

Effects of Ethmoid Surgery on Proptosis and Vision

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ABSTRACT:

Objective: To evaluate the role of external ethmoidectomy in improvement of proptosis and vision due to ethmoid disease.

Materials and Methods: This interventional study was conducted in the department of Otorhinolaryngology and Head and Neck Surgery Quaid-e-Azam Medical College and Bahawal Victoria Hospital BahawalPur, Pakistan, from September 2013 to February 2014. Twenty four males and females who presented in the OPD with proptosis due to polyposis and allergic fungal sinusitis were included in this study. All the patients were electively prepared for this operation. All patients had pre operative CT scan of nose, PNS, Orbit and Brain. Proptosis and vision was checked by the ophthalmologist. Informed written consent was taken from all patients. All underwent external ethmoidectomy operation via Lynch Howarth approach which provided a direct and in depth view of the ethmoids and orbit.

Results: 13 patients were males and 11 were females with mean age 22.46 ± 10.15 years (range 7-45 years). All patients had proptosis and size of proptosis improved in 17 patients (70.83%). Impaired vision was seen in 17 cases and improvement was seen in 11 cases (64.70%). There were no major post operative complications and the minor complications like external scar, lacrimation and anterior nasal discharge resolved completely.

Conclusion: External ethmoidectomy has a role in improvement of proptosis and vision due to ethmoid disease. Orbital complications due to ethmoid disease should therefore be timely diagnosed and treated so as to have remarkable improvement in proptosis and vision.

Keywords: Proptosis, Vision, Ethmoid Surgery, Lynch Howarth approach, Orbital decompression, Ethmoiditis

INTRODUCTION:

Proptosis is a latin word, which means, prolapse. The contents of the orbit are present within rigid confines of the bony orbital walls. Any disease process within the orbit or adjacent region has a tendency to displace the orbital contents forwards, this displacement of the globe is known as proptosis. Though proptosis may seem to be primarily the concern of the ophthalmologist, but because of the close proximity of the orbit and the paranasal sinuses and various connecting fissures and

foramina between the two, many fronto-ethmoidal lesions present with proptosis.¹ Ethmoid labyrinth is a group of small sinuses on each side that lie between upper part of nasal cavity and orbit, and separated from later by paper thin bone, lamina papyraccia or orbital plate of ethmoid. This presents poor barrier to infection which may therefore spread into orbit.² The fronto-ethmoidal diseases causing proptosis usually present as nasal polyps and mucoceles.³

Nasal polypi are frequently seen in ENT practice. The word polyp is basically of Greek terminology meaning many footed (poly-pous). It was recognized in India for the first time and by 1000 BC. Curettes had been devised to remove them.⁴ Nasal polypi are prolapsed lining of the edematous nasal or sinus mucosa. They block the nose to a variable degree depending on their size, and cause nasal obstruction. On clinical examination, nasal polypi appear as pale, smooth, shining, glistening, multiple bags like bunch of grapes. Allergy is an important cause of polyp formation. Both imaging and clinical techniques help the clinician to determine the axial position of the globe in relation to the orbital bony rim. An exophthalmometer of an accurate design is necessary for diagnosis of proptosis.⁵ Surgical intervention performed to treat an underlying fronto-ethmoidal disease causes decrease in volume of the orbital contents, and hence improvement in proptosis. The external fronto-ethmoidectomy gains its widest applications in treating patients with fronto-ethmoidal lesions.⁶ External ethmoidectomy is an operation designed to gain access to the ethmoid sinuses via an external incision placed between the corner of the eye and the nose. This operation is indicated for cleaning irreversible mucosal disease in the sinus, recurrent sinus disease, polyposis, chronic obstruction to the drainage of infection from the sinuses and sometimes, as an approach to the sphenoid and pituitary gland. Occasionally, this operation is also performed to remove a mucocele or a tumor of the ethmoids. It gives better visualization and access to all

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the ethmoidal cells. But the disadvantage of this surgery is external scar, which may be minimal with meticulous suturing. This early surgical intervention not only improves the cosmetic look of the patient by relieving proptosis, but would also avoid consequences such as visual loss⁷ and intracranial extension.⁸ Present study was designed with the objective to highlight the improvement of proptosis and vision in patients who underwent Lynch Howarth procedure for an underlying fronto-ethmoidal disease.

