

Chronic MLI of the Knee

Is there a place for conservative treatment?

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Treatment is still controversial

- Timing : acute < 3 w, delayed < 6 weeks, **chronic**
- ACL & collateral = sport injury
- PCL & collateral = traffic or fall injury
- Schenck's classification
- Young & Active = high expectations
- Old & Sedentary = ADL

Non op treatment

- ★ Some studies with good results have been reported with non operative treatment and immobilization in a cast or with an EF for 6 to 16 w.

Frassica J Clin Orthop 1991
Harner CD J Bone Joint Surg 1998
Schuster G Fortschr Med 1980
Shelbourne KD Orthop Rev 1991
Tarhan O Unfallchirurg 1993
Taylor AR J Bone Joint Surg 1972

- ★ No additional surgery despite some stiffness or instability
- ★ Present guideline is surgery

Literature

STUDY	No of patients/ Mean FU	IKDC (Exc-Good) Surg/Cons
Wong et al retrospective study (III)	15/11 - 34	73/54
Rios et al. retrospective study (IV)	21/5 - 36	76/0
Richter et al retrospective study (IV)	59/18 - 98	24/6
Dedmond and Almekinders meta-analysis (IV)	132/73 -36	NR/NR



Rationale

1) What can heal

Woo & al J Biomechanics 1997 & 2006

- MCL + Rabbits repair = non repair with or w/o ACL
- Collateral lateral when immobilized
- + Scars in and around the joint @ 6 weeks
- Uncomplete, unpredictable in MLI
- Can't expect healing anymore

Rationale

2) Prevalence of neglected MLI (voluntary or not)

- True dislocation rare *Rios J Trauma 2003
Leonardi Joints 2017*
- Missed diagnosis MLI due to circumstances unknown

3) Natural onset

- Varus, Instability (re-injury) *Bispo Jr Clinics 2008
Kanawo Clinics 2007
Société Orthopédique de l'Ouest 2008*
- OA 31%

Rationale

4) Rate of complications or failure (index surgery)

- Acute cases : 30 to 42%
 - 91pts @ 8y FU
 - 21% resurgery, 2 arthrodesis, 1 TKA, 4 amputations
- Chronic : 25% stiffness

5) Patient's expectations or profile



Multidirectional laxity ≠ instability

Bispo Jr & al Clinics 2008,63 (1),p3-8

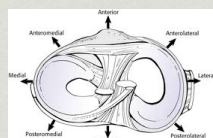
- Ref trauma center
- 109 chronic cases (within 3 years), age =16-55 yo
- Times 3 to **180 months** (24 months)
- Male 98%,
- ACL + collateral = sports and falls
- PCL + ACL + collateral = hit (traffic or wright)
- Varus deformity increases with time
- Earlier re injury if non repair

Chronic cases

- Functional Instability

*Hodrick Spot Med Arthro Rev 2005
Bin Arthroscopy 2007*

- PCL
- ACL



- ITB / ALL / LCL : Varus and recurvatum decoaptation
- MCL / POL : Valgus is moreoften controlled except for pivoting

IMAGING ++

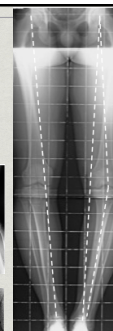
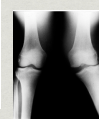
- Unipodal weight bearing alignment

- Stress radiographs

- Varus / valgus

- Lateral (telos)

- Centred on lateral view WB



Conservative treatment

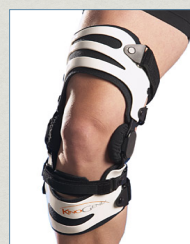
Kanawo Clinics 2007

- Rehabilitation anyway
- Protect insufficient ligament(s)
 - Appropriate to avoid retraction nor elongation
- Braces
- Varus / valgus discharge custom made
- Simple splint

Mechanical protection

- Bracing prevents from valgus and ER in grade III

*Wijkicks A.JSM 2001
Larsen Acta Orthop Scand 1987*






but...

Mechanical improvement

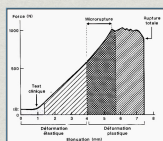
- Protected abnormal motion
- Quad function *Laprade J Orthop Sport Phys 2010*
- Edema control *Warden AJSM 2006*
Sparrow AJSM 2005
- Biking
- Low intensity pulsed US increased healing
- Improve collagen alignment, load to failure & tensile strength of peripheral ligaments *Wang J Biomech 2004*
Halinen AJSM 2006
Thornton J Orthop Res 2005

TYPE OF BRACES?

- Preventive or functional brace 
- Mechanical function
- Hinged brace (rigid arm on the side) 
- Sleeve 
- No rigid structure
- Similar to taping...?

Mechanical protection in normal knee Experimental studies

- Resistance / stress = 30% improvement
- Proportional
 - Tightness of the brace
 - Length of lateral rigid arms
- Decreases in knee flexion
- Forces used in tests < real trauma +++
- But effective in ADL



France, Am J Sport Med 1987
Brown, Clin Sport Med 1990
Meyer, Iowa Orthop J 1989
Erickson, Am J Sport Med 1993

Mechanical protection in unstable knee Experimental studies

- Braces limit anterior posterior translation
 - In vitro with forces < 150 N *Liu, J Rehabil Res Dev 1999*
Beynon, JBJS Am 1992, AJSM 2003
Wojtyls, Am J Knee Surg 2001
 - Not physiological !!
- Do not control efficiently in vivo
 - with strenuous activities b but ok /ADL
- Anatomical braces custom made (cost)

Functional protection in unstable knee

- Objective and subjective beneficial effects
 - Physical tests (figure of 8 run, jump,...)
 - Clinical signs (swelling, giving way,...)
 - Laximetry NS
- Efficient only if quadriceps < 80% +++
- Efficacy decrease with the intensity and duration of activity

*Colville, Am J Sport Med 1986
Cook, Am J Sport Med 1989
Mishra, Clin Orthop 1989
Surg 2001*

Proprioceptive role of braces

- Healthy knee
 - Isokinetic test : position without visual control
 - Improvement = 11% ($p > 0,05$)
- Lax knee
 - Improves the muscular activity (controlled by EMG)

Mac Nair, Arch Phys Med Rehab 1996

Nemeth, Am J Sport Med 1997

Ramsey, Clin Biomech 2003

Proprioceptive role of sleeves

- Improve proprioception
 - Simple bandage
 - Better when there is a preexisting deficit
- Better proprioceptive tests ($p < 0,05$)
 - Sleeve or taping
- Improvement ++ > ligamentoplasty ($p < 0,001$)

Barret, JBJS 1991

Herrington, Res Sport Med 2005

Kuster, Med Sc Sport Exerc 1999



Conclusion

- * In chronic cases with symptoms (instability), surgery can be considered
- * However if symptoms are mild, depending on the patient's activity level, conservative treatment can be considered
- * It includes prolonged rehab, bracing can be considered in low demand patient.

