

ETIOPATHOGENESIS OF ECCENTRIC PROPTOSIS IN PEOPLE OF SOUTHERN ODISHA

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Abstract

Background: Each eyeball (globe of the eye) remains protected inside a bony cavity in the skull called the orbit. This allows the eyes to move in any direction to attain a physiological axis. A lesion (tumor) in the extra conal space pushes the eyeball forward and laterally causes non-axial or eccentric proptosis. Proptosis can be associated with diminished vision, pain, watering and chemosis of the conjunctiva and can also be very dangerous as it can lead to permanent blindness. **Materials and Methods:** The present study was a retrospective cohort study, carried out on the patients attending the Out Patient Department (OPD) and In-Patient Department (IPD) of Ophthalmology in a tertiary care hospital in Southern Odisha. We have taken 50 patients with eccentric proptosis. Inclusion criteria were: i) All patients having eccentric proptosis attending the OPD and IPD and ii) Patients should be systemic stable. Exclusion criteria were: i) Patients with axial proptosis, ii) Patients with pseudoproptosis, iii) patients who were vitally unstable and requiring primary systemic stabilization, and iv) patients suffering from HIV and Hepatitis-B infection. **Result:** Most cases occurred in middle age (31-50 years). Male to female ratio was 1.08:1. There was a significant association between proptosis in males and age ($p=0.005$) whereas no significant association was found between the same in females ($p=0.942$). A disease that showed significant association with proptosis was Fronto ethmoidal mucocele ($p=0.000$). It included 18%. It was seen that people with infection and inflammation have more degree of proptosis but proptosis with neoplasm which was coming next had affected more people. People with infection and inflammation show a greater degree of visual loss and again a number of people with visual deficiency more in neoplasm. It is seen that adults were more affected by proptosis than paediatric age group. Neoplastic and structural causes are the most common cause of proptosis in adults ($p=0.000$) whereas infection and trauma were common in paediatric age group ($p=0.030$). **Conclusion:** In the present study, we found that the most frequent cause of eccentric proptosis in this part of the country was neoplasm. Infections and trauma were the commonest cause of eccentric proptosis in paediatric age group whereas neoplasia in the adult age group. Timely referral and early diagnosis and appropriate management can result in a reduction in proptosis and visual improvement.

INTRODUCTION

Each eyeball (globe of the eye) remains protected inside a bony cavity in the skull called the orbit. The globe is only 25% (7 cu mm) of the orbit volume (30 cu mm). This allows the eyes to move in any direction to attain a physiological axis. The entire globe is not within orbit as the vertical distance between the orbital rims is 35 mm and lies at the level of the cornea.

Clinically, the orbit is divided into intra-conal and extra-conal orbital spaces. The essential structures of the intraconal space are the optic nerve with its

meningeal coverings and subarachnoid space, the ophthalmic artery and the sympathetic plexus. Any space-occupying lesion in the spaces can cause bulging or protrusion of eye-balls out of the orbit called proptosis.^[1] A lesion (tumor) in the extra conal space pushes the eyeball forward and laterally causes non-axial or eccentric proptosis.

Eccentric proptosis can occur in any age group and sex. It may be unilateral or bilateral. Proptosis can be associated with diminished vision, pain, watering and chemosis of the conjunctiva and can also be very dangerous as it can lead to permanent blindness. Eccentric proptosis being a

multidisciplinary problem, cause a big obstacle in the path of many ophthalmologists. A large number of cases of such disease are found in this area. Management with limited resources is not satisfactory in view of the extensive aetiological background.^[2]

Keeping these points in view, a study was done to know the main cause of eccentric proptosis in this region of Odisha. The aim of the study was to find out the etiology and pathogenesis of the eccentric proptosis in Southern Odisha with the available scope, with the expectation that it will help to eradicate some of the problems in this field.

MATERIALS AND METHODS

The present study was a retrospective cohort study, carried out on the patients attending the Out Patient Department (OPD) and In-Patient Department (IPD) of Ophthalmology in a tertiary care hospital in Southern Odisha. We have taken 50 patients with eccentric proptosis.

Inclusion Criteria

- i) All patients having eccentric proptosis attending the OPD and IPD.
- ii) Patients should be systemic stable.

Exclusion Criteria

- i) Patients with axial proptosis,
- ii) Patients with pseudoproptosis,
- iii) Patients who were vitally unstable and requiring primary systemic stabilization,

- iv) Patients suffering from HIV and Hepatitis-B infection.

All the patients were given an informed consent form and were made to understand about the study to be done on them. All agreed to the study.

The age and sex of the patients were noted. Detailed ocular and systemic history were taken.

Topometry was done to evaluate the horizontal and vertical displacement of the proposed eye-ball.

Routine blood investigations were done.

Radiological investigations of the orbit (PA and Lateral view), Ultrasonography of the involved eye, CT scan and MRI were done in our hospital. Histopathological studies including FNAC of the orbital swelling and excisional biopsy were done in relevant cases.

