Differences and Similarities between Hip and Knee Indications for the Arthroscopic Management of Chondral Defects

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Disclosures

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Introduction

- Hip-specific indications for arthroscopic management of chondral defects are poorly defined in the literature.
- The principles for treating these defects in the knee are currently applied in hip arthroscopy.
- Fundamental differences in hip anatomy and biomechanics limit the applicability of cartilage preservation techniques used in the knee.
- The purpose of the present study is to review the indications for current cartilage preservation techniques in the hip and the knee to better define efficacious strategies for cartilage preservation.
Methods

Systematic Review of hip and knee arthroscopy 2004 and 2016

Excluded cases* (n=6,805)

Study sample (n=1,349)

- Case Reports
- Literature reviews
- Open procedures
- Osteonecrosis

Knee Microfractures (MF; n=476)
Knee Autologous Chondrocyte Transfer (ACT; n=557)
Hip Microfracture (MF; n=279)
Hip Autologous Chondrocyte Transfer (ACT; n=37)
Methods

• Sample size, patient demographics, BMI, defect location, Outerbridge severity grades, lesion size, and surgical technique were assessed.

• Duration of symptoms, associated injuries, follow-up time, and outcome measures were also recorded.

• Cohorts were grouped by surgical technique [MF vs. ACT and joint (hip vs. knee)].

• Statistical analysis was performed using Students t-test to compare means.

• Regression analysis was utilized to assess the impact of patient- and lesion-specific characteristics.
Results - Frequency

Number of patients

- Knee MF: n = 476
- Knee ACT: n = 557
- Hip MF: n = 279
- Hip ACT: n = 37
Results – Arthroscopic MF

- Significant differences were identified in gender, BMI, lesion size and mean follow-up time between hip and knee cohorts.

<table>
<thead>
<tr>
<th>Comparative measurements</th>
<th>Hip</th>
<th>Knee</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of studies</td>
<td>9</td>
<td>10</td>
<td>0.416</td>
</tr>
<tr>
<td>Number of patients</td>
<td>31.0±19.4</td>
<td>39.7±25.3</td>
<td>0.416</td>
</tr>
<tr>
<td>Mean age</td>
<td>35.1±7.0</td>
<td>36.1±3.8</td>
<td>0.722</td>
</tr>
<tr>
<td>% male patients</td>
<td>77.0±20.4</td>
<td>56.5±13.3</td>
<td>0.017</td>
</tr>
<tr>
<td>Duration of Symptoms (weeks)</td>
<td>99.6±75.9</td>
<td>154.4±50.1</td>
<td>0.297</td>
</tr>
<tr>
<td>Body mass index (Kg/m²)</td>
<td>24.0±0.0</td>
<td>25.6±0.49</td>
<td>0.008</td>
</tr>
<tr>
<td>Lesion size (mm²)</td>
<td>149.5±20.7</td>
<td>279.3±87.2</td>
<td>0.015</td>
</tr>
<tr>
<td>Follow up time (months)</td>
<td>22.2±3.9</td>
<td>48.2±34.2</td>
<td>0.039</td>
</tr>
</tbody>
</table>
Results – Arthroscopic ACT

- There were no differences identified in hip and knee patient parameters and chondral defects treated with ACT.

<table>
<thead>
<tr>
<th>Comparative measurements</th>
<th>Hip</th>
<th>Knee</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of studies</td>
<td>3</td>
<td>7</td>
<td>0.130</td>
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<tr>
<td>Number of patients</td>
<td>12.3±5.5</td>
<td>53.6±40.8</td>
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<tr>
<td>Mean age</td>
<td>35.2±4.8</td>
<td>33.6±2.8</td>
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<tr>
<td>% male patients</td>
<td>70.3±26.3</td>
<td>60.4±10.1</td>
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<tr>
<td>Duration of Symptoms (weeks)</td>
<td>-</td>
<td>181.9±36.1</td>
<td>-</td>
</tr>
<tr>
<td>Body mass index (Kg/m²)*</td>
<td>26</td>
<td>26.3±2.6</td>
<td>-</td>
</tr>
<tr>
<td>Lesion size (mm²)</td>
<td>357.3±96.0</td>
<td>425.4±58.1</td>
<td>0.194</td>
</tr>
<tr>
<td>Follow up time (months)</td>
<td>33.1±33.8</td>
<td>38.7±15.3</td>
<td>0.832</td>
</tr>
</tbody>
</table>

* Only one hip ACT study reported BMI and none reported duration of symptoms
## Results – Arthroscopy

<table>
<thead>
<tr>
<th>Arthroscopy Procedure</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Microfracture</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Lesion size</td>
<td>0.15</td>
<td>0.03-0.72</td>
<td>0.018</td>
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<tr>
<td>ACT</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• Lesion size</td>
<td>6.6</td>
<td>1.4-31.2</td>
<td>0.018</td>
</tr>
</tbody>
</table>

- Regression analysis demonstrated that lesion size was a significant predictor for MF and ACT.
- Patients with larger chondral lesions were more likely to undergo ACT while those with smaller lesions were more likely to undergo MF.
Discussion

• Significant differences exist in patient- and lesion-specific characteristics between hip and knee chondral defects treated with MF.
  – Patients who underwent MF for hip chondral defects demonstrated smaller lesion size, lower BMI and a greater proportion of males compared to those treated with MF for knee defects.

• No significant differences were identified in hip and knee patient parameters and chondral defects treated with ACT.

• Regression analysis demonstrated that lesion size was a significant predictor for arthroscopic technique.
  – While the odds of undergoing MF decreased with increasing lesion size, the odds of undergoing ACT increased with greater lesion size.
Conclusions

• In the hip, gender and lesion size may play a role in developing hip-specific indications for arthroscopic microfractures.

• Ultimately, understanding the differences and similarities between joint-specific algorithms for the management of chondral defects will optimize hip preservation strategies.
References


Thank You

Winston-Salem, NC