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# **PCL Avulsion: Indications & Open Technique**



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# Disclosures

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**Fellowship Support – Arthrex**

**Fellowship Support – Smith & Nephew**

**Associate Editor – Orthopaedic  
Journal of Sports Medicine**

**Editorial Board – American Journal of  
Sports Medicine**

**Editorial Board – Journal of Knee Surg.**

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# Albuquerque, New Mexico

**1/2 Area of France**

**High & Dry**

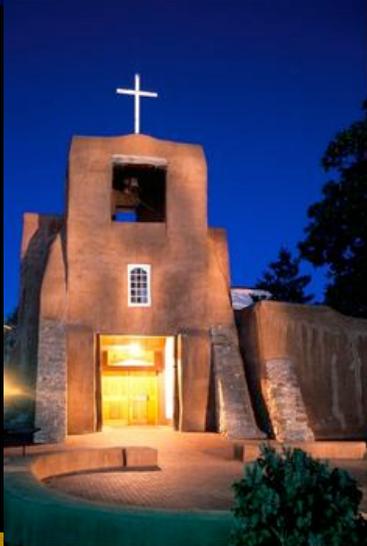
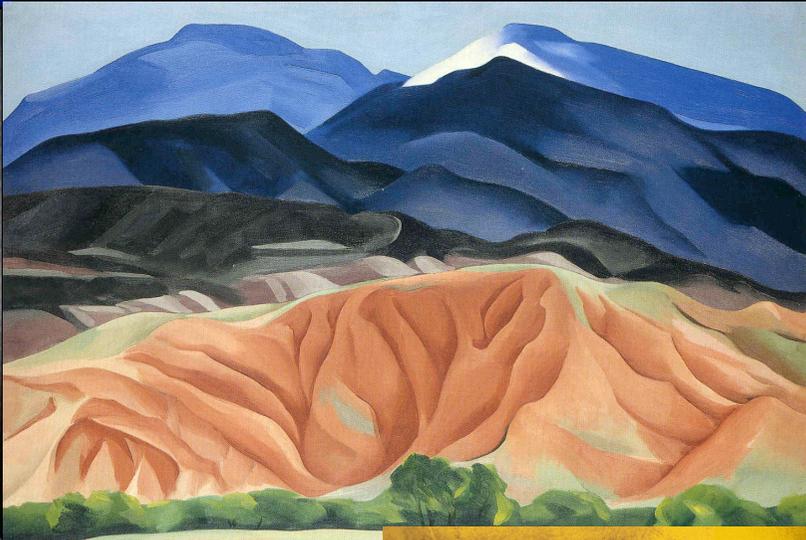
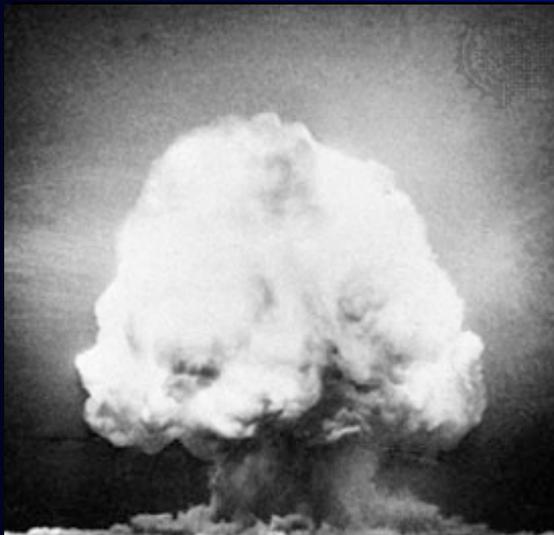
**1,800 m 22cm/yr**

