

ENDOPHTHALMITIS

MICHAEL A. CALLAHAN, MD, FACS

1. DEFINITION, INCIDENCE, CLINICAL SYMPTOMS, AND SIGNS
 - A. Blindness = 18% after endophthalmitis
2. WHO IS THE ENEMY? BACTERIOLOGY.
 - A. Where do the bugs come from?
 - B. Which bugs are the most common? Virulent?
 - C. Impact on the patient
3. PREOPERATIVE FACTORS TO PREVENT ENDOPHTHALMITIS
 - A. Sterilization of instruments
 1. Gas vs. Autoclave
 2. Disposables
 3. Blue Towels = Fibers
 4. Phaco handpiece and I/A handpiece
 5. Everything under the sun
 - B. Patient bacterial flora – lids, lashes, lacrimal, conjunctiva
 1. Preoperative topical antibiotics, lid scrub
 2. Surgical prep – soap and solution
 3. Conjunctival douche with Betadine
 4. Plastic drape or speculum to fold back lashes
 5. Wick to drain fluid away from the surgical field
 - C. What to do with monocular patient with a prosthetic eye?
 1. Ocularist Consult
 2. Preoperative Culture
 3. Operative draping separately
4. OPERATIVE FACTORS TO CONSIDER IN PREVENTING ENDOPHTHALMITIS
 - A. Short length of surgery
 1. Efficient teams
 2. IOL in room
 3. Machine set up
 4. Anesthesia coordinated
 - B. Pharmacy prepared antibiotics in the irrigating solution (Gills)
 - C. Solid Phaco wound construction and paracentesis
 - D. Competent assembly of all components used in the operation: preservative free Lidocaine, filtered air, use of BSS

- E. Use of disposable needles and cannulas
- F. Hydration of wound and paracentesis
- G. Measurement of intra-operative IOP with Barraquer Tonometer
- H. No such thing as a “self-sealing” incision – the surgeon must seal it
- I. Immediate Betadine and 4th generation fluoroquinolone (sub-conjunctival injections)
- J. Shield or sunglasses – no patch

5. POSTOPERATIVE FACTORS TO PREVENT ENDOPHTHALMITIS

- A. Start topical antibiotics same day or within 24 hours
- B. Keep dirty hands away and dirt away from eye
- C. Normal activities of daily living
- D. Do not rub eye or get dirt in it

6. DIAGNOSIS OF POSTOPERATIVE ENDOPHTHALMITIS

- A. Vitreous vs. Aqueous Culture
- B. Differentiation from TASS

7. TREATMENT OF ENDOPHTHALMITIS

- A. Done almost exclusively by R/V
- B. Vitrectomy with intracameral antibiotics vs. Vitreous tap with intracameral antibiotics and IV antibiotics
- C. Outcome = Timing of treatment vs. Virulence of organism
- D. Topical, subconjunctival, intravenous routes of antibiotic administration
- E. Judicious use of steroids

8. TASS

9. MRSA

10. PERTINENT NON-MEDICAL ISSUES

- A. Malpractice
- B. Medicine reimbursement for nasocomial infections.

Author Affiliations: Professor of Clinical Ophthalmology, University of Alabama Birmingham, Birmingham, AL.

