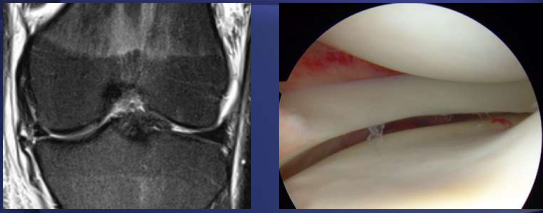


MCL Injuries: When and How to Repair



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University of Kentucky School of Medicine



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Disclosure

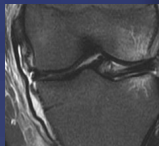
- Institution: Research/Education
 - Smith-Nephew Endoscopy



2

Isolated MCL Injury

- Usually heal – non-operative treatment
 - Grade I and II
 - Grade III mid-substance and femoral side
- Indelicato
 - Classic paper, CORR 1990
 - Treatment Phases –
 - Orthosis at 30°, partial weight bearing with crutches
 - ROM 30-90°, isokinetic exercises, full weight bearing
 - Removal of brace, full ROM, gradual exercise progression
 - Uniformly good results if ACL intact



3

Our Operative Indications

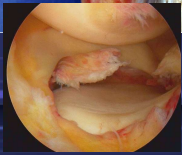
- **Acute Combined injury & Grade III MCL/POL**
 - Opens at 0 and 30 degrees
 - Increased ER/IR
 - Positive scope drive through sign
- **Acute Isolated Grade III MCL/POL w/ avulsion off tibia: Stener Lesion**
 - Opens at 0 and 30 degrees
 - Increased ER
 - Positive scope drive through sign
- **Chronic MCL/POL deficiency**
 - Anatomic surgery
 - Evaluate for malalignment
 - LaPrade Technique for reconstruction



4

Anatomy

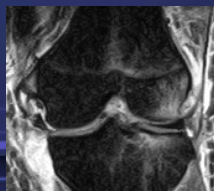
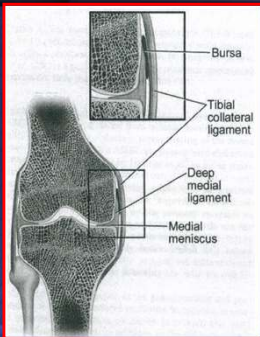
- **Superficial MCL**
 - 11 cm long; 1.5 cm wide
 - Insertions:
 - Medial femoral epicondyle
 - 6 cm distal to joint line
 - Inserts underneath pes tendons
 - Biomechanics
 - Mobile
 - Posterior: Tight in full extension
 - Anterior: Tight in both flexion & extension
 - Most lax @ 30° flexion



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Anatomy

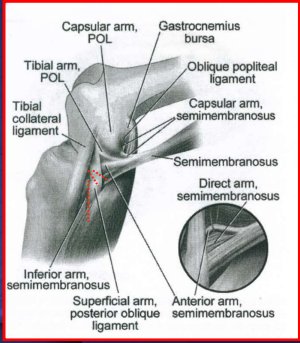
- **Deep MCL**
 - Insertions:
 - Near joint line
 - Medial meniscus
 - Blends with:
 - Capsule anteriorly
 - POL posteriorly
 - Divided into:
 - Menisiofemoral ligament
 - Meniscotibial ligament
 - (aka coronary ligament)



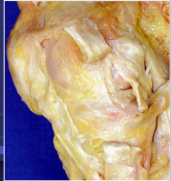
6

Anatomy

Posterior Oblique Ligament



- Insertions:
 - Adductor tubercle
 - Tibial joint line
 - Posteromedial capsule
 - Semimembranosus
- Loose in flexion
- Internal rotation restraint



7

Combined ACL/MCL injuries

Medial Collateral Ligament Injuries and Subsequent Load on the Anterior Cruciate Ligament

A Biomechanical Evaluation in a Cadaveric Model

- Partial and complete MCL tears significantly increased the load on the anterior cruciate ligament.


Baltaglia et al. AJSM Vol 37, No 2, 2009

From: Surg. 2003 Jul;16(2):148-51

Valgus medial collateral ligament rupture causes concomitant loading and damage of the anterior cruciate ligament.

Mazzocca AD, Nissen CW, Gearty M, Adams DJ.

