Association of Bacterial Growth with Tibial Tunnel Widening in Anterior Cruciate Ligament Revision Surgery
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E-Poster #9
Disclosures

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Background

• Tunnel lysis after ACL reconstruction surgery is well documented
  — little is known about its mechanisms and etiology
• The association between bacterial growth and tunnel lysis among patient undergoing ACL revision surgery remains elusive.
  Bacterial involvement in the biologic failure mechanism of some ACL reconstructions has been suggested among numerous recent studies.
  No studies yet show any correlation between bacteria and tunnel lysis.
Purpose and Hypothesis

- The purpose of this study was to determine the correlation between tibial tunnel widening and bacterial presence among ACL revision surgery.

- It was hypothesized that there would be a significant difference in tunnel widening between ACLR with bacterial presence and those without, suggesting a correlation in bacteria and the etiology in tunnel lysis.
Methods and Study Design

Cross-sectional analysis

ACL Revision reconstruction surgery between 2014 to 2018.

47 patients whose ACL graft and tunnels were evaluated for bacterial culture.

Pre-operative tibial tunnel width was assessed using magnetic resonance imaging (MRI)

- long, short, and diagonal measurements on an axial view.
Methods and Study Design

Positive bacterial growth was defined as:

- positive clinical culture from intra-operative tissues samples sent to hospital lab or
- positive bacterial outgrowth from intra-operative tissue cultures in the research laboratory.

Summary statistics and analysis was performed using STATA 14.0 and Microsoft Excel.

Scanning Electron Microscopic (SEM) image of a S. epidermidis (ATCC 35984) biofilm growing on the surface of an silicone IV catheter.
Results: Difference in ACLR Groups

The total mean age for the cohort was 28.2 years (SD=10.34) 
The total mean BMI was 27.3 kg/m2 
Four of 42 patients had positive cultures with bacterial outgrowth. 
  - 50% (2/4) grew coagulase negative staphylococcus. 
  - The other cultures had unknown bacterial outgrowth on clinical cultures.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Bacterial Growth</th>
<th>Positive Cultures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean 28.1 yr. (SD 10.5)</td>
<td>Mean 25.7 yr. (SD 8.8)</td>
</tr>
<tr>
<td>Male</td>
<td>62.70%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Body mass index (BMI)</td>
<td>Mean 27.6 (SD 5.8)</td>
<td>Mean 25.8 (SD 3.9)</td>
</tr>
<tr>
<td>Graft Used (Allograft)</td>
<td>30.50%</td>
<td>25.00%</td>
</tr>
<tr>
<td>Smoking History (Ever)</td>
<td>25.40%</td>
<td>25.00%</td>
</tr>
</tbody>
</table>
Results

• Culture negative patients
  – The mean tibial tunnel size was 11.45 mm (SD 2.53, range 6.6-15.6)

• Culture positive patients
  – The mean tibial tunnel size was 14.48 (SD 2.75, range 12.1-18.4)
Conclusions

- <10% of patients sampled had culture positive ACL graft tissue at time of revision
- All patients were asymptomatic
- Patients with culture positive findings had larger tibial tunnels at time of revision
Future Directions

• Mechanism for tunnel lysis after ACL surgery needs to be better understood
• Bacterial contamination may be a mechanism for tunnel lysis
• Impact of these finding on ACL graft risk failure and revision surgery are unknown
References


References


Thank You

wexnermedical.osu.edu

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