



# TRAUMATOLOGIA CAPSULO-LEGAMENTOSA DEL GINOCCHIO: LES. COMP. MEDIALE



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ISTITUTO CLINICO  
**SAN SIRO**  
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“The diagnosis and treatment of medial-sided knee injuries has evolved from an **aggressive surgical approach** for most injuries to an **nonoperative** phase to the present trend of **nonoperative and operative management**”

Jacobson KE, Chi FS. Evaluation and Treatment of Medial Collateral Ligament and Medial-Side Injuries of the Knee. Sports Med Arthrosc Rev:14,2:58-66, 2006

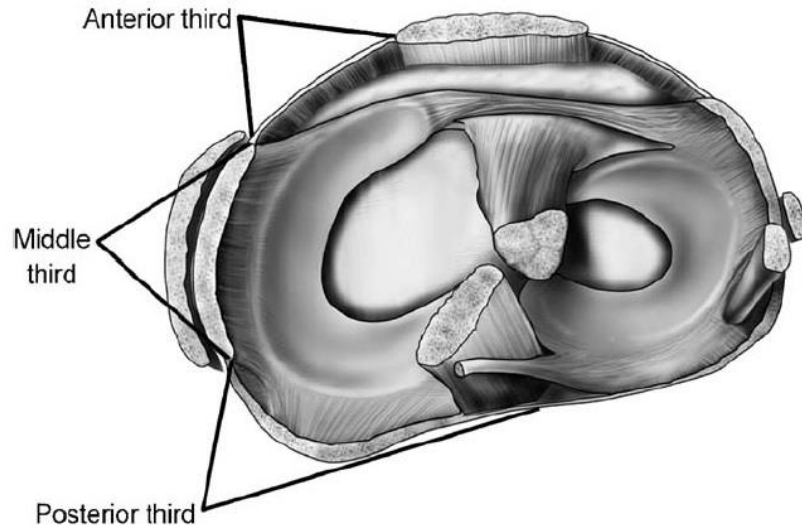
**Conoscenze  
scientifiche**

**Risultati  
clinici**

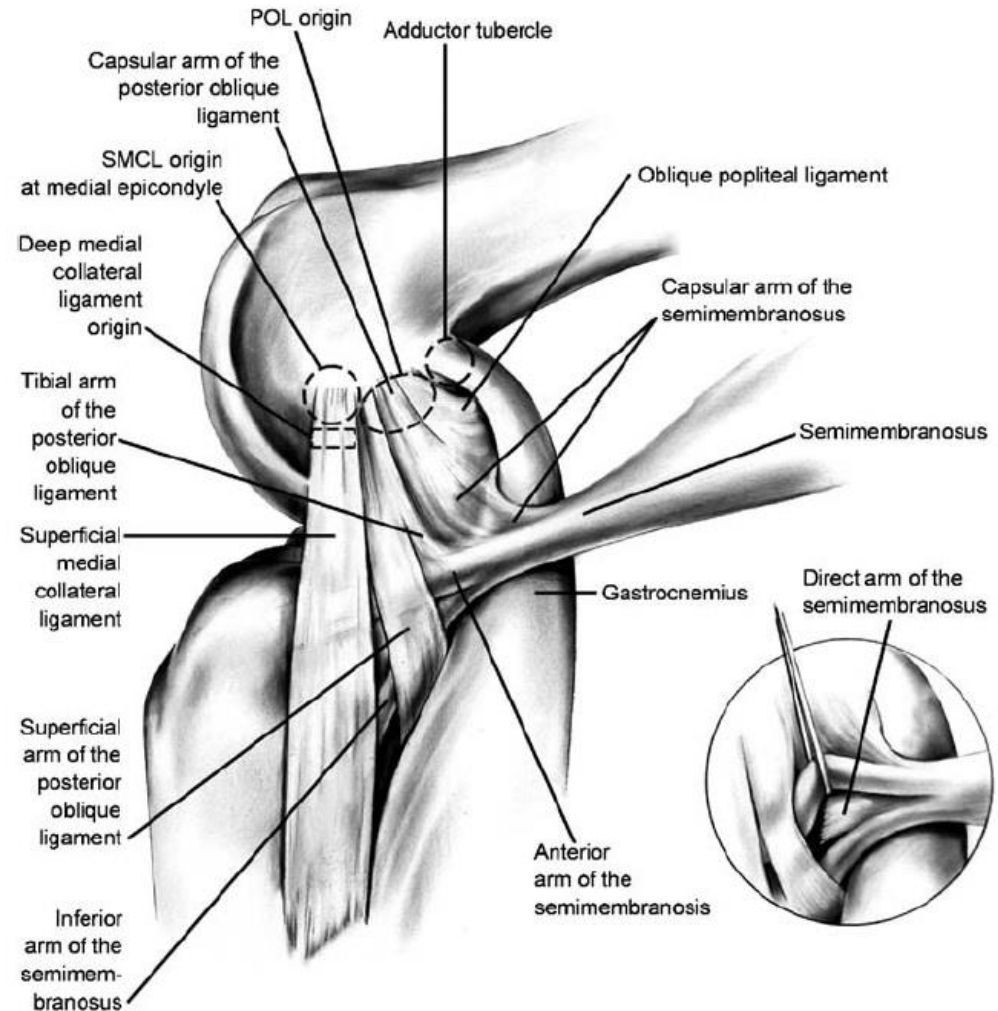
# LCI

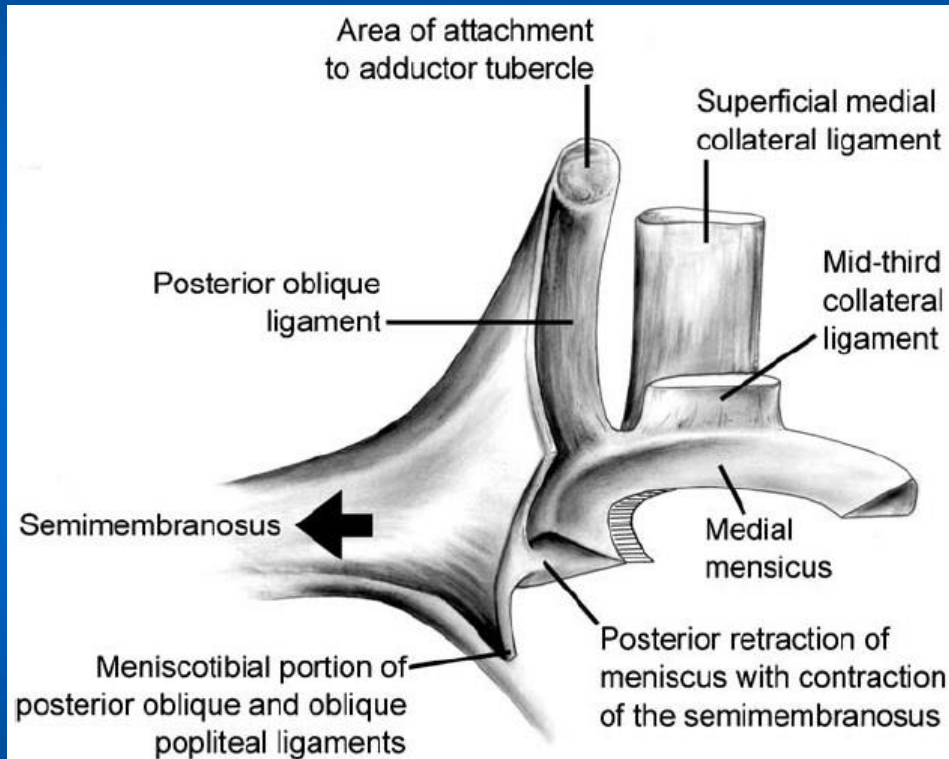
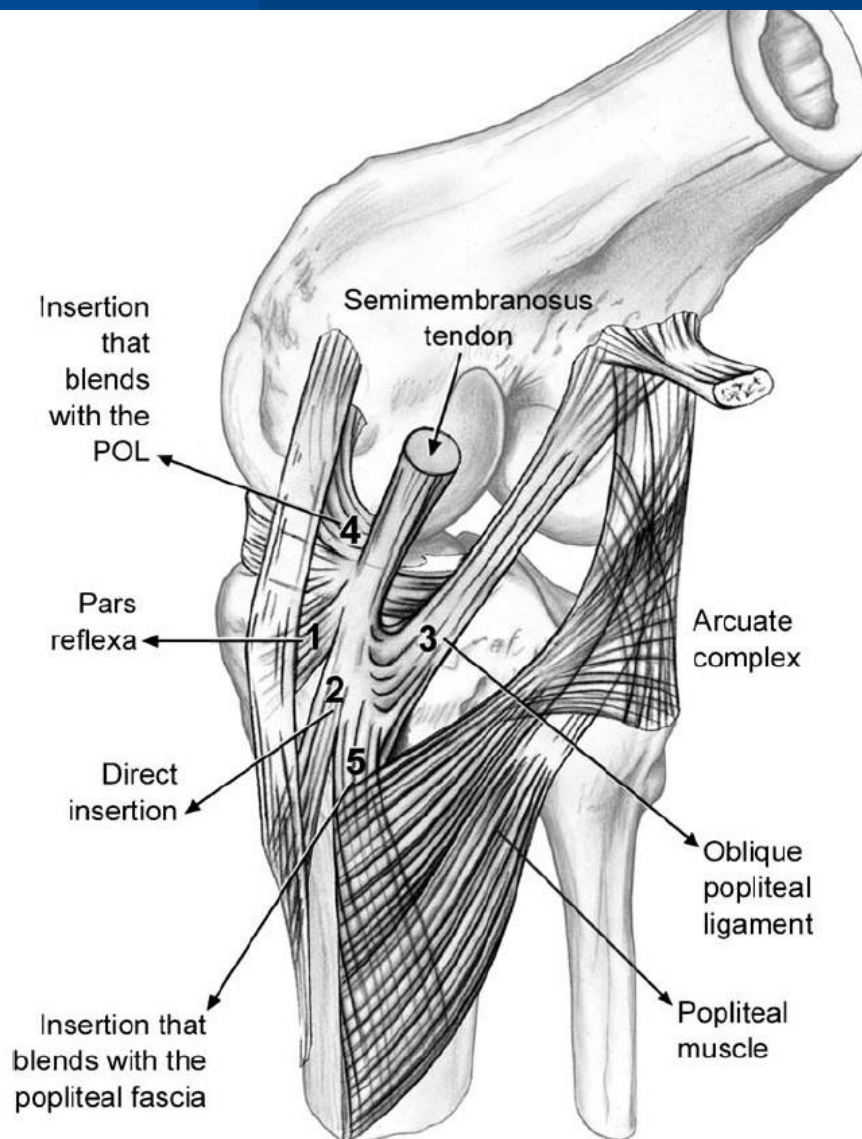
## Notevole capacità intrinseca di riparazione

