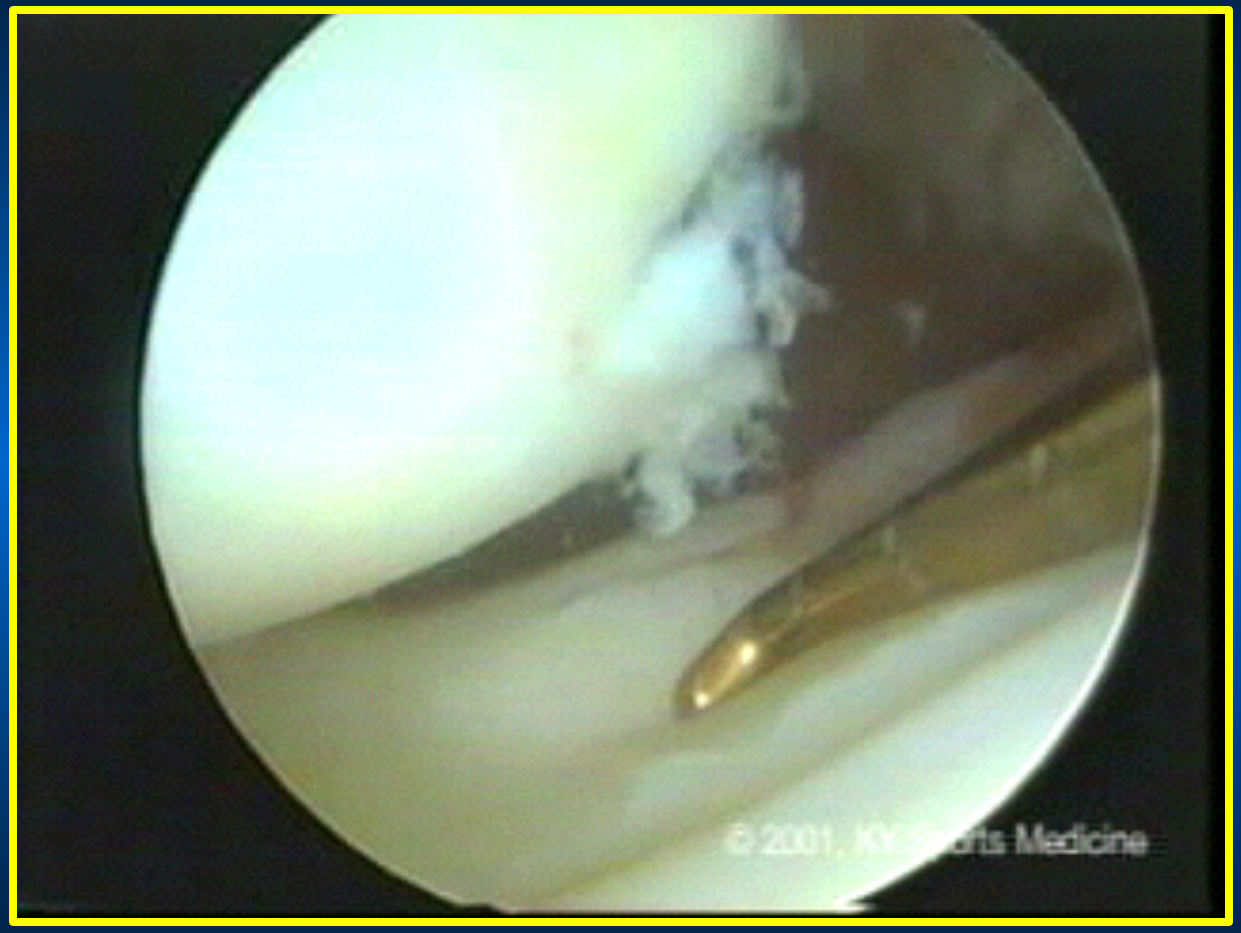

Medial meniscus

Medial meniscus

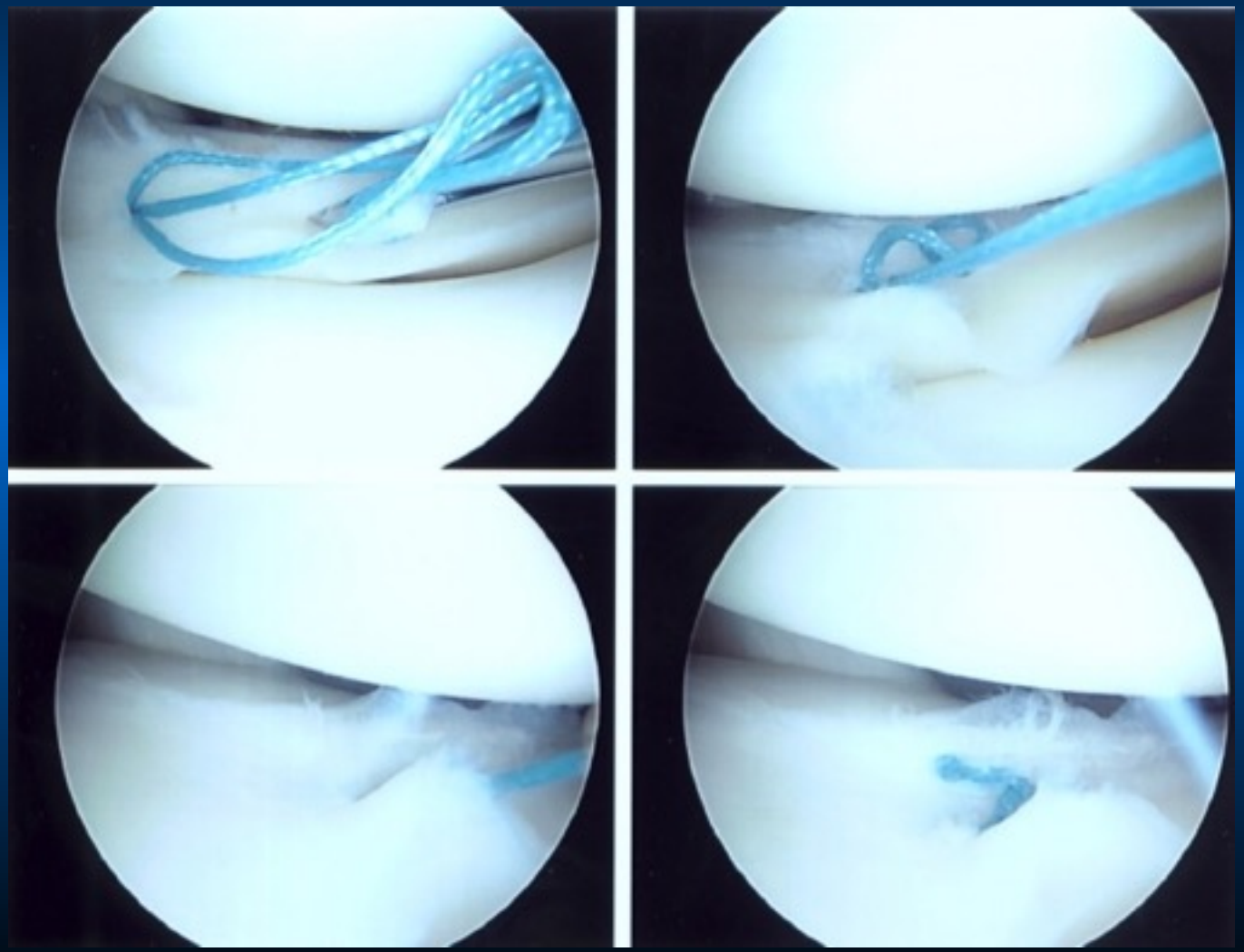




Lateral Meniscus

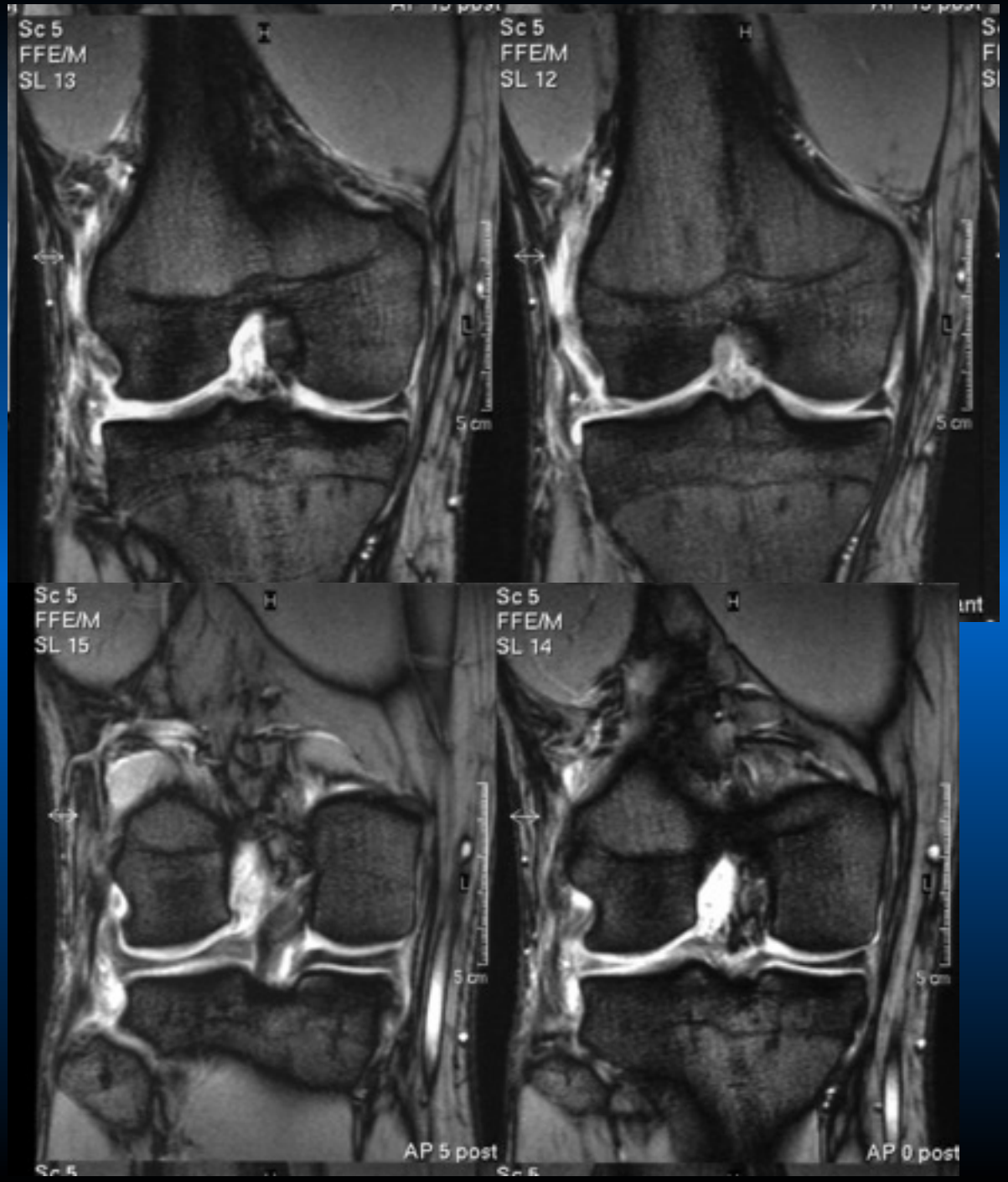


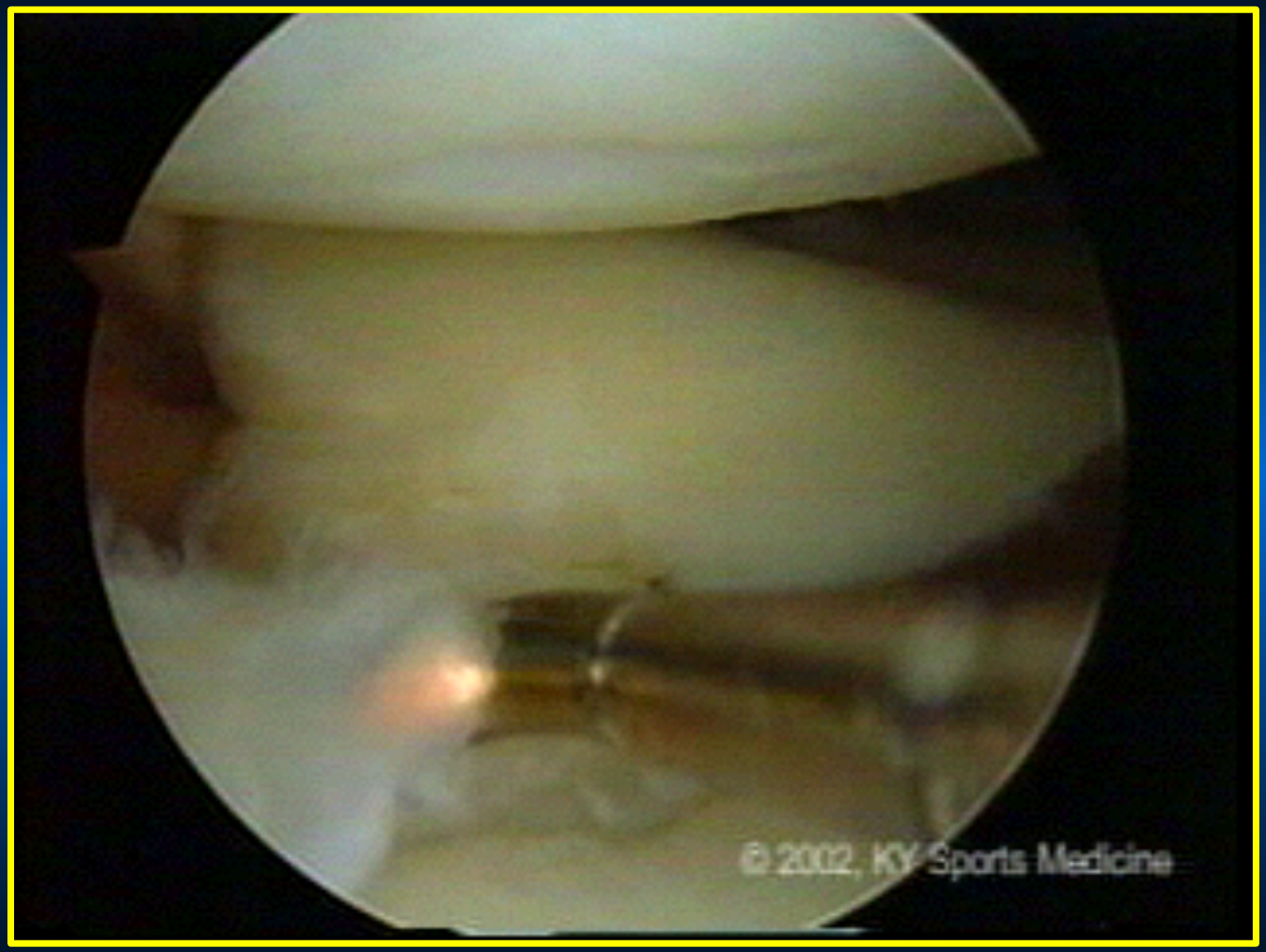
