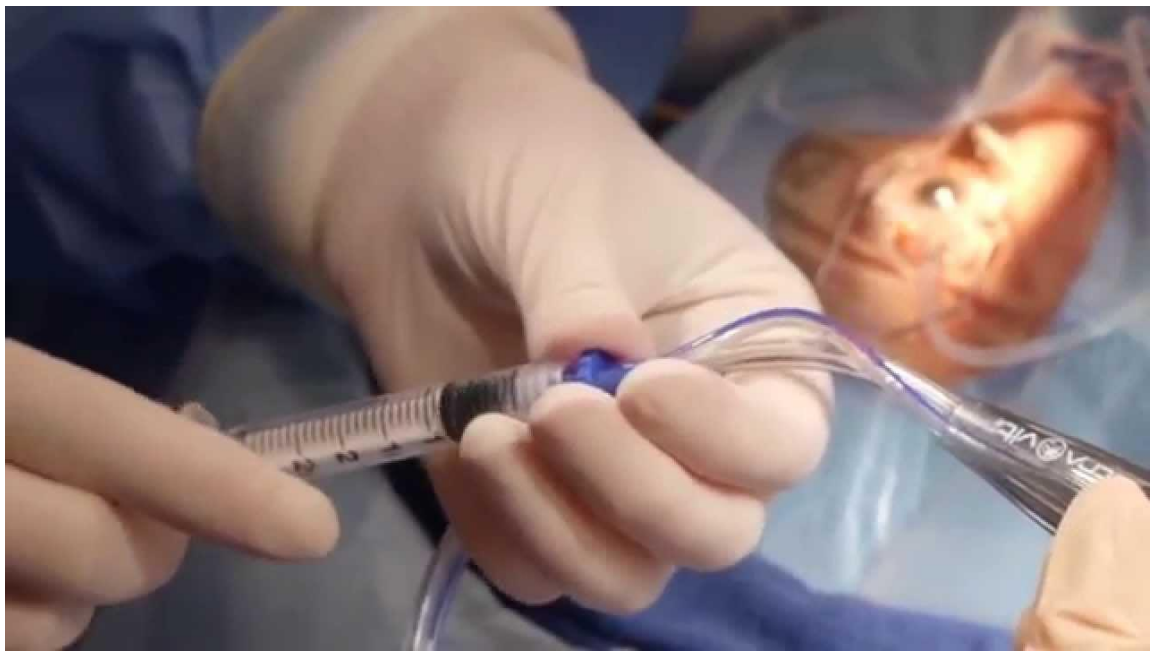
Endophthalmitis Guidelines

Diagnosis & Management of Endophthalmitis

University Hospitals of North Midlands NHS
NHS Trust



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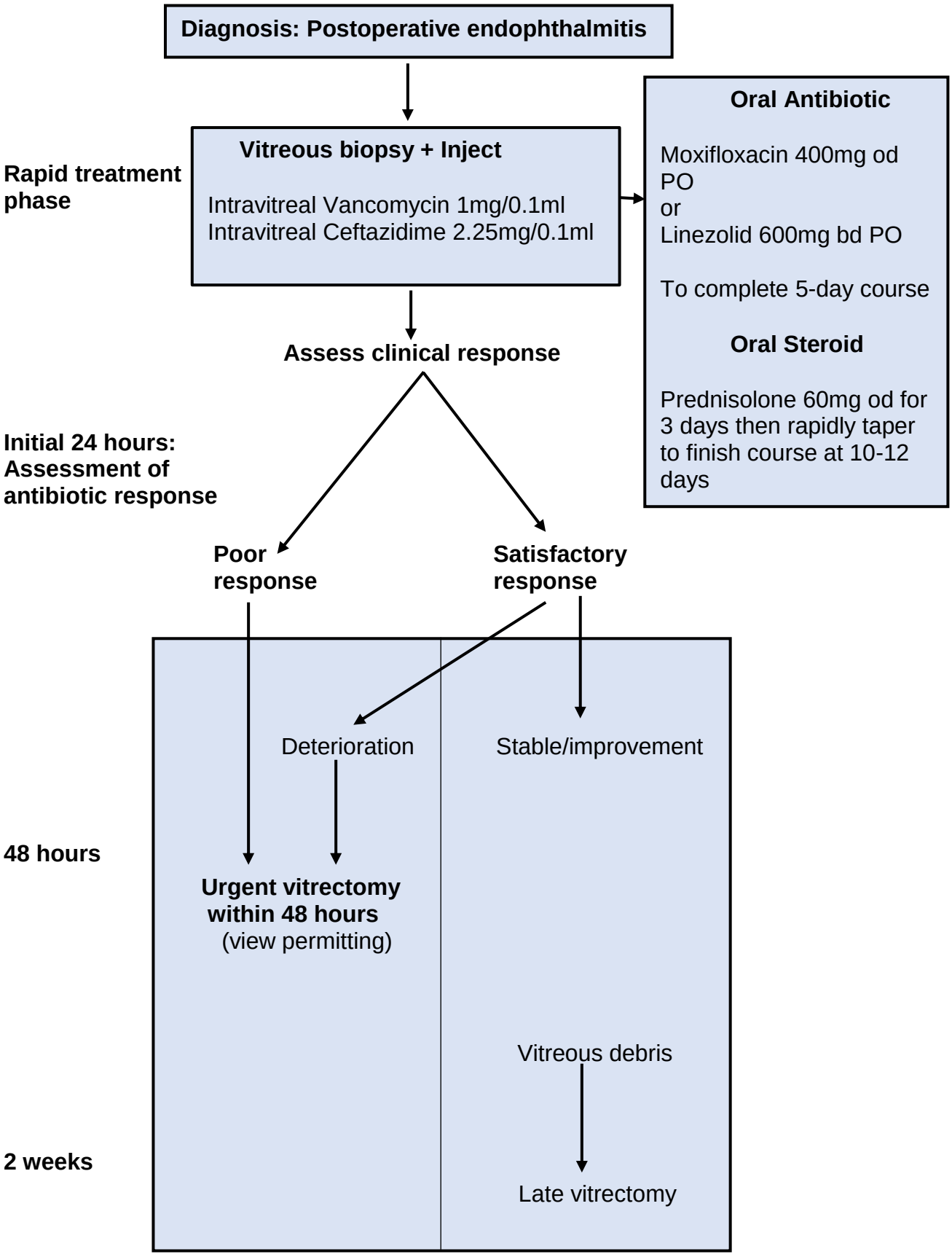

Modified EVS protocol adapted from: Management of Bacterial Postoperative Endophthalmitis and the Role of Vitrectomy; Clarke B, Williamson T, Gini G, Gupta B. Surv Ophthalmol 2018

Objective

Post-operative presumed infectious endophthalmitis is an ophthalmic emergency. Whilst visual prognosis often depends on visual acuity at presentation, outcome may be improved by early diagnosis, immediate vitreous sampling and intravitreal antibiotic therapy with broad spectrum agents, with control of inflammation using corticosteroids and timely vitrectomy where indicated. The objective of this guideline is to ensure that patients presenting with suspected endophthalmitis are promptly managed according to a standardized protocol, which is considered optimal management at present time.

Diagnosis

Bacterial endophthalmitis must be considered in any post-operative patient with pain, reduced vision, lid swelling, significant anterior chamber inflammation, hypopyon or vitritis, often with no fundal view. Be aware of the increased risk following complicated cataract surgery, in diabetics and the immunocompromised. The diagnosis is made on clinical grounds and is followed by intraocular sampling for microbiological culture. Always have a low threshold for suspecting endophthalmitis, as the risks of treatment are low and the consequences of missed diagnosis or delayed treatment are devastating to vision. A senior colleague must be consulted and the consultant on-call should be informed. The operating surgeon should also be informed and the case registered in the endophthalmitis record.

Management of Post-operative Presumed Bacterial Endophthalmitis

1. If appropriate swab of bleb, wound or corneal abscess site to be taken.

2. A vitreous sample is collected (Aqueous sampling is not routinely required) for gram stain, microscopy, culture & sensitivity (MC&S). Intravitreal Vancomycin (1mg in 0.1ml) and Ceftazidime (2.25mg in 0.1ml) administered as soon as possible. Sampling and injection is to be carried out in the outpatient injection suite/minor ops theatre or theatre depending on which will ensure the quickest treatment. Amikacin (0.4mg in 0.1ml) can be used in place of Ceftazidime if **true** penicillin allergy is reported.

