



Evaluation of Ocular Foreign Bodies

¹Dr Rohit Kndap, ²Dr Pranali Shah, ³Dr Prajakta Patil

¹Department of Ophthalmology, Krishna institute of medical sciences, Krishna Vishwa Vidyapeeth, Karad (MS)

²Department of Ophthalmology, Krishna institute of medical sciences, Krishna Vishwa Vidyapeeth, Karad (MS)

³Department of Ophthalmology, Krishna institute of medical sciences, Krishna Vishwa Vidyapeeth, Karad (MS)

KEYWORDS

VO,
OFB,
anterior segment,
posterior segments,
VC,
adnexa,
radiographic imaging.

ABSTRACT:

According to various studies done in the past, OFB can strike both sexes and at any age. Thus, the mechanical effects of FB, the introduction of secondary infections, and responses owing to particular materials are the three main types of eye damage induced by FB. Therefore, we have clinically tested and analyzed OFB in our study. One hundred patients participated in our study, and each one had extensive testing, including examinations of their anterior and posterior segments, VCs, adnexa, and radiographic imaging. In our study, we found that there is a statistically significant ($p < 0.05$) positive association between OTS and FBCVA. We have come to the conclusion that OFB is most common in the fourth decade of life and that men are disproportionately affected. Therefore, OTS was an excellent predictor for evaluating the final VO.

INTRODUCTION

According to various past studies, “any abnormal object, substance, or material that isn't supposed to be in the eye is considered to be a foreign body in the eye”.¹ Studies have also shown that, ocular foreign body (OFB) can cause serious damage to the eye.¹ In the event of an intraretinal foreign body, researchers concluded that the point at which the “particle becomes impacted into the retina is the location at which a tissue reaction is generated in the neighboring retina and choroid”. “This reaction is typically significant, and it results in the foreign body becoming encapsulated”.² Studies have also reported that, IOFB most frequently seen in the posterior segment, accounting for 58% of all cases.³ Studies have also proved that, 70% of eyes that had a perforation in the posterior segment went blind, while only 20% of eyes that had a perforation in the anterior segment went blind.^{2,3} Hence, in our study, we have evaluated and assessed clinically OFB.

AIM

To evaluate & assess OFB.

INCLUSION CRITERIA

1. All cases of OFB
2. Both male & female were included.

EXCLUSION CRITERIA

1. H/o of OFB with or without surgical intervention (SI).
2. Blast injuries
3. Age less than 5 years.

MATERIALS & METHOD

We have conducted a prospective study with a total of 100 patients in KIMS, Karad, starting in October 2017 and ending in May 2019, with 18 months in total after taking written informed consent. A detailed history was recorded, which includes the nature of the injury (NOI), the nature of FB (NOFB), the time lapse between the incidence and presentation (I-P), any prior intervention (PI), and previous OD. Visual acuity (VC) was checked by the Snellen chart with pinhole improvement. A thorough examination of the adnexa and anterior segments using slit-lamp biomicroscopic (SLB) and fluorescein (F) was done wherever necessary. Posterior segment examination was done by indirect and direct ophthalmoscopy after dilatation with 0.8% tropicamide and 5% phenylephrine eye drops (if not contraindicated). Radiological investigations were done in selective cases, followed by necessary treatment. Furthermore, in our study, most of the patients had superficial surface foreign



bodies (FB) (cornea or conjunctiva), which were managed on an OPD basis. These FB were removed using forceps, FB suction, or a 26-needle on SL. In some cases of large epithelial defect (LED), an eye pad was given with plenty of eye ointment. followed, and all the patients were recalled the next day for follow-up. Rest cases were admitted to the ward and managed either by medical or surgical means, depending on the need. VA

was recorded on the first follow-up with OPD patients and at the time of discharge. In case of any PS complications, VA was repeated after 1 month.

STATISTICAL ANALYSIS

We have used SPSS (version 22) for data analysis. Later on the initial measures of each group were compared with final measures of study period using chi-square test.

RESULT

Age (in years)	Frequency	Percent
5-10	2	2
11-20	2	2
21-30	17	17
31-40	44	44
41-50	18	18
>50	17	17
Total	100	100.0

Table 1: Age-wise distribution

In our study, we discovered that patients were primarily between the ages of 31 and 40 (44%), 41 to 50 (18%), and 21 to 30 (17%). Hence, the mean age of the patients was 40 years.

Gender	Frequency	Percent
Females	20	20.0
Males	80	80.0
Total	100	100.0

Table 2: Gender-wise distribution

In our study, we found that the majority of patients were male (80%), and females were 20%.

