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Analysis of Sino-Nasal Diseases Causing Proptosis

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Abstract: ***To analyse different sino-nasal diseases causing proptosis in patients presenting in ENT department. Study Design: Retrospective descriptive study. Settings: Department of ENT and Head & Neck surgery, Allied Hospital, Punjab Medical College Faisalabad. Period of study: Two years (June 2014 to May 2016). Patients and Methods: This study consisted of 30 patients who presented with history of proptosis because of some sino-nasal disease. Inclusion criteria: Patients having unilateral or bilateral proptosis of either sex with some lesion in the sino-nasal region. Exclusion criteria: Patients with proptosis due to endocrine and ophthalmological causes. Data Analysis: SPSS software, version 10 was applied to analyse the data. Chi square test was used to analyse the data. Results: Out of 30 patients; 56.6% were males and 43.4% were females ranging from 06 to 67 years with mean age of 34.3 years. In this study 70% of the patients had unilateral proptosis while 30% patients presented with bilateral proptosis. Different sino-nasal diseases causing bilateral proptosis were observed in this study. We found bilateral allergic nasal polyps in 3.3%, bilateral allergic fungal rhinosinusitis in 16.6% and both allergic nasal polyps and fungal rhinosinusitis in 10% of the patients. The remaining 70% of the patients having unilateral proptosis had nasal polyps in 6.7% , allergic fungal rhinosinusitis in 10% and both nasal polyps and fungal rhinosinusitis in 6.7% of the patients. Fungal ball in the maxillary sinus was diagnosed in 6.7% of the patients. Among 15 patients with fungal disease and proptosis 10 patients (66.7%) were immunocompetent whereas the remaining 05 patients (33.3%) were immunocompromized and metabolically moribund. Fronto-ethmoidal mucoceles in 6.7%, juvenile nasopharyngeal angiofibroma in 6.7%, inverted papilloma in 13.3% and malignant growths of nose and paranasal sinuses were diagnosed in 13.3% of the patients. 16.6% patients were smokers, another 16.6% were diabetic and 13.3% of the patients had hypertension. Treatment: All the patients underwent different surgical procedures to treat the basic pathological lesions causing unilateral or bilateral proptosis aiming at total clearance of the disease and orbital repositioning. Conclusion: Undoubtedly a number of sino-nasal diseases can cause either unilateral or bilateral proptosis but a fungal infection of the nose and paranasal sinuses is quite a common cause and is increasing day by day even in young, healthy otherwise immunocompetent patients. These patients need awareness programs regarding the importance of early diagnosis and prompt treatment to prevent fungal rhinosinusitis and hence to manage proptosis.***

Keywords: Proptosis, Nasal Polyps, Sino-Nasal Diseases, Fungal Rhinosinusitis.

INTRODUCTION

Many a dilemma are encountered by an ENT and head & neck surgeon in clinical practice and one such situation is the management of proptosis.[1] Proptosis is a symptom as well as a sign of both ENT and eye diseases. It is the clinical manifestation of pathology that results in anterior displacement of the eyeball beyond the orbital margin.[2] Delay in diagnosis and treatment may lead to many complications including loss of vision. The term exophthalmos and proptosis are usually used synonymously. Proptosis is defined as forwarding displacement of the eyeball beyond the orbital margin with the patient looking forward.[3]Majority of the cases of unilateral or bilateral proptosis are seen by ophthalmologists and only a few are referred to ENT department for management. Many conditions increase the orbital content and so cause axial displacement of the globe e.g; mass lesions, vascular anomalies, inflammatory processes or endocrine pathologies. Although proptosis is one of the commonest manifestations of orbital disease yet it may be the only symptom of nasal and paranasal sinus pathology.[4] In such a situation the ophthalmologist must be very careful

in dealing the proptosis. The nose and paranasal sinuses surround the orbit from 11 O' clock position superiorly to 6 O' clock position inferiorly.[5] in this way the eyeball is closely related to the nose, nasopharynx and paranasal sinuses. The orbit is separated from the frontal sinus by the floor of the frontal sinus, from the ethmoid sinuses by a paper thin bone called lamina papyracea, from maxillary sinus by the roof of the maxillary sinus and from sphenoid sinus by an anterolateral wall of the sphenoid sinus. Therefore different pathological conditions may push the eyeball in
Different directions causing proptosis. The majority of the bacterial and fungal infections of the orbit have primary origin particularly in the ethmoid and occasionally from the maxillary sinus.[6]
A particular sinister disease that is increasing day by day, is the mycotic infections of the nose and deep paranasal sinuses, which seems to be affecting young, healthy and otherwise immune competent patients in Pakistan. This is totally in contrast to the incidence of these infections in USA and Europe where only the immune compromised and metabolically
moribund patients are affected.[7]

