

**RISK FACTORS & OUTCOME OF POST-TRAUMATIC ENDOPTHALMITIS IN OPEN GLOBE INJURY IN A TERTIARY CARE HOSPITAL OF BIHAR**

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ABSTRACT **Background:** Post-traumatic endophthalmitis is a devastating complication of open globe injury (OGI) that can result in irreversible visual loss. It remains a significant challenge in ophthalmic trauma care, particularly in developing countries. **Purpose:** To evaluate the incidence, risk factors & outcome of traumatic endophthalmitis after OGI in a tertiary care hospital of Bihar. **Methods:** All Pts of OGI with endophthalmitis between Jan 2023 to May 2025 were retrospectively analysed. Pt data, injury details, clinical presentations and visual outcomes were collected. **Results:** 17 pts (12M/3F) with mean age 38 ± 2.5 yrs were included. 12 patients had signs at their initial presentation. All 17 pts were given single dose of Intravitreal Vancomycin (1mg/0.1ml) & Ceftazidime (2.25mg/0.1ml). In 7 eyes PPV was done & IOFB was removed in 2 eyes. The visual outcome was improved in 8 pts (46.6%), unchanged in 3 (13.3%) & worse in 6 pts (40%). 9 pts (53.3%) had delayed t/t >24 hrs after OGI & 3 (37.5%) out of these 9 pts had poor visual outcome. **Conclusion:** Early repair with Intravitreal antibiotics treatment & PPV with contaminated IOFB removal may salvage visual outcomes. Patients with delay in primary repair, ruptured capsule, IOFB, infected wound with organic matter had a high frequency of infection.

KEYWORDS : Open Globe Injury, Post-traumatic Endophthalmitis, Intraocular Foreign Body, Ocular Trauma, Visual Outcome

INTRODUCTION

Post-traumatic endophthalmitis is a severe complication of penetrating ocular trauma. It occurs in 4-16% of OGI & represents 25-30% of all cases of endophthalmitis. (1,2) Open globe injuries are defined as full-thickness disruptions of the cornea or sclera and represent one of the most severe forms of ocular trauma. Among the complications associated with open globe injuries, post-traumatic endophthalmitis is particularly devastating due to rapid intraocular inflammation and permanent structural damage. (3, 4)

The incidence of post-traumatic endophthalmitis varies depending on geographical location, access to healthcare facilities, environmental contamination, and injury characteristics. Tertiary care centres often manage complex and referred trauma cases, providing valuable insight into disease epidemiology and treatment outcomes. (5-7)

Ocular trauma, particularly OGI is one of the major causes of acquired visual loss in all age groups. Poor visual outcomes can be determined by mechanism of injury, virulence of microorganism, diagnosis & initiation of t/t, association of IOFB or lens rupture and large wound size. Early wound closure with Intravitreal antibiotics t/t may improve visual outcome. (8, 9)

MATERIALS AND METHODS

This was a Retrospective study done in BMIMS, Pawapuri, Bihar between Jan 2023 to May 2025. This study was conducted in accordance with the tenets of the declaration of Helsinki.

Patient data, injury details, clinical presentations and visual outcomes were collected. Details of globe injury including laterality, initial VA, anterior & posterior segment abnormalities and imaging investigations (B- scan) were assessed. Presence of endophthalmitis was determined by using clinical symptoms & signs (ocular pain, redness), deteriorating VA, purulent discharge, chemosis, edema, hypopyon & fibrin in AC and vitreous Opacification.

Written informed consent was taken from all the patients after explaining the procedure. Patients presented with endophthalmitis or had high risk of infection (IOFB, delayed presentation) were treated with Intravitreal Vancomycin (1mg/0.1ml) & Ceftazidime (2.25mg/0.1ml). Patients who had fungal infections, Intravitreal Amphotericin (5µg/0.1ml) were given.

Use of intensive topical antibiotics, steroids & oral systemic antibiotics depended on the severity of infection and associated ocular injuries. Surgical M/M including PPV was reviewed. Microbiological results from both aqueous and vitreous sampling & culture were collected.

Statistical Analysis

All the data were noted on MS Excel sheet and analyzed using SPSS 21.0 package (SPSS Inc, Chicago, USA). Results of the analysis were evaluated under 95% confidence interval and mean values as mean±SD. The p value < 0.05 was considered as statistically significant.

RESULTS

17 patients (12M/5F) with mean age 38 ± 2.5 yrs were included. 12 patients had signs at their initial presentation. All 17 patients were given single dose of Intravitreal Vancomycin (1mg/0.1ml) & Ceftazidime (2.25mg/0.1ml). In 7 eyes PPV was done & IOFB was removed in 2 eyes. The visual outcome was improved in 8 patients (46.6%), unchanged in 3 patients (13.3%) and worse in 6 patients (40%). 9 patients (53.3%) had delayed t/t >24 hrs after OGI. 3 (37.5%) out of these 9 patients had poor visual outcome.

