Endophthalmitis after Cataract Surgery: Changes in Management Based on Microbiologic Cultures

Samir N. Patel, MD

WillsEye Hospital
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• None
Summary

• In a study of 111 consecutive patients with endophthalmitis following cataract surgery, vitreous culture data helped prognosticate visual outcomes but had no effect on clinical management.
Endophthalmitis after Cataract Surgery

- Cataract surgery is one of the most performed surgeries worldwide
- Infectious endophthalmitis remains one of the most devastating complications
- The Endophthalmitis Vitrectomy Study (EVS) has provided guidance on initial management of endophthalmitis after cataract surgery
- Little data is available on the subsequent management after initial treatment
Current Treatment Paradigm

• Initial Management: vitreous tap & injection of intravitreal antibiotics
  • Consider vitrectomy
• Little consensus on subsequent management
• Role of microbiologic cultures in guiding future management is unclear
Current Treatment Paradigm

- Microbiologic samples must be processed within 2 hours
- Logistics of obtaining cultures may delay critical step: injecting antibiotics

Risks of Vitreous Tap

• Complications include iatrogenic retinal tears, retinal detachments, and/or choroidal detachments

• Up to 11% risk of postoperative retinal detachment in the EVS
Purpose

• To investigate the role of microbiologic culture data in the guiding subsequent management of patients with endophthalmitis after cataract surgery
Methods

• Retrospective, single-center, cohort study of endophthalmitis cases between 2014 to 2017

• Inclusion criteria:
  • Presumed infectious endophthalmitis following cataract surgery
  • At least three months of follow up

• Exclusion criteria:
  • Patients who did not have a vitreous or aqueous culture performed
  • Patients with a separate intraocular surgery or procedure, including intravitreal injection, between the time of cataract surgery and the development of endophthalmitis
Methods – Outcome Measures

• Changes in clinical management
  • Defined as either a repeat injection of intravitreal antibiotics or pars plana vitrectomy surgery within 2 weeks of initial treatment
Results – Incidence of Endophthalmitis

- Culture-positive cases required a repeat intervention in 6/57 (11%) cases compared to 3/54 (6%) cases for culture-negative cases ($p = 0.49$)
### Results – Cases with Changes in Management

<table>
<thead>
<tr>
<th>Case</th>
<th>Initial Treatment</th>
<th>VA at Endophthalmitis presentation</th>
<th>VA at 3 months</th>
<th>Final VA</th>
<th>Culture results</th>
<th>Time to repeat Intervention, days</th>
<th>Intervention</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T&amp;I</td>
<td>HM</td>
<td>HM</td>
<td>HM</td>
<td>Streptococcus pneumoniae</td>
<td>2</td>
<td>PPV without repeat culture</td>
<td>Worsening clinical exam</td>
</tr>
<tr>
<td>2</td>
<td>T&amp;I</td>
<td>HM</td>
<td>CF</td>
<td>CF</td>
<td>Streptococcus mitis</td>
<td>5</td>
<td>Injection of vancomycin</td>
<td>Worsening clinical exam</td>
</tr>
<tr>
<td>3</td>
<td>T&amp;I</td>
<td>CF</td>
<td>CF</td>
<td>CF</td>
<td>Staphylococcus lugdunensis</td>
<td>2</td>
<td>PPV without repeat culture</td>
<td>Declining vision</td>
</tr>
<tr>
<td>4</td>
<td>T&amp;I</td>
<td>HM</td>
<td>20/70</td>
<td>20/30</td>
<td>Staphylococcus lugdunensis</td>
<td>5</td>
<td>Injection of vancomycin and ceftazidime</td>
<td>Worsening clinical exam</td>
</tr>
<tr>
<td>5</td>
<td>T&amp;I</td>
<td>20/25</td>
<td>20/40</td>
<td>20/25</td>
<td>Staphylococcus epidermidis</td>
<td>5</td>
<td>PPV without repeat culture</td>
<td>Declining vision</td>
</tr>
<tr>
<td>6</td>
<td>T&amp;I</td>
<td>HM</td>
<td>HM</td>
<td>HM</td>
<td>Staphylococcus epidermidis</td>
<td>7</td>
<td>PPV without repeat culture</td>
<td>Retinal detachment</td>
</tr>
<tr>
<td>7</td>
<td>T&amp;I</td>
<td>20/50</td>
<td>20/100</td>
<td>20/25</td>
<td>NG</td>
<td>7</td>
<td>PPV with repeat culture</td>
<td>Worsening clinical exam</td>
</tr>
<tr>
<td>8</td>
<td>T&amp;I</td>
<td>HM</td>
<td>20/70</td>
<td>20/40</td>
<td>NG</td>
<td>5</td>
<td>Injection of vancomycin and ceftazidime</td>
<td>Worsening clinical exam</td>
</tr>
<tr>
<td>9</td>
<td>T&amp;I</td>
<td>HM</td>
<td>HM</td>
<td>HM</td>
<td>NG</td>
<td>3</td>
<td>PPV without repeat culture</td>
<td>Declining vision</td>
</tr>
</tbody>
</table>
Results – Visual Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Culture-positive Endophthalmitis (N = 57)</th>
<th>Culture-negative Endophthalmitis (N = 54)</th>
<th>Adjusted difference (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visual Acuity at Endophthalmitis Presentation</strong></td>
<td></td>
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<tr>
<td>logMAR (Snellen Equivalent)</td>
<td>2.33 (20/4400)</td>
<td>2.05 (20/2200)</td>
<td>-</td>
<td>0.09</td>
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<tr>
<td><strong>3-month follow-up</strong></td>
<td></td>
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<td></td>
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<tr>
<td>logMAR (Snellen Equivalent)</td>
<td>1.17 (20/320)</td>
<td>0.65 (20/80)</td>
<td>0.513 (0.13 – 0.89)</td>
<td>&lt;0.01</td>
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<tr>
<td><strong>6-month follow-up</strong></td>
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</tr>
<tr>
<td>logMAR (Snellen Equivalent)</td>
<td>1.28 (20/380)</td>
<td>0.78 (20/120)</td>
<td>0.487 (0.14 – 0.82)</td>
<td>0.04</td>
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<tr>
<td><strong>Final follow-up</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>logMAR (Snellen Equivalent)</td>
<td>1.09 (20/250)</td>
<td>0.59 (20/80)</td>
<td>0.394 (0.02 – 0.77)</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Results – Anatomic Outcomes

• Retinal detachments or retinal tears occurred in 19 of 111 (17%) eyes
  • Culture-positive eyes developed a secondary retinal detachment in 11 of 57 (19%) eyes compared to 3 of 54 (6%) culture-negative eyes ($p = 0.03$)

• 43 of 100 (43%) of patients developed secondary epiretinal membranes
Conclusions

• In 111 consecutive cases of endophthalmitis after cataract surgery, microbiologic culture results, whether positive or negative, did not alter the course of treatment
Conclusions

• Changes in management guided by clinical examination
• Microbiologic cultures did not inform management changes
• Culture results may help to prognosticate visual outcomes
• Prompt intravitrebral injection of antibiotics is the key and cultures may not be necessary
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References


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