Does Obesity Affect Outcomes in Hip Arthroscopy? A Matched-Pair Controlled Study with 2-year Minimum Follow-up

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• American Hip Institute Research support:
  o American Hip Institute
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  o Stryker

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  o DJO Global

• AANA Learning Center Committee

• Boardmember of American Hip Institute
Background

Obesity:
• Increasing rates
• Poorer outcomes in several orthopedic surgeries
• Greater risk of surgical site infections
Hip Biomechanics

• Joint reaction force reaches 3-6 times body weight
• Multiple muscles cross at the joint
• Excess weight increases demand
Purpose

• Compare two-year clinical outcomes of obese patients undergoing hip arthroscopy to a matched group of normal weight patients
Methods

• Study period: 2/2008 – 2/2012

• Inclusion criteria:
  o Primary hip arthroscopy
  o Minimum two-year FU
  o Radiographs pre and post surgery

• Exclusion criteria:
  o Revisions
  o Previous hip conditions
PROs

Patient reported outcomes included:

- Modified Harris hip score (mHHS)
- Non-arthritic hip score (NAHS)
- Hip outcome score – activities of daily living (HOS-ADL), and – sports specific subscale (HOS-SSS).
- Visual analog scale (VAS)
Obesity Categories

- Normal weight group – BMI <25
- Obese group – BMI >30
- Matched pair group was on 2:1 ratio (normal to obese)
### Matching Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Age Within 5 years</td>
</tr>
<tr>
<td>Tonnis Grade 0 or 1</td>
</tr>
<tr>
<td>Crossover percentage &lt; 20 or Crossover percentage &gt; 20</td>
</tr>
<tr>
<td>Workman’s Compensation Claim</td>
</tr>
<tr>
<td>Labral procedure</td>
</tr>
</tbody>
</table>
# Radiographic Measurements

<table>
<thead>
<tr>
<th></th>
<th>BMI&lt;25 (n=124)</th>
<th>BMI&gt;30 (n=62)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crossover %</td>
<td>9.36</td>
<td>8.78</td>
<td>0.83</td>
</tr>
<tr>
<td>Lateral CEA</td>
<td>29.2</td>
<td>30.8</td>
<td>0.19</td>
</tr>
<tr>
<td>Anterior CEA</td>
<td>30.4</td>
<td>34</td>
<td>0.1</td>
</tr>
<tr>
<td>Acetabular Inclination</td>
<td>4.61</td>
<td>3.88</td>
<td>0.48</td>
</tr>
<tr>
<td>Alpha Angle</td>
<td>56.4</td>
<td>56.6</td>
<td>0.95</td>
</tr>
<tr>
<td>Medial Joint Space (mm)</td>
<td>0.35</td>
<td>0.35</td>
<td>0.8</td>
</tr>
<tr>
<td>Central Joint Space (mm)</td>
<td>0.42</td>
<td>0.41</td>
<td>0.58</td>
</tr>
<tr>
<td>Lateral Joint Space (mm)</td>
<td>0.43</td>
<td>0.42</td>
<td>0.61</td>
</tr>
</tbody>
</table>
## Surgical Procedures

<table>
<thead>
<tr>
<th>Hip Procedure</th>
<th>Normal Weight N=124 (%)</th>
<th>Obese N=62 (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetabuloplasty</td>
<td>82 (66%)</td>
<td>48 (77%)</td>
<td>0.11</td>
</tr>
<tr>
<td>Femoroplasty</td>
<td>87 (70%)</td>
<td>38 (61%)</td>
<td>0.22</td>
</tr>
<tr>
<td>Labral Repair</td>
<td>72 (58%)</td>
<td>37 (60%)</td>
<td>0.83</td>
</tr>
<tr>
<td>Ligamentum Teres Debridement</td>
<td>64 (52%)</td>
<td>23 (37%)</td>
<td>0.06</td>
</tr>
<tr>
<td>Capsular Repair</td>
<td>59 (48%)</td>
<td>16 (26%)</td>
<td>0.019</td>
</tr>
<tr>
<td>Capsular Release</td>
<td>62 (52%)</td>
<td>44 (71%)</td>
<td>0.004</td>
</tr>
<tr>
<td>Labral Debridement</td>
<td>52 (42%)</td>
<td>25 (40%)</td>
<td>0.83</td>
</tr>
<tr>
<td>Iliopsoas fractional lengthening</td>
<td>33 (27%)</td>
<td>16 (26%)</td>
<td>0.91</td>
</tr>
<tr>
<td>Synovectomy</td>
<td>22 (18%)</td>
<td>19 (31%)</td>
<td>0.045</td>
</tr>
<tr>
<td>Trochanteric Bursectomy</td>
<td>16 (13%)</td>
<td>14 (23%)</td>
<td>0.09</td>
</tr>
<tr>
<td>Removal of loose body</td>
<td>12 (10%)</td>
<td>9 (15%)</td>
<td>0.33</td>
</tr>
<tr>
<td>Acetabular Notchplasty</td>
<td>6 (5%)</td>
<td>1 (2%)</td>
<td>0.28</td>
</tr>
<tr>
<td>Gluteus Medius Repair</td>
<td>4 (3%)</td>
<td>6 (10%)</td>
<td>0.07</td>
</tr>
<tr>
<td>Piriformis release</td>
<td>3 (2%)</td>
<td>0 (0%)</td>
<td>0.21</td>
</tr>
<tr>
<td>Sciatic nerve neurolysis</td>
<td>3 (2%)</td>
<td>0 (0%)</td>
<td>0.21</td>
</tr>
</tbody>
</table>
Results

- Obese hips = 62
- Normal weight hips = 124
- 72% Female
- Average age = 42
  - No differences in ages between groups
- Mean BMIs
  - Obese = 33.1 kg/m²
  - Normal = 22.7 kg/m²
Results - Outcomes

• Obese patients:
  o Significantly lower flexion & internal rotation (p<.05)
  o Pre-operative PRO scores significantly lower

• Both groups demonstrated significant improvement in pre to post-op scores (p<.001)

• No significant difference for delta, or amount of change in scores between groups
Figure 1 – Change in Patient Reported Outcome Scores from preoperative to two-year postoperative. mHHS, Modified Harris Hip Score; NAHS, Non-Arthritic Hip Score; HOS-ADL, Hip Outcome Score-Activities of Daily Living; HOS-SSS, Hip Outcome Score-Sport-Specific Subscale.
Table 8 – Patient Reported Outcome Scores (PRO) for the Obese and Normal Weight (Control) Groups. Change (Delta) in PRO scores is reported at 2-year postoperative Time point. mHHS, Modified Harris Hip Score; NAHS, Non-Arthritic Hip Score; HOS-ADL, Hip Outcome Score-Activities of Daily Living; HOS-SSS, Hip Outcome Score-Sport-Specific Subscales.
Complications & Endpoints

- Postoperative infections:
  - 2-normal weight; 3-obese
- Heterotopic ossification
  - 0-normal weight; 1-obese
- Revision Surgery
  - 5-normal weight; 5-obese
- Conversion to THA
  - 6-normal weight; 6-obese
Conclusion

• Obese patients overall lower absolute PRO scores pre-operatively and at 2Y FU
• Both groups demonstrated significant improvements in all PROs
• Delta between scores similar between groups
• Expectations should be adjusted for obese patients
References