

Endophthalmitis and Intravitreal injections

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Acute bacterial endophthalmitis

Incidence - about 1:1,000



Common causative organisms

- *Staph. epidermidis*
- *Staph. aureus*
- *Strep* sp.
- *Pseudomonas* sp.

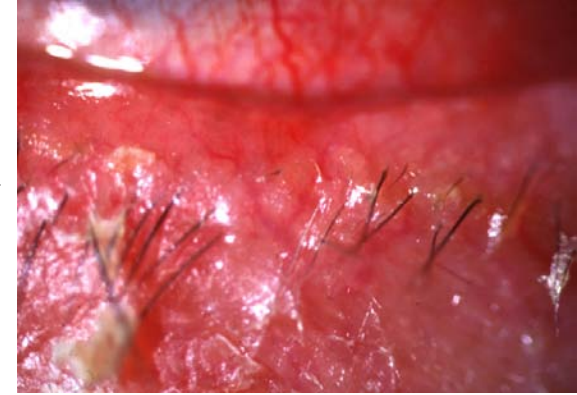
Source of infection

- Patient's own external bacterial flora is most frequent culprit
- Contaminated solutions and instruments
- Environmental flora including that of surgeon and operating room personnel

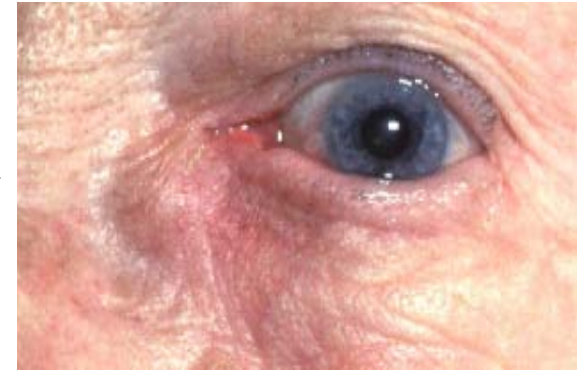
Preoperative Prophylaxis

- **Treatment of pre-existing infections**

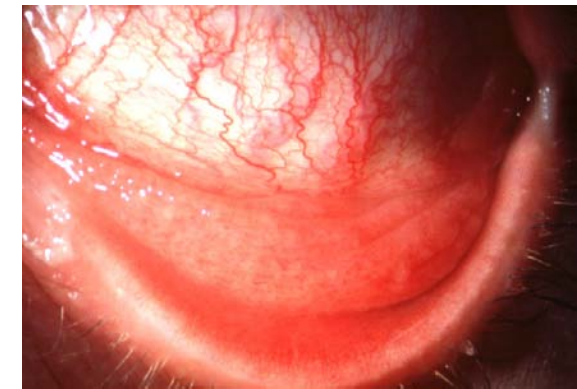
- **Staphylococcal blepharitis**



- **Chronic dacryocystitis**



- **Chronic conjunctivitis**

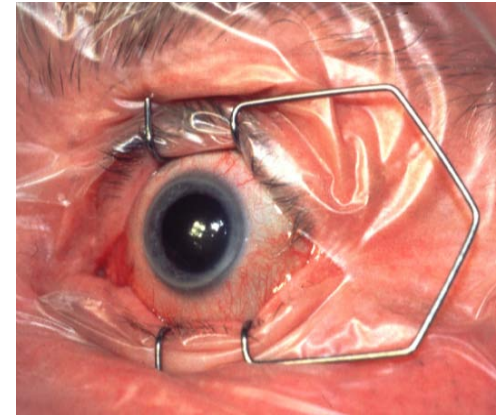


Australian case-control data

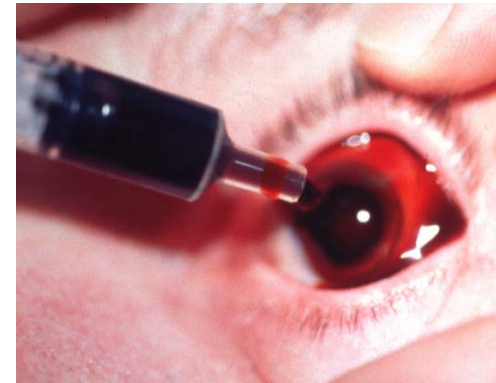
- Ng, Morlet et al J Cataract Refract Surg 2007 Feb;33(2):269-80
- 205 cases (4 matched controls each) 1980-2000
 - (approx 1/700 cases)
- Active risk management strategies may reduce risk by 81%
 - Betadine
 - Subconj injections (OR 0.46)
 - Concurrent eyelid procedures substantially increases risk