Lateral meniscus



22 yo

- Right knee
- Acute complete ACL tear
- Torn lateral meniscus

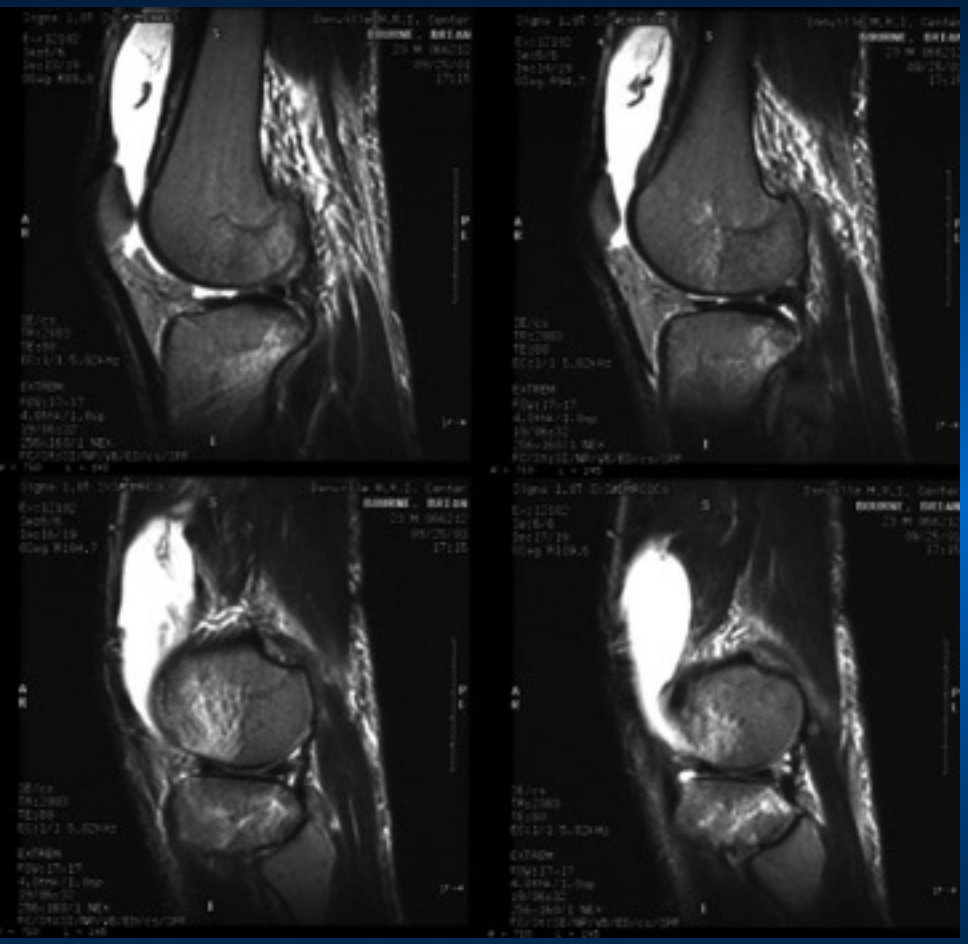

Sc 5
FFE/M
SL 13
5 cm
Sc 5
FFE/M
SL 12
5 cm
Sc 5
FFE/M
SL 15
5 cm
AP 5 post
Sc 5
FFE/M
SL 14
5 cm
AP 0 post

