Treatment of the Stiff Knee

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Classification

According to

- Anatomy
- Range of Motion
- Etiology
- Timing
Classification

Anatomy

- Articular
  - the cavity (adherences, prosthesis)
  - the capsule (patellar tendon)

- Extra-Articular (muscle)
Articular

Extra articular
Classification

Range of Motion

- Clinical examination
  - Stiffness after TKA: 10-90
  - TKA on stiff knee: 30-60

- Dynamic evaluation: < 5° / week
Classification

Etiology

- RSD
- Infection

- NON Prosthesis dependant
  Pre op: Multiple surgery, Hip
  Post op: Rehabilitation and Pain

- Prosthesis dependant
  Design and Size
  Constraint: Pcl R, Bicruciate R
  Positioning: Gap
Classification

- Timing or Duration of symptoms
  - Per-op stiffness
  - Post-op stiffness

- Early  Stiff TKA < D 45
- Late    D 45 < stiff TKA < 6 months
- Chronic after 6 months
Our series: 1188 Primary TKA

From 1987 to 2004  Mean FU: 31 (3-122)
Posterior stabilized HLS-Noetos
n=63  (F:49, M:14)

Infection and RSD were ruled out and excluded
1. Manipulation under anaesthesia  46
2. Arthroscopic release  3
3. Open arthrolysis  5
4. Component revision  2

PreTKA ROM :  113° (50-140)
During TKA :  122° (min 110°), no flexum
1. Manipulation under Anaesthesia

- N=46
- Time between TKA and MUA 30 days (10-90)

<table>
<thead>
<tr>
<th></th>
<th>During TKA</th>
<th>Before MUA</th>
<th>During MUA</th>
<th>At FU</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROM</td>
<td>122 +/- 5</td>
<td>67 +/- 11</td>
<td>117 +/- 8</td>
<td>114 +/- 16</td>
</tr>
<tr>
<td>Extension deficit</td>
<td>0</td>
<td>2 +/- 3</td>
<td>1 +/- 3</td>
<td></td>
</tr>
</tbody>
</table>

Pain score at FU 44: (+/-8)
1. Mobilisation under anaesthesia

**WHEN?**

Within 2 weeks: Fox JL JBJS Am 1981
After 3 weeks: Esler CN JBJS Br 1999
Within 3 weeks: Daluga J J J Arthroplasty 1991

No consensus in literature

For us, if there is a good ROM before TKA and completed wound healing is achieved and if we observed no progression or regression we recommend MUA within 10-90 days period.
1. Mobilisation under anaesthesia

How?

Xrays control +++
1. Mobilisation under anaesthesia

How?
2. Results of Arthroscopic Release

- N = 3
- No retinaculum release

<table>
<thead>
<tr>
<th>cases</th>
<th>Preop ROM</th>
<th>Final FU</th>
<th>Pain score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>0/0/70</td>
<td>0/0/125</td>
<td>45</td>
</tr>
<tr>
<td>Case 2</td>
<td>0/0/75</td>
<td>0/0/120</td>
<td>40</td>
</tr>
<tr>
<td>Case 3</td>
<td>0/5/45</td>
<td>0/0/120</td>
<td>30</td>
</tr>
</tbody>
</table>
2. Arthroscopic release

Technique

- Tourniquet, Pump, Shaver, Smillie-like
- 4 approaches
- Medial and Lateral Retinaculum releases
- PCL release?
- Complementary Mobilisation
- To close carefully, Drainage?
2. Arthroscopic release

Technique

- Mirror effect

- Prosthesis breakage

P. Burdin
2. Arthroscopic release

Post operative cares

- Post-operative pain control (femoral nerve)
- Posture or CPM
- Avoid excessive doses of LMWH
- Rehabilitation +++
## 2. Arthroscopic release

Non prosthesis dependant (D Dejour, P Burdin, SFA 2003)

- Ries MD 2000 Corr
  - N=6
- Babis GC 2001 JBJS Am
  - N=7
- SoFCOT 2001 RCO
  - N=31
- Christiensen CP 2002 J Arthroplasty
  - N=11
- SFA 2003 Perspectives...
  - N=42