**2 Million People**

**Almost 50% in  
Albuquerque Area**



# New Mexico



# My Journey to Val D'Isere

Albuquerque, NM



Lyon

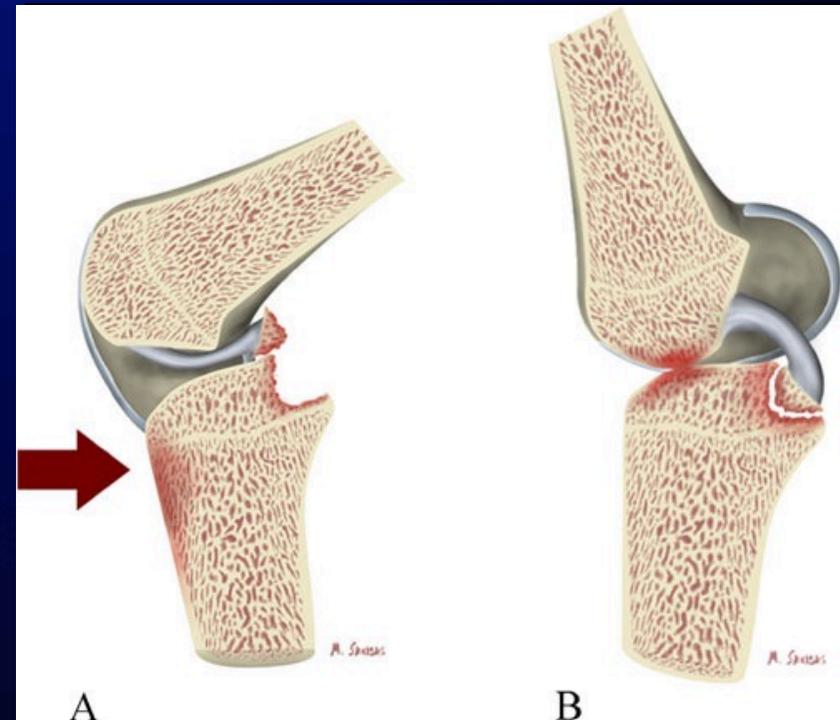


# PCL Avulsion

Rare Injuries

Mechanism

MVC  
Bicycle  
Fall



Meyers, JBJS 1975

# Classification

**Type I**

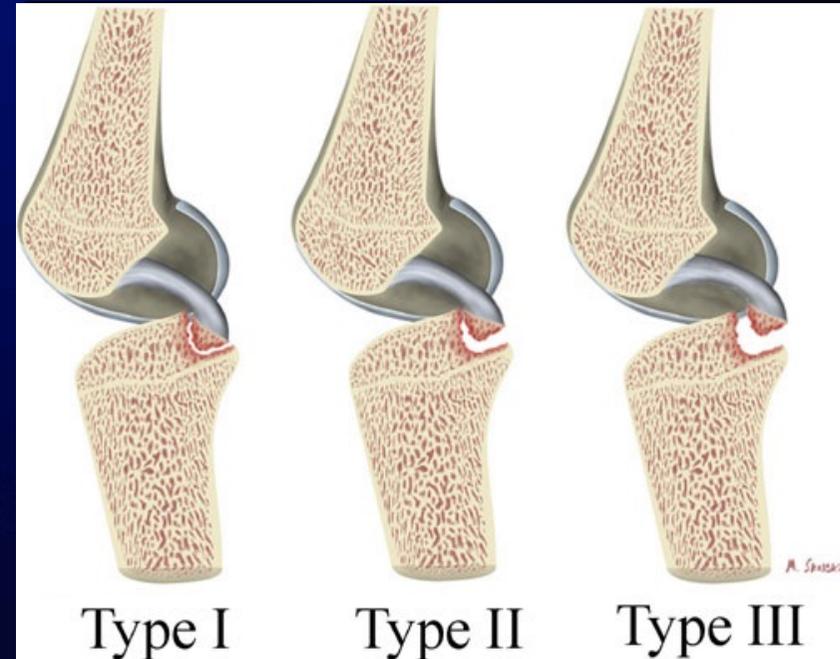