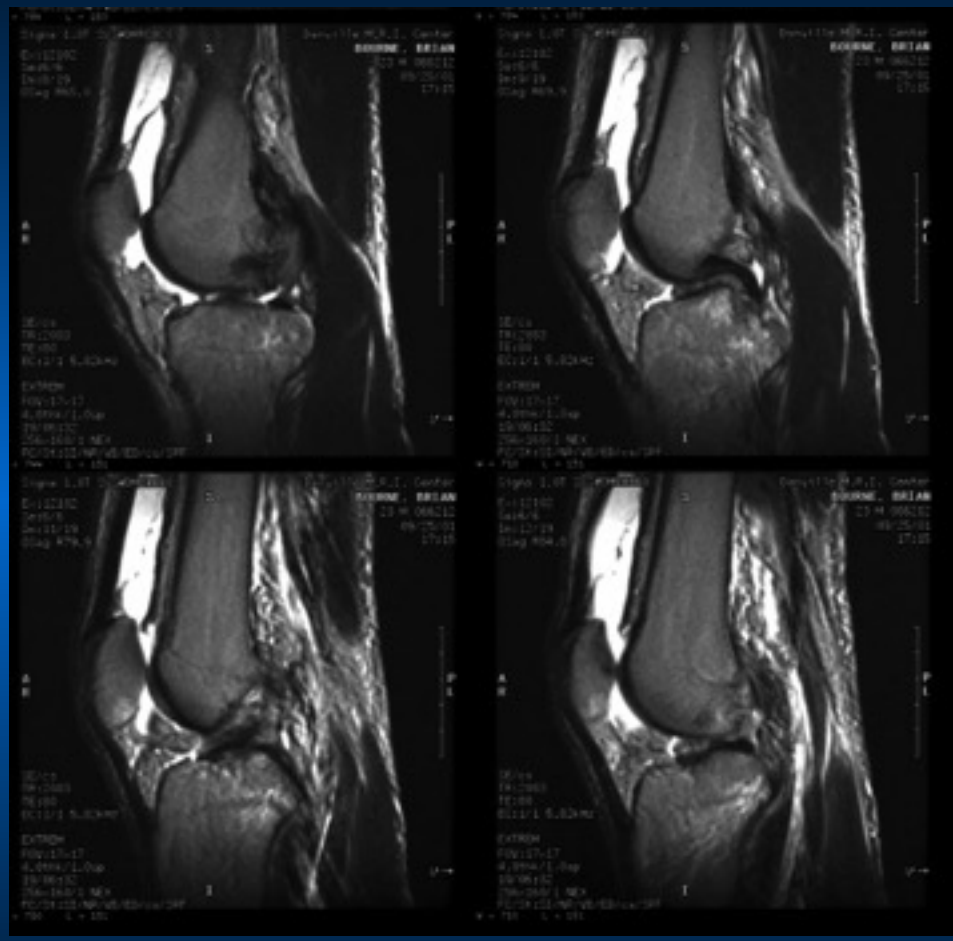

© 2002, KY Sports Medicine

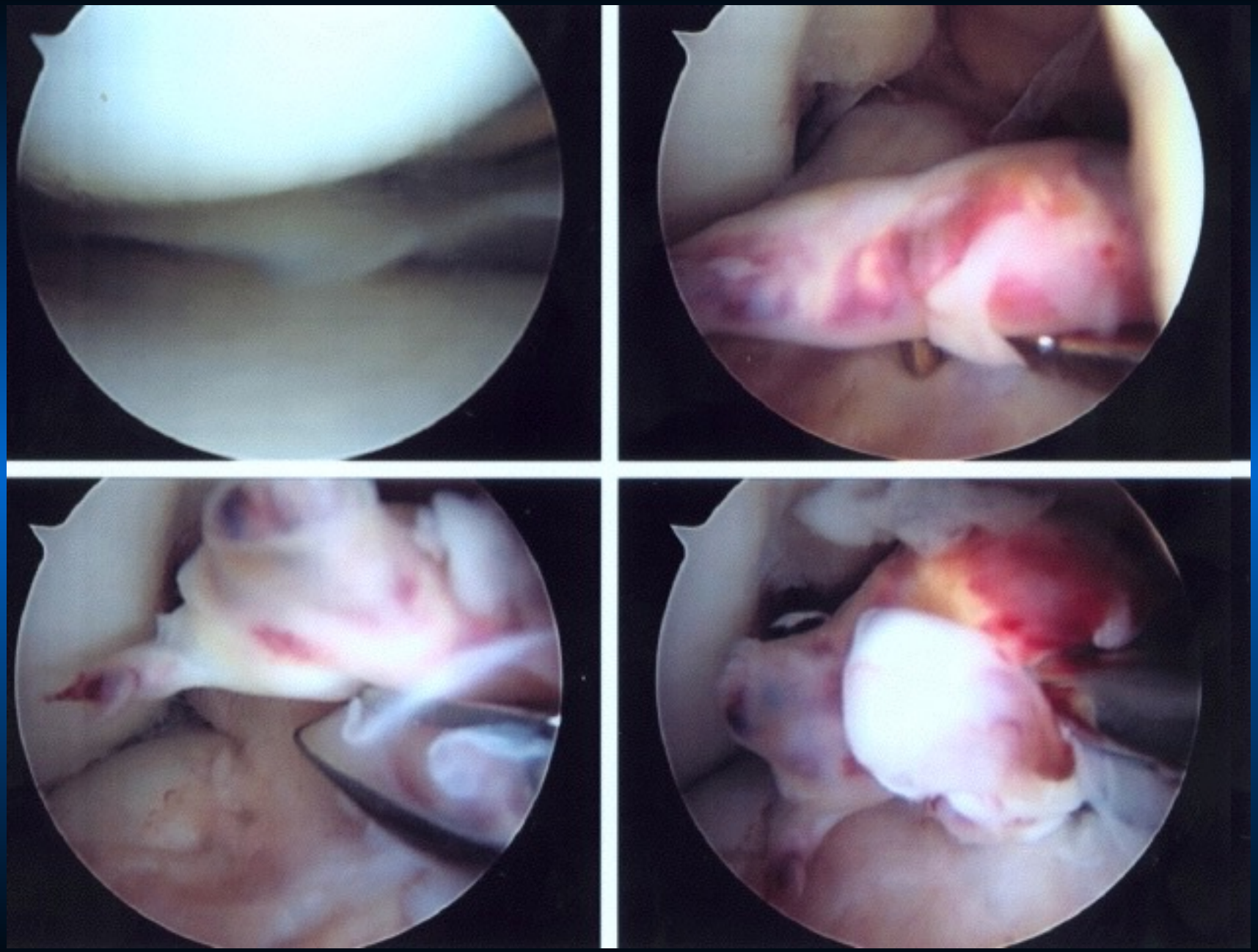
23 year old white male

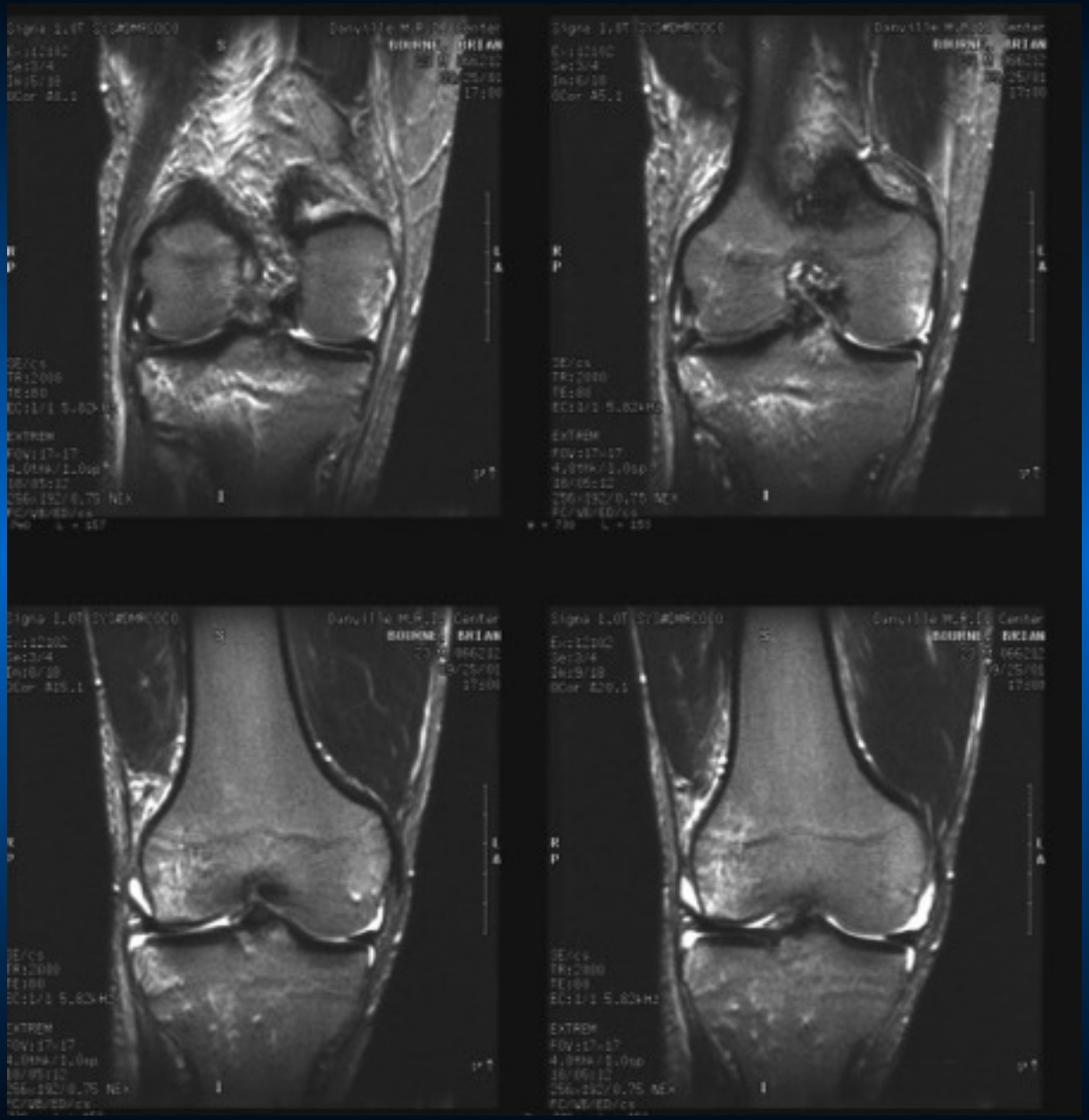
- Dirt bike accident
- Right knee
- PE and MRI scan:
  ACL tear and
  cystic lateral meniscus tear