MATERIALS AND METHODS

This retrospective descriptive study comprising of 30 patients, with unilateral or bilateral proptosis, was conducted in the Department of ENT and head & neck surgery, Allied Hospital, Punjab Medical College Faisalabad during a period of two years from June 2014 to May 2016. All these patients with unilateral or bilateral proptosis secondary to sino-nasal diseases, of either sex ranging from 06 years to 67 years with mean age of 34.3 years were included in the study. The patients having proptosis due to endocrine and ophthalmological causes were excluded. All the patients were subjected to detailed comprehensive history, clinical examination and relevant investigations particularly blood sugar level, CT scan and MRI to reach the diagnosis and extent of the disease. Biopsy of the lesion was taken in certain selected cases to make the histopathological diagnosis. All the patients underwent appropriate treatment according to the nature and extent of the disease. All the data were analyzed and computed by SPSS software, version 10. Chi-square test was applied to analyse the data. P values less than 0.05 were considered statistically significant. All the patients were reviewed and followed up
thoroughly at 1 week, 2 weeks, 4 weeks, 3 months, 6 months and 1 year.

RESULTS

Out of 30 patients; 56.6% were males and 43.4% were females (Fig.1) ranging from 06 to 67 years with mean age of 34.3 years (Table.1). In this study, 70% of the patients had unilateral proptosis while 30% patients presented with bilateral proptosis (Fig.2). Different sino-nasal diseases causing bilateral proptosis were observed in this study. We found bilateral allergic nasal polyps in 3.3%, bilateral allergic fungal rhinosinusitis in 16.6% and both allergic nasal polyps and fungal rhino sinusitis in 10% of the patients. The remaining 70% of the patients having unilateral proptosis had nasal polyps in 6.7%, allergic fungal rhinosinusitis in 10% and both nasal polyps and fungal rhinosinusitis in 6.7% of the patients. Fungal ball in the maxillary sinus was diagnosed in 6.7% of the patients. Among 15 patients with fungal disease and proptosis 10 patients (66.7%) were immunocompetent whereas the remaining 05 patients (33.3%) were immune compromised and metabolically moribund. Frontoethmoidal mucoceles in 6.7%, juvenile nasopharyngeal angiofibroma in 6.7%, inverted papilloma in 13.3% and
Malignant growths of the nose and paranasal sinuses were diagnosed in 13.3% of the patients (Table.2). 16.6% patients were smokers, another 16.6% were diabetic and 13.3% of the patients had hypertension.

