

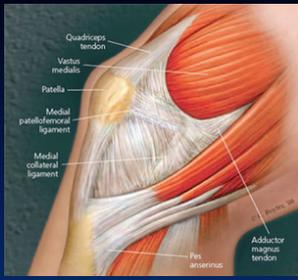
**Stiff Knee**  
after  
**Medial Compartment Injury**

*François Kelberine, Olivier Touchard*  
Aix-en-Provence, France




**Anatomy**

- ✓ Joint excluded
- ✓ MCL
- ✓ MPFL
- ✓ Hamstring tendons



**Biomechanics**

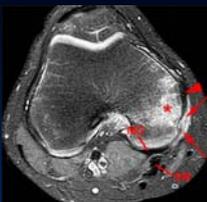
- ✓ MCL near isometric :
  - ✓ sMCL 2 bundles, dMCL 2 parts
  - ✓ Slack > mid flexion 30°/50°
  - ✓ Length variation of bundles 2% to 5%
  - Post parts of MCL decrease with flexion (p < 0,05)
  - Ant part of dMCL increase
- ✓ MPFL non isometric
  - ✓ Sup bundle taut in extension
  - ✓ Inf bundle taut @ 30°

*Park The Knee 2005*  
*Victor Am J sport Med 2009*




**Spectrum of causing factors > medial injury**

- ✓ After MCL tear
  - ✓ Conservative treatment
  - ✓ Post surgery
- ✓ MPFL reconstruction
- ✓ Tendinopathy
  - ✓ Rupture (harvesting/surgery)
  - ✓ Chronic
- ✓ Sudeck's syndrome (CRPS)
  - ✓ Timing of surgery
  - ✓ Single impact



**Patient's check**

- ✓ Clinical assesment
  - ✓ Slight lack of extension and/or deficit of flexion
  - ✓ Rigid or soft end point
  - ✓ Pain? Location
- ✓ Radiographs AP, lateral views in max Flex/Ext
- ✓ MRI
- ✓ Bone scan

**Expectations!**




**CRPS**

- ✓ Frequent & unpredictable
- ✓ Neural input of the medial aspect of the knee
- ✓ Timing of treatment
- ✓ Bone scan
- ✓ Medical treatment





### Medial tendinopathy : pes anserinus

- ✓ Acute or overuse Iatrogenic
- ✓ Risks factors (22 cases) valgus deformity & MCL deficiency  
*Alvarez-Nemegyei J Clin Rhum 2007*
- ✓ Sonography (37 cases) = few bursitis  
*Uson Scand J Rhum 2008*
- ✓ Rehab treatment, Injection



### MCL tear

- ✓ After conservative treatment  
*Jacobson Clin Sport Med 1999*
- ✓ Strict immobilization is detrimental  
*Woo J Biomechanics 2006*
- ✓ Early controlled motion / rehab
- ✓ Hinged brace  
*Reider Am J Sport Med 1993*



### MCL tear : Chronic symptoms

- ✓ Chronic medial pain
  - ✓ 4% Kelberine & Meyer ISAKOS 2009
  - ✓ up to 20% Holden Am J Sport Med 1983
- ✓ Combined with stiffness (lack of flexion)
  - ✓ MRI = deep MCL (scarring, thickening)
- ✓ Calcific femoral deposit (Pellegrini Stieda)  
*Wang Am J Orthop 1995*



### Treatments

- ✓ Sono guided steroid injection + analgesic+ needling  
*repeated Jones The Knee 2009*
- ✓ Calcification removal
- ✓ Anatomic Reconstruction MCL (several techniques)  
Which can led to stiffness.....



### MCL tear

After MCL repair/reconstruction

- ✓ Timing of repair  
ACL + MCL acute repair = major risk of stiffness  
*Hugston JBJS 1983*  
*Froke Knee Surg Sport Trauma Arthrosc 1998*  
*Petersen Acta Orthop Trauma Surg 1999*
- ✓ Lack of post op rehabilitation
- ✓ Non anatomic repair  
Knee kinematics are altered by a non anatomic reconstruction (short graft) *Van den Bogaerde KSSTA 2011*



### Treatment

- ✓ Steroid injections and / or needling (+ PRP?)
- ✓ Surgery (balance Benefice vs Risk : pain & recurrence)
  - ✓ Arthrolysis arthroscopic : medial gutter, electrocautery
  - ✓ Open arthrolysis step by step (distal detachment)