- X-ray: lateral capsular sign
- Segond fracture

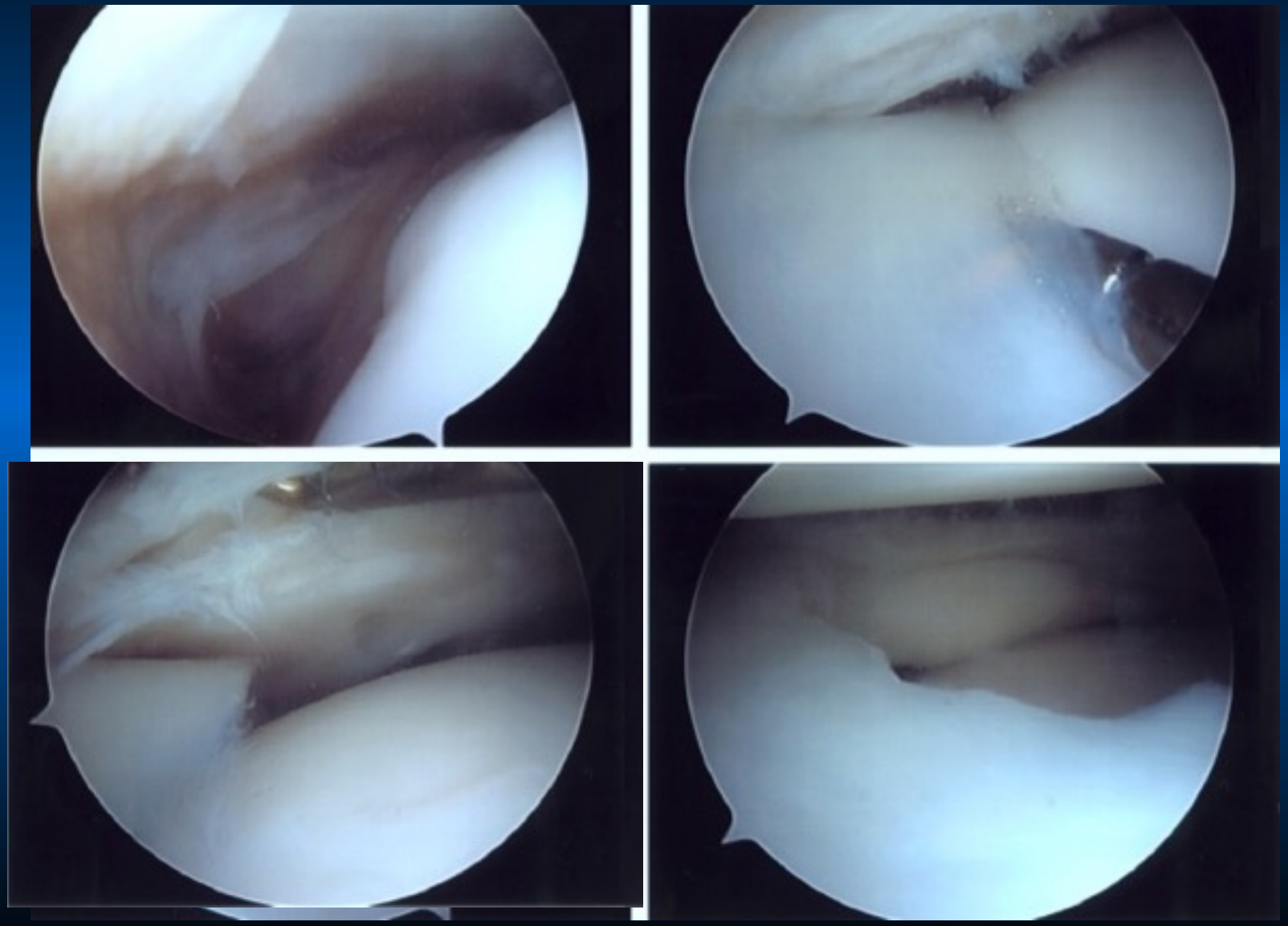




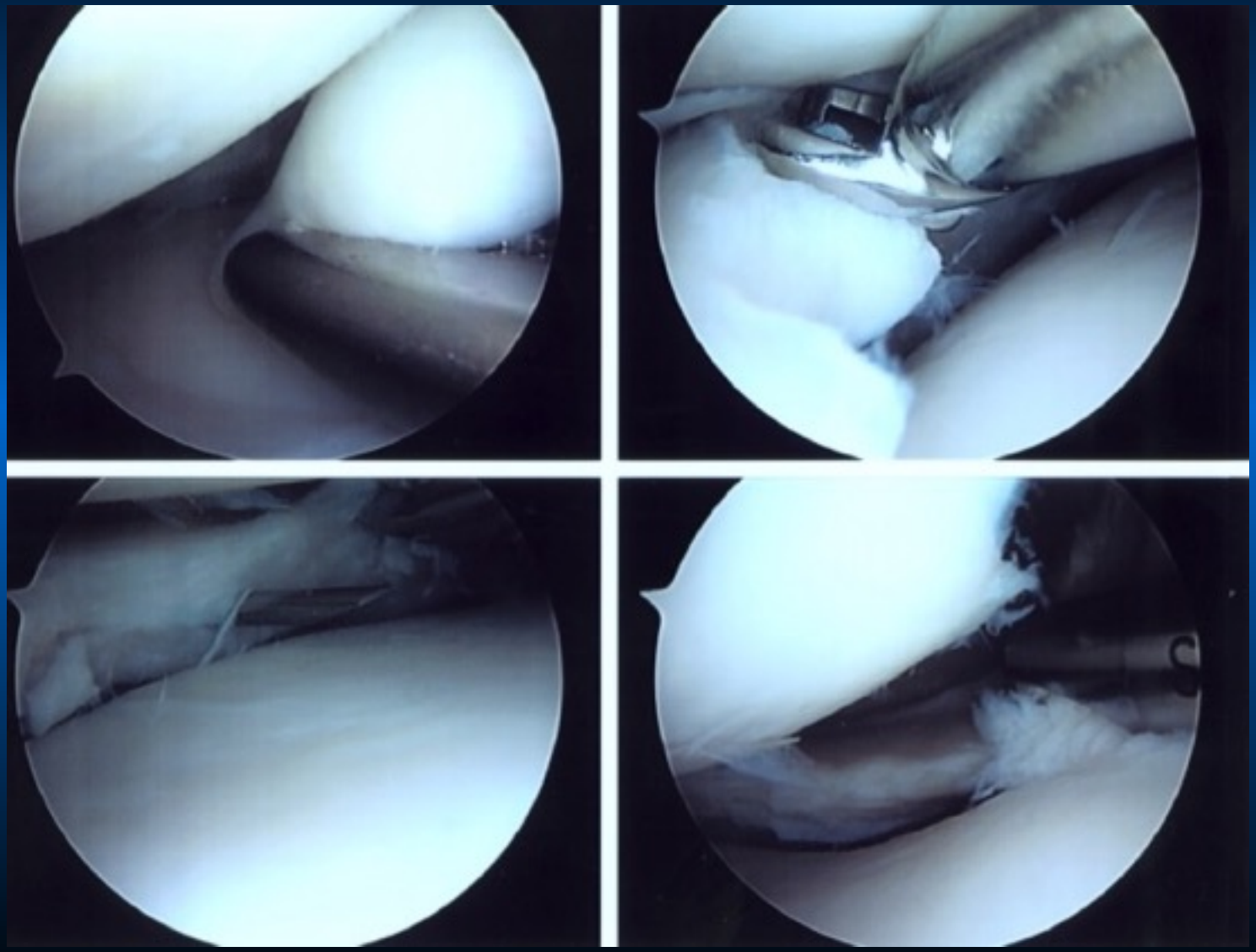




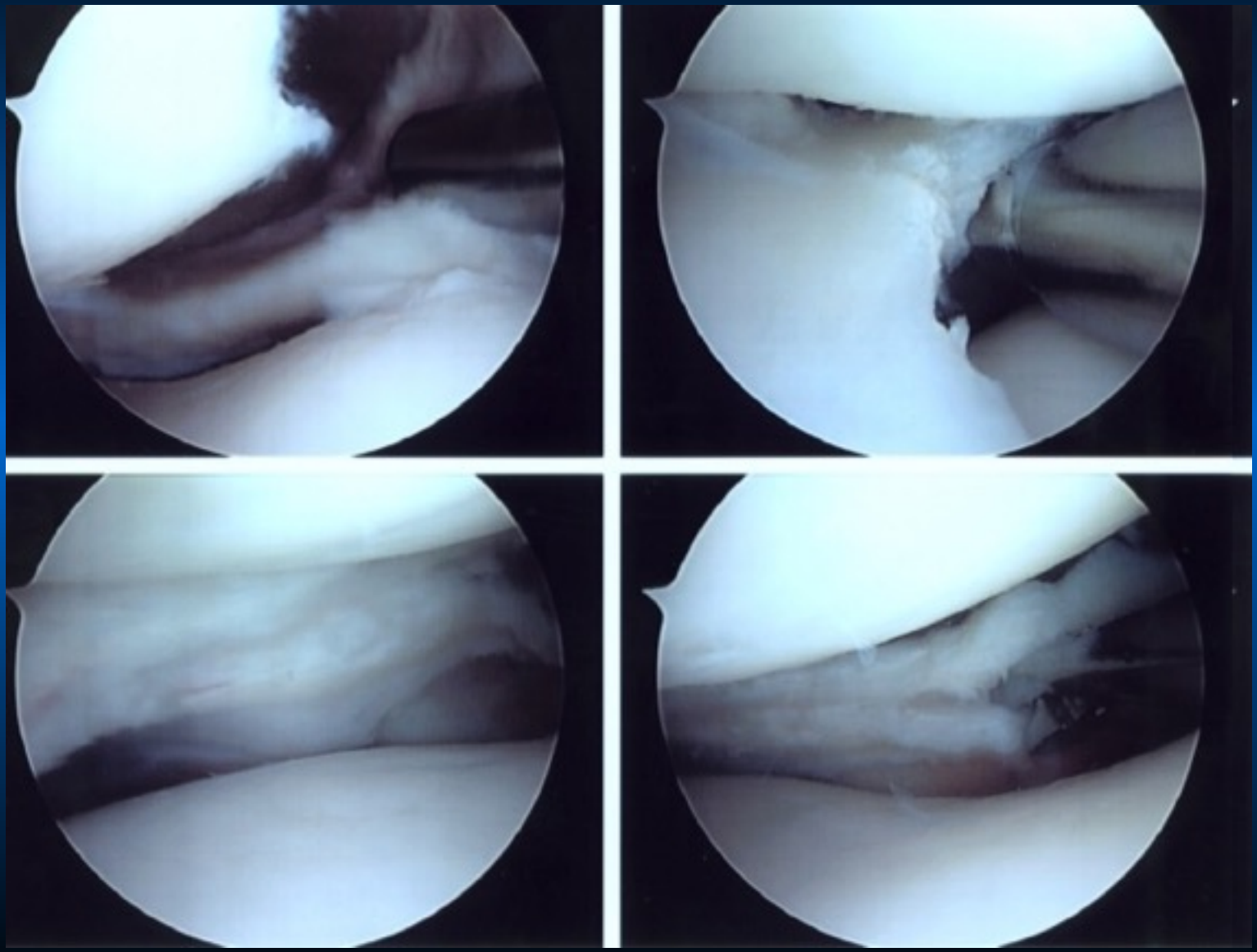
Lateral Meniscus



Lateral meniscus

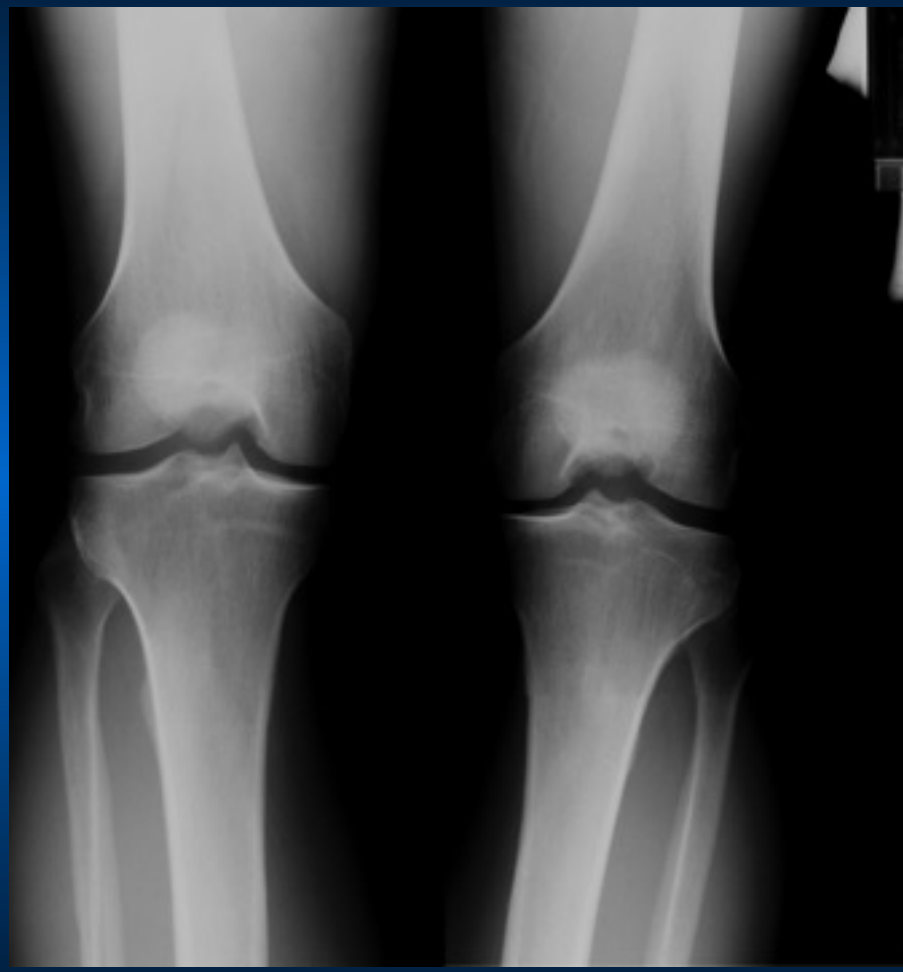


Lateral meniscus

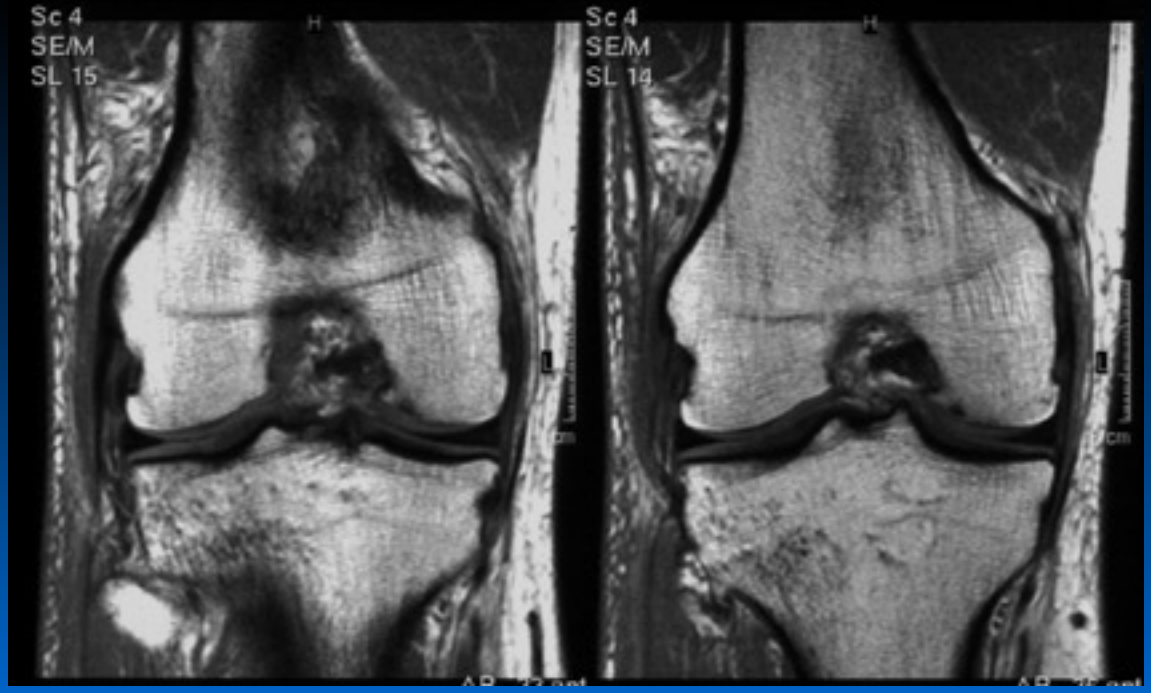


42 YO

- Soccer, contact injury
- Complete ACL tear
- Bucket handle tears of the medial and lateral meniscus
- Grade IV osteochondral lesion medial femoral condyle, right knee