Operative Prophylaxis

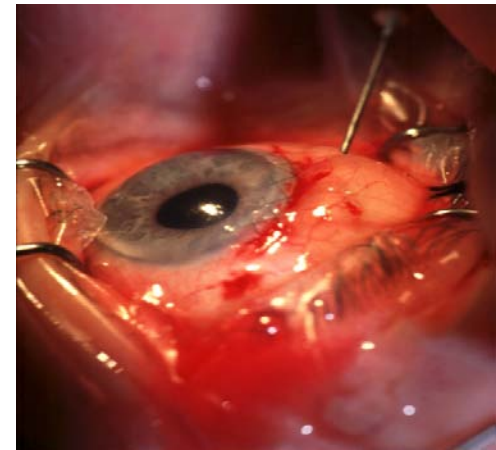
- **Meticulous prepping and draping**



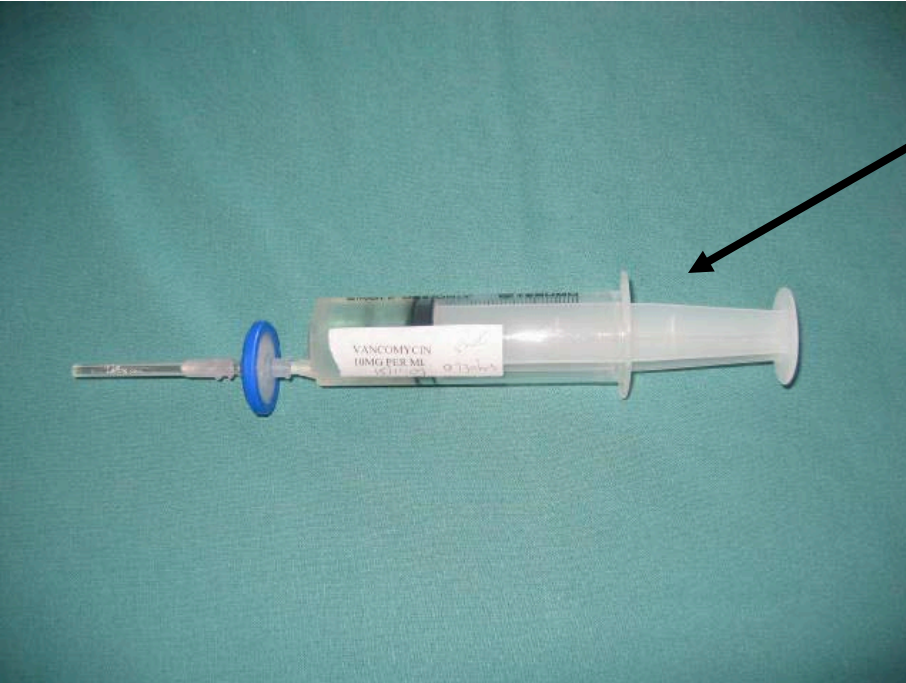
- **Instillation of povidone-iodine**



- **Postoperative injection of antibiotics**
 - **Subconjunctival**
 - **Intracameral**