- ACL strain increased significantly after isolated MCL injury
- MCL injury can place ACL at risk



8

Combined Ligament Injury Operative Indications


Combined Injury

— 2 schools of thought:


- Non-op treatment of MCL for 4-6 wks, and then reconstruct ACL and/or PCL
- Acute treatment of MCL and reconstruct ACL and/or PCL

— Recommend surgery for MCL when:

- Gross opening at 0°
- Avulsed off tibia
- When treated non-op, failure of MCL to heal within 1 month

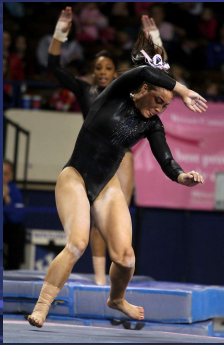


- Medial Hockey-stick Incision
- Layered approach



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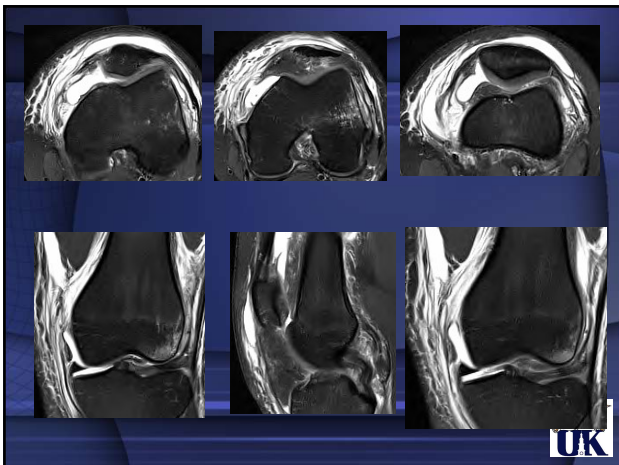
20yr elite gymnast



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11



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Pivot Shift

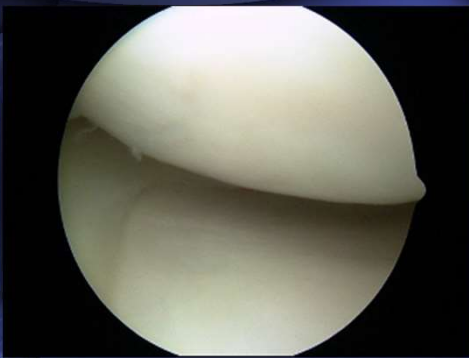


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Valgus Stress

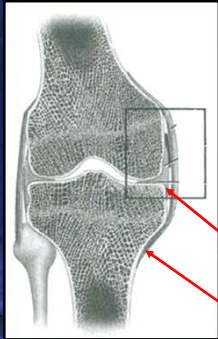


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Operative Technique (ACUTE)



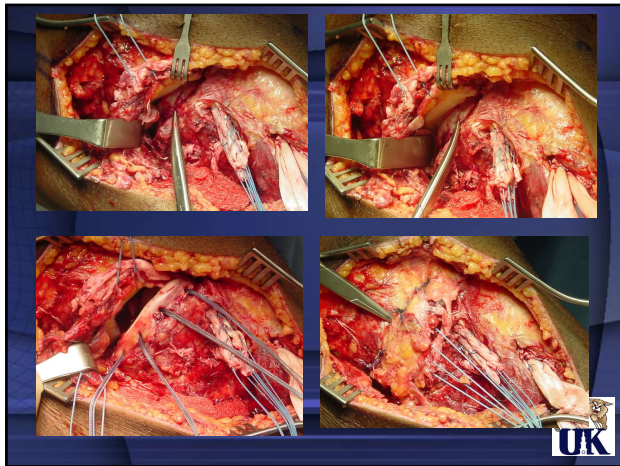
- **Deep MCL**
 - Repair with suture anchors
 - Meniscal repair as indicated
 - Tie sutures w/ knee in full extension
- **Superficial MCL**
 - Anchors or Spiked washer
 - Tie sutures w/ knee at 30°
 - Careful not to overtighten...flexion contracture
 - Check knee w/ gentle ROM to ensure not "captured"
- **Cruciate Ligaments**
 - Reconstruct first
 - Place tibial fixation only after MCL repair complete

Minimum of 3 "spot welds" with suture anchors

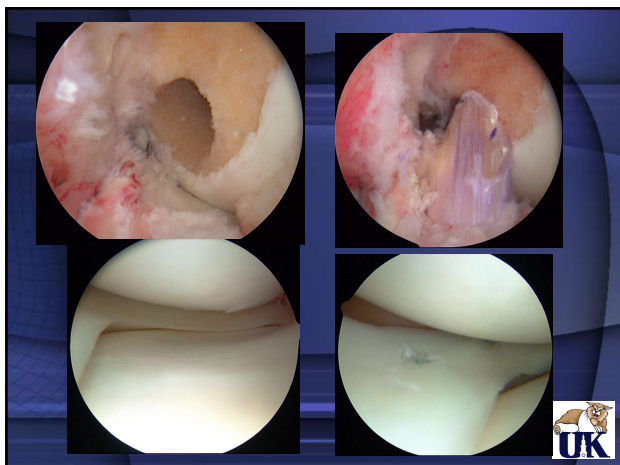
Suture Anchors or Spiked washer



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17



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Isolated MCL Injury

- Operative Treatment?