3. Always contact the laboratory or microbiologist on call to inform them that samples are being sent for urgent processing.

4. Patients are admitted to the ward and started on oral Prednisolone 60mg od (unless contraindicated by suspicion of fungal endophthalmitis or confirmed fungi on Gram stain). Baseline bloods, weight, blood sugar and blood pressure measurements must be taken prior to initiating systemic steroid and potential side effects must be discussed with the patient. Continue at 60 mg for 3 days and if good clinical response taper rapidly to finish the course at 10-12 days. Prescribe gastric protection.

5. Commence oral antibiotics. Moxifloxacin 400mg od or Linezolid 600mg bd. A 5-day course should be completed.

6. Intensive topical antibiotic treatment if concurrent keratitis or blebitis as indicated, otherwise G. Dexamethasone 0.1% (preservative free) hourly by day, G. Atropine 1% tds and G. Levofloxacin 0.5% qds.

7. Prescribe regular analgesia if required.

8. With no view of the posterior segment a B-scan is required to confirm vitreous involvement/extent of posterior segment involvement. Do not delay intravitreal sampling and intravitreal antibiotics if a B-scan is not possible immediately, but all patients should have one in the 24-48 hours following the procedure to provide documentation, assess prognosis and aid in further management.

9. Consider early vitrectomy in cases of light perception vision, traumatic endophthalmitis, bleb-related endophthalmitis, *Propionibacterium acnes* infection or vitrectomised eyes.

10. If by 24-48 hours the inflammatory signs, *e.g.* hypopyon, red reflex etc. are improving then continue with the current regimen. However, if the situation has either not improved, or is deteriorating consider vitrectomy view permitting. Do not repeat injection of intravitreal antibiotics.

The empirical intravitreal antibiotic regimen recommended by this protocol provides broad-spectrum cover against the vast majority of causative organisms. Individual patients may have their treatment adjusted if microbiology results show an unexpected organism or resistance to the drugs that have been started.

Procedure for Vitreous Biopsies & Intravitreal Antibiotics

Anaesthesia & prep:

1. Instil topical anaesthetic (G. Tetracaine 1% x 4).
2. Instil aqueous Povidone-iodine 5% into the conjunctival sac and onto lid margins.
3. Administer sub-Tenons or peribulbar Lignocaine 2% ipsilateral to the side of intended vitreous biopsy (which should be away from the surgical wound).
4. Dilute the intravitreal antibiotics according to pharmacy protocol contained in antibiotic kit (available on the EEC or theatre). Draw up the required volume (usually 0.1 ml of each antibiotic) into the same 1 ml syringe (unless using Vancomycin with Amikacin as these agents cannot be mixed).
5. Scrub up and wear gloves.
6. Insert the lid speculum.

Vitreous biopsy:

7. Firmly apply a cotton bud soaked in G. Tetracaine 1% to the globe at the site of the vitreous tap for 15 seconds immediately before needle insertion.
8. Use a blue 23-gauge needle on a 5 ml syringe; insert 4 mm (phakic eyes) or 3.5 mm (pseudophakic/aphakic eyes) posterior to the limbus into the mid-vitreous cavity (in previously vitrectomised eyes use a 27 or 30-gauge needle).
9. Aspirate 200-400 μl of vitreous and remove the syringe, needle and sample.
10. Discard the needle and cap the syringe with sterile red stopper. Label sample with patient details, date and time of collection.

Intravitreal antibiotic injection:

11. Intravitreal antibiotics are drawn up into a 1 ml syringe in a sterile manner with a 27 or 30-gauge needle. Ensure the dead space in the needle is filled with solution for injection before inserting the needle through the sclera at the appropriate distance posterior to the limbus in the same area as the vitreous sampling. If using Vancomycin together with Amikacin use a separate syringe and needle for each injection, as the antibiotic solutions are not mixable. As the eye is usually soft some counter pressure will help get the needle through the sclera.