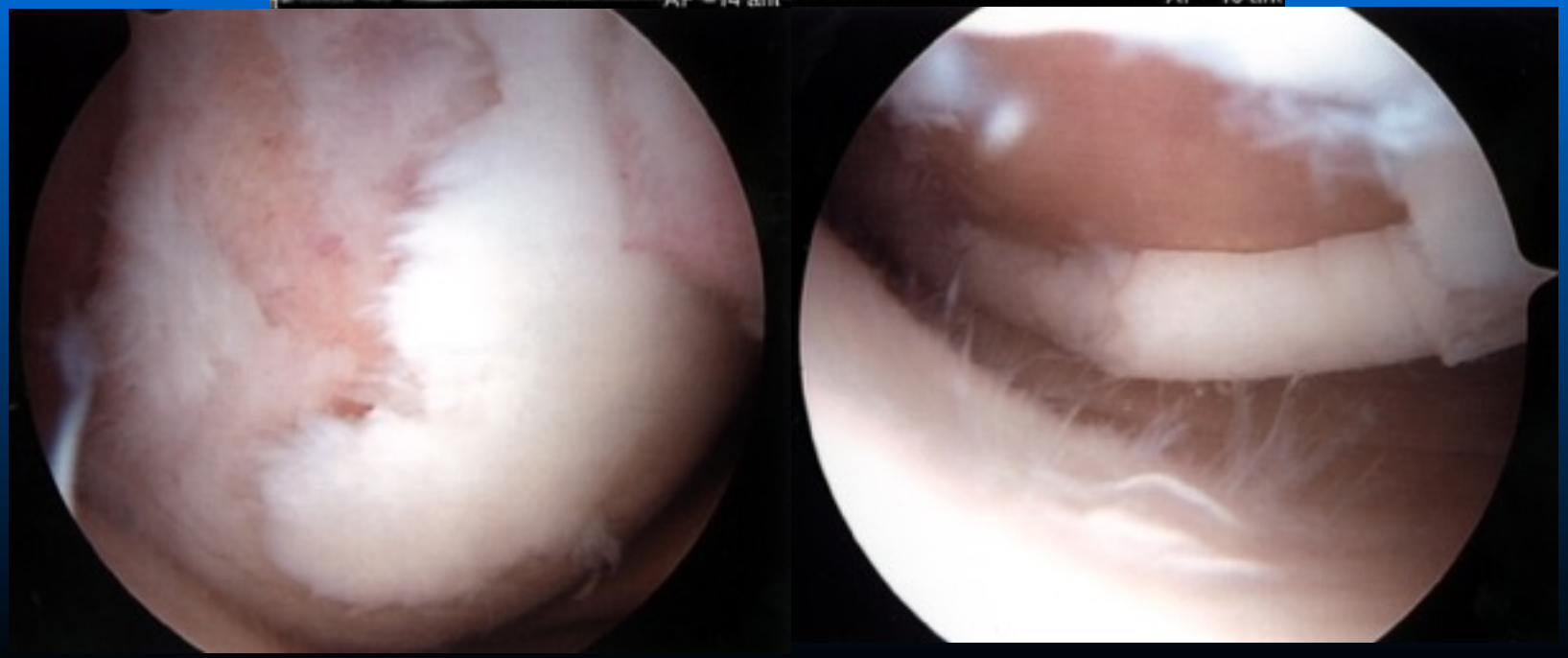


Sc 3
TSE/M
SL 10
Ec 2
H
P
5 cm
RL -79 right
Sc 3
TSE/M
SL 9
Ec 2
H
P
RL -75 ri
Sc 3
TSE/M
SL 5
Ec 2
H
P
5 cm
RL -57 right
Sc 3
TSE/M
SL 4
Ec 2
H
P
RL -52 ri

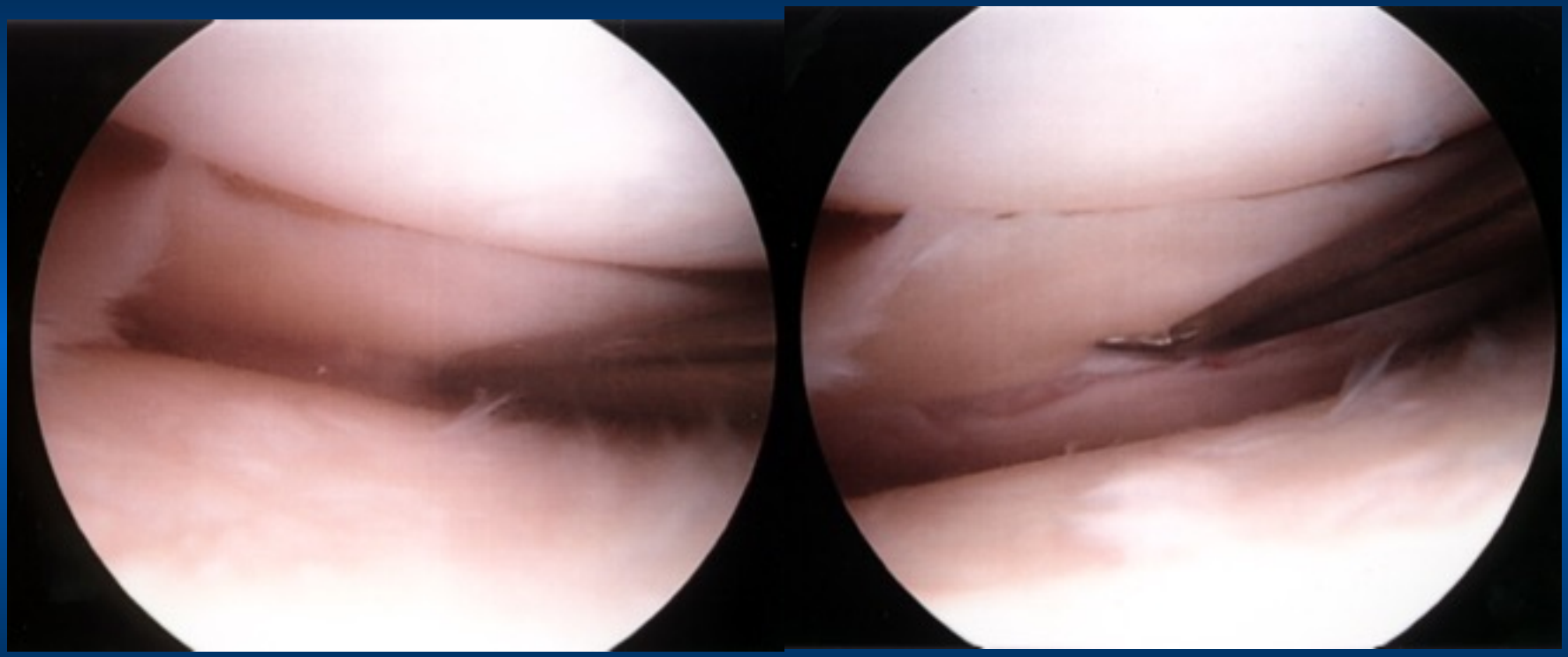

Sc 4
SE/M
SL 15
Sc 4
SE/M
SL 14

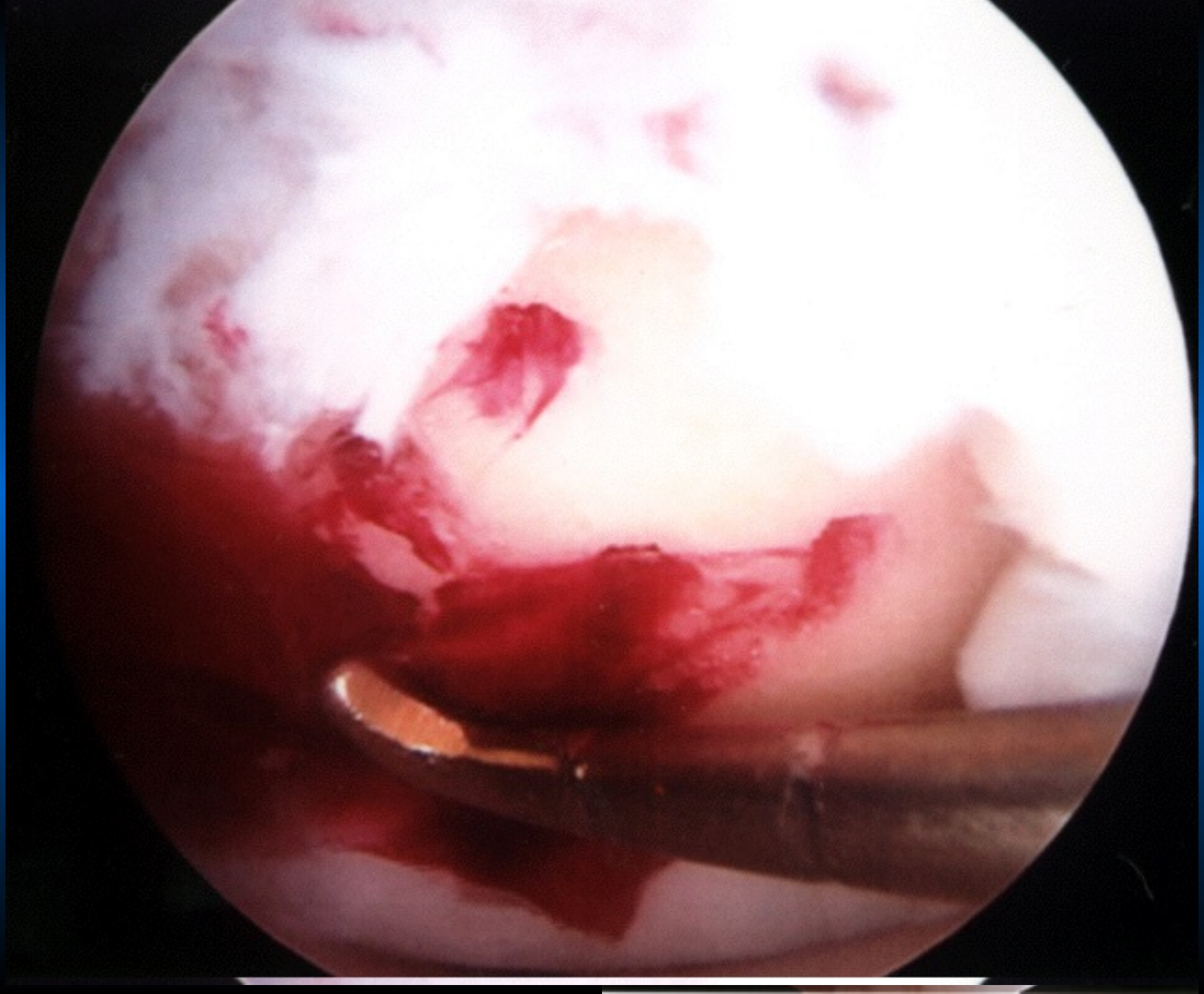
Sc 6
IR-TSE/M
SL 12
5 cm
Sc 6
IR-TSE/M
SL 11
5 cm

