4th Advanced Course on Knee Surgery

Val d'Isère 2012

Management of failed P.C.L. Reconstruction

Ph. COLOMBET

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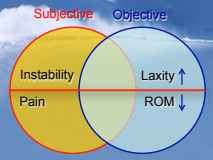
Definition of failure

- A combination of
1. SUBJECTIVE
   - Pain
   - Stiffness
   - Instability
2. OBJECTIVE
   - Residual laxity (Postero and Postero-lateral)
   - Degradation of cartilage
   - Loss of motion



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Management of PCLR Failure

- The strategy is based on:

1. What the patient is complaining of
2. Reason for failure analysis
3. Clinical examination
   - Traumatism circumstances
   - Knee Mobility
   - Laxity assessment
4. Imaging analysis
5. Treatment planning

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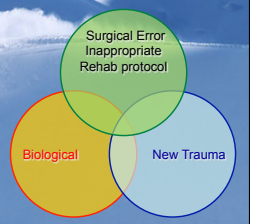
Reasons for failure

A combination of

1. SURGICAL ERROR
2. BIOLOGICAL
3. New TRAUMATISM

Mostly multifactorial



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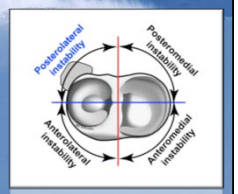
Reasons for failure

A combination of

1. Untreated combined inst.
2. Bad tunnel placement
3. Bad Graft Fixation
4. Untreated articular lesions
   Meniscal, chondral …



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Reasons for failure

New Traumatism

1. "Aggressive" / early rehabilitation.
2. Real New traumatism

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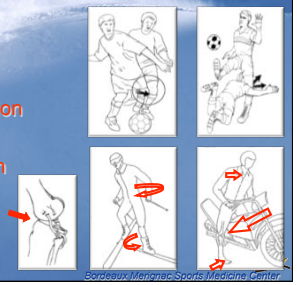
Clinical examination

Traumatism circumstances:

1. Varus
2. Varus-flexion –ER
3. Varus-hyperextension
4. Hyperextension
5. Posterior translation
6. Dislocation



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Clinical examination

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Clinical examination

Knee function evaluation:

1. Mobility
2. Pain
3. Effusion
4. Gait analysis
5. Laxity assessment

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Clinical examination

Laxity assessment:

1. Varus
2. Lateral laxity
3. Reverse Pivot Shift

Capsule, PCL, LCL

PCL, LCL

LCL

« Reverse pivot shift » Test (Jakob 1981)

- Positive + if PLC +
- Positive ++ if PLC + PCL

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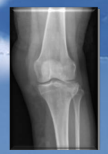
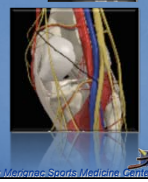
Clinical examination

Associated disorders

1. Fixed deformity
   - ✓ Vicious union
   - ✓ Fixed posterior subluxation
2. Nerve or vascular
3. Location of skin incisions





Popliteal artery

Peroneal nerve

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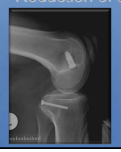
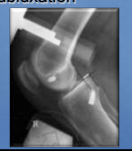
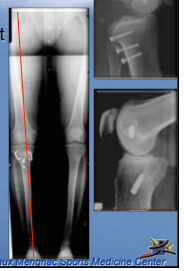
Imaging analysis

1. Standard radiographs
   - Tunnels position, enlargement
   - Different hardware type and place
   - Posterior tibial slope, knee alignment
2. Stress radiographs
   - Posterior draw, varus/valgus..
   - Reduction of subluxation







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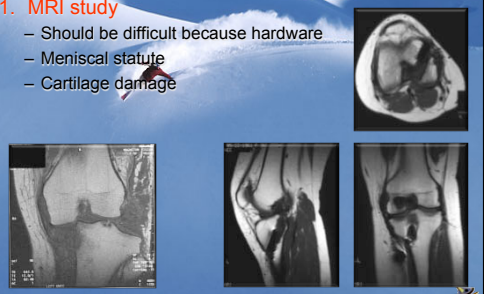
Imaging analysis

1. MRI study
   - Should be difficult because hardware
   - Meniscal statute
   - Cartilage damage



Management plan

1. Start from the patient's complains
   - Pain (degree and location)
   - Instability
   - Gait desorder
2. Check the lower limb alignment
   - Standing hip-knee-ankle x-rays

VALGUS | NORMAL AXIS | VARUS

Management plan

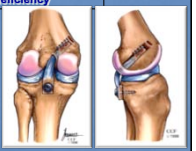
NORMAL AXIS

1. Evaluate Medial, lateral PLC structures
2. Consider the posterior tibial slope

PCL Revision

Correct the associated ligament deficiency

1. One or two stages procedure
   - Hardware removal
   - Bone graft tunnel
2. Techniques of reconstruction
   - Transtibial or Inlay (if bad tunnel placement initially)
   - Graft selection *(remains controversial)* (Quad. Tendon PB, HS, BPTB, allograft ..)