**Non-Displaced**

**Type II**

**Hinged**

**Type III**

**Displaced**



**White, Emerg Radiol 2013**

# Diagnosis

**Physical Exam**

**Posterior Drawer**

**Other Ligaments**

**Radiographs**

**A/P**

**Lateral**



# Diagnosis

**CT Scan**

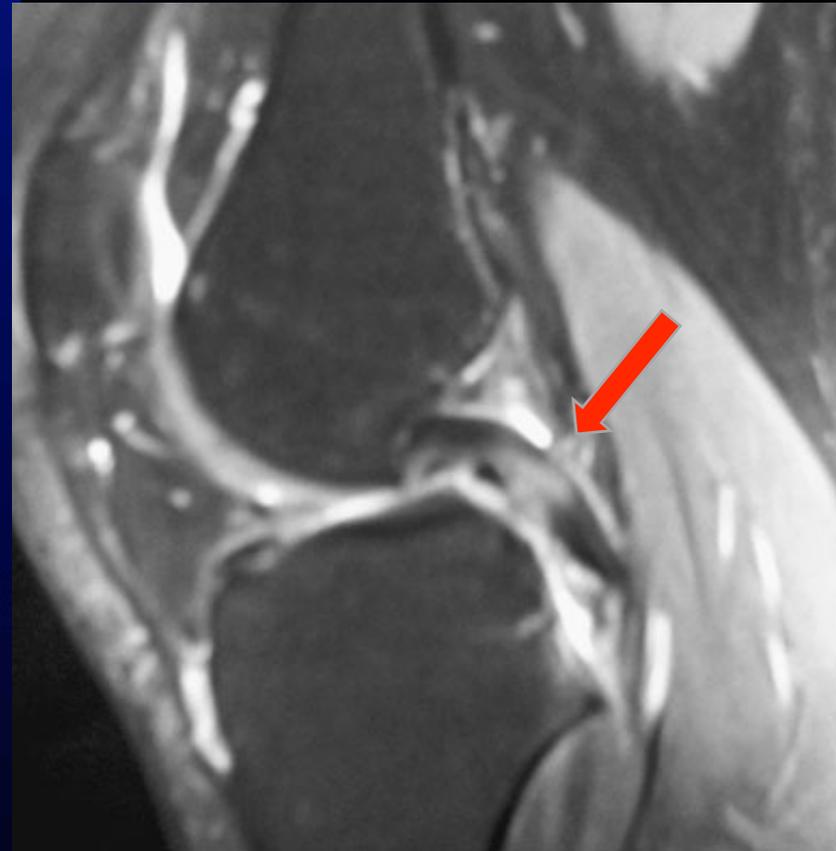
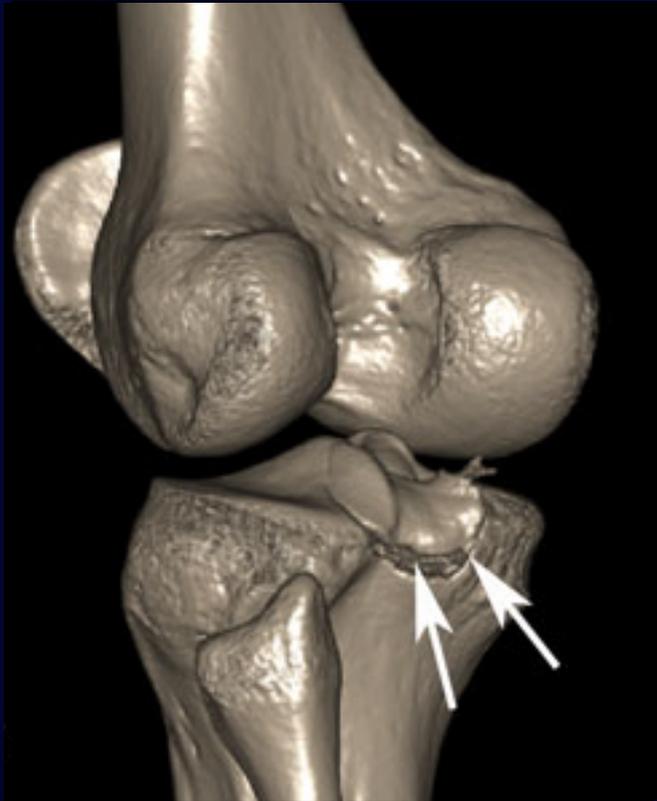
**True Size**  
**Comminution**