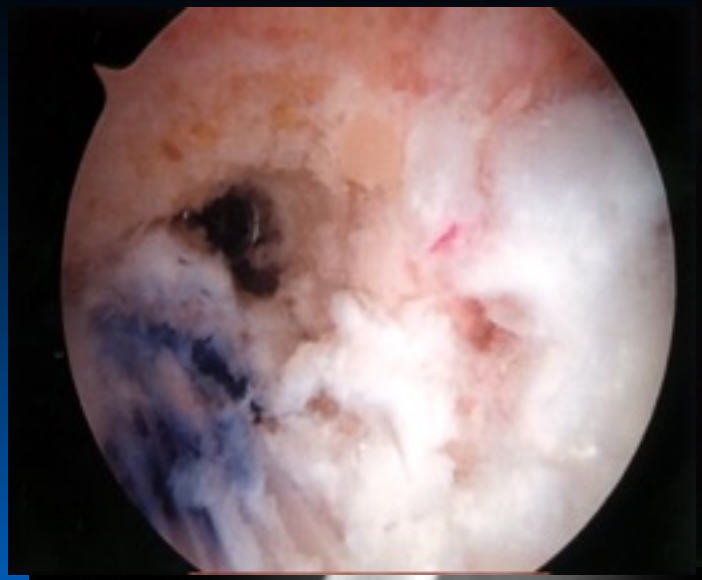
Sc 5
FFE/M
SL 17
AP -14 ant
Sc 5
FFE/M
SL 16
AP -16 ant

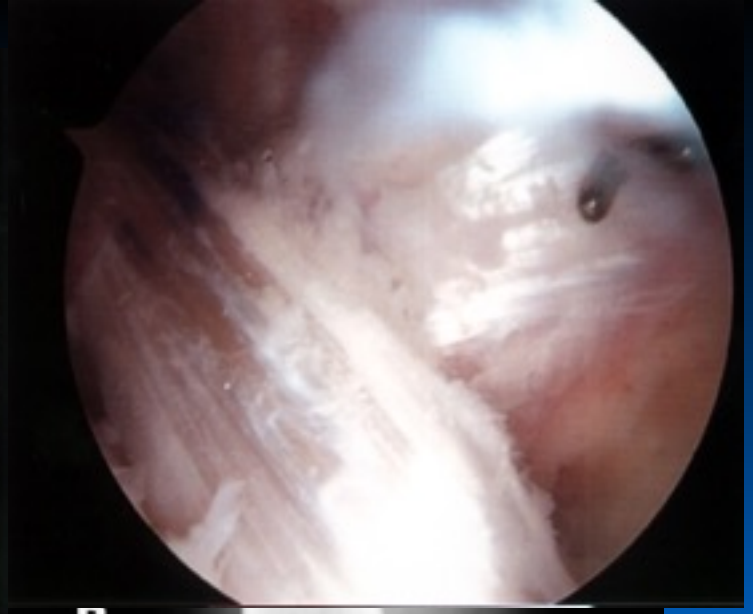


Sc 7
TSE/M
SL 4
H
P
5 cm
RL -82 right
Sc 7
TSE/M
SL 3
H
P
5 cm
RL -79 right









R

Post op x-rays

26 YO WM

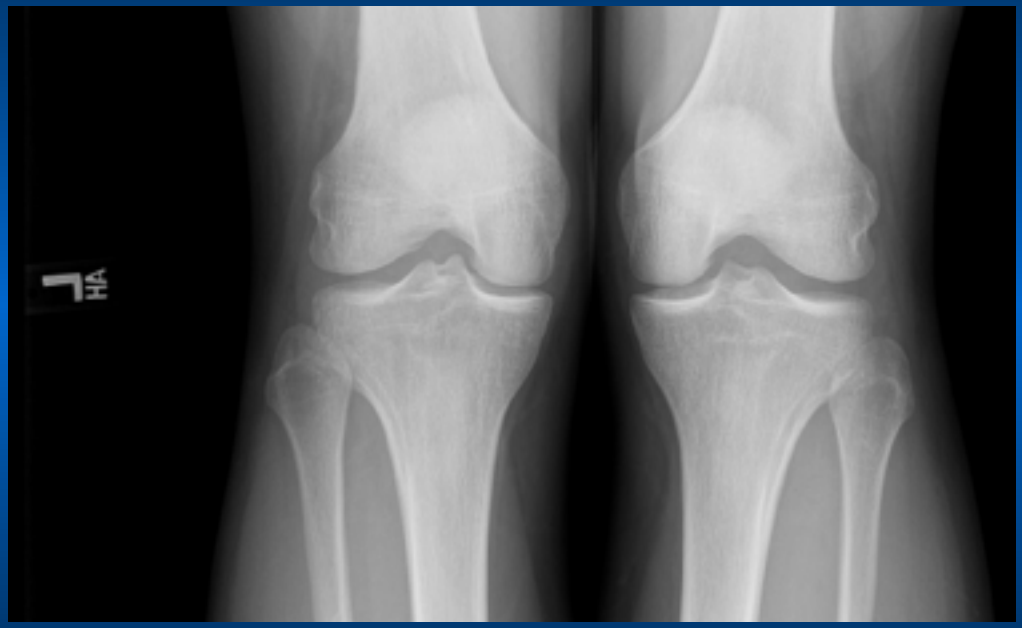
- Police officer, injured his left knee playing basketball two weeks prior to presentation.
- On further questioning, he has had problems with knee pain, shifting sensation for the last couple of years and he has been wearing a brace

PE

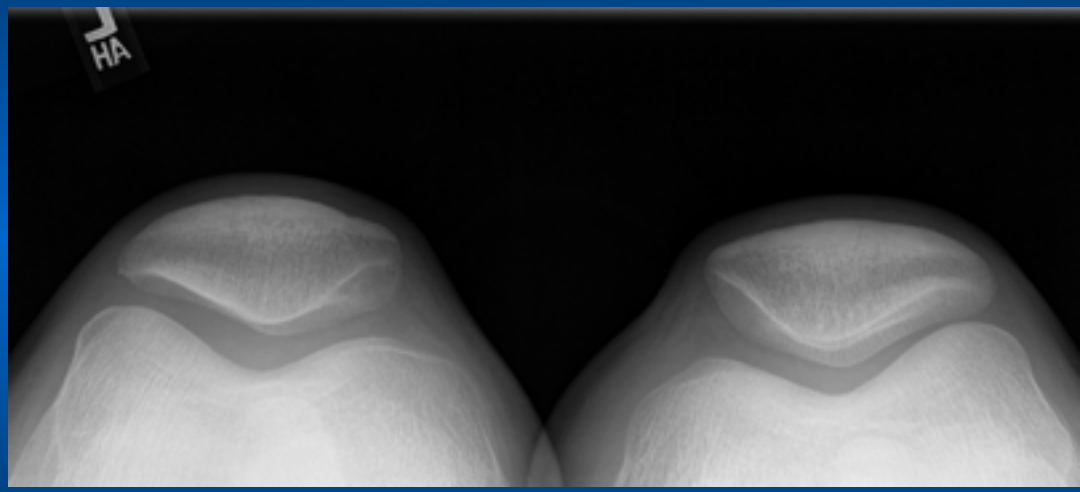
- RIGHT KNEE:
  - 10° hyperextension, 140° flexion.
  - Stable.
  - No medial or lateral joint line tenderness.
- LEFT KNEE:
  - 0-120° active and passive range of motion with pain medial and lateral extremes of flexion.
  - Negative bounce home test. Negative McMurray's test.
  - Anterior drawer is 2+.
  - Lachman is positive without an endpoint. Pivot shift is positive. There is symmetrical 2+ opening on varus stress testing at 30°. Stable in extension. Observation of gait shows no asymmetry. Varus thrust.

Plain radiographs

- Standing 30° flexed PA views, patellar views, lateral view of the left knee were obtained.
- No bony abnormalities.
- Symmetrical alignment, clear spaces.
- Negative Segond fracture.



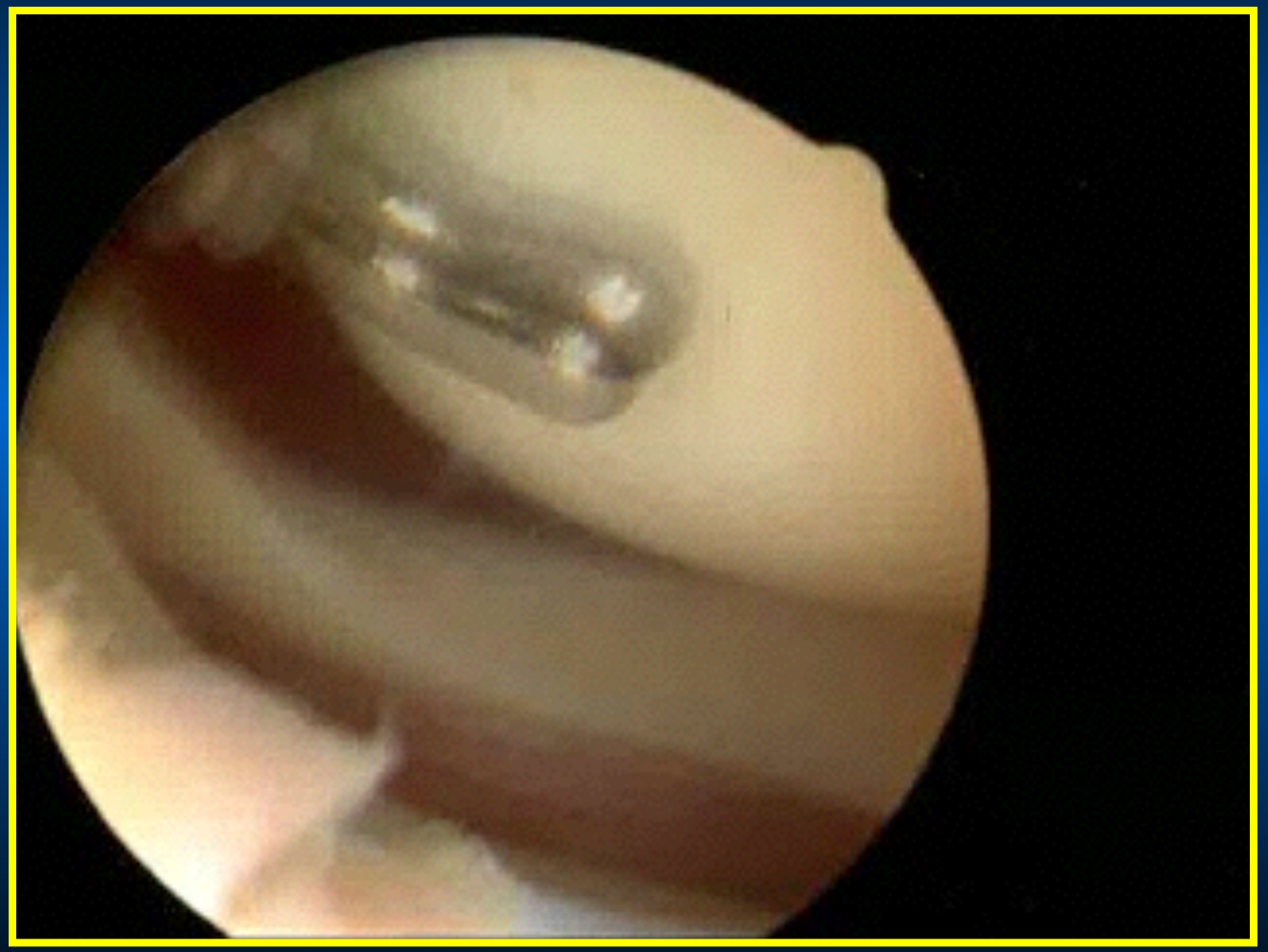
Plain radiographs



CLINICAL IMPRESSION

- Chronic severe anterolateral rotatory instability with complete anterior cruciate ligament tear
- Possible mediolateral meniscal tear.