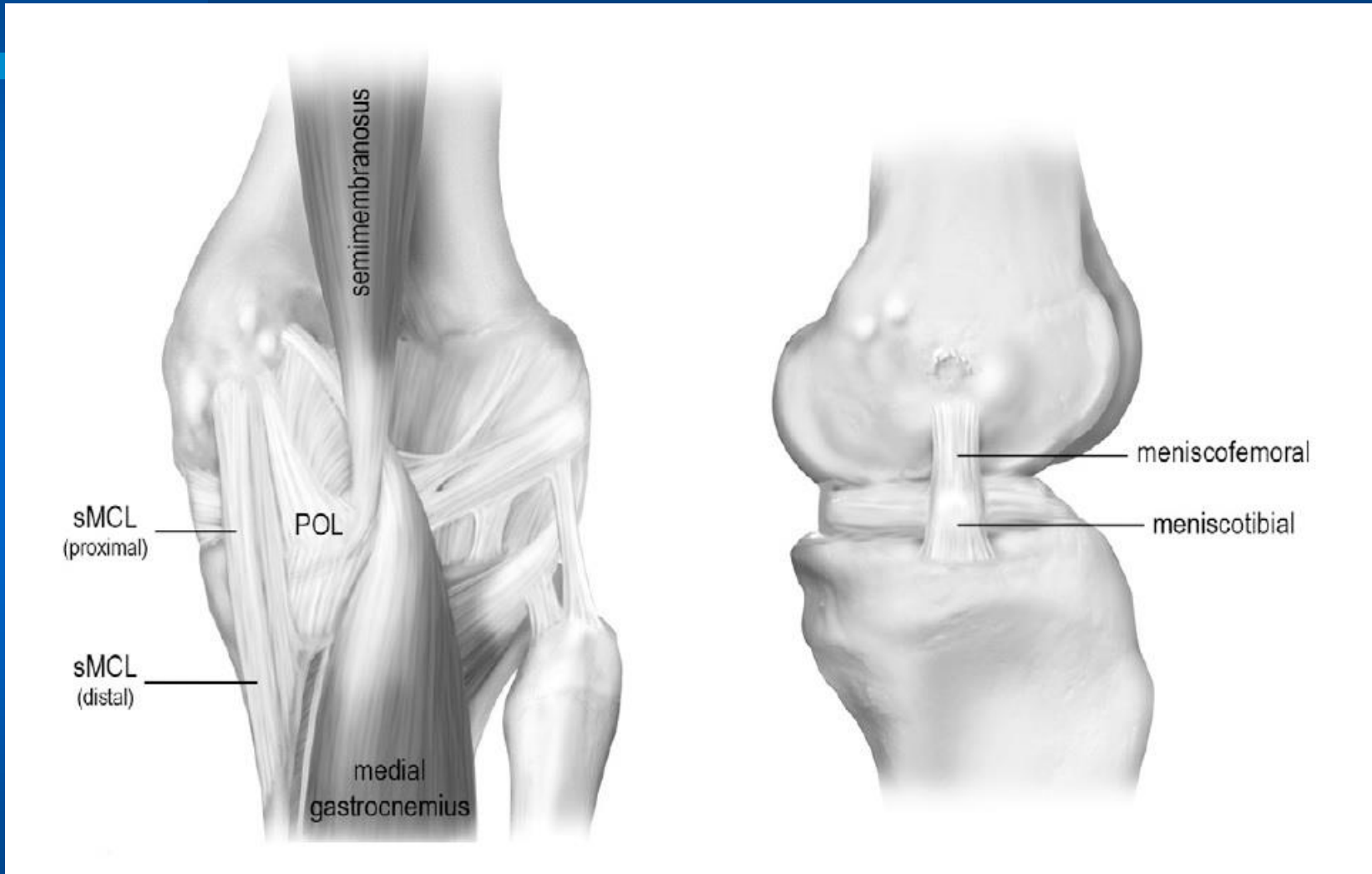
Liu X et Al. AM J Sport Med 2013  
French CB J Musculoskelet Neuronal Interact 2004  
Woo SL et Al. J Am Acad Orthop Surg 2000



Warren LF, Marshall JL The  
 supporting structures and layers on  
 the medial side of the knee: an  
 anatomical analysis: J bone Joint  
 Surg. 1979;61: 56-62