Evaluation of proptosis was done thoroughly. Proptometry was done for knowing the horizontal and vertical displacement of the affected eye. Visual acuity test was done for distance and near vision.

Statistical analysis: Statistical analysis was done using SPSS 16 software. Categorical variable was expressed in frequency and proportion. Chi-Square test was used to find association of proptosis with age, sex and aetiology. P value <0.05 was taken as statistically significant.

RESULTS

Out of all the patients that attended the OPD and IPD of the Ophthalmology Department within the study period, we collected 50 cases of eccentric proptosis who fulfilled our inclusion and exclusion criteria.

Table 1: Shows the age and sex distribution of the present study.

Age group (Years)	Male		Female		Total	
	Number	%	Number	%	Number	%
0-10	1	2	4	8	5	10
11-20	6	12	2	4	8	16
21-30	5	10	-	-	5	10
31-40	3	6	9	18	12	24
41-50	5	10	5	10	10	20
51-60	5	10	3	6	8	16
61-70	1	2	1	2	2	4
Total	26	52	24	48	50	100

Most cases occurred in middle age (31-50 years). Male to female ratio was 1.08:1. There was a significant association between proptosis in males and age (p=0.005) whereas no significant association was found between the same in females (p=0.942).

Table 2: Distribution by aetiopathogenesis.

Aetiopathogenesis	Male		Female		Total	
	No	%	No	%	No	%
Fronto ethmoidal mucocele	5	10	4	8	9	18
Orbital cellulitis	2	4	3	6	5	10
Acute dacryoadenitis	2	4	3	6	5	10
Lacrimal gland tumor	1	2	4	8	5	10
Meningioma	1	2	3	6	4	8
Dermoid cyst	4	8	-	-	4	8
Idiopathic orbital inflammatory disease	1	2	1	2	2	4
Trauma	2	4	-	-	2	4
Maxillary Antral Carcinoma	1	2	1	2	2	4
Angio fibroma nasal cavity	2	4	-	-	2	4
Miscellaneous	5	10	5	10	10	20
total	26	52	24	48	50	100

A disease that showed significant association with proptosis was Fronto ethmoidal mucocele (p=0.000). It included 18%.

Table 3: Amount of Proptosis

Amount of Proptosis(mm)	No of Cases	%	Neoplasm	Infection+inflammation	Others
5	13	26	-	2	1
6-7	20	40	10	4	6
7	17	34	7	6	4

It was seen that people with infection and infection have more degree of proptosis but proptosis with neoplasm which was coming next had affected more people.

Table 4: Visual loss with Proptosis

Visual Acuity	No of Cases	%	Neoplasm	Infection+inflammation	Others
PL-6/60	6	12	1	4	1
6/36-6/12	21	42	11	6	4
>6/12	23	46	4	5	14

People with infection and inflammation show a greater degree of visual loss and again a number of people with visual deficiency more in neoplasm.

Table 5: Distribution of various causes of proptosis among paediatric and adult cases.

Aetiology	Paediatrics (<15 years)		Adults (>15 years)		Total	
	Number	%	Number	%	Number	%
Inflammatory	1	2	1	2	2	4
Neoplastic	1	2	12	26	13	26
Infections	2	4	8	16	10	20
Trauma	2	4	-	-	2	4
Structural (Dermoid cyst+ Mucocele)	1	2	12	24	13	26
Miscellaneous	2	4	8	16	10	20

It is seen that adults were more affected by proptosis in adults(p=0.000) whereas infection and trauma were common in paediatric age group(p=0.030)

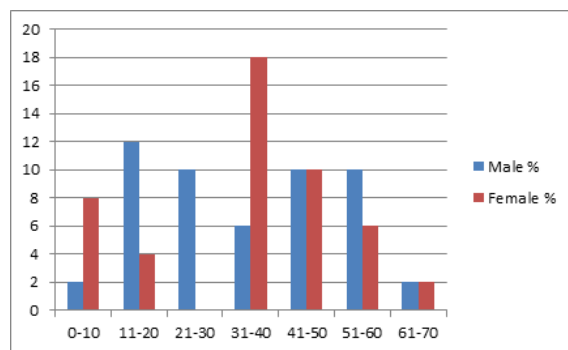


Figure 1: Age distribution among cases

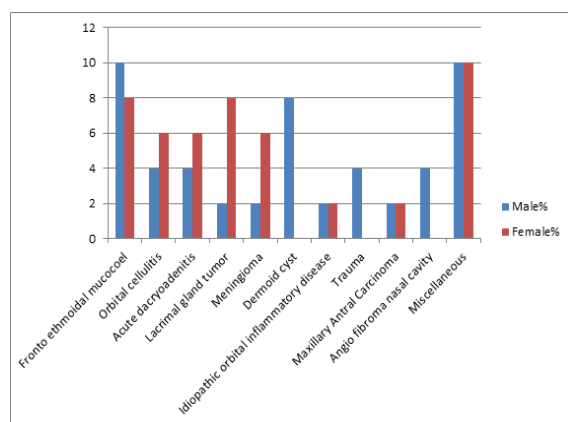


Figure 2: Percentage distribution of various causes of proptosis among male and female cases.

