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Etiological Pattern, Clinical Presentation and Outcome of Patients with Proptosis in a Tertiary Care Hospital

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ABSTRACT

Objective: To determine the etiological pattern, clinical presentation and outcome of patients with proptosis in a tertiary care hospital.

Study Design: Cross-sectional study.

Place and Duration of Study: Ophthalmology Department, Khyber Teaching Hospital, Peshawar Pakistan, from Jan 2019 to Jun 2020.

Methodology: This study was conducted on 60 patients having proptosis. Patients were treated either medically, surgically or both. The demographic profile included age, gender and type of proptosis. The outcome included recovery, re-treatment, referral to the relevant speciality and loss to follow-up, were measured.

Results: Out of 60 patients with proptosis, 39 were males, and 21 were female. Fifty-two patients had unilateral, and 8 had bilateral proptosis, with the majority suffering from non-axial proptosis. On aetiology exhibited tumours (45%), infectious (25%), inflammatory (16.6%), vascular (6.66%) and injury (6.66%). The surgical procedure was indicated in 27(45%) patients, while medical treatment was given in 28(46.6%) patients. Five patients (8.4%) received both surgical and medical treatment. Out of 60 patients, 26 patients (46.33%) fully recovered and 11 patients (18.33%) did not recover, 17(28.33%) patients were referred to other specialities for management, and 5(8.3%) patients lost to follow-up.

Conclusion: In our study, tumours were the main cause of proptosis, followed by infective and inflammatory causes, with the paediatric age group (<18 years) at more risk.

Keywords: Aetiology, Clinical features, Outcome, Proptosis.

How to Cite This Article: *Zahir SI, Khan MU, Ahmad M, Hussain I, Hamayun J. Etiological Pattern, Clinical Presentation and Outcome of Patients with Proptosis in a Tertiary Care Hospital. Pak Armed Forces Med J 2022; 72(6): 2113-2116. DOI: https://doi.org/10.51253/pafmj.v72i6.6097*

INTRODUCTION

Prop-tosis occurs when protrusion in the forward position or displacement of one or two eyeballs from the orbit occurs. The severity of proptosis can be measured with a plastic rule resting on the lateral orbital margin or with the Luedde exophthal-mometer using a similar principle.[1,2] Proptosis can be divided into two categories based on direction, i.e., Axial Proptosis and Eccentric proptosis. Axial proptosis is due to a lesion in the intraconal region. Examples include thyroid eye disease, cavernous haemangioma, and optic nerve tumour.[3]

Proptosis is either unilateral or bilateral. Local pathology often triggers unilateral proptosis, while bilateral proptosis is due to the underlying systemic disease.[4] TED can cause both unilateral and bilateral proptosis. TED is a common condition due to immune system dysfunction affecting the orbital muscle.[5,6] Diseases of the paranasal sinuses, nasopharynx and orbit can also cause proptosis with variable frequencies.[7]

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Received: 11 Jan 2021; revision received: 26 Aug 2021; accepted: 05 Oct 2021

Orbital inflammatory disease is responsible for up to 6% of orbital diseases involving all age groups. Therefore, it is a frequent reason to perform the orbital biopsy. Various causes of the orbital inflammatory disease include idiopathic and systemic or local inflammatory conditions.[8] Orbital cellulitis is the leading cause of unilateral proptosis in children and is commonly observed in the paediatric age group. Rhabdomyosarcoma (RMS) should also be considered in any child with a rapidly growing eyelid or orbital mass. Capillary haemangioma and dermoid are also common in children.[9] Despite all the resources, finding the cause of orbital cellulitis is sometimes challenging and requires extensive workup.[10] Diagnosis at an early stage and timely management of clinical condition saves permanent disability in complete vision loss.

METHODOLOGY

This study was conducted at the Department of Ophthalmology, Khyber Teaching Hospital, Peshawar Pakistan, from January 2019 to July 2020. The study followed the declaration of Helsinki and was approved by the Institutional Review Board of Khyber Medical College Peshawar.