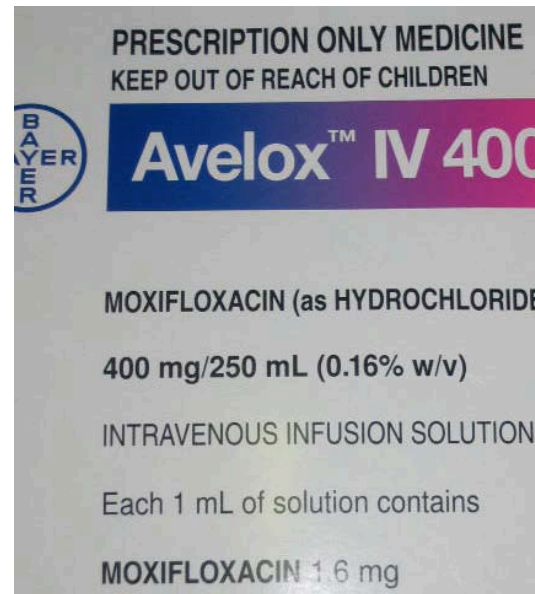
Intracameral options



- Vancomycin 1mg/0.1ml (as described by Gimbel)
 - Requires compounding
 - BUT using same agent as endophthalmitis treatment
- Cefuroxime (European studies)
 - Available NZ, but not available in Australia
 - Intracameral cefuroxime also requires compounding, has short-term stability, and carries a risk for hypersensitivity.
- Moxifloxacin (U.S.)
 - Want prepackaged dosing to avoid compounding

Moxifloxacin

- Fourth-generation fluoroquinolone,
- has potent and rapid bactericidal activity against the most common gram-positive postoperative endophthalmitis pathogens,
- has excellent ocular penetration after topical administration,
- is available (U.S) in a self-preserved ophthalmic formulation that has been shown safe and effective in preventing endophthalmitis when administered intracamerally in an animal model.
- \$80/bag in Aust. - too dilute



Perspectives on antibiotics for postoperative endophthalmitis prophylaxis: potential role of moxifloxacin.

O'Brien TP et al J Cataract Refract Surg 2007
Oct;33(10):1790-800.

Swedish database

- Lundstrom et al Ophthalmology 2007 May;114(5):866-70

- 2002-4 all cases nationally
- 1/2400 superior or corneoscleral
- + 1/5500 for CCTA (trend only)
- Vitreous loss, age >85 and non use intracameral cefuroxime significantly higher risk
- Low rate suggested as intracamerals

ESCRS multicentre trial.

J Cataract Refract Surg 2007 Jun;33(6):978-8

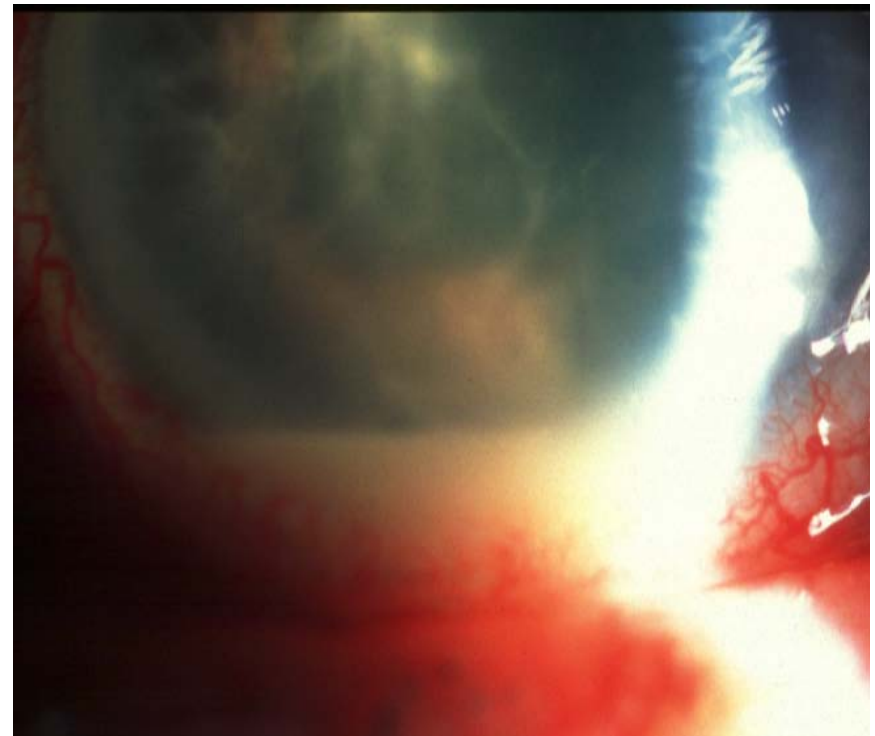
- 16603 pts, 24 centres
- Started 2003 terminated early (2006) as clear treatment benefit
- 29 patients (20 culture +ve)
 - But rate much higher than we would expect (~1/200)
- 4.92-fold increased risk if intracameral not used
- 5.88 fold increased risk CCI vs scleral
- 3.13 fold increased risk silicone IOL vs acrylic
- 4.95 fold increased risk if complicated surgery

