Emergency management: acute endophthalmitis

Endophthalmitis can have devastating consequences for a patient’s eye and vision. Prompt recognition and urgent treatment are vital.

How to recognise endophthalmitis

1. Suspect endophthalmitis if any of the following symptoms or clinical signs are present, particularly if there is a previous history of surgery, intravitreal injection or penetrating trauma:
   - Blurred vision
   - Pain
   - Red eye
   - Hypopyon
   - Vitreous opacities
   - Swollen eyelids
   - Poor red reflex

2. Perform B-scan ultrasonography (if available) to check for vitritis or retinal detachment.

3. Do not try to treat with a course of corticosteroids first – this will delay treatment and may result in losing the eye.

Protocol: How to respond to the condition

Do not delay! Treat as a medical emergency

Within 1 hour

- Perform an intravitreal tap or vitrectomy through the pars plana (see panel). Collect samples of vitreous for Gram stain and culture. A vitrectomy may be indicated if the patient has perception of light only. However, if a delay is likely before a vitrectomy can be performed, it is advisable to perform a vitreous tap and inject intravitreal antibiotics for more rapid treatment.

- Immediately following the intravitreal tap, inject antibiotics into the vitreous (see panel).

- After injecting intravitreal antibiotics, use a different syringe and a 30-gauge needle to inject preservative-free dexamethasone (400 μg in 0.1 ml) into the vitreous.

Then

- Consider adjunctive systemic therapy, with the same antibiotics as those used intravitreally, for 48 hours. This will maintain higher levels within the posterior segment of the eye. If systemic antibiotics are not available, topical antibiotics are better than nothing.

- Monitor the patient carefully.

- Use the response to treatment and the results of Gram stain and culture to determine whether further intravitreal antibiotic therapy is required.

Preparing for the emergency

An endophthalmitis kit should be accessible in every practice where postoperative patients are seen. This is essential for the prompt diagnosis and treatment of endophthalmitis. Include instructions for preparing the antibiotics (see p. 69).

Equipment for preparation of patient

- Tetracaine (anaesthetic) drops
- Povidone iodine
- Drape
- Speculum

Equipment for sub-Tenon’s anaesthetic injection

- 10 ml 2% lidocaine
- 10 ml syringe
- Sub-Tenon’s cannula
- Westcott scissors

Equipment for vitreous biopsy/tap

- 23-gauge or 25-gauge needle
- 5 ml syringe
- Calipers

Equipment for preparation of antibiotic injections

- 1 vial of 500 mg vancomycin or 1 vial of 500 mg (250 mg/ml) amikacin

Technique: How to do an intravitreal tap

- Use aseptic technique with drape
- Instil topical antibiotics and povidone iodine 5%
- Administer subconjunctival or sub-Tenon’s anaesthetic

- Insert a 23-gauge or 25-gauge needle 4   mm (phakic eyes) or 3.5  mm (pseudoaphakic/aphakic eyes) behind the limbus into the middle of the vitreous cavity, pointing at the optic disc (approx 7–8  mm deep) and aim to aspirate 0.3–0.5 ml of vitreous fluid.

Antibiotics

<table>
<thead>
<tr>
<th>1st choice:</th>
<th>OR</th>
<th>2nd choice:</th>
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<tbody>
<tr>
<td>Vancomycin 1 mg in 0.1 ml and</td>
<td>Ceftazidime 2 mg in 0.1 ml</td>
<td>Amikacin 400 μg in 0.1 ml and</td>
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<td>Ceftazidime 2 mg in 0.1 ml</td>
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Note: Use a new syringe and a new 30-gauge needle for each drug. Do not mix drugs together in the same syringe.
Exposure keratopathy can result in destruction of the cornea and blindness if not treated urgently.

Exposure keratopathy (also known as exposure keratitis) is damage to the cornea due to dryness caused by incomplete or inadequate eyelid closure, resulting in loss or insufficiency of the tear film. It is usually a mild condition that is simple to treat. However, it can become an eye emergency in the following situations:

- In unconscious patients in intensive care units, when there is inadequate lid closure
- In patients with a facial nerve palsy, which causes paralysis of the eyelids
- In patients who experience a sudden bleed behind the eye (e.g., after a peribulbar or retrobulbar block)
- In patients who have a condition, such as a tumour, that pushes the eye forward and makes it impossible for the eyelids to close (lagophthalmos)
- Following severe damage to the eyelids (particularly the upper lid), such as trauma, burns or scarring from Herpes zoster infection
- If corneal sensation is reduced (e.g., following Herpes zoster infection). This makes the eye particularly vulnerable to exposure.

If the keratopathy becomes severe, there is a very high risk of irreversible blindness within a matter of hours or days, so treatment must begin immediately.

**Signs and symptoms**

In severe cases, the cornea will look dry and may ulcerate, leading to perforation. Patients will experience pain or irritation, foreign body sensation, burning, blurring of vision, watering, redness and sensitivity to light.

**Examination**

Assess lid closure and corneal sensitivity. Perform fluorescein staining of the cornea to assess for infection, thinning, scarring or perforation of the cornea.

**Management**

Aim to cover, protect and lubricate the cornea.

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**Instructions for preparation of antibiotic injections**

**Vancomycin 1mg/0.1ml**

- Reconstitute 500 mg vial with 10 ml saline
- Withdraw all 10 ml into 10 ml syringe
- Add 8 ml saline into vial to make up to 10 ml (10 mg/ml)
- Use 1 ml syringe to draw 0.1 ml of this solution (1 mg/0.1 ml)

**Amikacin 400 μg/0.1 ml**

- Use 10 ml syringe to withdraw 1.6 ml of amikacin (250 mg/ml)
- Make up to 10 ml in the syringe with saline
- Discard 9 ml from syringe and make the remaining 1 ml up to 10 ml (in the syringe) by adding saline
- Transfer the solution into a sterile galley pot and use 1 ml syringe to draw 0.1 ml of this solution (400 μg/0.1 ml)

**Ceftazidime 2 mg/0.1 ml**

- Reconstitute 500 mg vial with 10 ml saline
- Withdraw all 10 ml into a 10 ml syringe
- Add 3 ml saline into vial to make up to 5 ml (20 mg/ml)
- Use 1 ml syringe to draw 0.1 ml of this solution (2 mg/0.1 ml)

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**Further reading**


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**Emergency management: exposure keratopathy**

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**Protecting unconscious patients**

Reach out to intensive care unit personnel to explain the dangers of exposure and encourage early detection and referral. Prescribe lubricating drops or ointments to all at risk.

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**Further reading**