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Proptosis in ENT Department: Presentation and Management

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ABSTRACT

Objective: The main aim of this study was to manage proptosis caused by different nasal and paranasal sinus diseases. **Study Design:** This was a retrospective descriptive study. **Settings:** The study was carried out in department of otorhinolaryngology and Head & Neck surgery, Allied Hospital, Faisalabad Medical University, Faisalabad. **Duration:** Two years i.e; June 2014 to May 2016. **Methodology:** 30 patients with proptosis because of some nasal and paranasal sinus disease. **Data Analysis:** To analyze data SPSS software version 10 and Chi square test were employed. **Results:** 56.6% were males and 43.4% were females among a total of 30 patients. The age of these patients was ranging from 06 to 67 years with mean age of 34.3 years. In this study 70% patients had unilateral proptosis and 30% patients with bilateral proptosis. 53.3% patients had nasal polyposis causing proptosis; 23.3% unilateral and 30% being bilateral nasal polyposis. 90% of our patients were found to have nasal obstruction; unilateral nasal obstruction in 60% whereas bilateral in 30%. Nasal mass was seen in 23.3% and epistaxis was observed in 30% of the patients. 13.3% of our patients had facial swelling and 53.3% had tele canthus. 50% of the patients were found to have fungal disease either in the nose or paranasal sinuses causing proptosis. Among these 18 patients having proptosis due to fungal disease, 10 patients (55.5%) were immunocompetent. On the other hand, the remaining 08 patients (44.5%) were immunocompromised and metabolically moribund. Smokers were 16.6%, diabetes mellitus was seen in another 16.6% and 13.3% of the patients had hypertension. Different surgical procedures were used to treat the lesions responsible for unilateral or bilateral proptosis. The basic aim of the treatment was to clear the disease completely and orbital repositioning. **Conclusion:** Although endoscopic sinus surgery is considered the treatment of choice at present in experienced hands yet midfacial degloving approach is another excellent surgical option to treat majority of these sino-nasal diseases causing proptosis especially at those settings where FESS like modern facility is not available.

Keywords: Proptosis, sino-nasal diseases, endoscopic sinus surgery, midfacial degloving approach.

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INTRODUCTION

In clinical practice an ENT and head & neck surgeon may encounter many a dilemma. Management of proptosis can be considered one such situation.[1] Proptosis is a symptom as well as a sign of both ENT and eye diseases. Clinically proptosis is the anterior displacement of the eyeball beyond the margin of the orbit.[2] If diagnosis and treatment are delayed, it may lead to many complications including loss of vision. Proptosis is defined as forward protrusion of the eyeball beyond the orbital margin when the patient looking forward.[3] Many of these patients having unilateral or bilateral proptosis are managed by ophthalmologists and only a few by ENT and head & neck surgeon. On many occasions' proptosis may be one of the commonest manifestations of orbital disease but in certain situations it may be the sole symptom of nasal and paranasal sinus disease.[4] Therefore the ophthalmologist must be very careful in dealing such cases of proptosis. The nose and paranasal sinuses surround the orbit from 11 O' clock position superiorly to 6 O' clock position inferiorly.[5] Different pathological lesions may push the eyeball in different directions causing proptosis. Many bacterial and fungal infections of the orbit originate primarily in the ethmoid and occasionally from the maxillary sinus.

Day by day the fungal infections of the nose and paranasal sinuses are increasing. These seem to be affecting young, healthy and otherwise immunocompetent patients in Pakistan. This is contradictory to the incidence of these infections in USA and Europe where only the immunocompromised and metabolically moribund patients are affected.[7] There are many surgical options available to manage sino-nasal lesions causing proptosis. Among these endoscopic sinus surgeries and midfacial degloving approach are considered excellent surgical means in modern rhino logical practice.[8,9]

METHODOLOGY

Study Design: Retrospective descriptive study.
Settings: department of otorhinolaryngology and Head & Neck surgery, Allied Hospital, Faisalabad Medical University, Faisalabad-Pakistan.
Duration: Two years i.e; June 2014 to May 2016
Sample Technique:
Sample Size: This study consists of 30 patients.