Other series - conflicting

- Wound construction
 - CCI increased risk in some studies but not others
 - Similarly Suture vs no suture
 - Good construction KEY
- Preop abics
 - role unclear (although moxifloxacin shows promise)
- Anaesthetic
 - Topical (11.8 OR) vs Block ?
 - 27 cases in 5011 (5/1000!)
 - Garcia-Arumi. J Cataract Refract Surg 2007 Jun;33(6):989-9

What about when it happens to YOU

- Have practice protocol to see all post-op patients reporting blurred vision
- Recognise early

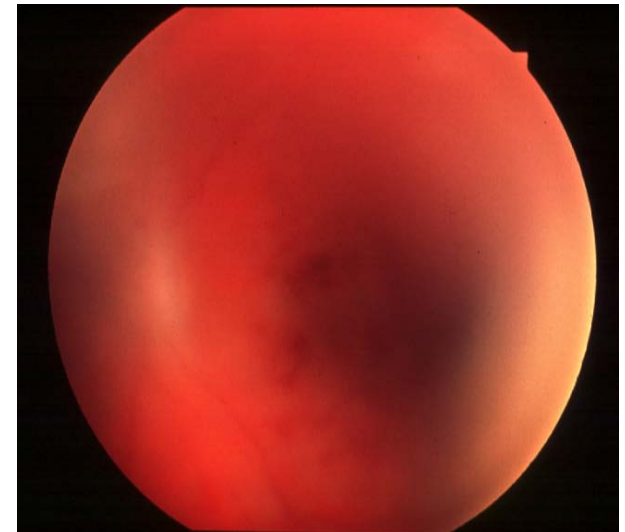
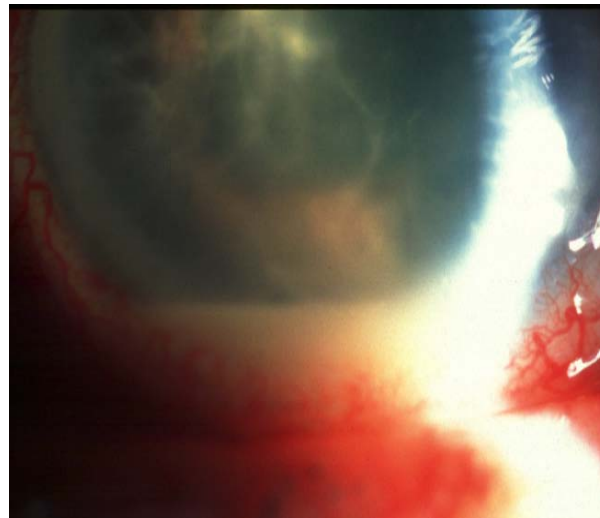


Endophthalmitis Vitrectomy Study (EVS)

- What is the role of immediate pars plana vitrectomy?
 - **Theoretic advantages**
 - Removal of infecting organisms
 - Clearing vitreous opacities
 - Collect abundant material for culture
 - Better delivery of intravitreal antibiotics
- What is the role of systemic antibiotics?
- Randomised multicenter trial, 420 patients
 - **BIAS**
 - Selection (NPL, no operative view excluded)
 - Intervention
 - VIT (delay up to 6 hours, no PVD)
 - TAP (= VIT in some cases)
 - Systemic Antibiotic choice (ceftazidime + amikacin)

EVS - Symptoms and signs

- Blurred VA
 - Most common symptom
 - 90% VA < 1.5/60 at presentation, 26% LPO
- NO pain in 25%
- 12% RAPD
- 86% hypopyon
- 80% no view



Risk factors for decreased VA outcome

- Presenting VA of LPO (most important factor
 - 2-fold greater risk)
- Others
 - older age (>85 y.o.)
 - diabetes
 - corneal infiltrate
 - PC tear
 - IOP <5 or >25mmHg
 - RAPD
 - Rubeosis
 - Absent Red reflex

Microbiology

- **69% culture positive (291 patients)**
 - 68% Gram +ve coagulase -ve (staph epidermidis)
 - 22% other G+ve (strep, staph aureus)
 - 6% G-ve (never isolated when could see retinal vessels)
 - 4% multiple
- **Sensitivity**
 - all G+ve sensitive to vancomycin
 - 90% G-ve sensitive to ceftazidime or amikacin
- **Outcome by microbiology (and VA outcome)**
 - Best prognosis with G+ve coagulase -ve or no growth
 - Worst with G-ve or 'other' G+ve
 - Initial VA more powerful