Occupation	Frequency	Percent
Welder	33	33.0
Farmer	27	27.0
Homemaker	7	7.0
Industry Worker	6	6.0
Wood Cutter	8	8.0
Other	19	19.0
Total	100	100.0

Table 3: Various Occupation(VO)

In our study, we found that the commonest population affected by OFB belongs to welders (33%), followed by farmers (27%) by their O.

Time period (in days)	Frequency	Percent
< 2	67	67
≥ 2	33	33

Table 4: Time period (TP)



In our study, we found that the majority of patients, i.e., 67%, presented to OPD within the first 2 days of the I, and the remaining 33% presented late, i.e., after 2 days.

Type of FB	Frequency	Percent
Metal	43	43.0
Vegetative Material	38	38.0
Stone	10	10.0
Chemicals	7	7.0
Other	2	2.0
Total	100	100.0

Table 5: FB

In our study, we found that the commonest FB observed was metal (43%), followed by vegetative material (VM) (38%). Both together form a major portion.

Eye	Frequency	Percent
Left	60	60.0
Right	40	40.0
Total	100	100.0

Table 6: Laterality of eye (LOE)

In our study, we found that in 60% of cases, the left eye (LE) is involved, while right eye involvement (REI) is seen in 40% of subjects.

Location	Frequency	Percent
Cornea	67	67.0
Conjunctiva	22	22.0
Iris	2	2.0
Sclera	2	2.0
Posterior Segment	2	2.0
Others	5	5.0
Total	100	100.0

Table 7: Site of lodgement of FB (SOL-FB)

In our study, we found that the commonest SOL-FB is the cornea (67%), followed by the conjunctiva (22%).

Visual acuity at time of presentation (TOP) OPD	Frequency	Percent
6/6 to 6/9	19	19.0
6/12 to 6/18	44	44.0
6/24 to 6/60	23	23.0
FC at 3mt	10	10.0
FC < 3mt	4	4.0
Total	100	100.0

Table 8: VA at TOP



In our study, we found that the distribution of patients according to their VA at the TOP to OPD for the first time.

Management	Frequency	Percent
OPD	89	89
IPD Medical	6	6
IPD Surgical	5	5
Total	100	100

Table 9: Mode of management(MOM)

In our study, we found that the majority of the patients are treated on an OPD basis, i.e., 89%, while the remaining 11% require admission to the hospital.

Second Intervention	Frequency	Percent
No	67	67.0
Yes	33	33.0
Total	100	100.0

Table 10: Requirement of 2nd intervention

In our study, we found that 33% of the patients required a second intervention, while the remaining 67% didn't.

Final BCVA	Frequency	Percent
6/6 to 6/9	58	58.0
6/12 to 6/18	22	22.0
6/24 to 6/60	13	13.0
FC at 3mt	5	5.0
FC < 3mt	2	2.0
Total	100	100.0

Table 11: FBCVA

In our study, we found that the majority of patients fall into the first category with VA better than 6/9.

visual acuity	Initial		Final		Chi-square	P-value
	Frequency	Percent	Frequency	Percent		
6/6 to 6/9	19	19.0	58	58.0	32.198	<0.0001
6/12 to 6/18	44	44.0	22	22.0		
6/24 to 6/60	23	23.0	13	13.0		
FC at 3mt	10	10.0	5	5.0		
FC < 3mt	4	4.0	2	2.0		
Total	100	100.0	100	100.0		

Table 12: Comparison between IVA & FBCVA

In our study, we found that comparison was statistically significant at $p < 0.05$.



Final BCVA	Time period from Onset to presentation to OPD				Chi-square	P-value
	< 2 days		≥2 days			
	Frequency	Percent	Frequency	Percent		
6/6 to 6/9	47	70.14	11	33.00	12.713	0.0128
6/12 to 6/18	10	14.92	12	36.36		
6/24 to 6/60	7	10.44	6	18.18		
FC at 3mt	2	2.98	3	9.09		
FC < 3mt	1	1.49	1	3.03		
Total	67	100.00	33	100.00		

Table 13: Comparison between TP-O V/s FBCVA

In our study, we found that comparison was statistically significant at $p < 0.05$.

Final BCVA	Cornea	Conjunctiva	Iris	Sclera	Posterior	Others	Chi-square	P-value
6/6 to 6/9	40	16	0	0	0	0	101.03	<0.0001
6/12 to 6/18	20	1	0	0	0	1		
6/24 to 6/60	5	3	0	0	1	4		
FC at 3mt	2	2	1	1	1	0		
FC < 3mt	0	0	1	1	0	0		

Table 14: Comparison SOL of FB v/s FBCVA

In our study, we found that comparison was statistically significant at $p < 0.05$.

No. of FBs	Frequency	Percentage
Single	90	90.00
Multiple	10	10.00
Total	100	100.00

Table 15: Number of FB

In our study, we found that 90% of the patients have a single OFB, while only 10% of patients have multiple FB.