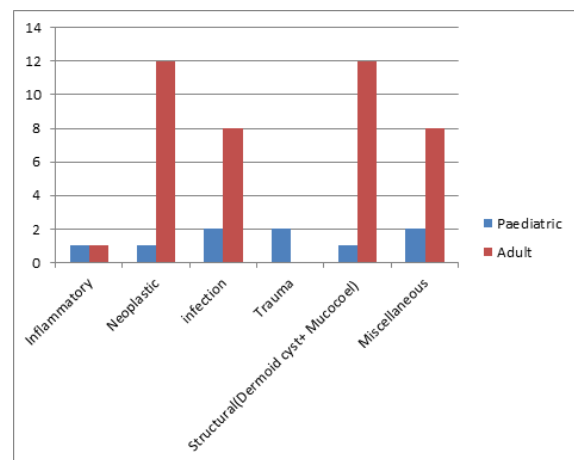


Figure 3: Distribution of causes among paediatric and adult patients.

DISCUSSION

The present study was a retrospective cohort study to identify the various causes or aetiopathogenesis of eccentric proptosis in people of Southern Odisha. The study was done on 50 subjects within the age group of 4 to 70 years. The peak incidence was noted in the age group between 31-40 years [Table 1 and Figure 1]. Our study showed similar findings with reported peak incidence in middle-aged adults.^[3,4]

In our study, a ratio of 1.08:1 occurred in males and females. It was found to be similar to the study by

Khalid Farooq et al,^[5] who found the ratio to be 1.17:1 but a study by Rituraj et al found it to be 0.69:1 showing a higher incidence in females.^[6]

All cases showed visual impairment from mild degree (>6/12) to maximum (6/60). Visual loss was maximum in infection and inflammation but maximum cases with impaired vision were found in neoplasm. A study by Masud et al showed 74% of proptosis patients with visual impairment.^[7]

In males, the most important cause of eccentric proptosis was found to be Fronto ethmoidal mucocele and in females, it was Fronto ethmoidal mucocele and lacrimal gland tumor that had the same incidence. Neoplasia and Fronto ethmoidal mucocele accounted for the highest incidence of proptosis in all cases (26 %). Infection and trauma were the commonest cause of proptosis in paediatric age group. Our study matched with the study of Rootman et al who also found that infection is the commonest cause of proptosis in children.³ Masud et al and Seregard also reported neoplasia as the most common cause of proptosis in their studies respectively.^[7,8]

Limitation of the study- A small sample size. A larger sample would have given a better statistical inference.

CONCLUSION

The orbit is an intimate relationship with the cranial cavity, nose, and paranasal sinus around it, thus being vulnerable to many disorders that might invade the orbit. A small lesion in the location can produce noticeable proptosis. In the present study, we found that the most frequent cause of eccentric proptosis in this part of the country was neoplasm. Infections and trauma were the commonest cause of eccentric proptosis in paediatric age group whereas

neoplasia in the adult age group. Timely referral and early diagnosis and appropriate management can result in a reduction in proptosis and visual improvement.

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REFERENCES

1. Krauss HR. Orbital Surgical Guidelines-Clinical Evaluation. *J Neurol Surg B Skull Base.* 2021;82(1):129-141. doi: 10.1055/s-0040-1722699.
2. Karlin JN, Krauss HR. Ophthalmic and orbital considerations in the evaluation of skull base malignancies. *J Neurooncol.* 2020;150(3):483-491. doi: 10.1007/s11060-020-03516-6.
3. Allen RC. The evolving role of the oculoplastic surgeon in skull base surgery. *Curr Opin Ophthalmol.* 2016;27(5):420-7. doi: 10.1097/ICU.0000000000000294.
4. Prince MJ, Wu F, Guo Y, Gutierrez Robledo LM, O'Donnell M, Sullivan R, Yusuf S. The burden of disease in older people and implications for health policy and practice. *Lancet.* 2015;385(9967):549-62. doi: 10.1016/S0140-6736(14)61347-7.
5. Farooq K, Malik TG, Khalil M. Demographic, clinical and imaging patterns of proptosis. *Pak J Med Health Sci.* 2010;4(3):179-83.
6. Topilow NJ, Tran AQ, Koo EB, Alabiad CR. Etiologies of Proptosis: A review. *Intern Med Rev (Wash D C).* 2020;6(3):10.18103/imr.v6i3.852. doi: 10.18103/imr.v6i3.852.
7. Masud MZ, Babar TF, Iqbal A, Khan MT, Zaffar ul Islam, Khan MD. Proptosis: etiology and demographic patterns. *J Coll Physicians Surg Pak.* 2006;16(1):38-41.
8. Seregard S, Sahlin S. Panorama of orbital space-occupying lesions. The 24-year experience of a referral centre. *Acta Ophthalmol Scand.* 1999;77(1):91-8. doi: 10.1034/j.1600-0420.1999.770121.x.