Inclusion Criteria: Patients with unilateral or bilateral proptosis of either sex having disease in the sino-nasal region.
Exclusion Criteria: Patients with proptosis due to endocrine and ophthalmological causes.

Methods:

The 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. The patients were given written proforma regarding detailed history. Then clinical examination was performed to note the clinical signs. Lastly relevant investigations were asked particularly blood sugar, 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. The tissue was also sent in normal saline for culture of the fungus in certain suspected cases.

All the patients underwent appropriate treatment according to the nature and extent of the disease. All the data was analyzed and computed by SPSS software, version 10. Chi square test was applied to analyses 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

56.6% of 30 patients were males and 43.4% were females ranging from 06 to 67 years with mean age of 34.3 years. Unilateral proptosis was found in 70% and bilateral proptosis was seen in 30% of the patients. 53.3% patients presented with nasal polyposis causing proptosis; 23.3% unilateral while 30% being bilateral nasal polyposis (Table 2). 90% of our patients were found to have nasal obstruction; unilateral nasal obstruction in 60% whereas bilateral in 30%. Nasal mass was seen in 23.3% and epistaxis was observed in 30% of the patients. 13.3% of our patients had facial swelling and 53.3% had tele canthus. 60% of the patients were found to have fungal disease either in the nose or paranasal sinuses causing proptosis (Table 3). Among these 18 patients with proptosis due to fungal disease 10 patients (55.5%) were immunocompetent whereas the remaining 08 patients (44.5%) were immunocompromised and metabolically moribund. 16.6% patients were smokers, another 16.6% were diabetic and 13.3% of the patients had hypertension.

Endoscopic sinus surgery was performed in 8 patients (26.7%), midfacial degloving approach was employed in 6 patients (20%) and trans antral ethmoidectomy was used in 5 patients (16.6%). 10% of the patients underwent external ethmoidectomy, 6.6% were treated with Total maxillectomy followed by post-operative radiotherapy while further 6.6% of the patients were treated by Cald-wel Luc's operation. Chemoradiotherapy, radiotherapy alone, endoscopic drainage and external front o-ethmoidectomy were employed in 3.4% of the patients each (Table 4). 24 patients (80%) were found disease free at the end of one year follow up period. Recurrence of disease was found in 04 patients (13.3%). One patient (3.3%) expired due to disease while one patient (3.3%) was found lost in follow up.

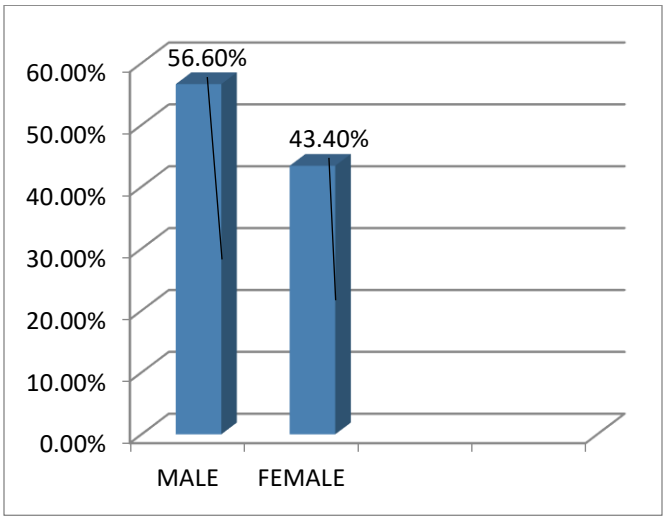

Figure 1: Showing sex distribution (N=30)