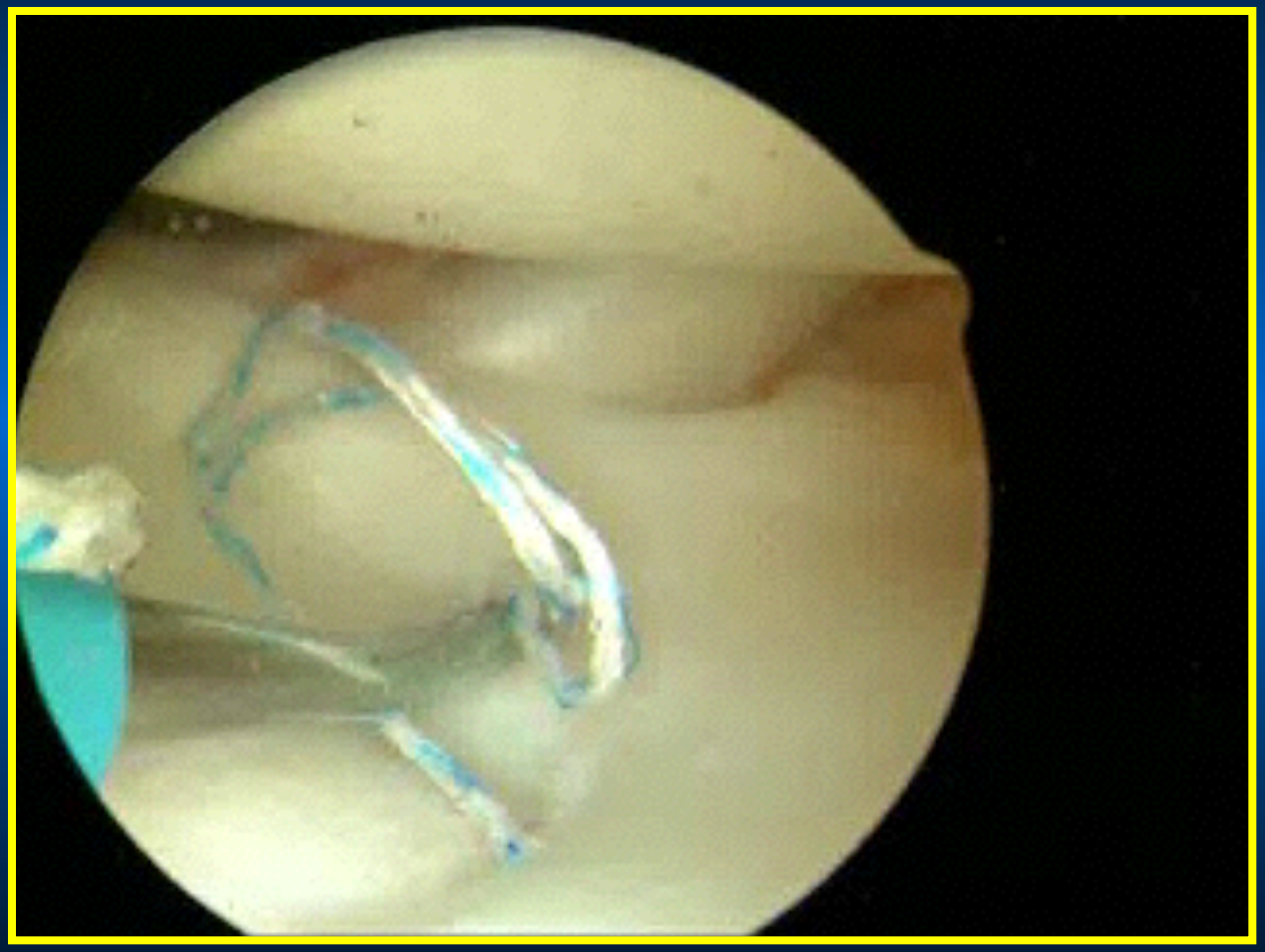
Arthroscopy: Probing



What treatment

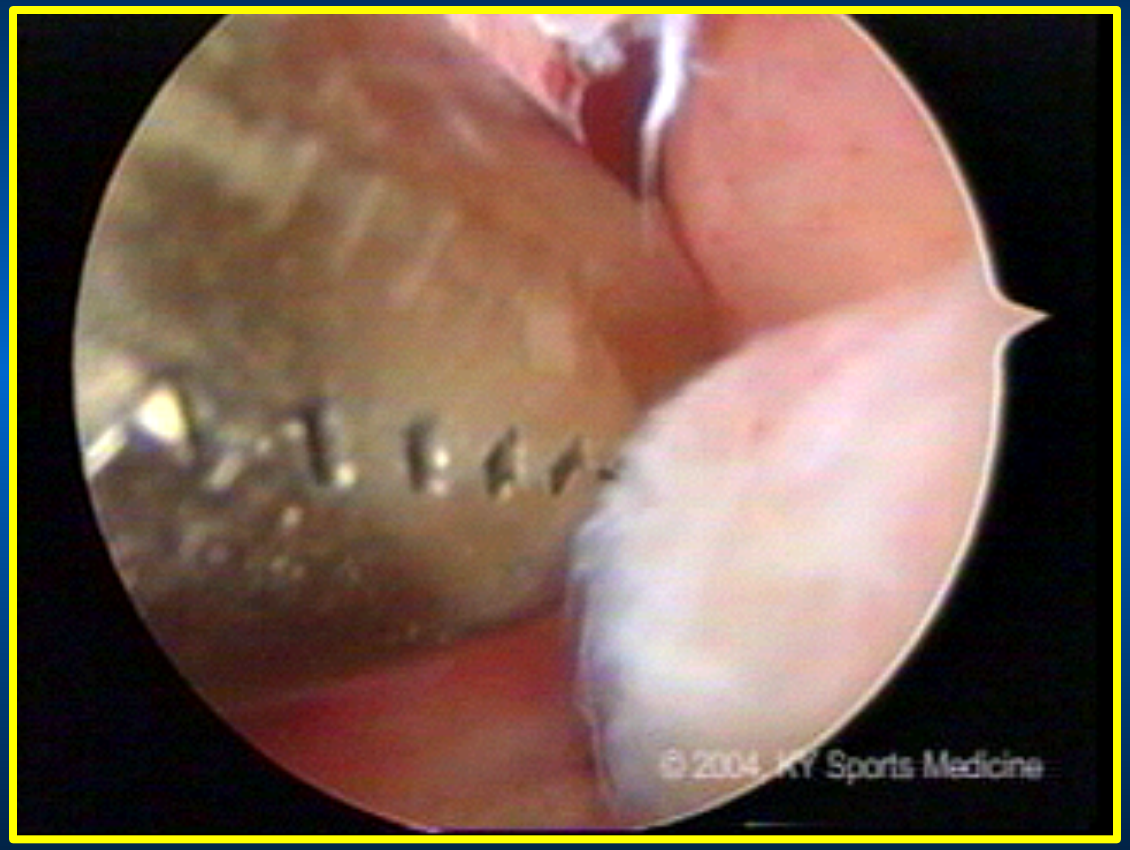
- Repair vs. Resection

Arthroscopy: LMT Repair

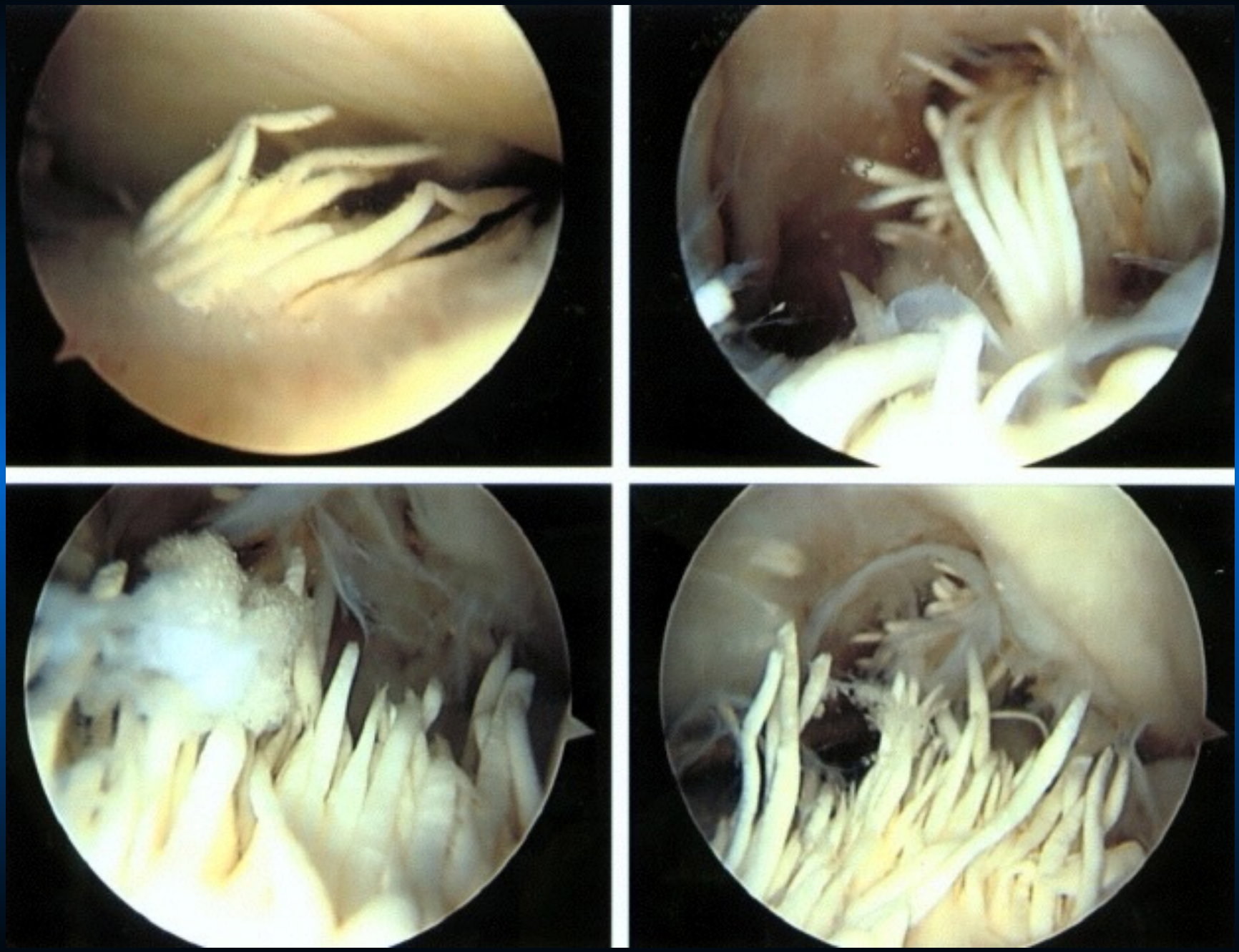


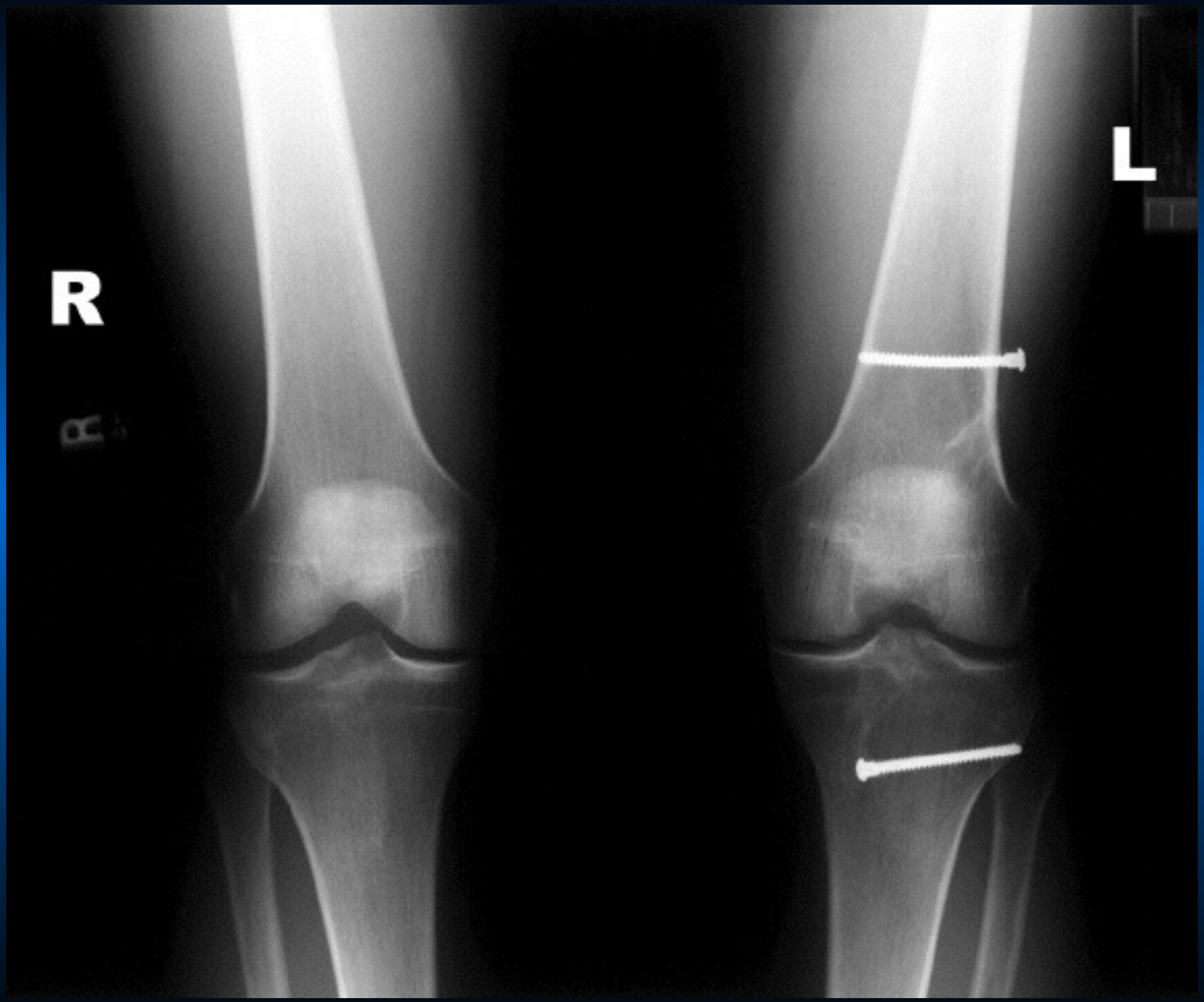
Post Op Plain Radiographs

Removal of Loose Body w/ Microfracture of MFC

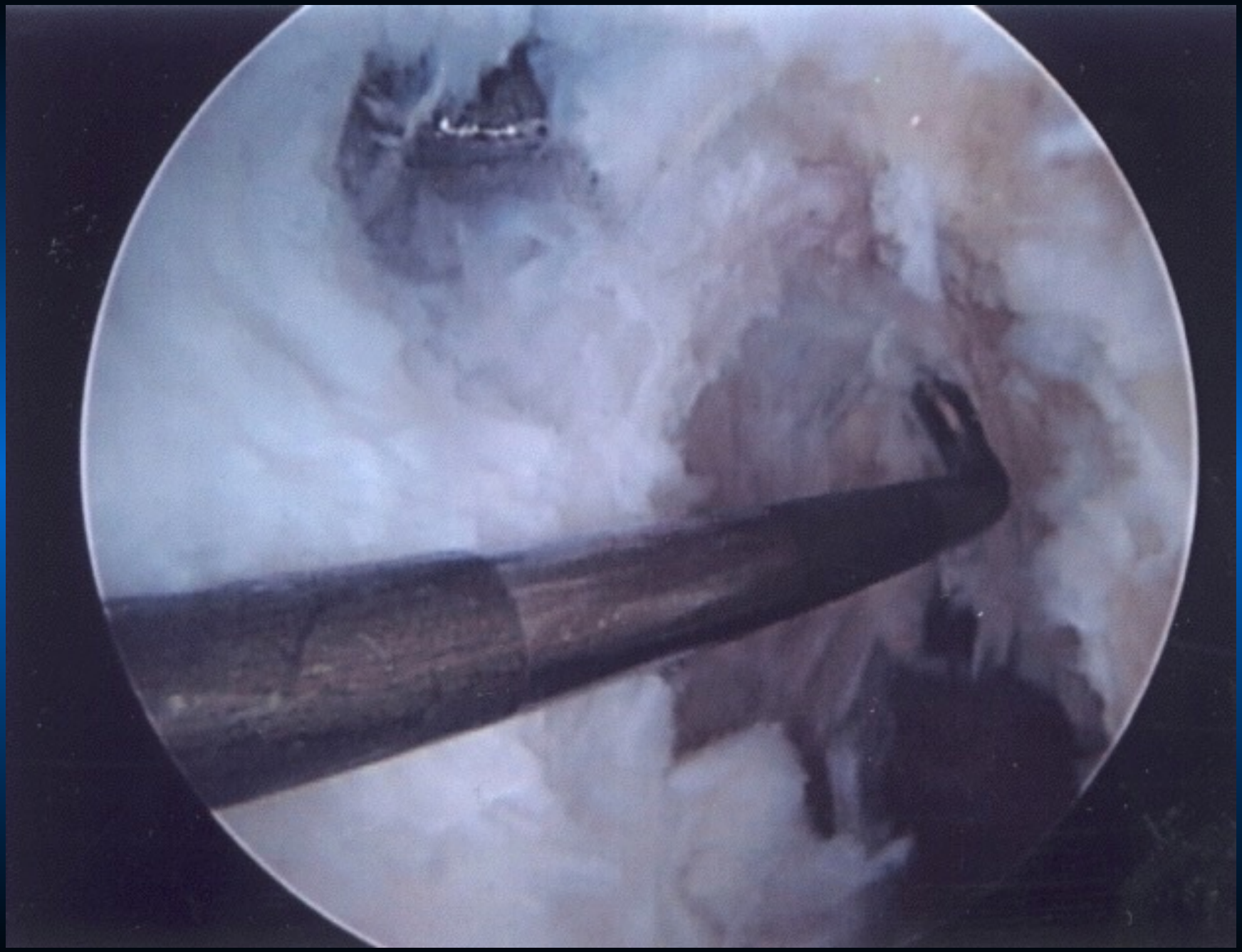


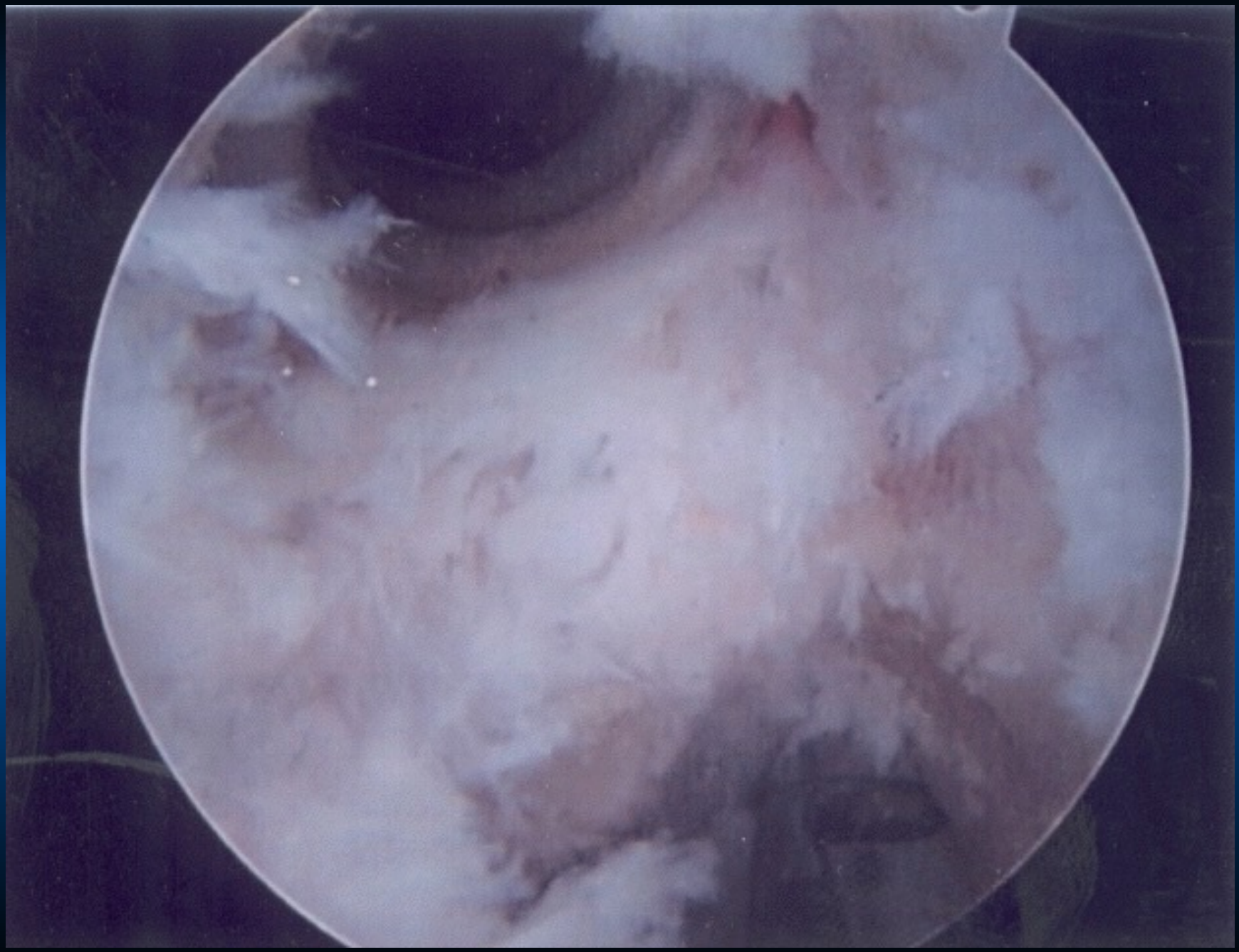
Be prepared!




R
L

0
1cm
2
3
4





ACL Reconstruction: Double Bundle 2006

- Not enough information
- Perhaps in revision surgery
- Double trouble, not double fun

Conclusions

- ACL Reconstruction is a Team Effort
- Goal: Do it once
- Visualize anatomic attachments of ACL and put tunnels in correct spots
- Fixation solid
- Rehabilitation and return to sport
- Have a protocol but individualize based on the patient and sport

Go ACL Team!

Go ACL Team!