Table 1: Clinical Findings

CLINICAL FINDING	PRESENT n (%)	ABSENT n (%)
Conjunctival hyperemia	17 (100%)	0 (0%)
Corneal edema	11 (64.7)	6 (35.2)
Keratic deposits	4 (23.5)	13 (76.4)
Hypopyon	11 (65.3)	6 (35.2)
Fibrinous membrane	7 (41.2)	10 (58.8)
Vitreous debris	10 (58.8)	7 (41.1)
IOFB	2 (11.7)	15 (88.2)
Cataractous lens	3 (17.6)	14 (82.3)

Table 2: Visual Outcome of Post-Traumatic Endophthalmitis Cases

VISUAL OUTCOME (VA)	PRE-OP BCVA (%)	POST-OP BCVA (%)
>0.1	3 (17.6)	7 (41.1)
<0.1	2 (11.7)	4 (23.5)
CF	2 (11.7)	1 (5.88)
HM	6 (35.2)	3 (17.6)
PL	3 (17.6)	2 (11.7)
NLP	1 (5.88)	0 (0)

DISCUSSION

The risk of Post-traumatic endophthalmitis is associated with anterior wound location, presence of IOFB & delay in primary wound closure. It is often associated with poor visual outcomes compared to other types of endophthalmitis. The reported incidence of endophthalmitis following open globe injury ranges from 3.1% to 11.9% in the absence of an IOFB.

Incidence in cases with IOFB ranges from 3.8% to 48.1% with higher

infection rate reported in eyes having retained IOFB contaminated with organic matter.

Epidemiology

Post-traumatic endophthalmitis predominantly affects young adult males due to increased occupational exposure. Industrial and agricultural injuries account for the majority of cases. The incidence is generally higher in developing countries due to delayed presentation and limited access to specialized ophthalmic care.

Pathophysiology

Penetrating ocular trauma allows microorganisms to enter intraocular structures. Retained foreign bodies and necrotic tissue provide a favourable environment for microbial growth. The resulting inflammatory response leads to vitreous infiltration, retinal damage, and irreversible structural destruction.

Risk Factors

Trauma-Related Factors

The presence of intraocular foreign body is one of the strongest predictors of infection. High-velocity injuries caused by metallic fragments or agricultural tools increase the likelihood of contamination. Large wound size, posterior segment involvement, and lens capsule rupture further increase infection risk.

Patient-Related Factors

Poor presenting visual acuity indicates severe ocular damage and is associated with poor visual outcomes. Systemic conditions such as diabetes mellitus and immunocompromised states increase infection susceptibility.

Treatment-Related Factors

Delayed presentation, delayed primary repair, and delayed removal of intraocular foreign bodies significantly worsen prognosis.

Microbiological Profile

Gram-positive organisms are the most common causative agents, particularly *Staphylococcus* and *Streptococcus* species. *Bacillus cereus* is frequently associated with fulminant infection and poor prognosis. Gram-negative organisms and fungi are less common but often produce aggressive disease progression.

CONCLUSION

Post-traumatic endophthalmitis remains a serious complication of open globe injury. Early diagnosis, prompt antimicrobial therapy, and timely surgical intervention are essential to improve visual outcomes.

Early repair with Intravitreal antibiotics treatment and PPV with contaminated IOFB removal may salvage visual outcomes. Patients with delay in primary repair, ruptured capsule, IOFB, infected wound with organic matter had a high frequency of infection.

REFERENCES

1. Fabian ID, Eliashiv S, Moisseiev J, Tryfonides C, Alhalel A. Prognostic factors and visual outcomes of ruptured and lacerated globe injuries. *Eur J Ophthalmol.* 2014;24(2):273–278. doi: 10.5301/ejo.5000364. [PubMed] [CrossRef] [Google Scholar]
2. Kong GY, Henderson RH, Sandhu SS, Essex RW, Allen PJ, Campbell WG. Wound-related complications and clinical outcomes following open globe injury repair. *Clin Exp Ophthalmol.* 2015;43(6):508–513. doi: 10.1111/ceo.12511. [PubMed] [CrossRef] [Google Scholar]
3. Li EY, Chan TC, Liu AT, Yuen HK. Epidemiology of open-globe injuries in Hong Kong. *Asia Pac J Ophthalmol.* 2017;6(1):54–58. doi: 10.1097/APO.0000000000000211. [PubMed] [CrossRef] [Google Scholar]
4. Fujikawa A, Mohamed YH, Kinoshita H, Matsumoto M, Uematsu M, Tsuiki E, Suzuma K, Kitaoka T. Visual outcomes and prognostic factors in open-globe injuries. *BMC Ophthalmol.* 2018;18(1):138. doi: 10.1186/s12886-018-0804-4. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
5. Essex RW, Yi Q, Charles PG, Allen PJ. Post-traumatic endophthalmitis. *Ophthalmology.* 2004;111(11):2015–2022.
6. Thompson WS, Rubsamen PE, Flynn HW Jr. Endophthalmitis after penetrating ocular trauma. *Ophthalmology.* 1995;102(11):1696–1701.
7. Ahmed Y, Schimel AM, Pathengay A. Endophthalmitis following open-globe injuries. *Eye (Lond).* 2012;26(2):212–217.
8. Bhagat N, Nagori S, Zarbin MA. Post-traumatic infectious endophthalmitis. *Surv Ophthalmol.* 2011;56(3):214–251.
9. American Academy of Ophthalmology. *Ocular Trauma Guidelines.* 2022.