Revising the stiff TKA

Warm up: Case NV

Literature

- Nicholls DW, Dorr LD. Revision surgery for stiff total knee arthroplasty. Arthroplasty 1990;5 (suppl):73

Definition

- Arc of motion < 70° (Christensen et al 2002)
- FFC > 20° or Arc of motion < 45° (Nicholls & Dorr 1990)
- FFC > 15° or Flexion < 75° (Kim et al 2004)
- Flexion < 85° (Scranton 2001)
- Flexion < 90° (Gandhi et al 2006)
- Painful vs. Pain free

Flexion requirements for ADL

- Stair climbing: 80°
- Sitting: 90°
- Shoelace tying: 105°
- Lifting object from the ground: 70°
- Individual variation, depending on patient height and hip mobility
- The smaller the patient, the more flexion is needed

Definition

- Arc of motion < 70° (Christensen et al 2002)
- Flexion < 90° (Nicholls & Dorr 1990)
- FFC > 15° or Flexion < 75° (Kim et al 2004)
- Painful vs. Pain free
- A knee is stiff when the patient is disappointed with the arc of motion
Incidence

- 8-12%
- 3.7%
- 1.3%

Stiff TKA, leading to revision TKA

Risk Factors

Pre-Operative
- Limited ROM
- Obesity
- Prior surgery

Intra-Operative
- Gap imbalance
- Oversizing
- Inadequate tibial resection
- Joint line elevation
- Remaining posterior osteophytes
- Inverse tibial slope

Post-Operative
- Poor patient motivation and compliance
- Deep infection
- Arthrofibrosis
- Extensor mechanism complications
- Heterotopic ossifications

Arthrofibrosis / RSD

- Osteoporosis
- Peripatellar fibrosis
  - Patella baja

Risk Factors

Post-op 9 months
Arthrofibrosis


Malrotation

Etiology
- Intrinsic
- Biological
- Mechanical
- Extra-Articular
- Psychological

Before you take your knife to revise this stiff TKA, wouldn't you consider the potential for change of these parameters that could lead to a better result?

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- Biological
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Risk Factors

Post–Operative
- Poor patient motivation and compliance
- Deep infection
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Alternatives to revision - conservative

- Time: do not revise before 1 year post-op
- Rehab
  - Intensify frequency of exercises
  - Slow down on intensity of exercises
- Pain control
- Medication: NSAID’s
- Lumbar sympathetic blockade + CPM
- Closed manipulation (preferably before week 12)

Alternatives to revision - operative

- Arthroscopic arthrolysis
- Open arthrolysis and PE exchange
  - 13 patients
  - Arc of motion: 55° → 91°

Revision of the stiff TKA

- 13 knees
- ROM < 45° or flexion contracture > 20°
- Mean extension gain: -32° → -7°
- Mean flexion gain: 18° → 44°
- Arc of motion gain unpredictable
- 60% of patients poor result

Revision of the stiff TKA

- 56 knees, FFC>15° and/or Flexion < 75°
- Mean flexion gain: 65° → 85°
- Mean extension gain: -11° → -3°
- 93% of patients increased arc of motion
- “benefits are modest”
Revision of the stiff TKA
- 16 knees, ROM < 70°
- No effect of type of anesthesia on outcome
- 6/11 Quad’s snip
- 1/11 Medial femoral condylar osteotomy
- Mean arc of motion gain: 40° → 73°
- 4/16 patients with remaining stiffness
- = 25% poor results

Painfree stiff TKA
- FFC>20°
  - Consider revision
  - Careful counseling of the patient
- Limited Flexion and Full Extension
  - Leave it alone

Do not go in again

Painful stiff TKA
- Exclude infection
  - ESR, CRP
  - Aspiration
- Exclude intrinsic, biological or psychological causes
- Determine mechanical causes

Specific hurdles in the revision of the stiff TKA
- Exposure
- Removal of components
- Patella baja
- Post-operative pain control
- Rehabilitation

Skin

References:
Subcutaneous fat
- Avoid making unnecessary flaps
- Respect superficial fascia (adherent skin)

Extensor mechanism
- Synovectomy
- Fibrotic fat pad

TTO
Case VM
- Female, age 70
- TKA 3y post-op
- Very painful L knee
- Hyperextension
- Limited flexion (70°)
- Very limited walking capacity except for inhouse transfers

Valgus malalignment
- Tight quadriceps mechanism
- Very painful joint

Case VM
- Valgus malalignment
- Tight quadriceps mechanism
- Very painful joint
Removal of components

Build-up distal femur

Build up distal femur

Case VM

Case VM
PROXIMALISATION OF TT

<table>
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<th>CASE</th>
<th>AGE</th>
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<tr>
<td>D.D.</td>
<td>60</td>
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<td>P.H.</td>
<td>72</td>
<td>6M</td>
<td>TKA/TIBIA#</td>
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Mean proximal shift: 12.2 mm (8-15)
Fixation with 2 screws or cerclage
0/8 patients with extension lag

Conclusion
- Stiffness is a difficult complication of TKA
- Mixed reported outcomes of revision TKA
- Strict patient selection
- Realistic expectations
- Technical hurdles to take

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THANK YOU