**MRI**

**Occult Injury**  
**Other Ligaments**



# Diagnosis



# Treatment

**Non-Operative**

**4 of 5**

**“Minimally Displaced”**

**Went on to  
Non-Union**

**Results of  
Acute > Chronic**



**Meyers, JBJS 1975**

**Torisu, Clin Orthop 1979**

**Bali, KSSTA 2012**

# My Indications

**Fix All  
PCL Avulsions  
As Soon  
As Patient's  
Condition  
Allows**

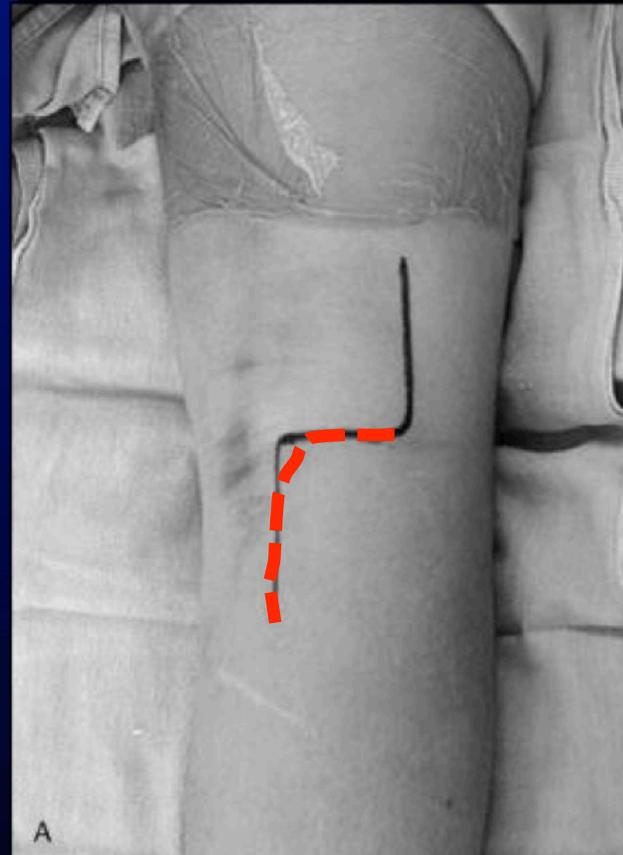


# Open Technique

**Prone**

**Posteromedial  
Approach**

**Hockey Stick  
Incision**

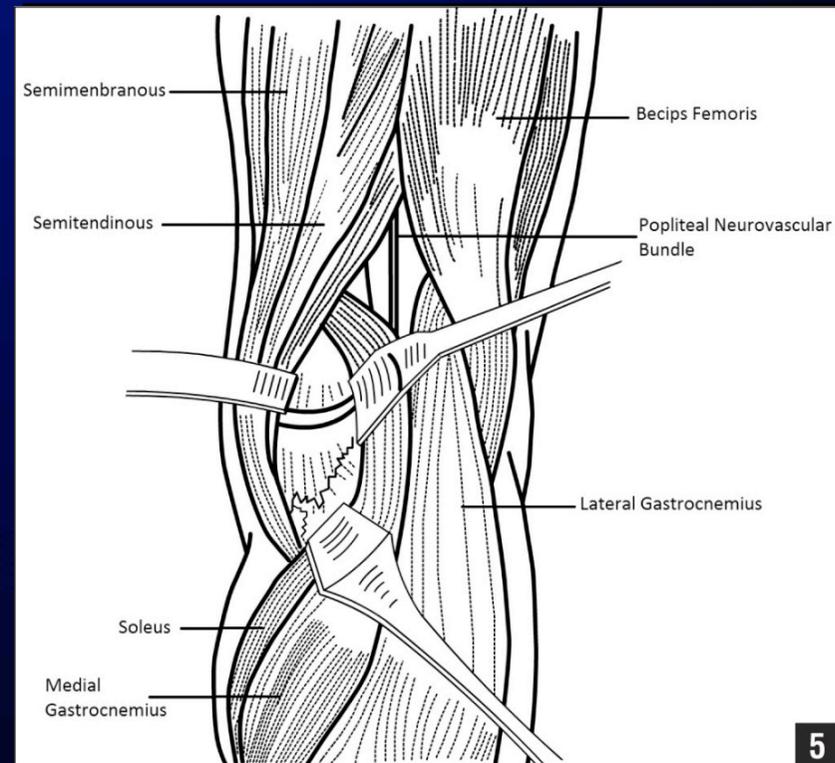


**Burks, Clin Orthop 1990**

# Open Technique

**Develop  
Interval Between  
Semitendinosus  
& Medial Gastroc**

**Retract Gastroc  
Medially**



