Neglected Patellar Tendon Rupture after Revision Total Knee Arthroplasty

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Case Presentation

Case 1
- 74 y/o male
- left knee pain and weakness for 1 year, progressing
- DM
- trauma history: denied
- left knee:
  ✓ gap (+)
  ✓ no significant tenderness
  ✓ ROM: 30~150 degree

Operation History
- s/p left TKR on 2008
- s/p left revision TKR on 2013
- left knee infection s/p arthroscopic debridement on 2014/6
- s/p left knee prosthesis removal with A/B cement spacer on 2014/7
- s/p left RE-revision TKR on 2014/8
- s/p arthroscopic debridement on 2014/11
- s/p arthroscopic debridement on 2015/3
- s/p 3rd left revision TKR on 2016/6

Image: X-ray
Insall-Salvati ratio: <0.8

Image: X-ray
2014/11/24
s/p 2nd revision
left knee s/p revision TKR with patella tendon tear

Image: X-ray
2016/10/25
s/p 3rd revision

Operation on 2016/11/2

- OP finding:
  - patella tendon avulsion over lower pole with partial healing and fibrosis
- OP method:
  - repair patella tendon with 2 suture anchors and 2 poplock

Image: X-ray

Case 2

- 73 y/o female
- left knee pain and weakness for 2 months after falling down
- DM, RA
- left knee:
  - gap (+)
  - ROM: 60~150 degree
- s/p bilateral TKR about 10 years ago
- s/p left revision TKR on 2016/9

Image: X-ray

Operation on 2016/11/4

- OP finding:
  - patella tendon avulsion from tibia site
  - retinaculum rupture
- OP method:
  - patella tendon repair
  - augmentation with retention wire and suture anchor

Image: X-ray
Follow-up

- Patient No.1: 0~60 degree after 3 months
- Patient No.2: 0~45 degree after 3 months

Correlation with Arthroplasty

- Incidence of patellar tendon disruption following TKA: 0.17~1.4%
- Risk factors: previous knee surgeries (stiffness), systemic conditions such as RA, DM, CKD, obesity...
- Reconstruction is widely discussed

Extensor mechanism complications following total knee arthroplasty

*Journal of Arthroplasty*


Lynch AF, Rorabeck CH, Bourne RB

281 TKA with patellar resurfacing in 6-year duration  
mean follow-up time: 42 months  
28 (10%) extensor mechanism complications  
3 quadriceps tendon ruptures  
5 patellar fractures  
4 patellar tendon ruptures  
11 recurring patellar subluxations  
4 chronic patellar pain  
1 malrotated patella  
9 (3%) required further surgery

Patellar tendon rupture after total knee arthroplasty

*Clin Orthop Relat Res*

1989 Jul;(244):233-8  
Rand JA, Morrey BF, Bryan RS

- Poor outcome of primary repair for patella tendon rupture after total knee arthroplasty  
- High infection rate
The management of extensor mechanism complications in total knee arthroplasty
Denis Nam, Matthew P. Abdel, Michael B. Cross, Lauren E. LaMont, Keith R. Reinhardt

Most common type: distal insertion to tibia -> stiffness and poor tissue quality due to systemic disease and previous surgery

Table 1
Outcomes of Primary Repair of Extensor Mechanism Disruption

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of Patients</th>
<th>Follow-up (mos)</th>
<th>Technique</th>
<th>Immobilization</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynch et al8</td>
<td>75</td>
<td>42</td>
<td>NR</td>
<td>NR</td>
<td>Early: 9 patients (19%), ROM, NR, Ambulation with aid: 22 patients (44%), Complications: 4 patients (8%)</td>
</tr>
<tr>
<td>Rand et al9</td>
<td>43</td>
<td>42</td>
<td>Reconstruction with sulcus, staple, xenograft, or semitendinosus graft, tensioning method not reported.</td>
<td>Cast immobilization in 11 patients for 5.5 wk</td>
<td>Early: 9 patients (21%), ROM, NR, Ambulation with aid: 14 patients (33%), Complications: 10 patients (23%)</td>
</tr>
<tr>
<td>Ozturk et al10</td>
<td>34</td>
<td>10</td>
<td>8 patients had standard primary repair; 2 patients had primary repair augmented with synthetic graft.</td>
<td>NR</td>
<td>Early: 9 patients (26%), ROM 3-10°, Ambulation with aid, NR, Complications: 4 patients (12%)</td>
</tr>
<tr>
<td>Snead et al11</td>
<td>12</td>
<td>12</td>
<td>Suture repair and Dacron tape reinforcement</td>
<td>Long leg cast for 6 wk in full extension</td>
<td>Early: 0 patients, Flex: 110°, Ambulation with aid: 0, Complications: 0</td>
</tr>
<tr>
<td>Abe et al12</td>
<td>21</td>
<td>21</td>
<td>Wire tension band reinforcement placed at 45° flexion.</td>
<td>No immobilization</td>
<td>Early: 0 patients, Flex: 90°, Ambulation with aid: 6, Complications: 0</td>
</tr>
</tbody>
</table>

Table 2
Outcomes of Allograft Reconstruction for Extensor Mechanism Disruption

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of Patients</th>
<th>Follow-up (mos)</th>
<th>Tensioning Method</th>
<th>Immobilization</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Langlais et al13</td>
<td>6</td>
<td>29</td>
<td>Sutured under slight tension with knee fully extended</td>
<td>Knee brace, full extension 6-8 wk</td>
<td>Early: 7 patients (28%), ROM, NR, Ambulation with aid: 6 patients (96%), Complications: 4 patients (57%)</td>
</tr>
<tr>
<td>Emerson et al14</td>
<td>20</td>
<td>49.2</td>
<td>Minimal, Knee fixed intraoperatively</td>
<td>Morbidity after wound healed</td>
<td>Early: 5 patients (28%), ROM 0°-10°, Ambulation with aid: 4 patients (14%), Complications: 5 patients (28%)</td>
</tr>
<tr>
<td>Bartsch et al15</td>
<td>14</td>
<td>42</td>
<td>Entire ext mechanism sewn in one piece with slight tension under tension, with the knee fixed 30°. Achilles allograft with knee fully extended</td>
<td>4 wk splint with the knee fixed 0°, 4 wk fixed 30°-90°</td>
<td>Early: NR, Flex: 90°, Ambulation with aid: 7 patients (50%), Complications: 1 patient (7%)</td>
</tr>
</tbody>
</table>

- Tendon augmentation with autograft or allograft reconstruction has better result than repair
- Improving intraoperative tension will lead to better outcome
Results of a new technique utilizing synthetic mesh
J Bone Joint Surg Am
2011;93[12]:1137-1143.

Gastrocnemius rotational flap available for patients undergoing
- resection of patella due to trauma
- resection of proximal tibia due to malignancy

Use of a Turndown Quadriceps Tendon Flap for
Rupture of the Patellar Tendon After
Total Knee Arthroplasty

Po-Chun Lin, MD, and Jun-Wen Wang, MD

77 y/o strong male

Conclusion
- Neglected patellar tendon tear is a complication of revision total knee arthroplasty that we should always keep in mind
- Be prepared for reconstruction in every surgery of patella tendon repair

Thanks for your attention