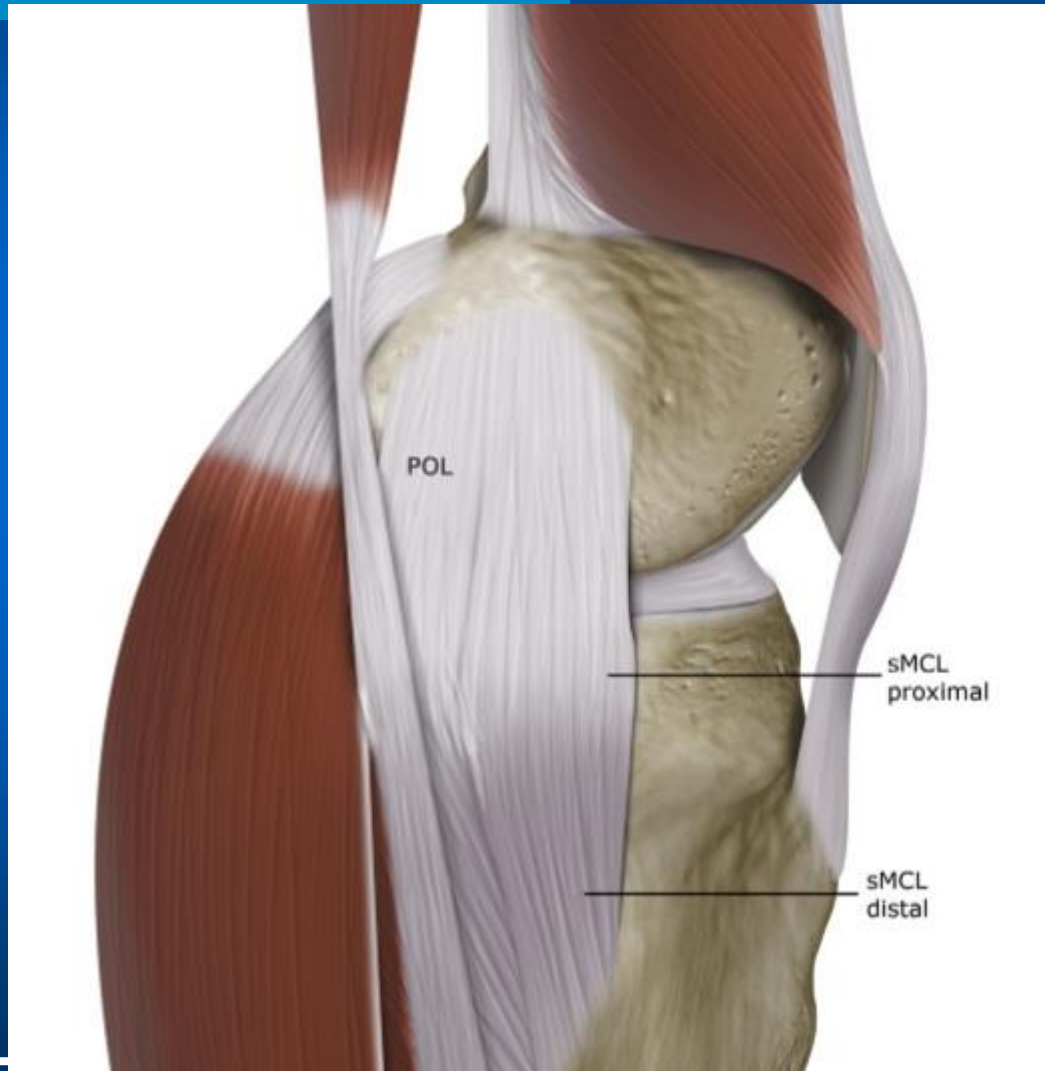




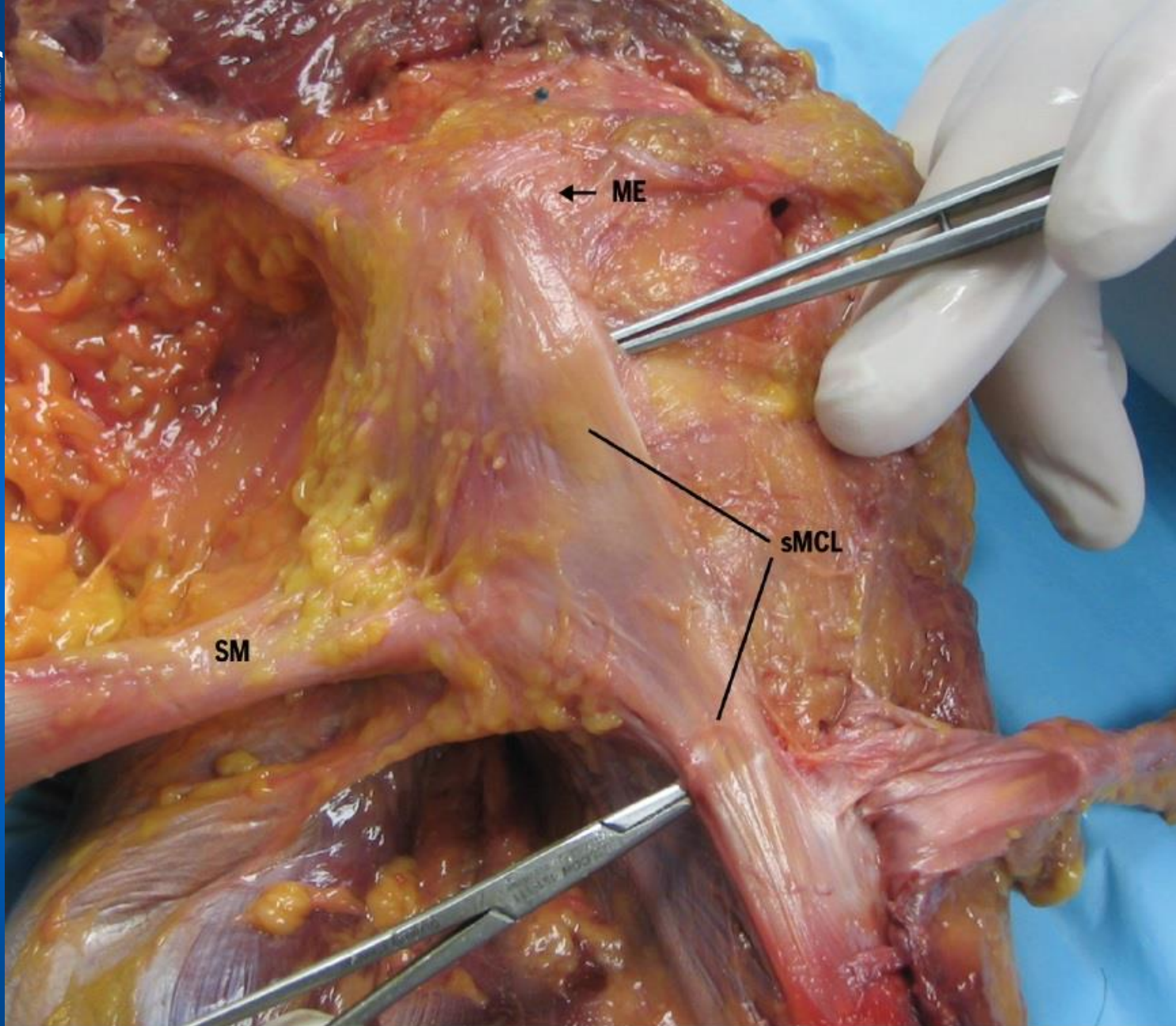




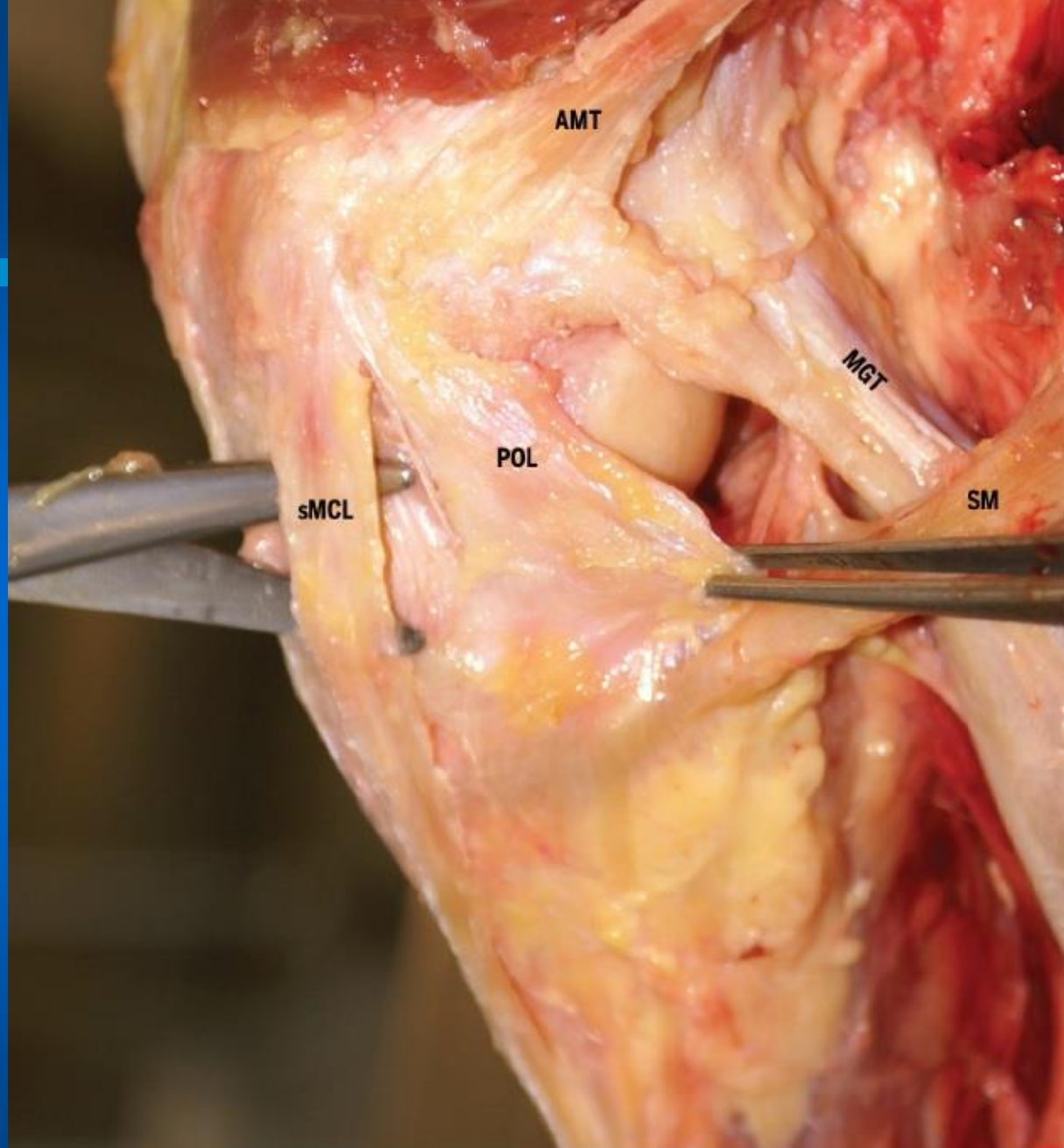
# ANATOMIA





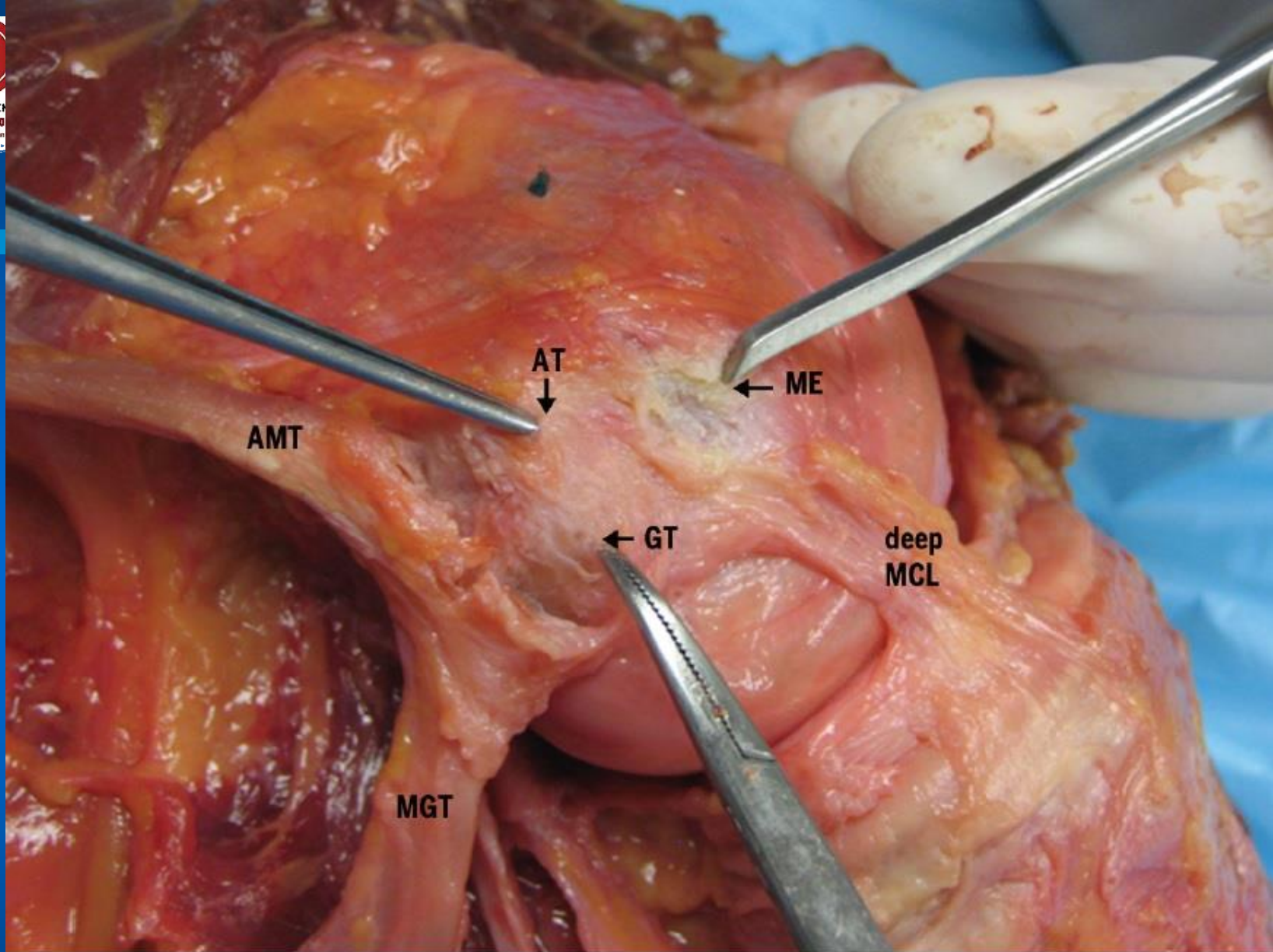


**FIGURE 2.** Photograph of a left knee demonstrating the course of the superficial medial collateral ligament. Abbreviations: ME, medial epicondyle; SM, semimembranosus tendon; sMCL, superficial medial collateral ligament.



