
Traumatic ENDOPHTHALMITIS

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Trauma

Endophthalmitis



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Trauma Assessment and the BETTS Classification

- **Birmingham Eye Trauma Terminology System (BETTS)** provided a standardized, simple system to describe mechanical injuries to the eye globe.
- **(BETTS)** is applicable to clinical practice audit , create an appropriate registry for injuries.
- The main concern of patients and their families is the visual prognosis.
- To address this, the **Ocular Trauma Score (OTS)** is used to calculate prognosis (with the assumption that the trauma is managed optimally).

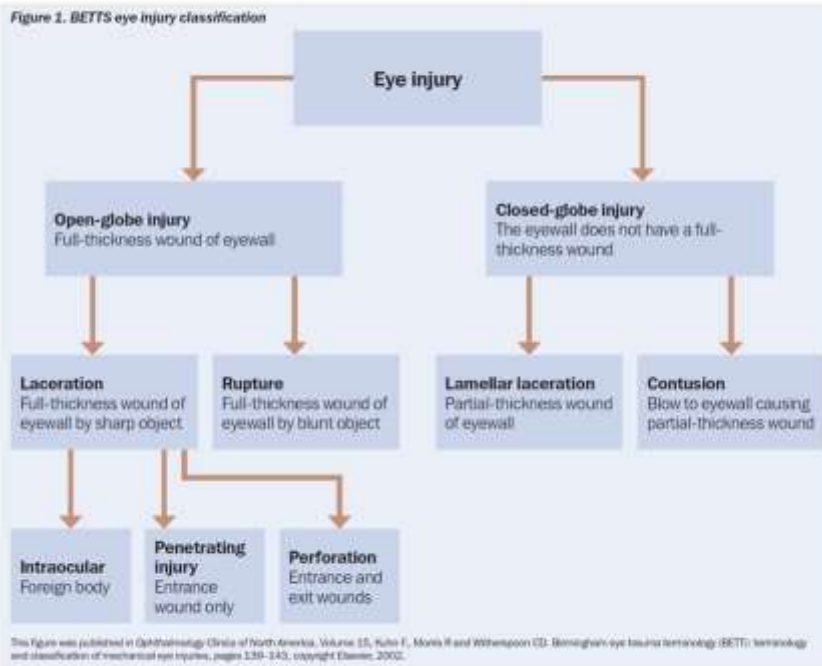


Table 1. Computational method for deriving the OTS score

Initial visual factor	Raw points
A. Initial raw score (based on initial visual acuity)	NPL = 60 PL or HM = 70 1/200 to 19/200 = 80 20/200 to 20/50 = 90 ≥ 20/40 = 100
B. Globe rupture	-23
C. Endophthalmitis	-17
D. Perforating injury	-14
E. Retinal detachment	-11
F. Relative afferent pupillary defect (RAPD)	-10
Raw score sum = sum of raw points	

Table 2. Estimated probability of follow-up visual acuity category at 6 months

Raw score sum	OTS score	NPL	PL/HM	1/200-19/200	20/200 to 20/50	≥ 20/40
0-44	1	73%	17%	7%	2%	1%
45-65	2	28%	26%	18%	13%	15%
66-80	3	2%	11%	15%	28%	44%
81-91	4	1%	2%	2%	21%	74%
92-100	5	0%	1%	2%	5%	92%

NPL: no perception of light; PL: perception of light; HM: hand movements

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Exclude and do



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Exclude



- **Life threatening trauma**
- **Rupture globe either anterior or posterior....**
- **IOFB**
- **Orbital wall fracture.....**
- **Retrobular Hge.(Prop.,IOP++,ecchym.,T lid, compressive ON)**
- **Infection.**

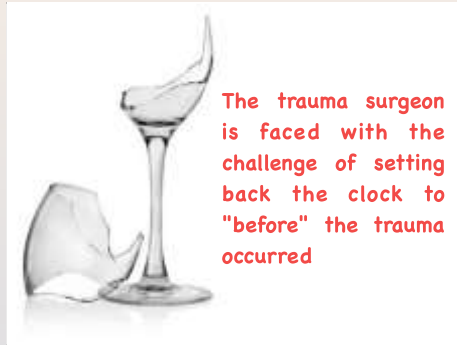
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do



- **FEEL BONY ORBIT, fracture, S. emph , sensation**
- **COMPARE SENSATION**
- **CHECK PROP. / ENOPH.**
- **ON FUNCTION (VA ,PUPIL, COLOR)**
- **EOMs MOTILITY .**