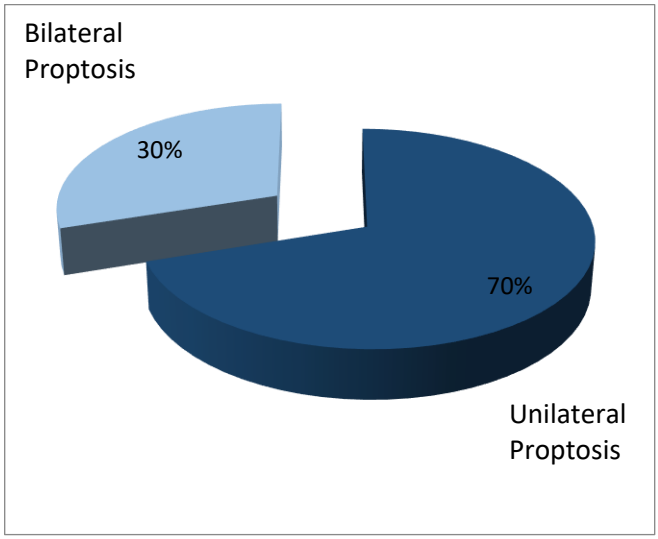

Figure 2: Distribution of Proptosis (N=30)

Figure 3: CT Scan of nose and PNS. Coronal view showing bilateral nasal polyposis and allergic fungal rhinosinusitis

Table 1: Age range (N=30)

Age range	No. of patients	Percentage
0-10 years	01	3.3 %
11-20 years	05	16.7 %
21-30 years	06	20 %
31-40 years	11	36.6 %
41-50 years	02	6.7 %
51-60 years	03	10 %
61-70 years	02	6.7 %
Total	30	100 %

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

Proptosis	Cause of proptosis	No. of pts	%
Unilateral	Nasal polyps	02	6.7%
Unilateral	Allergic fungal rhinosinusitis	03	10%
Unilateral	Both nasal polyps & allergic fungal rhinosinusitis	02	6.7%
Unilateral	Fungal ball in maxillary sinus	02	6.7%
Unilateral	Mucoceles in fronto-ethmoidal region	02	6.7%
Unilateral	Juvenile nasopharyngeal angiofibroma	02	6.7%
Unilateral	Inverted papilloma	04	13.3%
Unilateral	Squamous cell carcinoma of maxillary sinus	03	10%
Unilateral	Nasal rhabdomyosarcoma	01	3.3%
Bilateral	Nasal polyps	01	3.3%
Bilateral	Allergic fungal rhinosinusitis	05	16.6%
Bilateral	Both nasal polyps & allergic fungal rhinosinusitis	03	10%
Total		30	100%

Table 3: Clinical Features in Patients having Sino-nasal Diseases presenting with Proptosis (N=30)

Clinical Feature	No. of Patients	Percentage
Unilateral proptosis	21	70.0%
Bilateral proptosis	09	30.0%
Ethmoidal polyposis	16	53.3%
Nasal mass	07	23.3%
Unilateral Nasal obstruction	18	60.0%
Bilateral nasal obstruction	09	30.0%
Epistaxis	09	30.0%
Facial swelling	04	13.3%
Telecanthus	16	53.3%

Table 4: Treatment Options employed for Management of Proptosis (N=30)

Treatment Option	No. of Patients	Percentage
Endoscopic Sinus Surgery (ESS)	08	26.7%
Midfacial Degloving Approach and Medial Maxillectomy	06	20%
Jensen Horgan Procedure (Trans-antral Ethmoidectomy)	05	16.7%
External Ethmoidectomy	03	10%
Cald Wel Luc's Operation	02	6.7%
Total Maxillectomy followed by Post Oprtative Radiotherapy	02	6.7%
Chemo-radiotherapy	01	3.3%
Radiotherapy alone	01	3.3%
External Fronto- ethmoidectomy	01	3.3%
Endoscopic Drainage	01	3.3%
Total	30	100%

DISCUSSION

Life is a beautiful blessing gifted by ALLAH ALMIGHTY. It 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. Many nasal, nasopharyngeal and paranasal sinus lesions may cause unilateral or bilateral proptosis. Proptosis 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 17 to 21 mm with an average of 18 mm.