Location on cornea	Frequency	Percentage
In pupillary area	25	37.31
Outside pupillary area	42	62.68
Total	67	100.00

Table 16: Location of FB on cornea(C)



In our study, we found that 37.31% of the patients had a CFB in the pupillary area, while 62.68% had a CFB outside the pupillary area.

Location	Frequency	Percentage
Global	74	74.00
Adnexal	23	23.00
Mixed	3	3.00
Total	100	100.00

Table 17: LOFB

In our study, we found that 74% of FB are global, 23% are adnexal, and 3% are both global as well as adnexal in location, according to the newer classification.

Raw sum score	OTS score	Frequency	Percentage
0-44	1	0	0
45-65	2	2	2
66-80	3	18	18
81-91	4	24	24
92-100	5	56	56
Total		100	100

Table 18: OTS

In our study, we found that 56% of patients fall into OTS 5, followed by 24% of patients who fall into OTS 4.

Ocular trauma score							
Raw score	OTS score	No PL	PL to HM	CF to 6 mt	6/60 to 6/18	>6/12	Total
0-44	1	0	0	0	0	0	0
45-65	2	0	1	1	0	0	2
66-80	3	0	1	2	12	3	18
81-91	4	0	0	2	7	15	24
92-100	5	0	0	0	3	53	56

Table 19: Comparison OTS V/S FBCVA

In our study, we found that there was a positive correlation between OTS and FBCVA with statistical significance ($p < 0.05$).

DISCUSSION

Our study revealed that C was most commonly affected site, accounting for 67% of cases, followed by the conjunctiva with a 22% incidence. Another study conducted by A.R. Nalgirkar found that the "cornea was the predominant location for foreign bodies (41.6%), followed by the conjunctiva (13.8%)".⁴ Only one patient in the study had an intra-ocular foreign body. Chiquet et al.⁵ and another study by Suzijarto et al.,⁶ it was determined that the prevalence of CFB was 68%, while the prevalence of FB in the sclera was 32%. Jost B. Jonas, MD, et al., showed that 4.2% of patients had post-traumatic

infectious endophthalmitis and had ocular trauma while hammering on a chisel.⁷ In contrast, 18.2% of patients developed posttraumatic infectious endophthalmitis after working with soil-contaminated tools. Furthermore, in our study a positive correlation was observed between the eye stress score (ESS) and the FBCVA at a significance level of $p < 0.05$. Thus, according to our research, the ODS proves to be an effective method for predicting the long-term outcomes of an individual's ocular health.



CONCLUSION

We found that the occurrence of OFB is highest during the fourth decade of life, with a greater prevalence among males. The Metal made up 43% of the most frequently observed FB, with VM making up 38% of cases. In the anterior segment, FBs in the eye are more prevalent compared to those occurring in the posterior segment. The conjunctiva, which accounts for 22% of cases, is the second most frequently affected site for the lodging of FB, accounting for 67% of cases. EFB often has a more favorable V prognosis as compared to intraocular FB. The duration between the occurrence of an event and the commencement of therapy was a significant predictive determinant in determining the ultimate visual result. Patients who seek early medical attention in the OPD have a more favorable visual prognosis compared to those who wait to seek care. Thus, OTS was a highly reliable predictor for assessing the ultimate VO.

retrobulbar foreign bodies. *Ophthalmology*. 2000 May 1;107(5):823-8.

REFERENCE

1. Pandey AN. Ocular foreign bodies: A review. *J Clin Exp Ophthalmol*. 2017;8(2):1â.
2. Shah P, Karambelkar VH. Clinical Evaluation of Ocular Foreign Bodies. *Indian Journal of Forensic Medicine & Toxicology*. 2020 Jul 1;14(3).
3. Mester V, Kuhn F. Ferrous intraocular foreign bodies retained in the posterior segment: management options and results. *International ophthalmology*. 1998 Nov;22:355-62.
4. Shah P, Karambelkar VH. Clinical Evaluation of Ocular Foreign Bodies. *Indian Journal of Forensic Medicine & Toxicology*. 2020 Jul 1;14(3).
5. Chiquet C, Zech JC, Gain P, Adeleine P, Trepsat C. Visual outcome and prognostic factors after magnetic extraction of posterior segment foreign bodies in 40 cases. *British Journal of Ophthalmology*. 1998 Jul 1;82(7):801-6.
6. Szijártó Z, Gaál V, Kovács B, Kuhn F. Prognosis of penetrating eye injuries with posterior segment intraocular foreign body. *Graefe's Archive for Clinical and Experimental Ophthalmology*. 2008 Jan;246:161-5.
7. Jonas JB, Knorr HL, Budde WM. Prognostic factors in ocular injuries caused by intraocular or