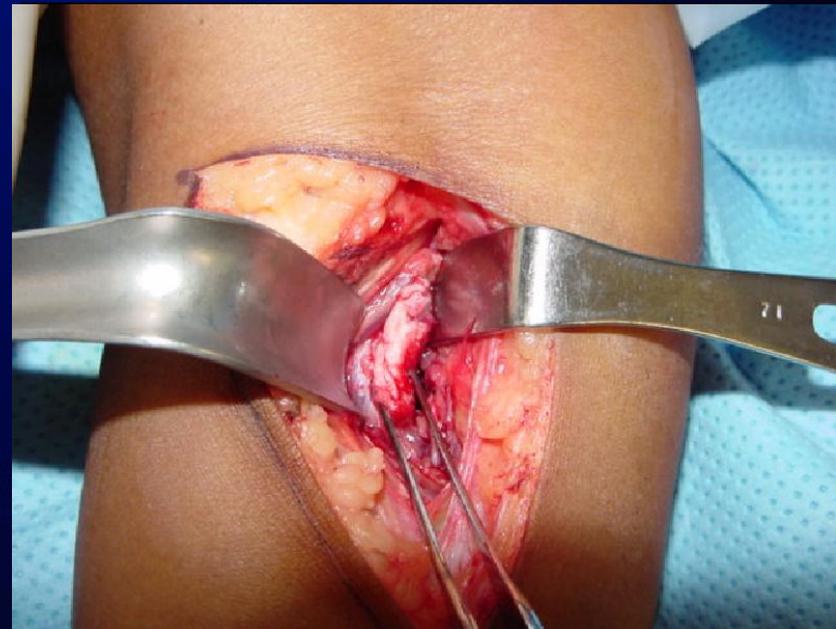
**Burks, Clin Orthop 1990**

# Open Technique

**Posterior  
Capsulotomy**

**Mobilize and  
Reduce Fragment**

**Traction Suture**



# Open Technique

**Fix with Guide Pin**  
**Confirm with C-arm**  
**4.0 mm Cannulated**  
**Screw & Washer**  
**Angled Distally**

**Tie Suture Around**  
**Screw & Washer**



# Comminuted Fragment

**Can Pass  
Sutures Through  
PCL and  
Through Drill  
Holes in  
Proximal Tibia**



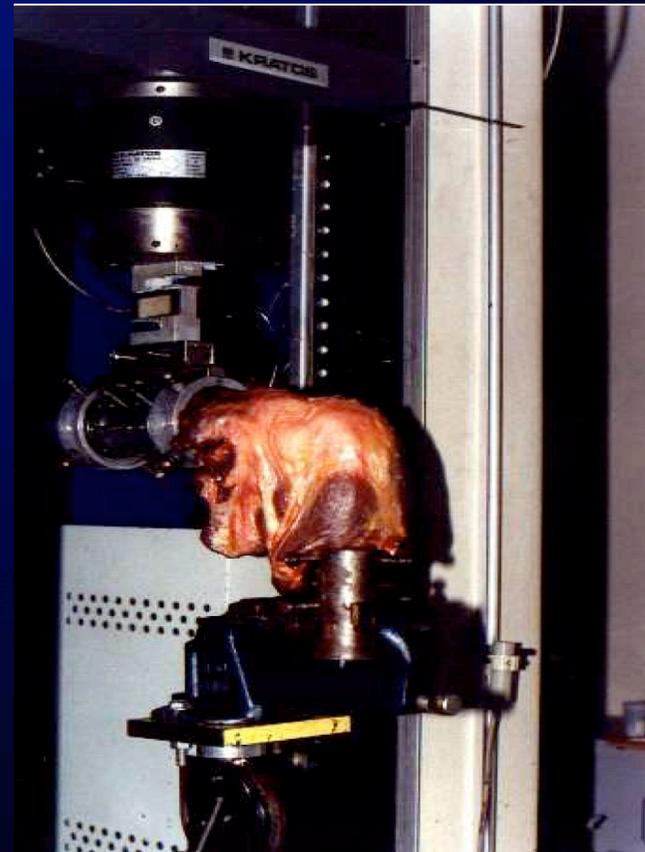
# Biomechanics

## No Difference Screw Fixation (A) vs Suture Fixation (B)

TABLE 1. Tibial Posterior Displacement

	Group A			Group B		
	Intact	Injured	Repaired	Intact	Injured	Repaired