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Endophthalmitis



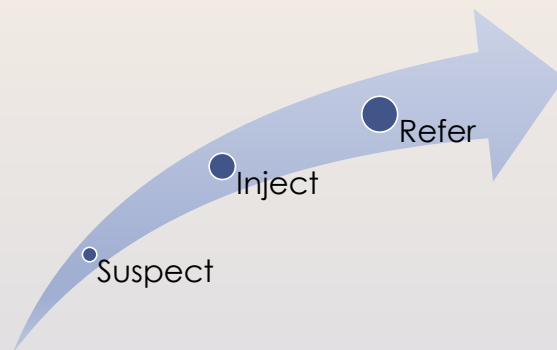
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Endophthalmitis

- An inflammation of the **inner structures** of the eyeball
- Uveal tissue
- Retina
- associated with pouring of exudates in the vitreous cavity, anterior chamber and posterior chamber.

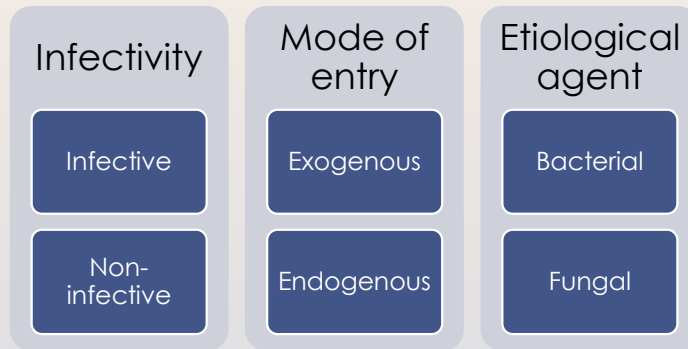
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Does this exist?



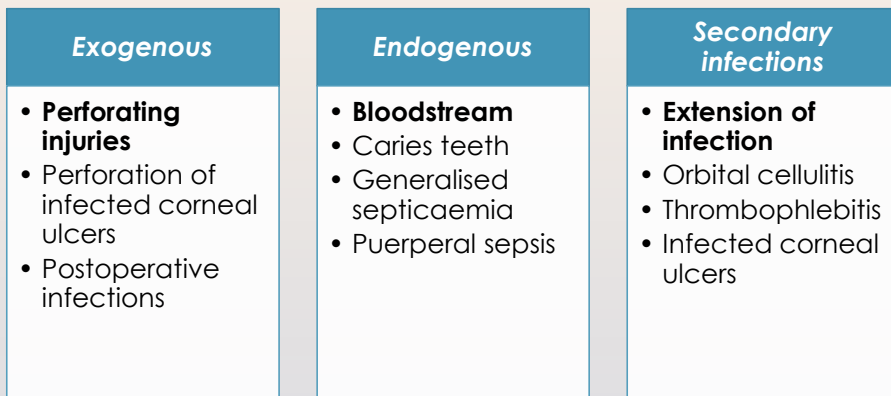
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Classification



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Modes of infection



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Traumatic Endophthalmitis

- The risk for developing endophthalmitis after sustaining open globe injuries is estimated at about 7%.
- The incidence of endophthalmitis in cases of penetrating ocular trauma: 3% to 30% and after intraocular foreign body: 1% to 61%.

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Risk factors

- Retained IOFB (nature and velocity)
- Lens rupture,
- Delayed timing of primary repair,
- Age greater than 50 years,
- Female gender,
- Large wound size, and wound location.
- Ocular tissue prolapse,
- Placement of primary intraocular lens (IOL),
- Rural locale

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Endophthalmitis

- **Bacillus and Streptococcus** are common species found in penetrating trauma with an intraocular foreign body
- Other species isolated include
 - S. epidermidis, Propionibacterium acnes,
 - Pseudomonas and Gram-negative organisms,
 - fungi and mixed pathogens
- Bacillus species and gm -ve bacteria are associated with more aggressive infection and are especially common in organic FB.

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Diagnosis: Endophthalmitis

- Culture and sensitivity studies on aqueous and vitreous samples
 - Anterior chamber tap
 - Vitreous tap
 - Vitreous biopsy
- Full infection screen
 - CBC, blood cultures and culture of all indwelling lines and catheters

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Aqueous tap

- An anterior chamber paracentesis is performed using a 25 or 27 gauge needle and 0.1 ml of aqueous material is aspirated.