56.6% patients were males and 43.4% patients were females in our study with male to female ratio of 1.3:1. This shows slight male preponderance. Globally gender distribution is variable and indicates male preponderance in majority of the studies. According to a study by Isawumi MA et al[10] the male to female ratio is 5:1 showing male preponderance. Another study conducted by Anudhavadivu S et al[11] 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[12] 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.[10,11] According to Klossek J M research majority of the patients were belonging to a younger age group I,e; 30 years. Unilateral and or bilateral nasal polyposis are often associated with complete opacification of the sinus cavities on CT scan and are frequently associated with bone expansion. Such CT scan findings are common and highly suggestive of fungus.[13] 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.[11]

Many diseases, for example infections, inflammatory lesions and neoplasms of the nose and paranasal sinuses are the main causes for proptosis. Fungal sinusitis was initially considered as ethmoidal polyposis causing proptosis.[17] Fungal rhinosinusitis is gradually becoming one of the common otolaryngological cause of proptosis.[5] Our study revealed that fungal infection of the sino-nasal region was responsible in 50% of the patients having proptosis, 43.3% being allergic fungal rhinosinusitis and 6.7% having 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 immunocompromised and metabolically moribund patients was 33.3%. In USA and Europe immunocompromised patients are commonly the victims of the fungal infections of the sino-nasal region.[14] Other studies, both national and international, conducted in the past also support our view.[1,15,16.]

Proptosis may also be seen in both benign and malignant tumors of the nose and paranasal sinuses. 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 cause of proptosis. According to international study conducted by Orvidas et al[18] 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 fronto-ethmoidal region (6.7%) which are different from national and international studies. A study by Haq A[1] et al shows allergic nasal polyps as cause of proptosis in 20 % of the patients and another study by Venugopal M and Sagesh M[3] reveals mucoceles of fronto-ethmoidal region to be responsible for proptosis in 22.7% of the patients.

A variety of surgical options are available to manage the proptosis caused by different sino-nasal lesions ranging from as simple procedure as nasal polypectomy to most sophisticated advanced procedure such as endoscopic sinus surgery. Usually the decision about the surgical option to be used is based on surgeon's preference and the extent of the disease. An ethmoidectomy may be one of three major types i,e; the external ethmoidectomy, the intranasal endoscopic ethmoidectomy and transantral ethmoidectomy. Sometimes, depending upon the extent of the disease, more than one approach may be combined during the surgical intervention.[9,19] According to Aukema et al medical therapy alone may be inadequate for the treatment of nasal polyposis. According to this study although 12 week treatment with fluticasone propionate nasal drops reduced the need for sinus surgery in patients with nasal polyposis and chronic rhinosinusitis, yet 14 of 27 patients still required some form of surgical intervention.[20] Functional endoscopic sinus surgery (FESS) is a highly sophisticated type of surgery which has revolutionized the surgical management of chronic sinus disease.[21] It is associated with high rate of success (approximately 90%) for symptomatic improvement in patients with medically refractory chronic rhinosinusitis and chronic polypous rhinosinusitis.[22]

The midfacial degloving approach is another very excellent surgical option for management of vast majority of sino-nasal diseases responsible for proptosis including nasal polyposis, inverted papilloma, nasopharyngeal angiofibroma and sino-nasal malignancies. The midfacial degloving approach gives a good exposure of the mid third of the face. Moreover, it provides excellent cosmetic results. This surgical option can be considered as a valuable procedure especially at those settings where FESS like facilities are not available. This gives low morbidity and excellent cosmetic outcome as well.[23] According to a study conducted by Murtaza et al nasopharyngeal angiofibroma can be excised successfully by using midfacial degloving approach. By using this approach, the anterior, medial, lateral and posterior walls of the maxillary sinus can be removed producing a large cavity. This large space is confluent with nasal cavity and post nasal space and gives adequate access for removal of the angiofibroma. In addition, any extension of the angiofibroma into the orbit and infratemporal fossa if found can also be removed by using this approach.[24]

CONCLUSION

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. Although endoscopic sinus surgery is considered the treatment of choice in experienced hands at present yet midfacial degloving approach is another excellent surgical option to treat majority of these sino-nasal diseases causing proptosis.

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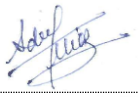
Dr. Adeel Niaz Registrar, Department of ENT Allied Hospital, Faisalabad	Graphs Making and Designing	
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