

Stiff knee after ACL/PCL reconstruction: surgical indications

Ph. Neyret, V. Duthon
4th advanced course on knee surgery
Val d'Isère 2012



Centre A Trillat
103 Grande rue de la Croix-Rousse
69004 Lyon-France
philippe.neyret@chu-lyon.fr
victoria.duthon@hcuge.ch



Definition

Loss of knee extension $>10^\circ$ and knee flexion $<125^\circ$

(Harner CD et al. AJSM 1992)

Table 2 Classification of arthrofibrosis [30]

	Description
Type 1	$\leq 10^\circ$ extension loss and normal flexion
Type 2	$>10^\circ$ extension loss and normal flexion
Type 3	$>10^\circ$ extension loss and $> 25^\circ$ flexion loss with decreased medial and lateral movement of the patella (patellar tightness)
Type 4	$>10^\circ$ extension loss and $\geq 30^\circ$ of flexion loss and patella infera with marked patellar tightness



(Shelbourne KD et al. AJSM 1996)

Deviation from the contralateral normal limb motion

Statistics

Most common complication after ACL reconstruction: 4% to 35% of cases

(George MS. AJSM 2006)

Incidence: 11% in a case series of 244 ACL reconstructions

(Harner CD. AJSM 1992)

3-7 % need arthrolysis (mobilisation or arthroscopic)

(Landreau P. 2004)

Stiffness after ACL reconstruction

Loss of extension

- cyclop syndrome -> arthroscopic anterior arthrolysis
- tibial tunnel of ACL graft too much anterior -> notch plasty, revision

Loss of flexion

- lack of reeducation
- femoral tunnel of ACL graft too much anterior -> revision

Combined stiffness

- reconstruction too early
- complex regional pain syndrome

Causes

- Pre-operative stiffness
- Post-operative hemathoma
- Pain
- Infection
- Immobilisation
- Physiotherapy



Consequences

- Loss of flexion:
affect daily living when limited at 90°
- Loss of extension:
quadiceps hyperactivity
increased surface pressure on femoro-patellar joint
limp and low back pain

Surgical indications

- Knee flexion < 125° (or less than 85% of normal knee)
- Flexion contracture > 10°
- Failure to progress with appropriate nonsurgical treatment for 2 months

DeHaven KE. Instr Course Lect 2003

Surgical techniques

- Mobilisation under anesthesia
- Arthroscopic arthrolysis
- Open surgical arthrolysis (arthrotomy)
- Surgical extra-articular arthrolysis (Judet, Lobenhoffer)

Surgical principles

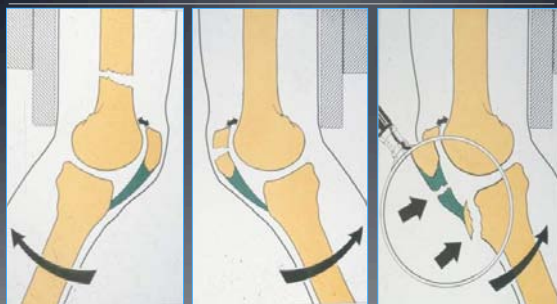
1. Not during inflammatory phase
2. Arthroscopic arthrolysis, notchplasty
3. Open anterior release
4. Open posterior release
5. Tibial tubercle slide if patella infera

DeHaven KE. Instr Course Lect 2003

Mobilisation



Mobilisation: complications



Mobilisation: complications



Cartilage crush!



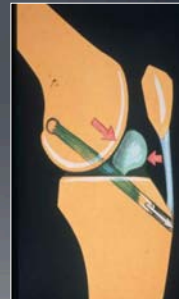
Arthroscopic arthrolysis

“cyclop syndrome”

“intercondylar notch scarring”

-> shaving of the cyclop

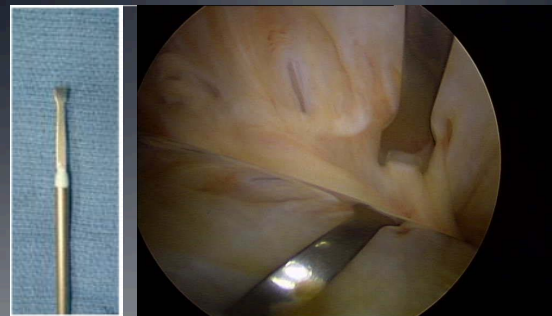
-> notch plasty if impingement



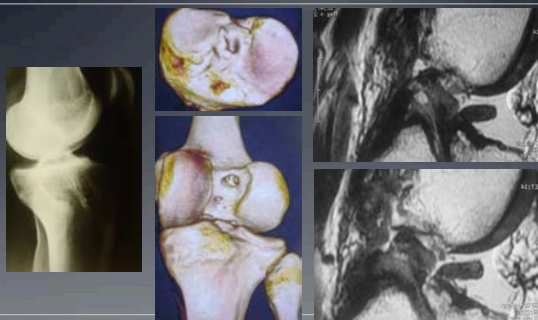
Shaving + notch-plasty



Arthroscopic arthrolysis



Tunnel position



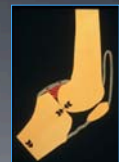
Open arthrolysis: intra-articular

• Anterior:

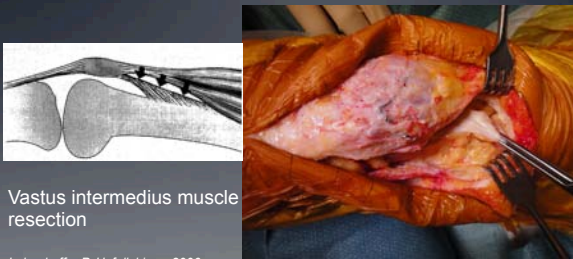
• Posterior:

Retro-ligamentar internal and external arthrotomy

Desinsertion of posterior capsule on femoral condyles



Open arthrolysis: extra-articular



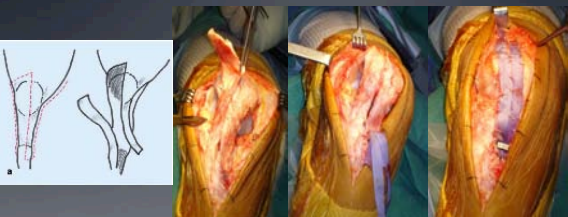
Vastus intermedius muscle resection

Lobenhoffer P, Unfallchirurg 2006

Open arthrolysis: extra-articular




Patella infera : tendon lengthening



Z-plasty of the patellar tendon according to H.Dejour

Patella infera: ATT slide



Lobenhoffer P, Unfallchirurg 2006

Stiffness prevention

... Arthrofibrosis is much better prevented than treated...


Pre-op: full range of motion, no effusion, muscle tonus

Intra-op: anatomic position of tunnels

Post-operative physiotherapy with early range of motion:

- adequate pain management
- control of swelling, prevent hematoma
- early recovery of quadriceps function and prevent hamstrings contracture
- patella mobilisation

Thank you



Types

- Localized anterior intra-articular arthrofibrosis: cyclop
 - Localized intra- or extra-articular arthrofibrosis: infrapatellar contracture syndrome
 - Global arthrofibrosis
 - Graft malposition
 - Excessive graft tension
 - Soft-tissue calcifications
 - Flexion contracture
-

Clinical aspects

- Timing of surgery
 - Mechanism and associated injuries
 - Surgical technique
 - Post-operative rehabilitation
 - Pain factors
 - Infection/sepsis
-