DISCUSSION

ALLAH ALMIGHTY gifts us life that is a wonderful and balanced blend of pain and pleasure. It gives us so many charms, but on the other hand, we also see it doing some injury work in the form of sino-nasal diseases which if not diagnosed early and treated promptly, may endanger life. Different diseases of the nose, paranasal sinuses and nasopharynx may cause unilateral or bilateral proptosis. Proptosis can be defined as the forward displacement of the eyeball beyond the orbital margin with the patient looking forward. It can be measured with Hertel's mirror exophthalmometer. The distance between lateral orbital margin and the apex of the cornea is used as an index for measuring proptosis. Normally this distance is roughly 18 mm. However individual and racial variations must be kept in mind while measuring proptosis.
In this study 56.6% patients were males and 43.4% patients were females with a male to female ratio of 1.3 : 1 showing slight male preponderance. Gender distribution worldwide is variable but indicating male preponderance in the majority of the studies. According to a study by Isawumi MA et al[8] the male to female ratio is 5 : 1 showing male preponderance. Another study conducted by Anudhavadivu S et al[9] also supports male preponderance with male to female ratio of 2.5 : 1. On the other hand, a study by Zaidi S H et al[7] shows female preponderance while a research conducted by Naidu et al[10] shows equal distribution of gender.
According to our study, the age of our patients ranged from 06 to 67 years with mean age of 34.3 years. Moreover, majority of our patients (36.6%) fell within 31 to 40 years range. In this way this study closely correlates with other studies conducted abroad.[8,9.]
According to a research conducted by Klossek J M most patients belong to a younger age group (approximately 30 years of age), either male or female. Bilateral, but also unilateral, polyps present in the nose associated with complete opacification of the sinus cavities on CT scan associated frequently with bone expansion are common and highly suggestive of fungus.[11] 70% of our patients had unilateral proptosis while 30% patients had bilateral proptosis. However international literature shows unilateral proptosis in 80% of the patients and bilateral proptosis in 20% patients.[9]
A number of diseases such as infections, inflammatory lesions and neoplasms of the nose and paranasal sinuses are responsible for proptosis. Fungal sinusitis was initially considered as ethmoidal polyposis causing proptosis.[15] Fungal rhinosinusitis is gradually emerging as one of the common otolaryngological cause of proptosis.[5] Our study revealed that fungal infection of the sino-nasal region was responsible for 50% of the patients having proptosis, 43.3% were allergic fungal rhinosinusitis and 6.7% having the fungal ball in the maxillary sinus. Moreover, this study also showed that mycotic infections of the nose and paranasal sinuses were more commonly seen in rather younger, healthier and immunocompetent individuals (66.7%) whereas the percentage of the

immunocompromized and metabolically moribund patients was 33.3%. In the USA and Europe, immunocompromized patients are commonly the victims of the fungal infections of the sino-nasal region.[12] Other studies, both national and international, conducted in the past also support our view.[1,13,14.]

Neoplasms of the nose and paranasal sinuses, both benign and malignant, may also present with proptosis. Our series showed that neoplastic lesions of the sino-nasal region, both benign and malignant, were responsible for proptosis in 33.3% of the patients which were the most common causes of proptosis next to fungal rhinosinusitis. Benign tumors causing proptosis were 20% including juvenile nasopharyngeal angiofibroma (6.7%) and inverted papilloma (13.3%). Malignant neoplasms causing proptosis were 13.3%. Squamous cell carcinoma of the maxillary sinus (10%) and rhabdomyosarcoma of the nose (3.3%) were found as the cause of proptosis. According to an international study conducted by Orvis et al[16,] 85% are squamous cell carcinoma of the maxilla mainly and 5 to 20 % adenocarcinoma of the ethmoid sinus and both may present with proptosis. Other otolaryngological causes of proptosis in our study were allergic nasal polyps (10%) and mucocele of the frontoethmoidal region (6.7%) which are different from national and international studies. A study by Haq A[1] et al shows allergic nasal polyps as the cause of proptosis in 20 % of the patients and another study by Venugopal M and Sagesh M[3] reveals mucoceles of the frontoethmoidal region to be responsible for proptosis in 22.7% of the patients.

CONCLUSION

Different sino-nasal diseases may be the cause of either unilateral or bilateral proptosis. In particular, the sino-nasal polyposis complicated by allergic fungal rhinosinusitis is associated with proptosis and its incidence, unfortunately, is increasing day by day even in young, healthy and otherwise immunocompetent individuals. A large sample study is needed to be conducted that will throw more light on this problem. Management of proptosis by ENT and head & neck surgeon is often a dilemma but anyhow it is the need of the hour that the patients with sino-nasal polyposis and allergic fungal rhinosinusitis should be given awareness regarding the importance of early diagnosis and prompt treatment well in time to prevent fungal sinusitis and consequently to manage proptosis.