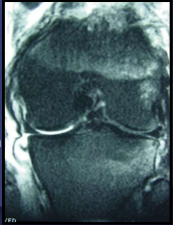


An intraoperative photograph showing a surgical approach to the knee joint. The MCL is visible, and surgical instruments are used to access the ligament. A small logo with the letters 'UK' is in the bottom right corner.

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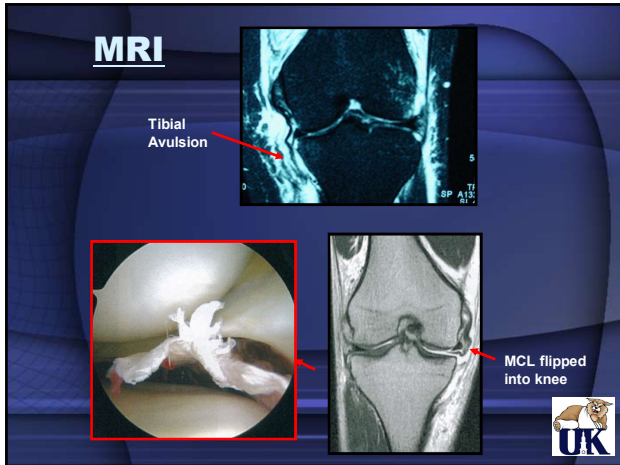
Isolated MCL - Operative Indications

- Femoral Avulsions
 - More Common
 - Heal without surgery
 - Higher % of stiffness
 - Especially w/ surgery
- Tibial Avulsions
 - Slower healing
 - Decrease % of stiffness
 - Synovial fluid
 - inhibition of healing
 - Meniscal instability
 - Stener lesion
 - MCL flipped over pes

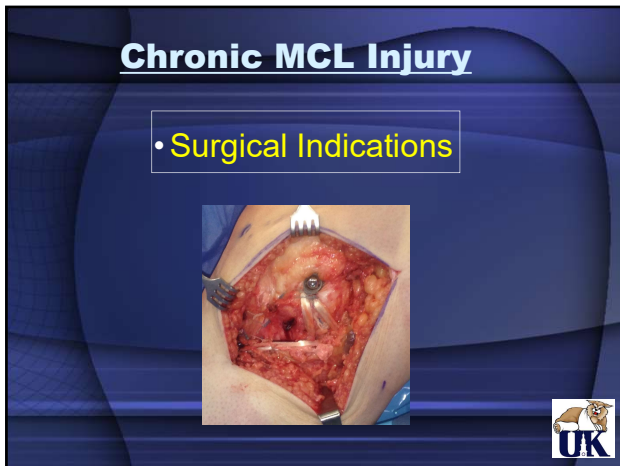


An MRI scan of a knee joint showing a tibial avulsion. An arrow points to the site of the avulsion. A small logo with the letters 'UK' is in the bottom right corner.

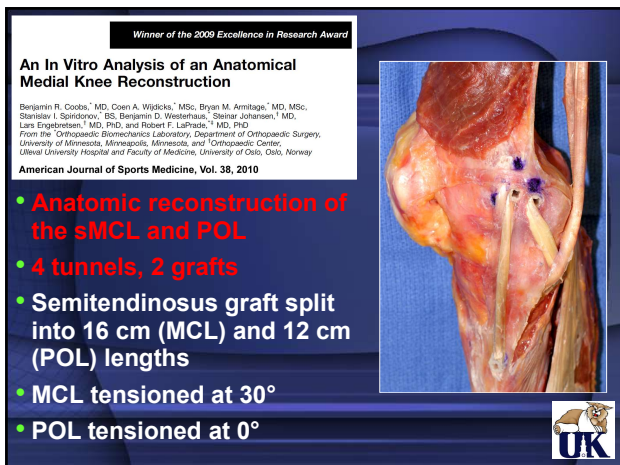
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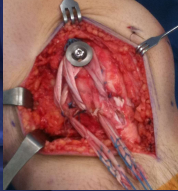
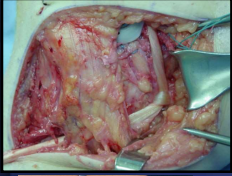


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Operative Technique (CHRONIC)



- **MCL Reconstruction**
 - Free graft
 - Autograft ST/G
 - Achilles Tendon Allograft
 - Semitendinosus in-situ
 - Use open-ended tendon stripper
 - Maintain tibial insertion
 - Attach to:
 - Semimembranosus
 - Medial Epicondyle
 - Back to Pes insertion
 - Reconstructs MCL & POL



