Instability in Total Knee Arthroplasty: Where Are We Now and Where Do We Go?

(Organized by the Knee Society and ORS)

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Instability In Total Knee Arthroplasty: What Is the Scope of the Clinical Problem and What Current Treatments Exist?

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I. TKA STABILITY

A. Dependent On Component Articular Geometry And Soft Tissue Supporting Structures (Ligaments/Capsule/Muscles)

B. Better obtained BIOLOGICALLY than PROSTHETICALLY As Constraint Creates Increased Fixation Stresses

C. Incidence: 2-22%

D. Etiologies

   1. Ligament Imbalance / Malalignment / Component Failure / Faulty Prosthetic Design

E. Symptoms - Variable

   1. None / Pain / Weakness / Giving Way

F. Diagnosis

   1. Clinical Exam

      a. Measurable Ligamentous Laxity / Hyperextension
b. Posterior Sag / Effusion

2. Stress Radiographs / Dynamic Fluoroscopy

G. Prevention

1. Balance & Equalize Flexion and Extension Gaps
2. Restoration of Joint Line

II. TKA INSTABILITY: MANAGEMENT

A. Non-operative

1. Mild Instability Often Asymptomatic
   a. AP laxity < 7mm Often Not Perceived By Patient

2. Bracing (Problems with Compliance) / Physiotherapy

B. Operative

1. Key: Balance and Equalize Flexion/Extension Gaps and Restore Joint Line

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<thead>
<tr>
<th>Extension Adequate</th>
<th>Extension Loose</th>
<th>Extension Tight</th>
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<tbody>
<tr>
<td>Flexion Adequate</td>
<td>No changes</td>
<td>Augment distal femur</td>
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<td></td>
<td></td>
<td>• Resect distal femur</td>
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<td></td>
<td></td>
<td>• Posterior release</td>
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<td>• D/C posterior osteophytes</td>
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<tr>
<td>Flexion Loose</td>
<td>Larger femoral component with posterior augmentation</td>
<td>Thicker tibial component</td>
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<td>• Larger femoral component with posterior augmentation</td>
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<td>• Resect distal femur</td>
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<tr>
<td>Flexion Tight</td>
<td>• Smaller femoral component</td>
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<td>• Posterior tibial slant</td>
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<td></td>
<td>• Consider PS</td>
<td>• Smaller femoral component with distal augmentation</td>
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<tr>
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<td>• Thinner tibial component</td>
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<td>• Resect tibia</td>
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C. Operative Treatment Options

1. Thicker Tibial Insert
   a. Often Fails
2. More Congruent Insert
3. PCL Substituting TKA (Mild Instability)
   a. Favored In Cases Of Unstable Posterior Cruciate Retaining TKA

4. Constrained TKA (Severe Instability)
   a. Not All Are the Same!!
   b. Variations in Varus-Valgus Laxity / Rotational Laxity / Post Height
   c. Unlinked Constrained (i.e., Total Condylar III) Vs. Linked (Hinge)
       - Consider Mobile Bearing Unlinked Constrained

5. Linked Hinge TKA
   a. Rarely Required / Often Associated with Premature Failure
   b. Indications
       - Global Instability / Uncontrolled Hyperextension / Tumor Resection
       - Comminuted / Osteopenic Supracondylar Femoral Fracture

6. Ligamentous Advancement\(^6\)
   a. MCL vs. LCL Advanced at Femoral Origin
   b. Technically Demanding\(^7\)
   c. Protect Repair (Brace vs. Constrained TKA)
   d. Limited Cases Reported

REFERENCES


