Long term results of surgical treatment of knee juvenile osteochondritis dissecans by arthroscopic fixation with bioabsorbable implants

Iosifidis M, Melas I, Gkikas G, Petras K, Metaxiotis D

OrthoBiology, Surgery Centre, Thessaloniki, Greece
Orthopaedic Department, Papageorgiou Hospital, Thessaloniki, Greece
I (and my co-authors) have no financial conflicts to disclose

Michail I. Iosifidis, MD, PhD
Material

Cohort

• 24 patients (26 knees)
  • 18 ♂ (75%) | 6 ♀ (25%)

• Age
  • $12.8 \pm 1 \ (11.2 - 14.5)$ years

• Location
  • 23 medial femoral condyle (88.5%) | 3 lateral (11.5%)
  • 10 right knee (38.5%) | 16 left (61.5%)
Method

Imaging

• Radiography

• MRI
Method

Management

- Conservative (activity modification)
- Stable lesion (stage 1-2)
- Operative
  - Unstable lesion (stage 3+)
  - Failure of conservative treatment (≥ 6 months)
Method

Surgical procedure

- Knee arthroscopy
- Measurement & classification (Guhl)
- Fixation
- Bioabsorbable implants
  CONMED SmartNail® (96L/4D) PLA
Method
Method

Postoperative course

• Rehabilitation
  • Protected weight bearing (6 weeks)
  • Physical therapy (3 months)
• Follow up
  • Monthly until 6 months post-op and then yearly
• Return to sports (3-6 months)
  • Clinical / radiographic signs of healing
Method

Outcome measures

• Hughston rating scale
  • 4 — No limitation of activity
  • 3 — Mild aching with strenuous activity
  • 2 — Mild aching and swelling with strenuous activity
  • 1 — Pain and swelling with mild activity
  • 0 — Pain and swelling with no activity