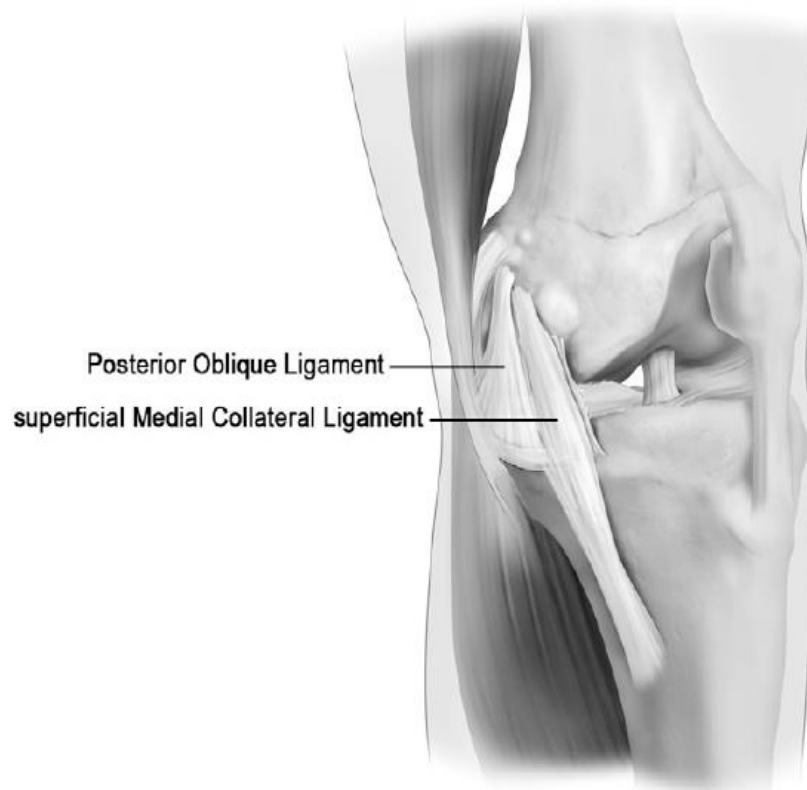
**FIGURE 4.** Photograph of a right knee demonstrating the central arm of the posterior oblique ligament. Abbreviations: AMT, adductor magnus tendon; MGT, medial gastrocnemius tendon; POL, posterior oblique ligament; SM, semimembranosus tendon; sMCL, superficial medial collateral ligament.