- Williams RI 1996 Corr PCL resection: arthro
2. Arthroscopic release

Our Results (n:3)

- ROM: Flexion + 30°
  Extension + 5°

- No severe complication

SFA 2003 Hulet C and Djian P
2. Arthroscopic release

Indications

- Non Prosthesis dependant
- Technically difficult
- No ... complication
- Incomplete improvement
- Period: D45...D90 .....D180 (except if PCL section)
3. Open Arthrolysis

- Previous scars: one or two approaches
- Supra patellar poach and Gutters
- Removal of tibial insert
  - Allows to reach posterior capsule or retroL arthrotomies
  - Facilitates patellar eversion and management of patellar complications
  - Thinner tibial insert (?? Babis 2001 JBJS Am)
3. Results of open arthrolysis

- N = 5
- Retinaculum release +++

<table>
<thead>
<tr>
<th>Case</th>
<th>Procedure</th>
<th>Preop ROM</th>
<th>ROM at FU</th>
<th>Pain Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Arthrolysis</td>
<td>0/0/70</td>
<td>0/10/70</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>Arthrolysis</td>
<td>0/0/90</td>
<td>0/0/90</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>Arthrolysis</td>
<td>0/0/40</td>
<td>0/0/115</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>Arthrolysis + clunk</td>
<td>0/0/60</td>
<td>0/0/130</td>
<td>50</td>
</tr>
<tr>
<td>5</td>
<td>Arthrolysis + clunk</td>
<td>0/0/70</td>
<td>0/0/130</td>
<td>40</td>
</tr>
</tbody>
</table>
# 4. Results of component revision

- **N= 2**
- **Arthrolysis + ****

<table>
<thead>
<tr>
<th></th>
<th>Gestures</th>
<th>Preop ROM</th>
<th>At FU</th>
<th>Pain Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 9</td>
<td>+ patellar component removal</td>
<td>0/0/70</td>
<td>0/0/120</td>
<td>50</td>
</tr>
<tr>
<td>Case 10</td>
<td>+ Revision of Tibial component + clunk</td>
<td>0/15/70</td>
<td>0/0/120</td>
<td>50</td>
</tr>
</tbody>
</table>
4. Component revision

Prosthesis dependant

- Extension deficit (Incomplete posterior capsule release and osteophytes excluded)
  tightened Extension Gap

- Improper distal femoral cut
- Too thick tibial component
4. Component revision

Prosthesis dependant

- Flexion deficit (Incomplete posterior capsule release and osteophytes excluded, excessive tightness of PCL)
  - Tightened Flexion gap
  - Tightened Anterior gap
  - Patellar problems
Tibio-femoral gap in flexion

Femoral GAP
Tibial GAP

Tibio-femoral gap in extension

Femoral GAP
Tibial GAP
“Influence of the height of the joint space on the three-dimensional kinematics of total knee prostheses and behavior of the lateral collateral ligaments: an in vitro study”

RCO, 2002, vol 88: 803-811
Chatain F, Marin F, Lavaste F, Skalli W, Neyret Ph
4. Component revision

- Lack of Flexion
  - tightened Flexion gap
  - tightened anterior gap

“Anterior gap” described by C. Vielpeau and P. Rivat maitrise orthopedique
Anterior Gap in flexion

Anterior Gap in extension
4. Component revision

- **Flexion deficit**
  - tightened flexion gap
  - tightened anterior gap
  - Patellar problems (55%)
  - Patella infera
  - Too thick patella
  - Too proeminent femoral component
  - Unsurfaced Patella ??
  - Lateralized patellar component
  - Patellar tilt due to femoral component malrotation

Good prognostic factor for revision of stiff knee

*Bonnin M, Deschamps, Neyret Ph and al RCO 2000*
4. Component revision
Conclusion

- Non Prosthesis dependant

D 10-90
MUA

D45-90
Arthroscopic release

D90-180
Open arthrootomy

- Prosthesis dependant Ext= Flexion Gaps

Tibial gap

Femoral gap

Anterior gap