Inclusion Criteria: Patients of either gender, aged 1 to 75 years with proptosis were included in the study.

Exclusion Criteria: Bedridden or debilitated patients with severe cardiac or renal diseases or uncontrolled diabetes were excluded from the study.

The study components included aetiology, clinical presentation and outcome of proptosis in patients who were presented at the Ophthalmology Outpatient and Inpatient Departments referred from other hospitals around the province or directly to our hospital. The participants were informed about the nature of the study. Informed consent was taken in the local language. All the study participants who satisfied inclusion and exclusion criteria were interviewed for basic demographic characteristics.

Clinical evaluation included detailed history (including onset, duration, and rate of progression of proptosis), visual acuity, colour vision, pupillary reaction, extra-ocular movements, intraocular pressure, slit-lamp biomicroscopy, fundoscopy and cycloplegic refraction. Associated anterior segment signs were noted. The clinical presentation of proptosis was classified as axial or eccentric depending on the direction of proptosis. The severity of proptosis was assessed with an exophthalmometer. Measuring Proptosis with a simple two-ruler method was also used in some patients and helped measure dystopia. During medical therapy, the amount of proptosis was measured daily as-the treatment was continued, improvement was documented daily, and the same was done after carrying out surgical procedure.

Other specific tests were done, such as the Valsalva manoeuvre, testing for ocular pulsations, and auscultation for a bruit. In suspected vascular causes of proptosis MRA (magnetic resonance arteriography) or MRV (magnetic resonance venography) was advised. Routine blood and radiological investigations (CT, MRI) of the orbit was done. The histopathological study was taken in relevant cases, including fine-needle aspiration cytology of the orbital swelling and incisional biopsy. Consultation from other specialities was taken if the tumour was from adjacent sinuses, nasal or nasopharyngeal areas, or metastatic tumours. In cases of generalised disorders such as leukaemia and lymphomas, medical specialists and/or oncologist were consulted. Routine and other selective investigations included T3, T4, and thyroid-stimulating hormone levels. For this study, 18 years and below were considered the paediatric age group and above 18 as adults.

Statistical Package for Social Sciences (SPSS) version 20.0 was used for the data analysis. Frequencies and percentages were used for categorical variables. Mean and SD were calculated for numerical variables.

RESULTS

There was a total of 60 patients having a mean age of 22.65±21.24 years. The minimum age was one year, and the maximum was 75 years. Male patients were twice as compared to female patients. Thirty-six (60%) patients had non-axial proptosis, and 24(40%) had axial proptosis. Among 60 cases, 86.66% were unilateral, and 13.33% were bilateral. The causes of proptosis included tumours (45%) in our study, mostly followed by infectious (25%), inflammatory (16.66%), vascular (6.66%) and injury (6.66%). Vascular causes were rare (Table-I).

Table-I: Etiologies of Proptosis (n=60)

Etiology	(n)	(%)
Inflammatory	10	16.66
Infectious	15	25.0
Tumor	27	45
Vascular	4	6.66
Injury	4	6.66

Regarding the severity of proptosis, mild proptosis was observed in 8(13.3%) patients. Moderate was 43(71.7%), and severe was 9(15%).The surgical procedure was performed on 27(45.0%) patients, 28(46.6%) patients received medical treatment, and 5(8.4%) patients received both surgical and medical treatment (Table-II). Medical treatment with antibiotics or anti-inflammatory drugs was carried out in infective or inflammatory causes of proptosis. At the same time, in surgical in neoplastic conditions, as shown in the table below, some patients received both surgical and medical treatment.