**FIGURE 1.** Photograph of a left knee, demonstrating the ME, AT, and GT. The attachments of the AMT and the MGT have been peeled back, while the superficial medial collateral ligament has been removed to demonstrate the deep MCL. Abbreviations: AMT, adductor magnus tendon; AT, adductor tubercle; GT, gastrocnemius tubercle; MCL, medial collateral ligament; ME, medial epicondyle; MGT, medial gastrocnemius tendon.

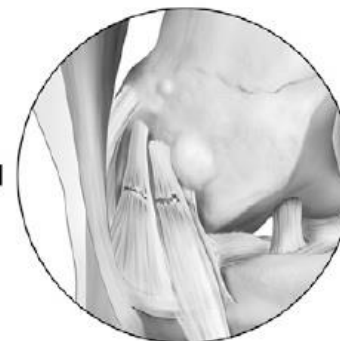
# ANATOMIA



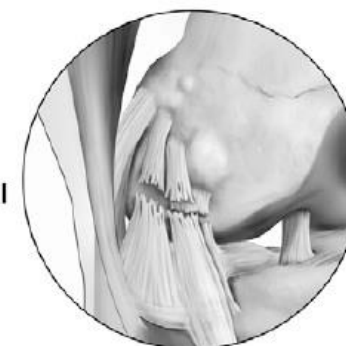
Grade I



Grade II

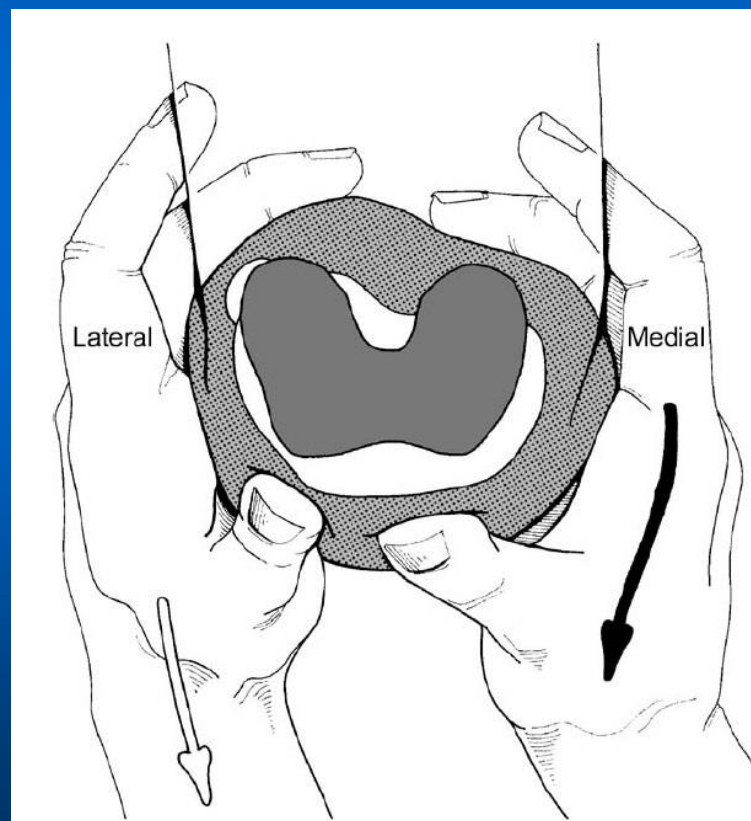


Grade III



## Mechanism of injury

- valgus and external rotation force to the lateral knee
  - non-contact force results in milder sprains
  - direct blow usually causes complete disruption of MCL
    - rupture usually occurs at **femoral insertion** of ligament with proximal tears having greater healing rates
    - distal injuries tend to have excessive valgus laxity





**grado 1:** non lassità in valgo-stress a 0° e 30°

**Grado 2:** lassità in valgo-stress a 30° ma non a 0°

**Grado 3:** lassità in valgo-stress a 0° e 30°

**Grado 0° di flessione  
No estensione**

Fetto JF, Marshall JL. Medial collateral ligament injuries of the knee: a rationale for treatment. Clin Orthop 1978;132:206-18





- Classification of MCL Sprains

- Grade 1

- mild severity
    - no loss of ligamentous integrity (stretch injury)
    - minimal torn fibers

- Grade II

- moderate severity
    - incomplete tearing of MCL (partial tear)
    - increased joint laxity
    - end point found at 30 degrees of flexion with valgus stress
    - fibers remain apposed

- Grade III

- severe
    - complete disruption of ligament (complete tear)
    - gross laxity
    - no end point with valgus stress at 30 degrees of knee flexion

**Table 2**  
**Medial collateral ligament injury**

Grade	Amount of Opening (mm)	Clinical Severity
I	0–5	Mild
II	5–10	Moderate
III	>10	Severe

## Imaging

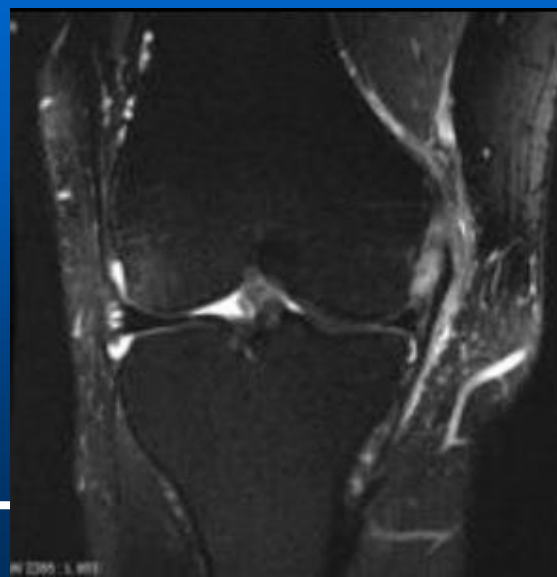
- Radiographs
  - recommended
    - AP and lateral
  - optional view
    - stress radiographs in skeletally immature patient
      - may indicate gapping through physeal fracture
  - findings
    - usually normal
    - **calcification** at the medial femoral insertion site (Pellegrini-Stieda Syndrome)
- MRI
  - modality of choice for MCL injuries
  - identifies location and extent of injury
  - useful for evaluating other injuries





**Medial collateral ligament (MCL) injuries** are **graded** into three groups on MRI, much in the same way as many other ligaments:

- **grade 1:** (minor sprain) high signal is seen medial (superficial) to the ligament, which looks normal
- **grade 2:** (severe sprain or partial tear) high signal is seen medial to the ligament, with high signal or partial disruption of the ligament
- **grade 3:** complete disruption of the ligament



# TRATTAMENTO

## LESIONE LCI

1. Solo LCI
2. LCI + LCA
3. LCI + lesioni leg. multiple

**Grado 1:** non chirurgico

Non carico per 1 settimana, quindi  
carico a tolleranza e ripresa  
graduale attività sportiva dopo 20  
gg





## Treatment

- Nonoperative
  - **NSAIDs, rest, therapy**
    - indications
      - grade I
    - therapy
      - quad sets, SLRs, and hip adduction above the knee to begin immediately
      - cycling and progressive resistance exercises as tolerated
    - return to play
      - grade I may return to play at 5-7 days
  - **bracing, NSAIDs, rest, therapy**
    - indications
      - grades II
      - grade III
        - if stable to valgus stress in full extension
        - no associated cruciate injury
    - technique
      - immobilizer for comfort
      - hinged knee brace for ambulation
    - return to play
      - grade II return to play at 2-4 weeks
      - grade III return to play at 4-8 weeks
    - outcomes
      - distal MCL injuries have less healing potential than proximal injuries

# LESIONE LCI monoleg.

**Grado 2:** non chirurgico

Non carico per 20 gg (carico  
sfiorante), ginocchiera ( $0^{\circ}$ - $90^{\circ}$ )

