INTRODUCTION

• Surgeons have many options when choosing the type of graft that will be used to replace a ruptured ACL. These options are categorized as allografts or autografts. Allografts are not commonly used in the pediatric population due to higher rates of failure, risk of infection and age of graft donor. Some studies have shown that children are more prone to graft failure if they undergo ACL reconstruction with an allograft instead of an autograft.1,2

• Commonly autografts are the hamstring tendons and the patella tendon. For a hamstring autograft, the semitendinosus and gracilis tendons are used.

• As healthcare costs in medicine are increasing, it is important to consider cost-effectiveness when deciding which type of procedure to perform. This study will compare the costs associated with performing the hamstring autograft versus the bone-patella tendon-bone (BTB) autograft in pediatric patients, as well as operating time and complications.

• When comparing cost of different autografts in adults, Genuario, et al. showed that hamstring autografts were more cost-effective than BTB autografts, while Forsblad, et al. found that BTB was less expensive.1,4

• Surgical time for BTB patients has also been found to be shorter than hamstring patients as patella patients, a randomized list of these patients were pulled from the list.

• To maintain the integrity of comparing operating time of the different graft types, operating time was only compared between patients who had either an ACL reconstruction only or with a meniscectomy. Patients with a meniscus repair or additional ligament repairs were excluded from operating time comparison.

• 78 patients met this criteria for the operating time comparison.

METHODS

• The hamstring patients were added by matching them on age and gender with patients from the BTB group.

• The charts and surgery notes for the patients were then reviewed. Age and gender, operating time, complications encountered and initial length of post-operative therapy prescribed were recorded for all patients.

• To maintain the integrity of comparing operating time of the different graft types, operating time was only compared between patients who had either an ACL reconstruction only or with a partial meniscectomy. Patients with a meniscus repair or additional ligament repairs were excluded from operating time comparison.

• No significant association between graft type and complication rate, X^2 = .238(1, 166), p = .626, phi = .057. See Chart 1 for specific complications.

• No significant relationship between therapy sessions initially prescribed and graft type, X^2 = 0.78(2, 131), p = .962, phi = .024.

Chart 1: Complications by Graft Type

<table>
<thead>
<tr>
<th>Complication</th>
<th>Hamstring autograft</th>
<th>Patella autograft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patellar tendinosis</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Intraoperative hardware failure</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Hemarthrosis</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Patellar nerve palsy</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Patellar bone fragmentation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Arthrofibrosis</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Neupatellar synovitis</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Femoral nerve palsy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Superficial wound infection</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Graft failure (not rupture)</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

REFERENCES


DISCUSSION

• The one patient in this study that had a graft failure due to rupture of the autograft was in the hamstring group. It was established that hamstring autograft is a more cost-effective graft option than patella in the pediatric population, in terms of operating time, cost and complications.

• It could then be said that hamstring graft patients incur a lower cost due to the lower average surgery time of 138 min. These results were consistent with the study by Genuario, et al, while they contrasted the results of Forsblad, et al.3,4

• Genuario, et al. determined cost-effectiveness of hamstring versus BTB in adults by using cost and effectiveness. Effectiveness was measured by complications and graft failure.4

• It is of note that both groups in our study had an equal number of arthrofibrosis cases, since this complication requires manipulation under anesthesia, which incurs more cost for the patient.

• The exclusivity of the patellar tendonitis and patellofemoral syndrome to the BTB group may be due to the fact that the patellar tendon was harvested for the reconstruction.

• The one patient in this study that had a graft failure due to rupture of the autograft was in the hamstring group. While arthroms are not as commonly used in the pediatric population as the two grafts compared in this study, a future direction for this study could compare the cost-effectiveness of alligators.

• Conclusion: It was established that hamstring autograft is a more cost-effective graft option than patella in the pediatric population, in terms of operating time, cost and complications.