Table-II: Surgical and Medical Treatment of Proptosis Patients (n=60)

Treatment	(n)	(%)
Surgical Treatment	27	45.0
Medical Treatment	28	46.6
Both	5	8.4

Regarding outcome, Out of 60 patients, 26 (43.33%) recovered, 11(18.33%) were not recovered they were further called for treatment, 17(28.33%) patients were referred to other specialities mostly oncology and 5(8.33%) lost to follow up as shown in the Table-III.

Table-III: Final Outcome of Proptosis Patients (n=60)

Final Outcome	(n)	(%)
Recovered	26	43.33
Not Recovered (for further treatment)	11	18.33
Referred to other specialities	17	28.33
Lost to follow up	5	8.33

DISCUSSION

Proptosis is not an uncommon condition with multiple etiologies and presenting patterns.[11] Proptosis may lead to complications ranging from corneal dryness to blindness. Therefore, it is often dealt with by both ophthalmologists and otorhinolaryngologists collectively in ideal situations.[12] Dryness of the eye occurs due to failure of the eyelid to fully close. The dryness is not only uncomfortable but could lead to corneal ulceration and the development of exposure keratopathy in extreme cases. Therefore, healthcare professionals commonly prescribe gels to moisten the eye and protect the cornea from extreme dryness.[13] To treat spotted infection in the eye, antibiotic therapy is prescribed. In more severe cases, i.e., the presence of a tumour requires surgical intervention, either diagnostic in the form of incisional biopsy, removal of tumour or reconstruction.[14] Our study focused on etiologic patterns, presentations, and outcomes in the said population group.

In our study, the tumour was the most common cause of proptosis, accounting for 45% of cases. This finding is similar to the study conducted by Ogbeide *et al*. who also observed that neoplasia is responsible for 81.8% of proptosis cases.[15] Tumours in our study included both malignant and benign neoplasia (cystic nature was also included).

Infection-related proptosis was seen in 25% of patients. Inflammation accounted for 16.66% of cases in our study. A study conducted in Nigeria reported the frequency of vascular lesions to be around 2.9%, much less than observed in our study.[10] Vascular lesions were reported at 7% and 7.40% in two other different studies respectively.[3,4] Our study found injury accounted for 6.66% of proptosis cases which is nearly similar to other studies findings, i.e. 7.40% and 6% cases.[3,16]

Unilateral proptosis was common in our study, similar to a Southern Nigerian study.[15] In our study, non-axial proptosis was present in 60% of patients. This finding is similar to an Indian study which showed the frequency of non-axial proptosis to be 51.85%.[3]

Our study found that the male gender had a higher prevalence of proptosis than the female. We found male predominance in our study, which is comparable to studies conducted in India which also showed male predominance.[16,17]

The majority of the patients presented with proptosis were found in the age group of 1 to 17 years which was 58.3%, similar to the Nigerian study, which showed the highest percentage of patients in the age group of 0 to 15 years.[10] We observed in our study that the most common cause of proptosis in children is infection and orbital cellulitis is the leading entity in this group. This finding was also observed in a study performed by Loganathan *et al*.[18] Most of our study cases had proptosis of moderate to severe grade when graded in categories and were children, so it is recommended that proper education of parents is needed because mild severity cases were ignored with mild signs and symptoms and proper referral was not done, which had better outcome at that stage as compared to the presentation at moderate to severe stage. Few patients in our study were lost to follow-up, so it is necessary that proper counselling of patients and parents is needed regarding the importance of on-time treatment and follow-up. If not, they will come at the end-stage of the disease process, where they can be incurable.

CONCLUSION

From our study, we conclude that tumours are the major cause of proptosis in our region followed by Infective and inflammatory causes, mostly involving the paediatric age group (<18yrs). Most of the patients with infective and inflammatory causes recovered with medical treatment. Patients with tumours were mostly treated surgically followed by referral to other specialities (mostly oncology) if needed.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SIZ: Conception, data acquisition, data analysis, drafting the manuscript, critical review, approval of the final version to be published.

MUK & MA: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

IH & JH: Critical review, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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