Ripresa graduale attività sportiva  
dopo 40 gg

# LESIONE LCI monoleg.

- Grado 3:** non chirurgico/chirurgico
- Trattamento riabilitativo per 4/6 settimane quindi rivalutazione
  - Trattamento chirurgico immediato

## NONOPERATIVE TREATMENT OF ACUTE GRADE III MEDIAL KNEE INJURIES

### Goals for All Phases

- Early, pain-free full range of motion of the knee
- Minimal loss of quadriceps strength
- Healing of injured ligament complex with little to no residual instability

### Phase 1: 1 to 2 Weeks

#### Ice:

- Ice knee as tolerated and as needed based on symptoms

#### Weight bearing:

- Use crutches and apply touchdown to partial weight bearing and progress as tolerated. Progress to 1 crutch (on opposite side), then discontinue crutches only when normal gait is possible

#### Brace:

- Hinged knee brace set from 0° to 90° of knee flexion

#### Range of motion:

- Emphasize full extension
- Progress flexion as tolerated

#### Therapeutic exercises:

- Quadriceps sets: 30 repetitions, 10 times a day
- Straight leg raises. No weights. The knee must be held in full extension (no sag). If not, exercise is performed with brace locked in full extension
- Range-of-motion exercises as tolerated
- Sitting hip flexion, 10 sets of 10 repetitions daily
- Side-lying hip abduction, 10 sets of 10 repetitions daily
- Standing hip extension, 10 sets of 10 repetitions daily
- Standing hamstring curls, as tolerated; if painful, discontinue
- Bike, as comfortable, 10 to 20 minutes, low resistance, start as soon as possible
- No limits on upper extremity workouts that do not affect the injured knee

### Phase 2: 3 to 4 Weeks

#### Weight bearing:

- As tolerated with hinged brace

#### Range of motion:

- Full extension
- Progressive flexion as tolerated

#### Therapeutic exercises:

- Progress above exercises as tolerated to 5 to 10 lb (2-4 kg)
- Progress to 20 minutes of exercise biking daily; increase resistance as tolerated. This is the key exercise to promote healing, rebuild strength, and maintain aerobic conditioning
- Progress to weight-room exercises. Limit the injured knee's range of motion to between 0° and 90° of knee flexion when lifting weights (in the brace)
- Hamstring curls
- Leg presses: double-leg press and single-leg press on injured side
- Progress isokinetics

- Step-ups

#### Precaution:

- Examination by physician is necessary at approximately 3 weeks to verify ligament healing

### Phase 3: 5 Weeks

#### Weight bearing:

- Gait in hinged knee brace through 6 weeks, as comfortable

#### Brace:

- Gradually open fully per quadriceps control
- Discontinue use when ambulating with full weight bearing and no gait deviation

#### Range of motion:

- Full, symmetrical

#### Therapeutic exercises:

- Continue at least 20 minutes of daily exercise bike program. Resistance should be progressively increased at each session
- Progress to weight-room exercises. Limit motion to 30° to 90° of knee flexion while performing leg presses, squats, etc
- Hamstring curls
- Leg presses: double-leg press and single-leg press
- Progress isokinetics
- Step-ups
- Progress walk-to-run, as tolerated, once cleared by surgeon
- Progress agility drills from balanced to unilateral exercises (single-leg hop-scotch jumps, etc)

#### Precautions:

- Verify healing by physician at 5 to 6 weeks to progress to next level
- Verify with stress radiographs as needed

### Phase 4: 6 Weeks

#### Brace:

- Discontinue brace with gait, wear for competition through competitive season or for at least 3 months
- Protective use when out of home, hinged brace open per quadriceps control

#### Range of motion:

- Full, symmetrical

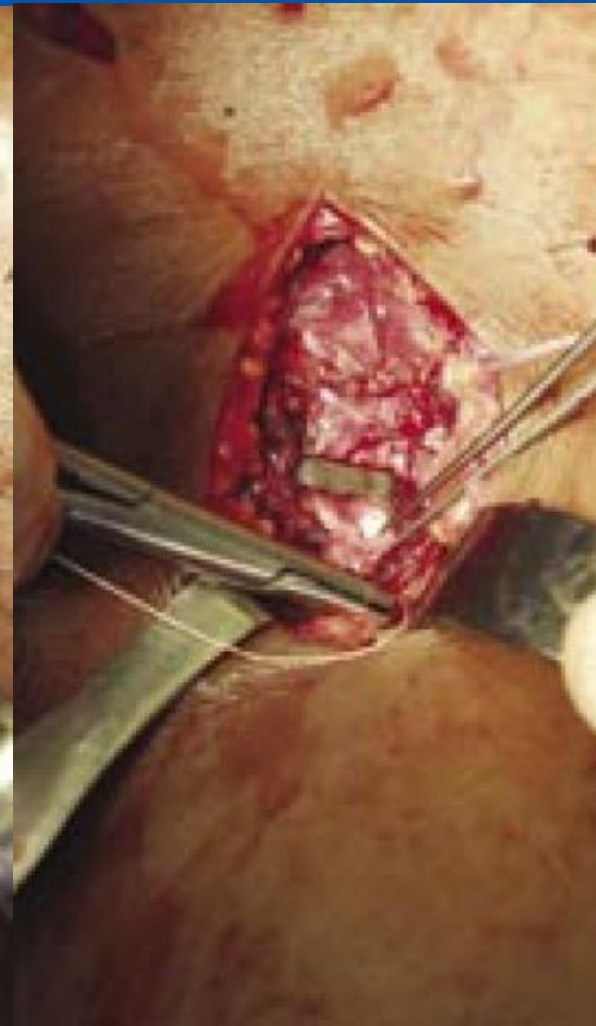
#### Therapeutic exercises:

- Continue daily exercise bike use through 12 weeks after injury (at least 20 minutes per day)
- Progress sport-specific exercises