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Vitreous tap

- A trans pars plana aspiration with a 23 gauge needle 0.2 ml of vitreous aspirated.
- Small gauge battery powered vitrector.
- Three port vitrectomy

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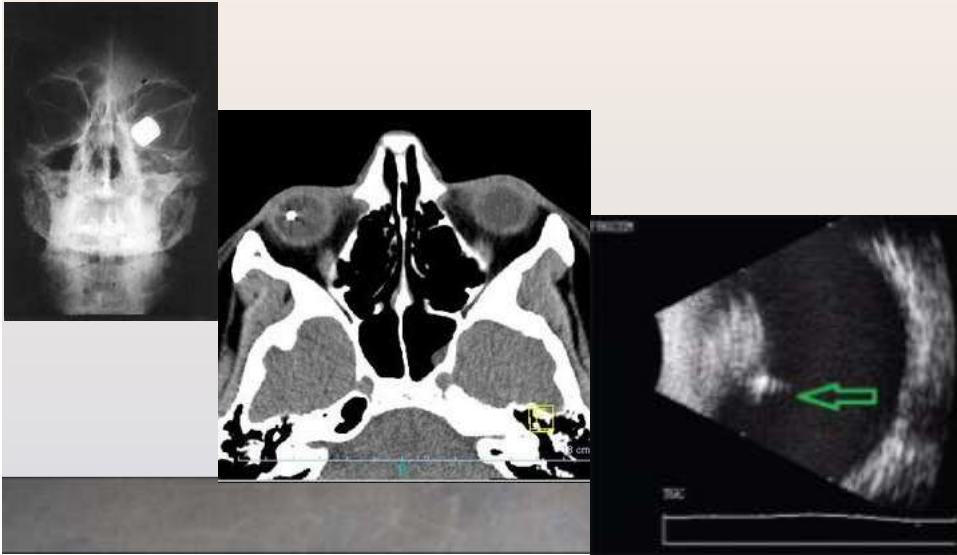
- Repeat cultures may be needed
 - When clinical response is not good inspite of using correct antibiotic
 - Due to presence of contaminants in media.
 - Presence of fungus which is especially likely to be missed initially.
- Negative cultures may arise due to
 - Presence of fastidious organisms
 - Insufficient sampling
 - Sterile endophthalmitis
- PCR

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Diagnosis: FB



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Management

- Medical and ophthalmological emergency
- Suspected acute endophthalmitis requires emergency admission.
- Suspected delayed postoperative endophthalmitis needs urgent referral within 24 hours.
- Most patients will be admitted for a diagnostic work-up and antimicrobial treatment

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Goals of treatment

- Retention of useful vision
- Minimize the infection with antimicrobial agents
- Limit the inflammation
- Symptomatic relief

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Treatment

Medical

- Antibiotics - Intravitreal , periocular , topical , systemic
- Anti-inflammatory - topical , periocular , systemic (not for chronic Endophthalmitis)
- Supportive

Surgical

- Vitrectomy

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AB injection

- Selection of AB depends on
 - Spectrum.
 - Safety.
 - Bioavailability.
 - Physical combination compatibility.
- Interval between injections
- Dosing

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Medical treatment

Broad spectrum antibiotics

- Intravitreal – aminoglycoside & vancomycin

First choice	Vancomycin 1 mg in 0.1 ml Ceftazidime 2.25 mg in 0.1 ml
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Second choice	Vancomycin 1 mg in 0.1 ml Amikacin 0.4 mg in 0.1 ml
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Third choice	Vancomycin 1 mg in 0.1 ml Gentamycin 0.2 mg in 0.1 ml
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- Periocular / subconjunctival injection
 - vancomycin 25 mg & ceftazidime 100mg daily
 - Gentamycin 20mg & cefuroxime 125mg daily
- Topical therapy every 30-60 min
- Systemic
 - IV ceftazidime , cefotaxime
 - Oral ciprofloxacin

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Corticosteroids

- Indication
 - recent onset after rule out fungal infection.
- Contraindication
 - Late onset endophthalmitis
 - Fungal endophthalmitis
- Reduce inflammation → limit ocular damage
- Eg : dexamethasone

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- **Intravitreal**
- **Subconjunctival**
- **Topical**
- **Systemic** → Oral corticosteroids should preferably be started after 24 hours of intensive antibiotic therapy.