• pedi-IKDC
  • 0 — 100 (no symptoms and limitations)
<table>
<thead>
<tr>
<th>No</th>
<th>Sex</th>
<th>Age</th>
<th>Knee</th>
<th>Femoral condyle</th>
<th>Hefti</th>
<th>Hughston (pre-op)</th>
<th>pedi-IKDC (pre-op)</th>
<th>Guhl</th>
<th>Longest diameter</th>
<th>Smart Nails®</th>
<th>Hughston (post-op)</th>
<th>pedi-IKDC (post-op)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>13.8</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>2</td>
<td>70.7</td>
<td>III</td>
<td>18</td>
<td>2</td>
<td>4</td>
<td>90.2</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>14.2</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>2</td>
<td>67.4</td>
<td>III</td>
<td>16</td>
<td>2</td>
<td>4</td>
<td>87.0</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>12.4</td>
<td>L</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>58.7</td>
<td>II</td>
<td>15</td>
<td>1</td>
<td>3</td>
<td>78.3</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>12.8</td>
<td>R</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>68.5</td>
<td>II</td>
<td>24</td>
<td>3</td>
<td>4</td>
<td>84.8</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>13.0</td>
<td>L</td>
<td>Lateral</td>
<td>3</td>
<td>1</td>
<td>65.2</td>
<td>III</td>
<td>25</td>
<td>3</td>
<td>3</td>
<td>82.6</td>
</tr>
<tr>
<td>6a</td>
<td>M</td>
<td>11.8</td>
<td>R</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>69.6</td>
<td>II</td>
<td>14</td>
<td>1</td>
<td>4</td>
<td>88.0</td>
</tr>
<tr>
<td>6b</td>
<td>M</td>
<td>11.8</td>
<td>L</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>69.6</td>
<td>II</td>
<td>16</td>
<td>1</td>
<td>4</td>
<td>88.0</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>11.2</td>
<td>R</td>
<td>Medial</td>
<td>3</td>
<td>2</td>
<td>76.1</td>
<td>III</td>
<td>22</td>
<td>2</td>
<td>4</td>
<td>95.7</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>11.3</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>64.1</td>
<td>III</td>
<td>15</td>
<td>1</td>
<td>3</td>
<td>83.7</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>11.5</td>
<td>R</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>69.6</td>
<td>II</td>
<td>20</td>
<td>2</td>
<td>4</td>
<td>84.8</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>13.2</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>2</td>
<td>73.9</td>
<td>III</td>
<td>24</td>
<td>3</td>
<td>4</td>
<td>92.4</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>13.4</td>
<td>L</td>
<td>Lateral</td>
<td>3</td>
<td>1</td>
<td>65.2</td>
<td>III</td>
<td>18</td>
<td>2</td>
<td>3</td>
<td>83.7</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>14.0</td>
<td>R</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>64.1</td>
<td>III</td>
<td>28</td>
<td>3</td>
<td>2</td>
<td>73.9</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>12.1</td>
<td>R</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>68.5</td>
<td>III</td>
<td>15</td>
<td>1</td>
<td>4</td>
<td>91.3</td>
</tr>
<tr>
<td>14a</td>
<td>M</td>
<td>12.4</td>
<td>R</td>
<td>Medial</td>
<td>2</td>
<td>2</td>
<td>70.7</td>
<td>II</td>
<td>16</td>
<td>1</td>
<td>4</td>
<td>90.2</td>
</tr>
<tr>
<td>14b</td>
<td>M</td>
<td>12.4</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>65.2</td>
<td>III</td>
<td>20</td>
<td>2</td>
<td>4</td>
<td>90.2</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>14.2</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>64.1</td>
<td>III</td>
<td>25</td>
<td>3</td>
<td>3</td>
<td>82.6</td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td>13.5</td>
<td>R</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>59.8</td>
<td>III</td>
<td>18</td>
<td>2</td>
<td>3</td>
<td>80.4</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>11.5</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>2</td>
<td>68.5</td>
<td>III</td>
<td>18</td>
<td>2</td>
<td>4</td>
<td>90.2</td>
</tr>
<tr>
<td>18</td>
<td>M</td>
<td>12.2</td>
<td>L</td>
<td>Lateral</td>
<td>2</td>
<td>1</td>
<td>60.8</td>
<td>II</td>
<td>14</td>
<td>1</td>
<td>4</td>
<td>85.9</td>
</tr>
<tr>
<td>19</td>
<td>M</td>
<td>14.5</td>
<td>R</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>59.8</td>
<td>III</td>
<td>24</td>
<td>3</td>
<td>2</td>
<td>69.6</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>12.5</td>
<td>L</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>69.6</td>
<td>II</td>
<td>25</td>
<td>3</td>
<td>4</td>
<td>94.6</td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>12.9</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>2</td>
<td>75.0</td>
<td>III</td>
<td>18</td>
<td>2</td>
<td>4</td>
<td>93.5</td>
</tr>
<tr>
<td>22</td>
<td>M</td>
<td>13.6</td>
<td>R</td>
<td>Medial</td>
<td>2</td>
<td>1</td>
<td>65.2</td>
<td>III</td>
<td>26</td>
<td>3</td>
<td>4</td>
<td>88.0</td>
</tr>
<tr>
<td>23</td>
<td>F</td>
<td>12.2</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>60.8</td>
<td>III</td>
<td>14</td>
<td>1</td>
<td>4</td>
<td>83.7</td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td>13.6</td>
<td>L</td>
<td>Medial</td>
<td>3</td>
<td>1</td>
<td>59.8</td>
<td>III</td>
<td>20</td>
<td>3</td>
<td>3</td>
<td>78.3</td>
</tr>
</tbody>
</table>
Results

Statistical analysis

- Hughston
  - $1.3 \pm 0.5$ (pre-op) | $3.6 \pm 0.6$ (post-op)
  - Significant increase ($p < 0.001$)

- pedi-IKDC
  - $66.6 \pm 4.9$ (pre-op) | $85.8 \pm 6.3$ (post-op)
  - Significant increase ($p < 0.001$)
Results

Comparisons / correlations

• Hughston
  • Significant differences between stages
    • $2,8 \pm 0,4$ (Hefti 2) | $2,0 \pm 0,5$ (Hefti 3) — $p = 0,001$
    • $2,8 \pm 0,5$ (Guhl II) | $2,1 \pm 0,6$ (Guhl III) — $p = 0,012$
  • Negative correlation with age ($r = -0,518$)

• pedi-IKDC
  • Negative correlation with size ($r = -0,407$)


