Survival Analysis of Medial Open Wedge High Tibial Osteotomy for Medial Unicompartment Knee Osteoarthritis

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I have no financial conflict to disclose.
Introduction

- 10yrs follow up result in HTO
  → 2/3 more than 2500 pts able to avoid TKA
    

- Short to mid-term follow up result in isolated HTO
  → excellent survival and clinical outcome on systemic review of
    more than 4500 subjects
    
    Harris et al, Knee. 2013;20(3):154-161

- Which technique is better between **closing wedge vs opening wedge** techniques remain on a debate
Purpose

• To evaluate the outcomes including survival rate and to analyze the factors that affect the survival rate after medial open wedge high tibial osteotomy (MOWHTO) performed as the primary treatment for medial unicompartmental OA of the knee
Materials and Methods

Flowchart


Excluded (n=18 knees):
- With ACL Reconstruction (n=13 knees)
- With PCL Reconstruction (n=5 knees)

Inclusion criteria (n=373 knees)

Excluded (n=34 knees):
- Inadequate follow-up

Analysis (n=339 knees)

Non-Failure (n=305 patients)

Failure (n=34 knees):
- Conversion TKA (n=13 knees)
- KS scores poor (n=21 knees)

Indication for surgery

- ≥ 40 yrs of age
- Medial compartment OA
- Not improved after 3mos of conservative tx
Materials and Methods

- **Possible risk factors for failure**
  - Preop gender, age, previous knee surgery hx, BMI, flexion contracture, varus knee, K-L grade
  - Intraop medial, lateral, patellofemoral ICRS grade, microfracture
  - Postop HKA angle, correction angle, MPTA & TPSA change
Intraop Arthroscopic finding

Based on ICRS cartilage lesions grading system

<table>
<thead>
<tr>
<th>ICRS Grade</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medial compartment</td>
<td>0</td>
<td>98</td>
<td>94</td>
<td>106</td>
<td>41</td>
</tr>
<tr>
<td>Lateral compartment</td>
<td>208</td>
<td>109</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Patellofemoral compartment</td>
<td>36</td>
<td>151</td>
<td>116</td>
<td>36</td>
<td>0</td>
</tr>
</tbody>
</table>

*ICRS; international cartilage repair society
Survival and risk factors

- Kaplan-Meier survivalship

All HTO patients  Postop HKA angle

Postoperative HKA angle

- 3~5°
- >5°
- <3°
Survival and risk factors

- Kaplan-Meier survivalship for medial & lat compartment ICRS grade
## Survival and risk factors

### Risk factor analysis after MOWHTO

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Category</th>
<th>Number of knees</th>
<th>Hazard ratio</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICRS grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medial compartment</td>
<td>&lt; Gr 3</td>
<td>192</td>
<td>4.57</td>
<td>2.16-9.64</td>
<td>0.000</td>
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<tr>
<td></td>
<td>≥ Gr 3</td>
<td>147</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral compartment</td>
<td>&lt; Gr 2</td>
<td>317</td>
<td>3.22</td>
<td>1.32-7.81</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>≥ Gr 2</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postop HKA angle (°)</td>
<td>&lt; 3°</td>
<td>128</td>
<td>0.31</td>
<td>0.17-0.58</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>3~5°</td>
<td>169</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 5°</td>
<td>49</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

* HKA; hip-knee-ankle
Conclusions

- **Medial opening-wedge HTO** provide reasonable **survival rate at mid to long term follow-up**.

- **Medial and lateral compartment cartilage ICRS grade and postoperative knee mechanical axis** appeared to be significant factors associated with the survivorship of this procedure.