

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

Samir N. Patel, MD



WillsEye Hospital

Financial Disclosures

- 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



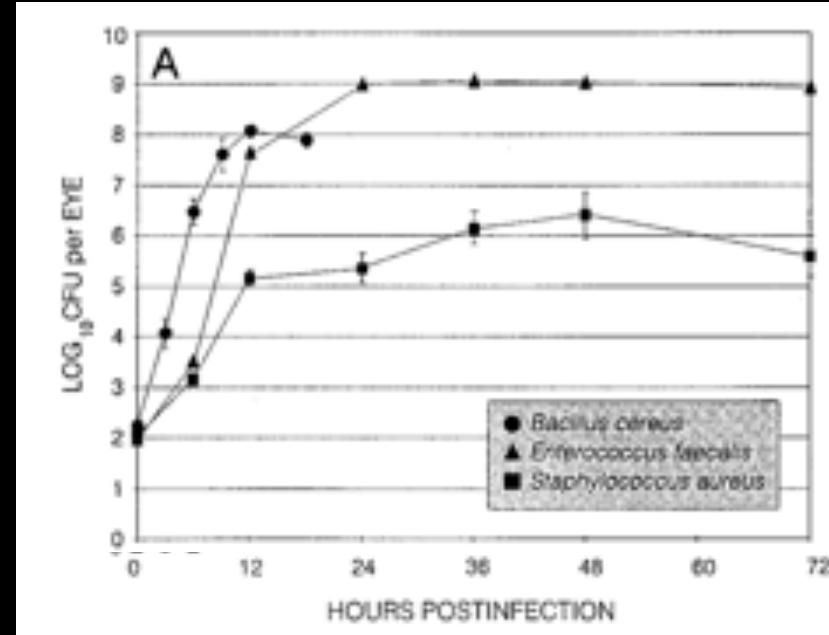
Current Treatment Paradigm

- 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



Callegan MC, et al. Pathogenesis of gram-positive bacterial endophthalmitis. Infect Immun. 1999 Jul;67(7):3348-56



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



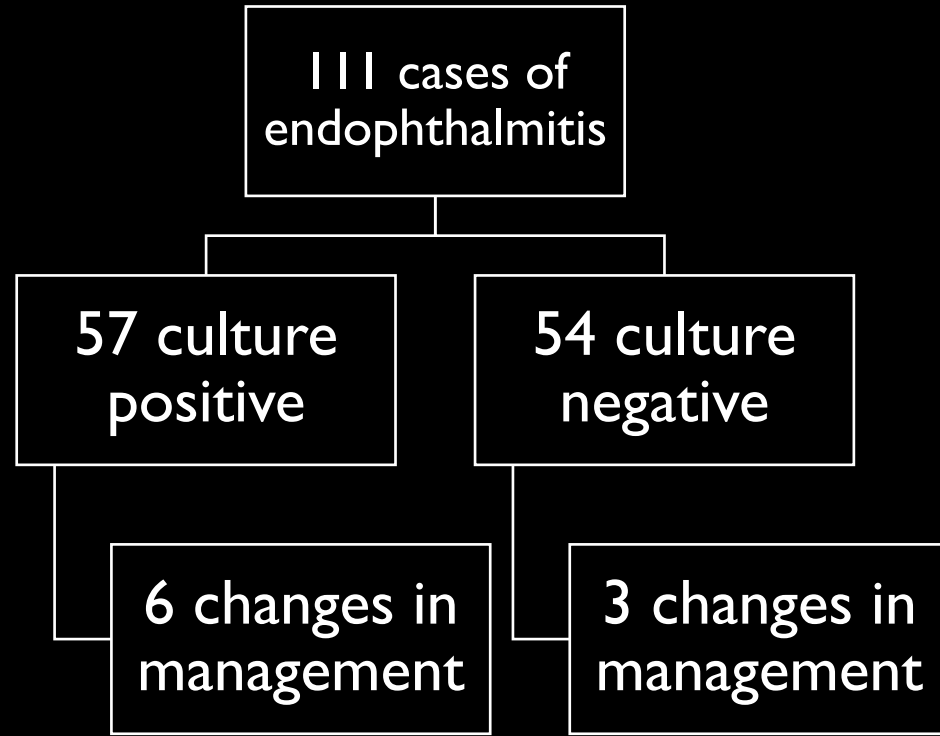
Methods – Outcome Measures

- 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

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



Results – Visual Outcomes

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



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 intravitreal injection of antibiotics is the key and cultures may not be necessary



Acknowledgements

- Philip P. Storey, MD, MPH
- Hannah Levin, BS
- Maitri Pancholy, MD
- Anthony Obeid, MD, MPH
- Turner D. Wibbelsman, BS
- Jason Hsu, MD
- Sunir J. Garg, MD
- Allen C. Ho, MD
- James F. Vander, MD
- James P. Dunn, MD



References

- Results of the Endophthalmitis Vitrectomy Study. a randomized trial of immediate vitrectomy and of intravenous antibiotics for the treatment of postoperative bacterial endophthalmitis. Arch Ophthalmol 1995;113(12):1479-96.
- Kuhn F, Gini G. Ten years after... are findings of the Endophthalmitis Vitrectomy Study still relevant today? Graefes Arch Clin Exp Ophthalmol 2005;243(12):1197-9.
- Callegan MC, Booth MC, Jett BD, Gilmore MS. Pathogenesis of gram-positive bacterial endophthalmitis. Infect Immun 1999;67(7):3348-56.
- Forster RK. Experimental postoperative endophthalmitis. Trans Am Ophthalmol Soc 1992;90:505-59.
- Patel SN, Storey PP, Pancholy M, et al. Changes in management based on vitreous culture in endophthalmitis after intravitreal anti-vascular endothelial growth factor injection. Am J Ophthalmol 2019;207:224-31.



Thank You!