#### Precaution:

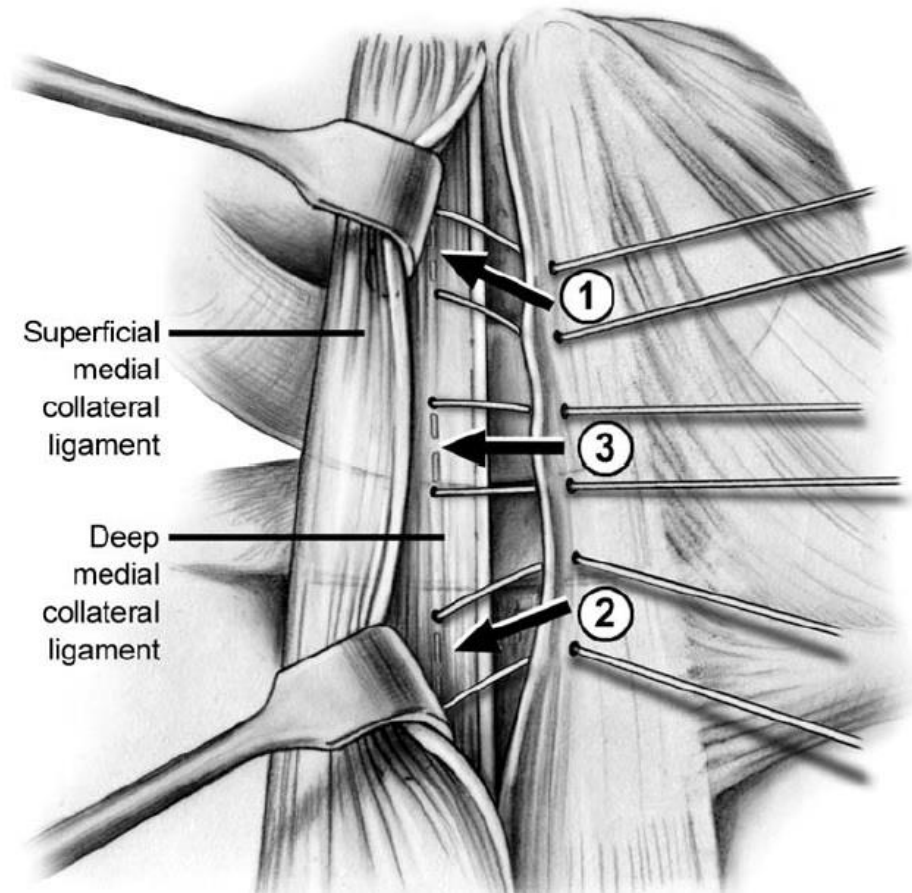
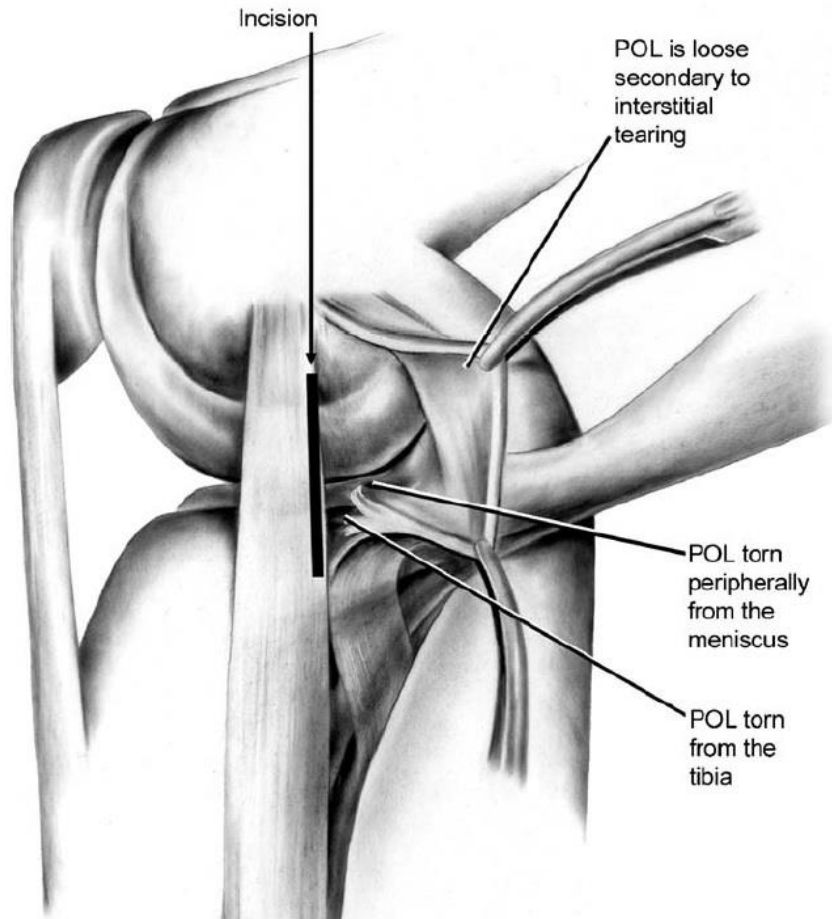
- Return to competition once full motion and strength return and the patient passes a sport functional test and is cleared by the physician

# LESIONE LCI monoleg. ACUTO

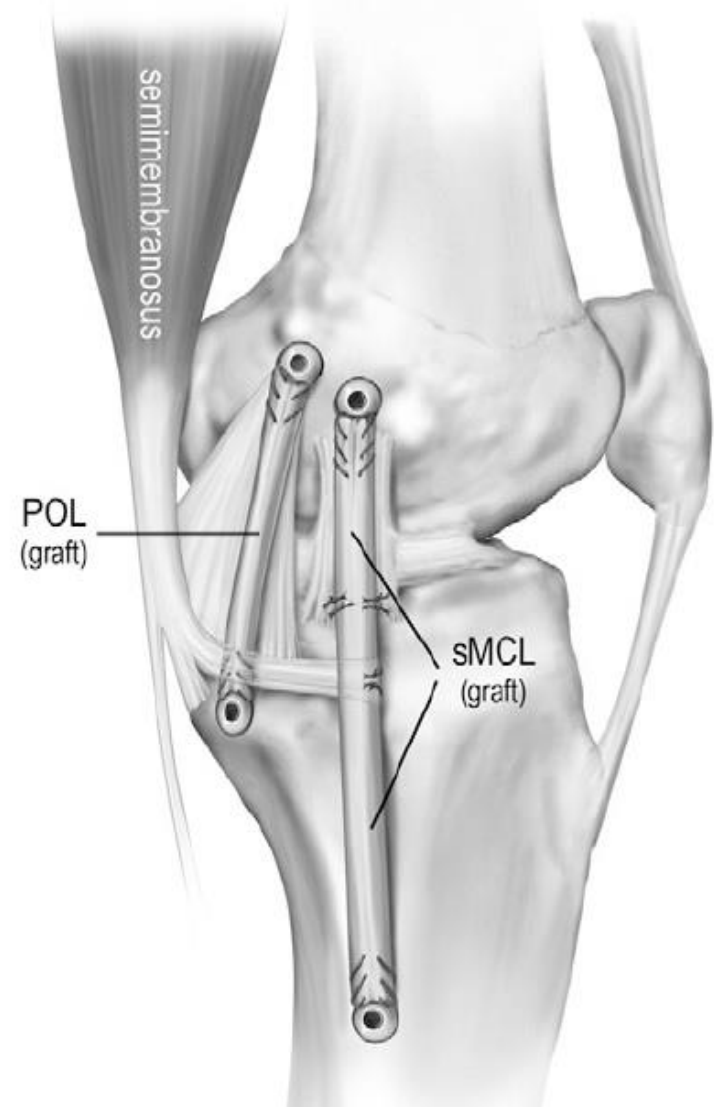
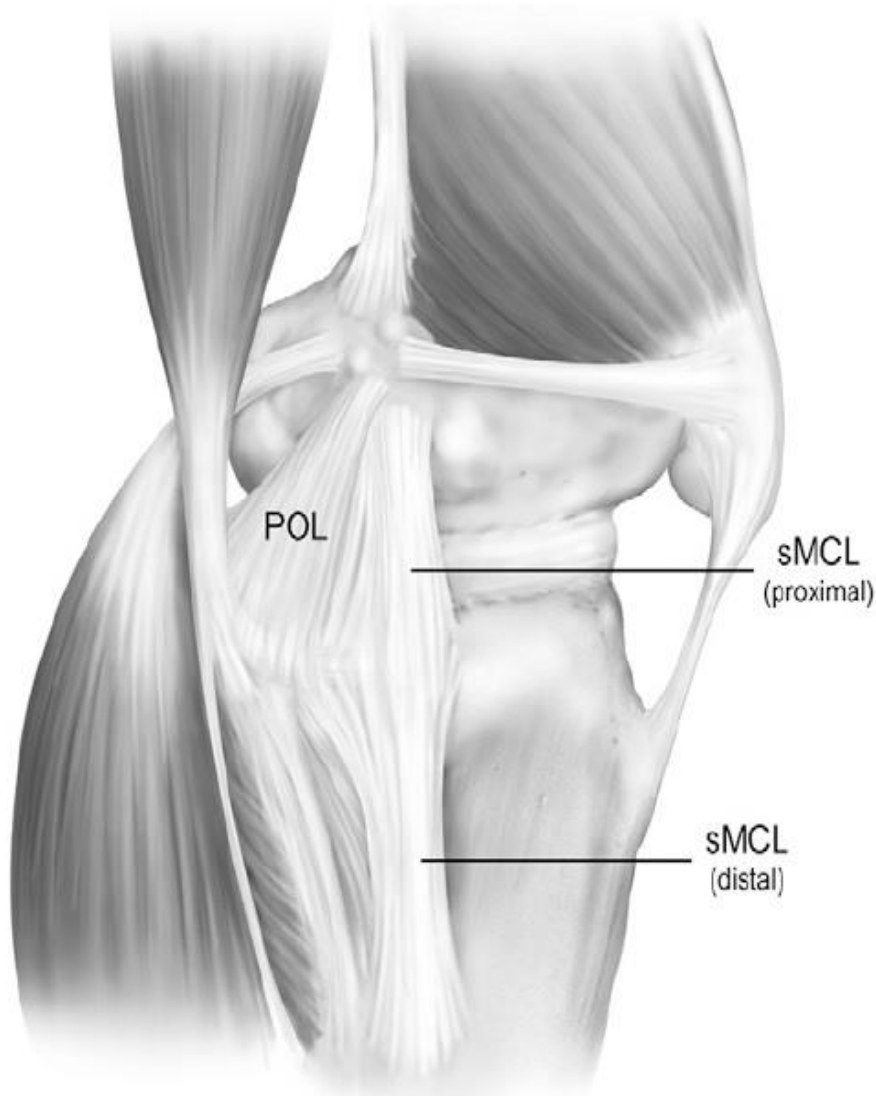