12. Slowly inject antibiotic solution into the mid-vitreous cavity then withdraw needle.

Management of fungal endophthalmitis

The diagnosis of fungal endophthalmitis is usually also made on clinical grounds with a classic ocular appearance of fungus in the choroid or in the retina and/or vitreous in a patient with a history of intravenous drug use or recent sepsis or hospital episode in which intravenous lines are being or were used. Occasionally fungal endophthalmitis occurs following intraocular surgery or penetrating injury.

Patients with endogenous endophthalmitis (bacterial or fungal) need to be managed in combination with a physician to help identify the source and in other diagnostic and treatment issues.

1. *Presumed Candida Lesions confined to the choroid* - these may be treated systemically with drugs that do not penetrate well into the eye (as these lesions are outside the blood-retinal barrier).
   a) **Empiric therapy** – Intravenous echinocandin[$] (note poor ocular penetration)
   b) **Specific Therapy for culture confirmed cases**: Contact Microbiology for specific advice. Treatment would usually comprise intravenous echonicandins[$] or IV/PO fluconazole[#] 12mg/kg stat (standard dose 800mg) followed by 6mg/kg daily (standard dose 400mg) depending on species and susceptibility results. Oral step-down therapy for fluconazole resistant isolates may comprise oral voriconazole* 400mg bd for 2 doses then 200mg bd or posaconazole 200mg qds again depending on susceptibility and treatment should continue for at least 6 weeks

2. *Presumed Candida Flat lesions in the retina* – These are also outside the blood retinal barrier but it is often worth giving a trial of agents with good intraocular penetration [i.e. fluconazole[#] 12mg/kg stat (standard dose 800mg) followed by 6mg/kg daily (standard dose 400mg) or voriconazole* 6mg/kg bd IV for 2 doses then 4mg/kg bd IV switching to 200mg bd orally when appropriate depending upon likely infecting species or susceptibility tests] to see if it is possible to prevent further extension into the eye and therefore avoid vitreous involvement. If healing occurs, the lesion(s) remain flat and do not extend into the vitreous, in which case at least 6 weeks' therapy with the drug would be appropriate. However, this is not always successful and if vitreous involvement follows, vitrectomy is required.

3. *Presumed Candida lesions extending into the vitreous* – these require vitrectomy and intraocular amphotericin B (5-10ug in 0.1ml; use 10ug in aphakic eyes as reduced half-life) together with a systemic anti-fungal agent that penetrates well into the eye. Fluconazole[#] 12mg/kg stat (standard dose 800mg) followed by 6mg/kg daily (standard dose 400mg) or voriconazole* 6mg/kg bd IV for 2 doses then 4mg/kg bd IV switching to 200mg bd orally when appropriate for at least 6 weeks to ensure eradication of the underlying systemic infection as well as any residual fungus in the eye. Therapy should be reviewed following positive identification of the fungal species and availability of drug sensitivity testing, either from samples taken from the infected eye or from the blood.

4. *Presumed ocular filamentous fungi infection* – These should always be discussed with a microbiology consultant, but therapy will depend upon likely infecting agent. For most species, voriconazole* 6mg/kg bd IV for 2 doses then 4mg/kg bd IV switching to 200mg bd orally after 1-2 weeks would be appropriate.

* Due to a high degree of inter-individual variation in voriconazole's pharmacokinetics, it is imperative that levels are sent to ensure that these are therapeutic. A pre-dose level should be sent on day 4 of therapy and the usual target range for treatment is 2-6mg/l.

Reduce fluconazole dose in renal impairment according to creatinine clearance – consult BNF or discuss with microbiology or pharmacy

$ Echinocandins: All echinocandins have similar spectrum of activity, pharmaco-kinetics and pharmako-dynamics. The Trust may use any of them based on National/ Regional procurement issues.

Micafungin 100 to 200mg once a day depending on the patient weight

Caspofungin 70mg stat followed by 50-75mg daily depending on weight/ hepatic function.

Reduce caspofungin dose in hepatic impairment – consult BNF or discuss with microbiology or pharmacy