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- Atropine and analgesic
 - relieve pain
- Vitrectomy
 - Severe and resistant cases
 - Fungal endophthalmitis

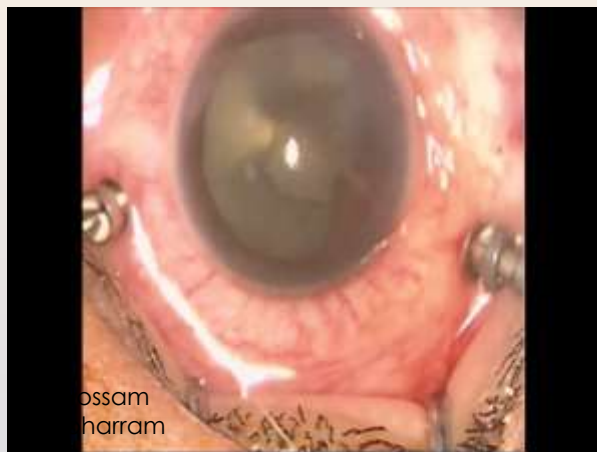
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INDICATIONS FOR VITRECTOMY

- Endophthalmitis vitrectomy study



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COURSE AND OUTCOME

“if it isn't worse, it's better”

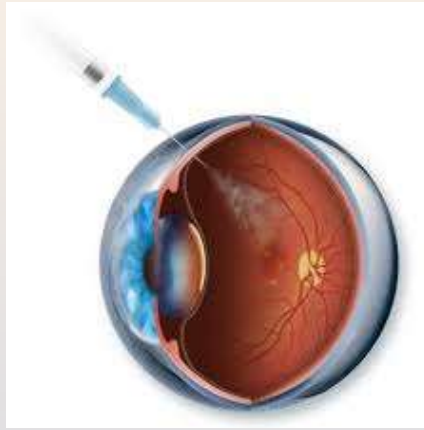
- Media clarity and visual acuity may not improve initially.
- An early response may be determined on the basis of level of pain and lid injection.
- Repeat intravitreal injections of antibiotics may be required if the condition worsens and infection persists as confirmed by a repeat culture.
- Serial ultrasonography may be used to monitor clinical response and detect retinal detachment.

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Complications

- Retinal necrosis
- Retinal detachment
- Increased intraocular pressure
- Retinal vascular occlusion
- Optic neuropathy
- Hypotony
- Panophthalmitis
- Papillitis
- Phthisis bulbi

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Anti Vegf endophthalmitis

- Incidence 1\1500
- Presentation
- Prevention (povidone iodine, speculum, mask, no talking)
- Role of antibiotics
- Treatment Guidelines

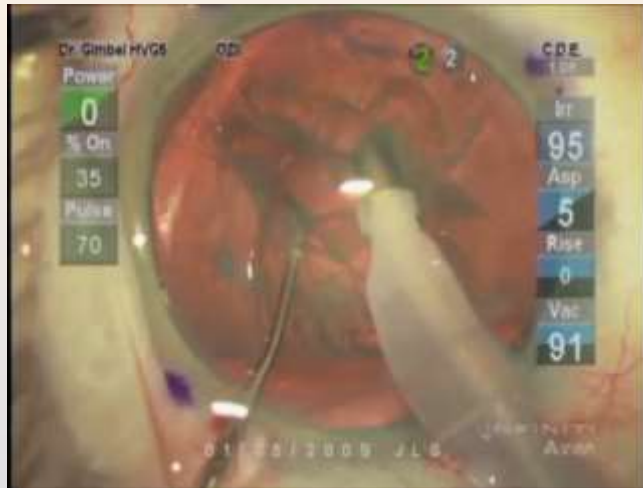
Guideline Areas with General Agreement

- Povidone-iodine (5-10 percent) should be the last agent applied to the intended injection site before injection.
- Topical antibiotics pre-, peri- or postinjection are unnecessary.
- No evidence supports the routine use of a sterile drape.
- Avoid contamination of the needle and injection site by the eyelashes or the eyelid margins.
- Avoid extensive massage of the eyelids either pre- or postinjection (to avoid meibomian gland expression).

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- Use adequate anesthetic for a given patient (topical drops, gel and/or subconjunctival injection).
-
- Use sterile or nonsterile gloves as consistent with modern office practice.
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- Either surgical masks should be used or both the patient and providers should minimize speaking during the injection preparation and procedure.
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- Monitor IOP both pre- and post-injection.
- Routine anterior chamber paracentesis is not recommended.

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Ophthalmic procedure	Incidence of endophthalmitis (%)
Overall postsurgical endophthalmitis	0.05–0.3
Postcataract surgery endophthalmitis	0.01–0.3
Postintraocular injection endophthalmitis	0.03–0.87
Postvitrectomy endophthalmitis	0.018–0.076
Post-trabeculectomy surgery endophthalmitis	0.2–9.6
Postkeratoprosthesis endophthalmitis	0–12.5
Postpenetrating keratoplasty	0.2–0.4

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- ICL endophthalmitis rate 1/6000 case
- Post squint 1/3500 to 1/18500 caused mainly by perforation
- Post buckle insertion less than 0.1%
- Post DSAEK with 0.8% rate

THANK YOU