Mean (mm)	9.25	19.21	12.07	10.01	20.13	14.94
Minimum (mm)	4.57	13.79	6.55	6.36	16.32	7.54
Maximum (mm)	13.50	24.54	19.90	13.11	27.91	24.06

NOTE. No statistically significant difference was found between groups A and B ( $P = .229$ ).



Sasaki, Arthroscopy 2007

# Pediatric Patients

**Same Approach  
But  
Keep Screw in  
Epiphysis  
Use Fluoroscopy**



# Rehabilitation

**Brace in Extension  
For 2 Weeks**

**Flexion < 90°  
For 6 Weeks**

**Then Full Motion  
And Strengthening**

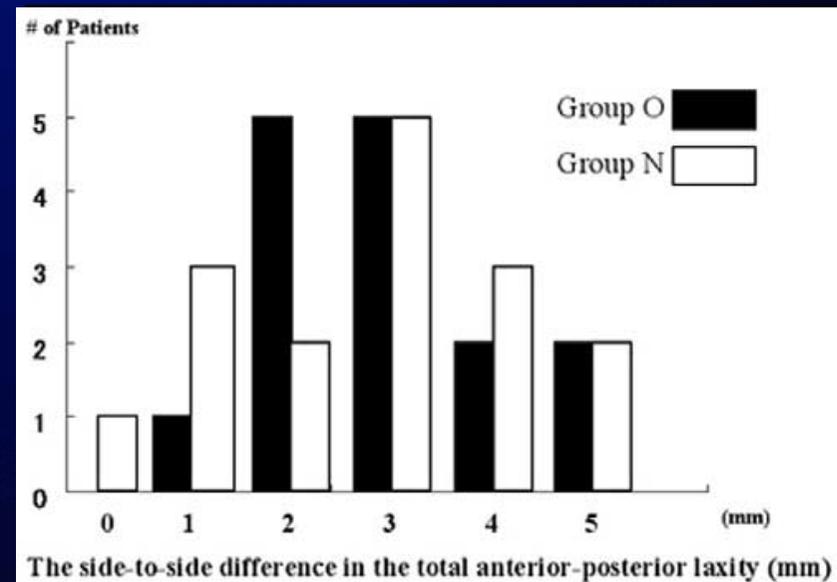


# Outcomes

31 Patients

Mean Laxity  
3.1 mm

Mean Lysholm  
90



Inoue, Am J Sports Med 2004

# Outcomes

## 10 Patients

1+ Drawer	80%
2+ Drawer	20%

Mean MFA = 14

0 (Best) – 100 (Worst)