Good VA outcome in $\frac{3}{4}$ (VA >6/30)

- **For LPO patients**

- *VIT better than TAP*

- 3x better chance of VA >6/12 (33% vs 11%)
- 2x better chance of VA > 6/30 (56% vs 30%)
- <1/2 risk of severe VA loss to < 1.5/60 (20% vs 47%)

- **for HM or better**

- *NO DIFFERENCE between VIT and TAP*

- VA > 6/12 (66% VIT vs 62% TAP)
- VA > 6/30 (86% VIT vs 84% TAP)
- SVL (5% VIT vs 3% TAP)

- **No benefit of IV antibiotics for any group**

Treatment post-cataract endophthalmitis

- *****URGENT TREATMENT*****
 - Delay while referring or arranging theatre is inappropriate



Be prepared!

- Have endophthalmitis pack ready
- Typed instructions including antibiotic preparation instructions

- Ceftazidime

- 2mg/0.1ml

- Vancomycin

- 1-2mg/0.1ml



EQUIPMENT FOR VITREOUS TAP IN THE ROOMS

Xylocaine 2% with 1 in 100,000 adrenaline
Dental cartridge syringe
3 – 30 gauge needs for above
Vancomycin – 1 ampoule 500mg anaesthetic drawer
Ceftazidime - 1 ampoule 1g anaesthetic drawer
Sterile toothed forceps
Sterile lid speculum anaesthetic shelf next to change room 1
Gloves – size 7 ½ - two pairs
Gloves - size 8 two pairs
Ciprofloxacin capsules – 750mg x 14 (i.e. 750mg bid x 1/52) patient needs script w
Aqueous Betadine solution
Prednisolone 25mg tablets script needed
Prednisolone 5mg tablets script needed
Atropine 1% drops fridge in tea room in OT
Ciloxan drops script needed
Prednefrin Forte drops script needed
Syringes 10ml x 2
5ml x 2
2ml x 2

Simple trolley set-up

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

- Open up syringes
 - Those for tap
 - Those for injections



- Make up antibiotics
- Organise trolley



Perform procedure

- Subconj LA
 - helps a little
- Standard betadine prep
 - 1 ml syringe if don't have calipers

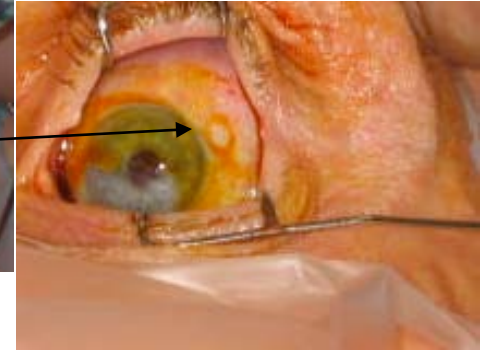
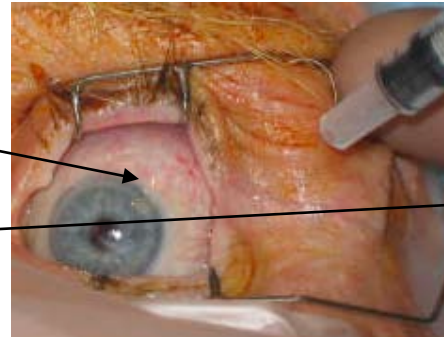
- Then apply drop betadine
- Ring mark = 3.5mm

- Take specimens

- Use 23G for vitreous tap
 - Needle aimed towards optic nerve
 - Aspirate as much as can (0.1-0.5ml)
 - AC tap as well (if can) use 30g needle

- Inject antibiotics

- 30G for inject
- Forceps help as soft eye.



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Conclusions

- *****URGENT TREATMENT*****
 - Delay while referring or arranging theatre is inappropriate
- Intravitreal antibiotics for all patients
- Treat then refer (BUT REFER EARLY)
 - Often need aggressive early further treatment
 - Often need further surgery (Detachment, ERM, PCO) >35%
- Good results expected for most patients
 - Requires prompt and effective management