# LESIONE LCI monoleg. SUB-ACUTO



# LESIONE LCI monoleg. SUB-ACUTO



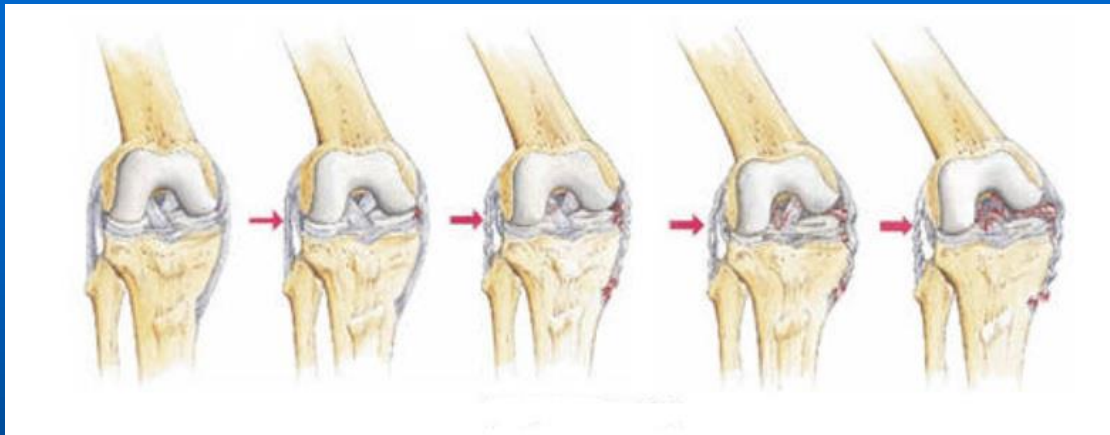


# TRATTAMENTO

## LCI + LCA

- Instabilità mediale dopo ricostruzione solo LCA
- lassità LCI può lesionare neo-LCA

## 3° grado Lesione LCI 95% dei casi lesione LCA



Dale et Al. Clin Sports Med 36 (2017) 87–103

# LESIONE LCI + LCA

Hugston 1994

Jokl 1984

Shelbourne 1992

Hillard-Sembell 1996

...

## DATI CONTRASTANTI

# LESIONE LCI + LCA

## STUDI BIOMECCANICI

Wijdicks 2009

Battaglia 2009

Coobs 2010

Feeley 2009

Griffith 2009

# RICOSTRUIRE SEMPRE LCI

# LESIONE LCI + LCA

**Operative and nonoperative treatments of medial collateral ligament rupture with early anterior cruciate ligament reconstruction: a prospective randomized study**

Halinen J, Lindahl J, Hirvensalo E, Santavirta S

American Journal of Sport Medicine 2006

## **Livello di evidenza 1**

1 gruppo LCI (grado 3°) trattato chir

1 gruppo LCI (grado 3°) non trattato

## **Risultati identici**

Il LCI non deve essere trattato chirurgicamente quando la ricostruzione del LCA viene eseguita in una fase precoce.

# LESIONE LCI + LCA

**Anterior cruciate ligament and medial collateral ligament injuries**

**Zaffagnini et Al.**

J Bone Joint Surg 2011;93-B:1060-4

**2 gruppi**

**Lesione LCA/lesione LCA + LLI**

Dopo ricostruzione del LCA nel gruppo con lesione LLI i test di stabilità antero-posteriore e varo-valgo sono peggiori

**Ricostruire LCA LCI per evitare aumento della  
lassità anche del LCA**

# LESIONE LCI + LCA

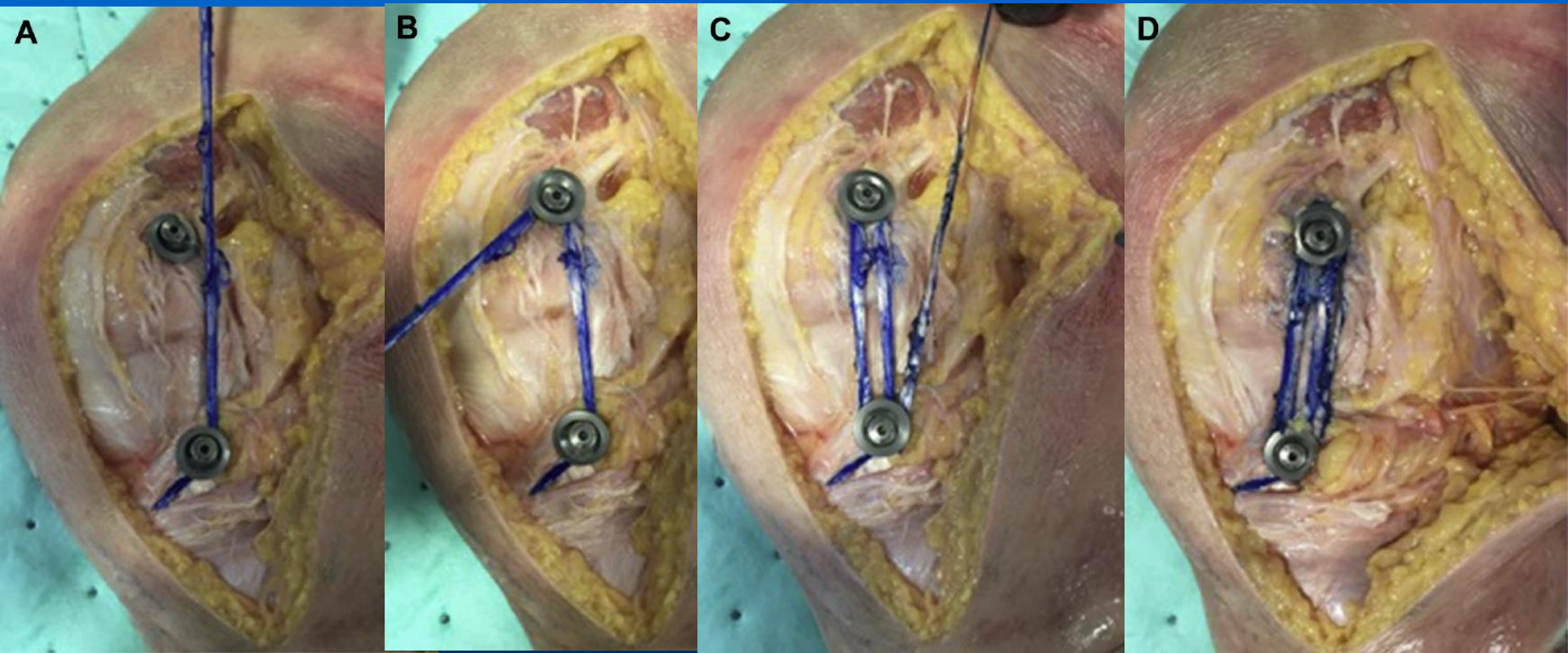
Lubowitz JH, MacKay G, Gilmer B (2014) Knee medial collateral ligament and posteromedial corner anatomic repair with internal bracing. Arthrosc Tech 3(4):e505–e508





# LESIONE LCI + LCA

## TECNICA DI BOSWORTH modificata



**Table 3**

**Treatment of anterior cruciate ligament and medial collateral ligament injuries based on grade of medial collateral ligament injury**

<b>MCL Injury</b>	<b>Treatment of Combined ACL and MCL Injuries</b>
Grade I	MCL: Rehabilitation for 6 wk ACL: Reconstruction after MCL rehabilitation
Grade II	MCL: Rehabilitation for 6 wk; early surgical repair for Stener-like distal tear ACL: Reconstruction after MCL rehabilitation
Grade III	MCL: Rehabilitation for 6 wk; repair or reconstruction if valgus instability on examination after ACL reconstruction; reconstruction for chronic MCL tears ACL: Reconstruction after MCL rehabilitation

# TRATTAMENTO

LCI + LCA + LCP + LCE ...