High ISS Worse

1 Arthrofibrosis



Nicandri, J Ortho Trauma 2008

# Outcomes

42 Patients

Good 64%

Fair 29%

Poor 7%

F/U 18 Months

Acute > Chronic



Bali, KSSTA 2011

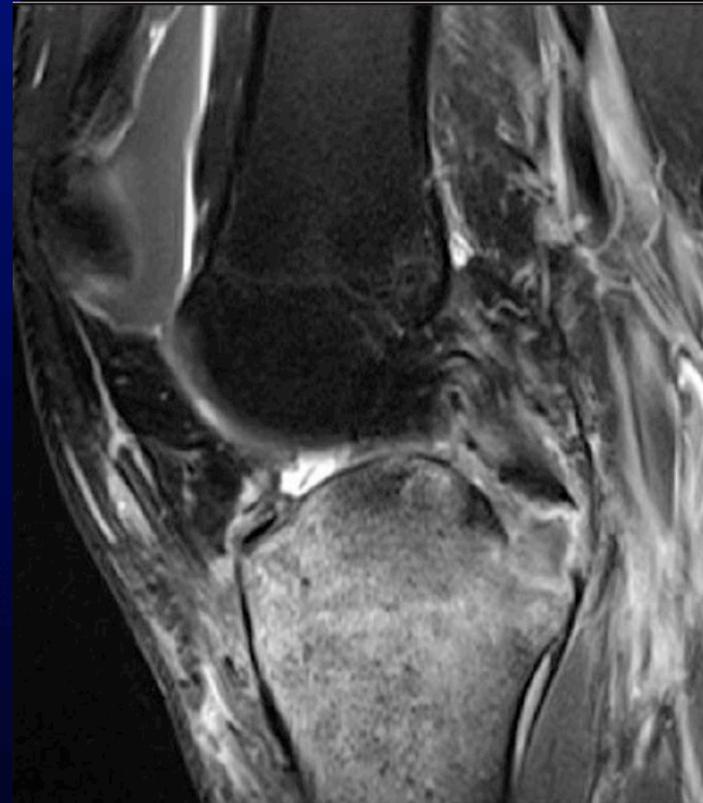
# Occult Injury

**No Difference  
In Outcomes**

**Inoue**

**Worse Outcomes**

**Bali**



**Inoue, Am J Sports Med 2004  
Bali, KSSTA 2011**

# Outcomes

**Almost All Heal**

**1+ Laxity Common**

**Good Functional  
Results**



# Scope vs. Open

47 Patients

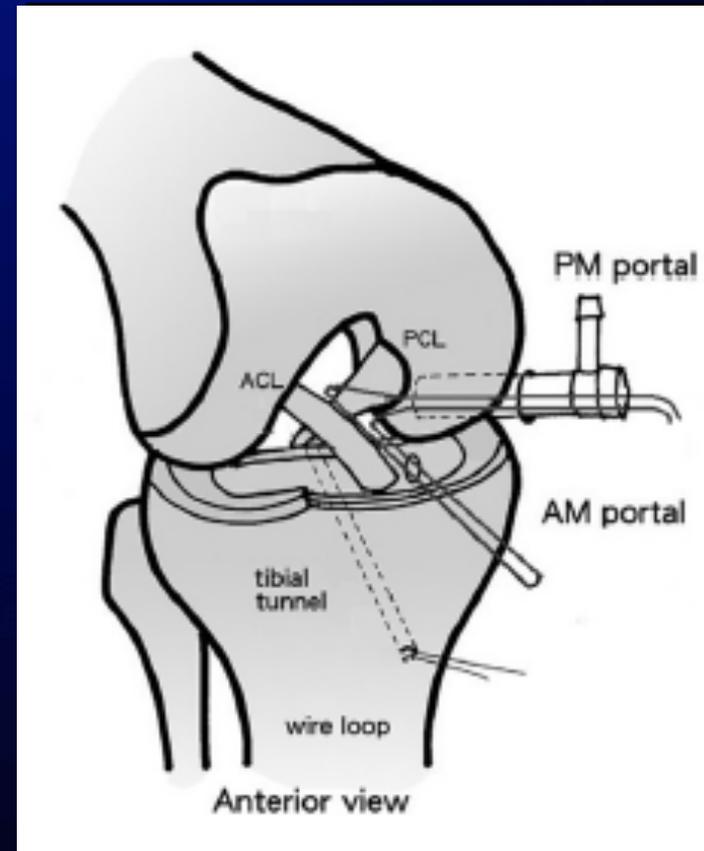
Equal Results

Lysholm

95.3 vs 94.8

0-3 mm Laxity

85% vs 74%



Sabat, Arthroscopy 2016

# Why I Prefer Open

**Easier**

**Faster**

**Cheaper**

**Equal Results**



# Thank You !!

