Acute Complications of Pediatric and Adolescent Knee Arthroscopy

Ali Ashraf, MD  
Christy M. Christophersen, MS  
Lindsay Hunter, MS  
Diane L. Dahm, MD  
Amy L. McIntosh, MD

Department of Orthopedic Surgery and Sports Medicine  
Mayo Clinic  
Rochester, MN
Background

• Knee arthroscopy is a common orthopedic procedure

• ↑Children participating in competitive sports → ↑Knee injuries → arthroscopic management

• Reported complications low (adolescent/adult)

• No pediatric specific data exists
Objectives

• Determine the acute complications (within 6 months) of knee arthroscopy in patients 17 years and younger

• We hypothesize a low complication rate in this patient population
Methods

- Retrospective chart review 1997 - 2009
- Patients 17 years and younger undergoing an arthroscopic knee procedure
- Demographic and surgical data collected
- Intra-operative & postoperative complications for up to 6 months
  - Complications were divided into Major and Minor categories
  - Only 1 minor & 1 major counted
Methods

Grouped patients based on procedure type/CPT code:

1: Ligament reconstruction
2: Ligament + Meniscus treatment
3: Meniscus treatment
4: Chondroplasty
5: Synovectomy and/or lateral release
6: OCD
7: Tibial eminence treatment
8: Diagnostic arthroscopy
Results

• 1,002 knee arthroscopies in 875 patients

• 476 Females (54.4%)

• 399 Males (45.6%)

• Mean age: 15.4 (Range 4-17) years
Results

Procedures

- 291 Ligament reconstruction (29%)
- 222 Ligament + Meniscus treatment (22%)
- 208 Meniscus treatment (20.8%)
- 103 Treatment of OCD with or without loose body removal (10.3%)
- 63 Chondroplasty (6.3%)
- 53 Synovectomy and/or lateral release (5.3%)
- 43 Diagnostic arthroscopy (4.3%)
- 19 Tibial eminence treatment (1.9%)
Results

Complications

- 14.3% overall complication rate in 1,002 procedures.
- 21 major complications (2.1%)
- 122 minor complications (12.2%)
- 2 (1) major and (1) minor complications,
- 4 more than one minor complication
- 2 more than one major complication

- NO DVT, PE, Vascular Injury, CRPS
Results
Major Complications

• Death (cardiac) (1): (0.09%)
• Septic Arthritis (3): (0.29%)
• Wound (9) → revision surgical closure: (0.89%)
• Arthrofibrosis (4) → manipulation under anesthesia: (0.39%)
• Unplanned subsequent procedure (4): (0.39%)
• Major Medical Complication (2): (0.18%) (DIC and A-fib)
# Results

## Complications

<table>
<thead>
<tr>
<th>Type of complication</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-articular instrument breakage</td>
<td>1 (0.09%)</td>
</tr>
<tr>
<td>Arthrofibrosis-no manipulation</td>
<td>1 (0.09%)</td>
</tr>
<tr>
<td>Sensory nerve paresthesia</td>
<td>5 (0.49%)</td>
</tr>
<tr>
<td>Failed regional anesthetic</td>
<td>10 (0.99%)</td>
</tr>
<tr>
<td>Post-op pain pump complication</td>
<td>15 (1.49%)</td>
</tr>
<tr>
<td>Superficial wound infection → po ABX</td>
<td>18 (1.79%)</td>
</tr>
<tr>
<td>Persistent effusion → arthrocentesis</td>
<td>59 (5.8%)</td>
</tr>
<tr>
<td>Minor medical complication*</td>
<td>17 (1.69%)</td>
</tr>
</tbody>
</table>

*urinary retention, nausea and vomiting, severe constipation*
<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>BMI</th>
<th>Surgical Procedure</th>
</tr>
</thead>
</table>

Statistically Significant
<table>
<thead>
<tr>
<th>Time parameter (Major Complications)</th>
<th>Odds Ratio (CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourniquet Time &gt;=114 minutes</td>
<td>8.561 (2.669, 27.459)</td>
<td>0.0006</td>
</tr>
<tr>
<td>Operative Time &gt;=220 minutes</td>
<td>3.766 (1.533, 9.254)</td>
<td>0.004</td>
</tr>
<tr>
<td>Anesthesia Time &gt;=265 minutes</td>
<td>3.556 (1.377, 9.184)</td>
<td>0.009</td>
</tr>
</tbody>
</table>
Results

• 3 + CPT codes
  • OR: 5.059 (CI: 1.913, 13.375)
  • p-value: 0.001
Conclusion

• Patients who had more complex procedures (≥ 3 CPT codes) with longer operative/anesthesia and tourniquet times were more prone to a major complication.
• **Major** complications low (2.1%)

• **Minor** complications more common (12.2%)
  • however, this mainly consists of patients having to undergo an arthrocentesis

• DVT, PE, and CRPS did not occur in our patient population
Thank You