Management plan

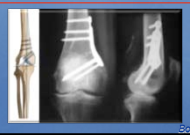
VALGUS AXIS

No Medial joint opening → PCL Revision

Abnormal MCL Post-Med Structures

Lat. Meniscus? Lat. OA?
- Varus femoral osteotomy
- Prior to PCL Revision

PCL Revision
Med. Lig. reconstruction



Management plan

VARUS AXIS

Primary Varus
No ligament deficiency

PCL Revision

See in the future if :
- Symptoms
- Narrowing Med. Joint space

Medial pain
Narrowing joint space

HTO first
Then PCL revision if needed

Management plan

VARUS AXIS

Associated with:
Lateral Lig. deficiency

HTO ++++
Little hyper correction in valgus
(Mostly enough, very effective on gait)

Assess lateral opening
External tibial rotation

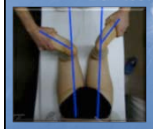
PCL Revision

PCL Revision
PLC reconstruction

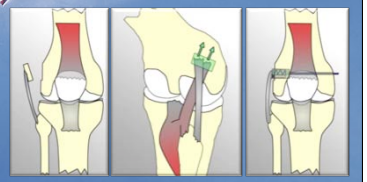
Management plan

PLC reconstruction

1. Many different techniques are proposed
   - Dail test



Re-tightening techniques



Augustine, Hughston R. Jakob

Management plan

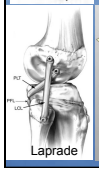
PLC reconstruction

1. Many different techniques are proposed

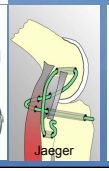
Reconstruction techniques

G. Bousquet

B. Clancy

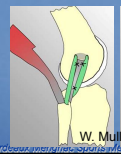


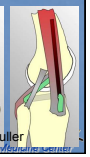
Laprade



Jaeger

Jakobsen





W. Muller

Rehabilitation

Bracing
- the graft at the femoral attachment is at greater risk for abrasion, asymmetrical loading, and eventual failure
- hinged brace with a posterior calf pad or dynamic anterior drawer brace for 8 weeks

Flexion
- Flexion was then progressed to 100° at 6 weeks,
- 110° at 8 weeks, and 135° by 10 weeks

Weight bearing
- 25% body weight for the first 4 weeks at 0° in a brace and progressed to 50% body weight at 6 weeks full weight bearing with the brace unlocked was allowed at 8 weeks

Clinical results

F. Noyes, AJSM 2005

Subjective and functional results
- Satisfactory for pain, swelling giving way, walking, stair climbing
- No limitations in knee motion
- inferior compared with results of PCL primary reconstructions for acute ruptures
- *53% of the patients could participate in light recreational activities*

Clinical results

F. Noyes, AJSM 2005

Objective results

LAXITY:
–stress radiograph posterior tibial translation at follow-up 5.1 ± 2.4mm
(*Cooper AJSM 2004* 6.8 mm and *Aglietti KSSTA 2002* 4.8 mm)

MOBILITY
–All knees had at least 0° to 135° of motion, and no knee had a joint effusion

IKDC global: (n=15)
–A=1 B=7 C=6 D=1

CONCLUSION I

1) PCL revision is difficult surgery!
- **Which put emphasis on initial PCL R.**
- **Secondary restraints lesions**

(MCL, LCL, PLC, bone correction, tunnel placement..)
- **Beware of Neurovascular lesions**

(pre-op arteriogram)

CONCLUSION II

2) Know the limits of such a surgery

- It is a salvage knee situation
- The goals in a revision population are:
  - to *reduce symptoms with daily activities* and
  - to expect that approximately 50% will be able to resume light recreational activities.

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CONCLUSION III

3) Take a pre-op strategy!

- Determine etiology of failure
  (don't do the same mistakes)
- Choose the good option
  - 1 vs 2 stage?
  - Inlay vs tunnel?
  - HTO?
  - PLC reconstruction?

4) Revision PCL results are not as good as primary

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Thanks for your attention!

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