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REFERENCES

1. Taban M, Behrens A, Newcomb RL, *et al.* Acute Endophthalmitis Following Cataract Surgery. *Arch Ophthalmol.* 2005; 123:613-620.
2. Townsend-Pico WA, Meyers SM, Langston RHS, Costin JA. Coagulase-negative *Staphylococcus* Endophthalmitis After Cataract Surgery with Intraocular Vancomycin. *Am J Ophthalmol.* 1996; 121:318-319.
3. Narang S, Gupta A, Gupta V, Dogra MR, *et al.* Fungal Endophthalmitis Following Cataract Surgery: Clinical Presentation, Microbiological Spectrum, and Outcome. *Am J Ophthalmol.* 2001; 132:609-617.
4. Fine IH. Clear Corneal Incisions. *Int Ophthalmol Clin.* 1994; 34:59-72.
5. ASCRS, ASORN. Recommended practices for cleaning and sterilizing intraocular surgical instruments. *J Cataract Refract Surg.* 2007; 33:1095-1100.
6. Nichman LD, Chang DF, Johnson SH, Mamalis N, *et al.* What is the association between clear corneal cataract incisions and postoperative endophthalmitis? *J Cataract Refract Surg.* 2006; 32:1556-1559.
7. Chang DF, Braga-Mele R, Mamalis N, Masker S, *et al.* Prophylaxis of postoperative endophthalmitis after cataract surgery. *J Cataract Refract Surg.* 2007; 33:1801-1805.
8. Olson RJ. Reducing the Risk of Postoperative Endophthalmitis. *Surv Ophthalmol.* 2004; 49:S55-S61.
9. Axer-Siegel R, Stiebel-Kalish H, Rosenblatt I, Strassmann E, *et al.* Cystoid Macular Edema after Cataract Surgery with Intraocular Vancomycin. *Ophthalmology.* 1999; 106:1660-1664.
10. Gritz DC, Cevallos AV, Smolin G, Whitcher JP. Antibiotic Supplementation of Intraocular Irrigating Solution. *Ophthalmology.* 1996; 103:1204-1209.
11. Naor J, Savion N, Blumenthal M, Assia EI. Corneal endothelial cytotoxicity of diluted povidone-iodine. *J Cataract Refract Surg.* 2001; 27:941-947.
12. Humayun M, Gottlieb CC, Rafuse PE. Intraocular ophthalmic ointment following clear corneal phacoemulsification: Clinical implications. *J Cataract Refract Surg.* 2006; 32:2135-2138.
13. Deramo VA, Lai JC, Fastenberg DM, Udell IJ. Acute Endophthalmitis in Eyes Treated Prophylactically with Gatifloxacin and Moxifloxacin. *Am J Ophthalmol.* 2006; 142:721-725.
14. Ball JL, Barrett GD. Prospective randomized controlled trial of the effect of intracameral vancomycin and gentamicin on macular retinal thickness and visual function following cataract surgery. *J Cataract Refract Surg.* 2006; 32:789-794.
15. Hollander DA, Vagefi MR, Seiff SR, Stewart JM. Bacterial Endophthalmitis After Resident-Performed Cataract Surgery. *Am J Ophthalmol.* 2006; 141:949-951.
16. Al-Mezaine HS, Kangave D, Al-Assiri A, Al-Rahji AA. Acute-onset endophthalmitis after cataract surgery. *J Cataract Refract Surg.* 2009; 35:643-649.
17. Francis IC, Roufas A, Figueira EC, Pandya VB, *et al.* Endophthalmitis following cataract surgery: The sucking corneal wound. *J Cataract Refract Surg.* 2009; 35:1643-1645.
18. Kadry AA, Fouda SI, Shibl AM, El-Asrar AA. Impact of slime dispersants and anti-adhesives on *in vitro* biofilm formation of *Staphylococcus epidermidis* on intraocular lenses and on antibiotic activities. *J Antimicrobial Chem.* 2009; 63:480-484.
19. Taban M, Sarayba MA, Ignacio TS, Behrens A, *et al.* Ingress of India Ink Into the Anterior Chamber Through Sutureless Clear Corneal Cataract Wounds. *Arch Ophthalmol.* 2005; 123:643-648.
20. Mamalis N, Edelhauser HF, Dawson DG, Chew J, *et al.* Toxic anterior segment syndrome. *J Cataract Refract Surg.* 2006; 32:324-333.
21. Holland SP, Morck DW, Lee TL. Update on toxic anterior segment syndrome. *Curr Opin Ophthalmol.* 2007; 18:4-8.
22. Johnston J. Toxic anterior segment syndrome – More than sterility meets the eye. *AORN Journal.* 2006; 84:967-984.
23. Haymore J, Zaidman G, Werner L, Mamalis N, *et al.* Misdiagnosis of Hydrophilic Acrylic Intraocular Lens Optic Opacification. *Ophthalmology.* 2007; 114:1689-1695.
24. Trost LW, Kivilcim M, Peyman GA, Aydin E, *et al.* The Effect of Intravitreally Injected Povidone-Iodine on *Staphylococcus epidermidis* in Rabbit Eyes. *J Ocular Pharma Therapeut.* 2007; 23:70-77.
25. Trinavarat A, Atchaneeyasakul L, Nopmaneejumrulers C, Inson K. Reduction of Endophthalmitis Rate after Cataract Surgery with Preoperative 5% Povidone-iodine. *Dermatology.* 2006; 212(supp1):35-40.
26. MacRae SM, Brown B, Edelhauser HF. The Corneal Toxicity of Presurgical Skin Antiseptics. *Am J Ophthalmol.* 1984; 97:221-232.
27. Fraunfelder FW. Corneal Toxicity From Topical Ocular and Systemic Medications. *Cornea.* 2006; 25:1133-1136.
28. ESCRS Endophthalmitis Study Group. Prophylaxis of postoperative endophthalmitis following cataract surgery. *J Cataract Refract Surg.* 2007; 33:978-988.
29. Altan T, Acar N, Kaplan Z, Unver YB, *et al.* Acute-Onset Endophthalmitis After Cataract Surgery. *Retina.* 2009; 29:606-612.