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Case

- 27 yo male professional motocross rider
- Hx of previous bilateral ACL reconstructions, left knee MCL injury in August 2014 treated non-operatively
- Complains of continued left knee medial sided “looseness” and instability despite wearing brace



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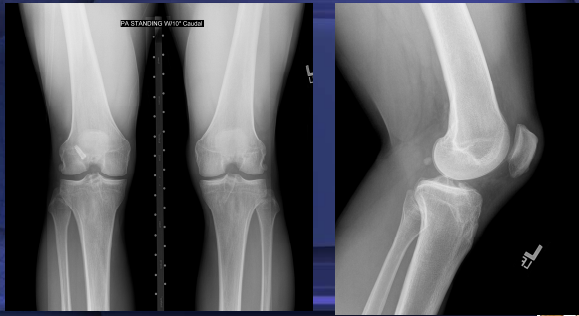
Case

- **Physical Exam**
 - Full AROM/PROM
 - (-) Lachman's, Anterior Drawer, Pivot Shift
 - (-) Posterior Drawer, Dial test
 - Grade 3 opening medial joint line with valgus stress at 0° and 30°



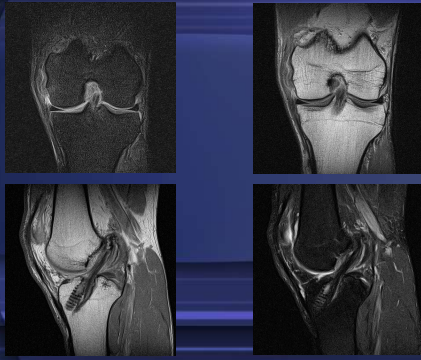
27

Case



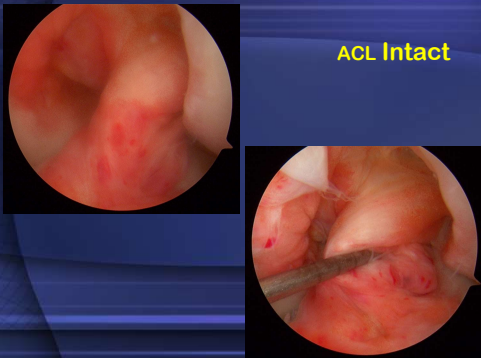
28

Case



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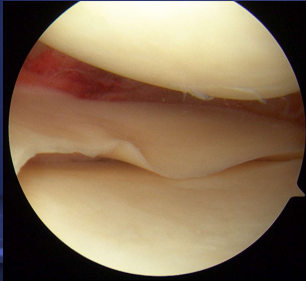
Case



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Case

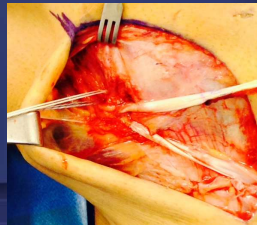
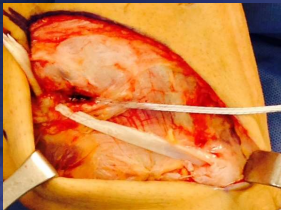
Medial Side "Drive through sign"



31

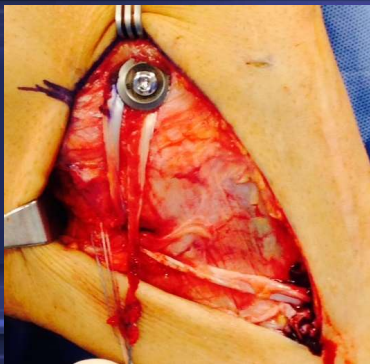
Case

• Medial Sided Posterior Oblique Ligament Reconstruction with Semi-T autograft



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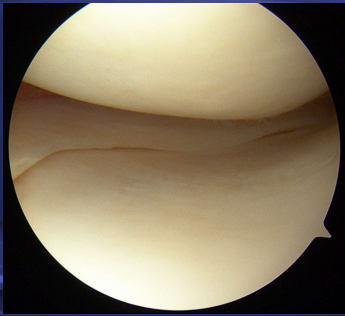
Case



33

Case

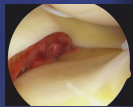
Improved "drive-through" sign after medial sided repair



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Conclusions

- Majority of MCL injuries heal without surgery
- MCL injuries increase load of ACL
- Consider Acute MCL Repair
 - Combined injury with Grade III opening MCL
 - Acute isolated Grade III injuries off tibial side
- Chronic Injury - Reconstruction
 - Functional MCL laxity with symptoms after adequate healing time
 - Normal alignment



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Thank You



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