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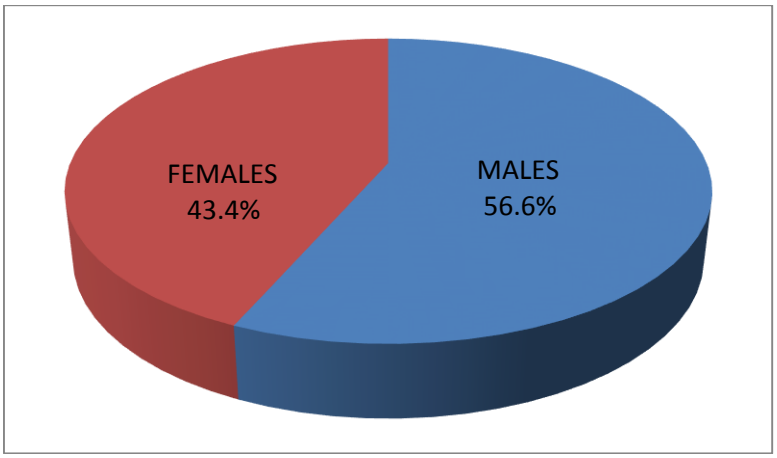

Fig. 1. Gender distribution (N=30)

Table. 1. Age range (N=30)

Serial number	Age range	No. of patients	Percentage
1	0-10 years	01	3.3 %
2	11-20 years	05	16.7 %
3	21-30 years	06	20 %
4	31-40 years	11	36.6 %
5	41-50 years	02	6.7 %
6	51-60 years	03	10 %
7	61-70 years	02	6.7 %
Total		30	100 %

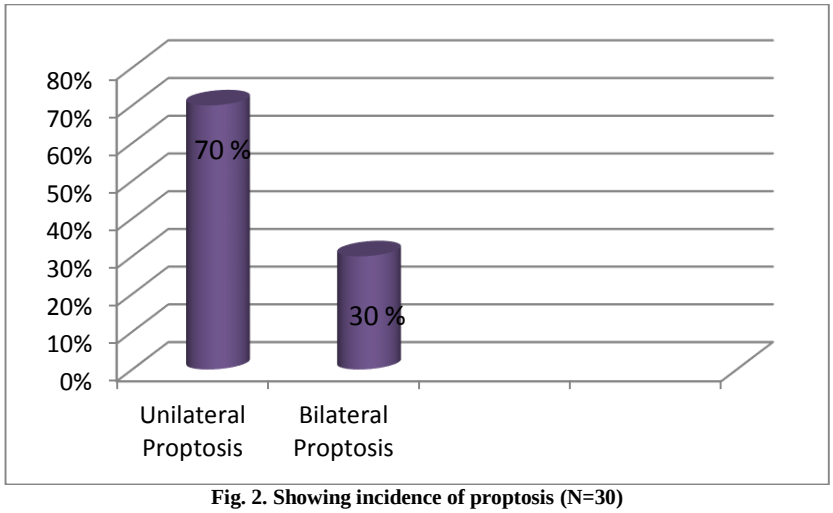

Fig. 2. Showing incidence of proptosis (N=30)

Fig. 3: Showing right unilateral proptosis due to allergic fungal rhinosinusitis

Table. 2. Showing various causes of proptosis (N=30)

Serial number	Proptosis	Cause of proptosis	No. of patients	Percentage
1	Unilateral	Nasal polyps	02	6.7 %
2	Unilateral	Allergic fungal rhinosinusitis	03	10 %
3	Unilateral	Both nasal polyps & allergic fungal rhinosinusitis	02	6.7 %
4	Unilateral	Fungal ball in maxillary sinus	02	6.7 %
5	Unilateral	Mucoceles in fronto-ethmoidal region	02	6.7 %
6	Unilateral	Juvenile nasopharyngeal angiofibroma	02	6.7 %
7	Unilateral	Inverted papilloma	04	13.3 %
8	Unilateral	Squamous cell carcinoma of maxillary sinus	03	10 %
9	Unilateral	Nasal rhabdomyosarcoma	01	3.3 %
10	Bilateral	Nasal polyps	01	3.3 %
11	Bilateral	Allergic fungal rhinosinusitis	05	16.6 %
12	Bilateral	Both nasal polyps & allergic fungal rhinosinusitis	03	10 %
Total			30	100 %

Fig. 4. CT scan of nose and Paranasal sinuses.Axial view showing Allergic Fungal Rhinosinusitis causing proptosis of the left eyeball.

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