MATERIALS AND METHODS:

This study was conducted at department of ENT & Head and Neck Surgery of Quaid-e-Azam Medical College and Bahawal Victoria Hospital BahawalPur from September 2013 to February 2014. Patients with nasal polyposis and proptosis were admitted. Proper history and examination was carried out, relevant investigations and CT scan of nose, paranasal sinuses were done in all patients. With the help of ophthalmologist, vision and proptosis was measured preoperatively. Proptosis was measured in millimeters with the help of exophthalmometer. Protrusion of the eye ball 19 mm or more was labelled as proptosis. Post operative decrease in size of proptosis was labeled as improvement, and noted in millimeters. Similarly vision was checked by ophthalmologist by Snell'n chart, and labeled 6/6, 6/9, 6/12, 6/18 etc. with decreasing vision. One step improvement in vision was labeled as one line improvement. A perferma was designed and filled with care. All patients under went external ethmoidectomy operation by LynchHowarth approach. Improvement in vision and proptosis was measured, 7 days and then 30 days after surgery. Patients with proptosis (19 mm and above) due to nasal polypi and allergic fungal sinusitis of any age and of any gender with or without visual impairment were included in the study. Whereas patients with proptosis due to orbital disease, patients with intracranial extension of disease, patients with proptosis due to nasal tumours/mucocele and patients with blindness were excluded from the study.

RESULTS:

A total of 24 patients with proptosis due to nasal polypi and allergic fungal sinusitis were included in the study. Out of these 13(54.16%) were male, and 11 (45.83%) were female. The mean age was 22.46 ± 10.15 years (range 7-45 years). All patients under went external ethmoidectomy approach. Proptosis and vision was measured 7 days and 30 days after surgery, but results were finalized 30 days after surgery. Improvement of proptosis was seen in 17 (70.83%) cases (Table 1). Average improvement in proptosis was 0.90 mm after seven days, and 1.95 mm after 30 days (Table 2) Impaired vision was seen in 17 cases, out of which 11 cases (64.70%) showed improvement in vision. In 6 cases no improvement of vision was seen (Table 3) Average improvement in vision was 0.82 lines after 7 days, and 1.17 lines improvement after 30 days (Table 4)

Table: 1
Improvement in Proptosis

Proptosis	No. of patients
Improvement	17 (70.83%)
No improvement	7 (29.16%)
Total	24

Table: 2
Average improvement in Proptosis

	After 7 days	After one month
Average improvement in proptosis	0.90 mm	1.95 mm

Table: 3
Improvement in Vision

Vision	No. of patients
Improvement	11(64.70%)
No improvement	6(35.29%)
Total	17

Table: 4
Average improvement in Vision

	After 7 days	After one month
Average improvement in vision	0.82 lines	1.17 lines

DISCUSSION:

The forward displacement of eye ball is called proptosis. Majority of cases of unilateral and bilateral proptosis are seen by ophthalmologist and only few are referred to ENT departments.⁹ The cause of proptosis in Otorhinolaryngology is mainly the disease in the frontal and the ethmoidal sinuses.¹⁰ The fronto-ethmoidal disease causing proptosis usually presents as nasal polypi and mucoceles.³ Proptosis is the most common ophthalmic sign of allergic fungal sinusitis.¹¹ Orbital involvement must be ruled out whenever an ENT patient presents with orbital complaints like proptosis, ophthalmoplegia, neurological dysfunction of eye, chemosis or epiphora.¹² Ballooning of edematous sinus or nasal mucosa is called nasal polypi. Patients may present with simple nasal polypi or polypi with fungus. Some of the patients with nasal polypi may also have intraorbital or intracranial extension. The treatment of nasal polypi, especially to prevent recurrence, has always been a challenging task for ENT surgeons. Small polypi without introrbital or intracranial extension may respond to oral or nasal corticosteroids, but the recurrence rate is high and usually surgery is required.¹³ The surgical treatment is intranasal polypectomy or ethmoidectomy. Although the chances of cure after surgical treatment are considered more, they are not free from complications like hemorrhage, infection, intraorbital or intracranial complications.

Recently a new technique of nasal polypectomy or ethmoidectomy has been developed, which is done with the help of Endoscope, called Functional Endoscopic Sinus Surgery (FESS). The Concept of Surgery was developed in 1970s, by Stammberger.¹⁴ Whichever technique of surgery is used, there is quite a high incidence of recurrence of nasal polypi after the operation, so surgery should be followed by corticosteroid nasal spray.¹⁵ The rate of recurrence is higher in patients with asthma, eczema and aspirin hypersensitivity.¹⁶ Patients with proptosis due to nasal polypi and allergic fungal sinusitis (thick viscous mucin) were included in our study. Allergic fungal sinusitis is a non invasive, but vigorous, inflammatory response to mold that occurs in immunocompetent patients with chronic sinusitis and nasal polyposis. It typically occurs in patients who have a history of atopic disease. Occasionally, the patients with allergic fungal sinusitis present with ophthalmic signs and symptoms, most commonly proptosis and diplopia.¹⁷ CT scans of these patients show hypertrophic sinusitis and often hyper attenuating allergic mucin within the sinus cavities. Extra sinus extension of disease is common. Surgical histopathology shows eosinophilic-lymphocytic mucosal inflammation and inspissated allergic mucin containing non-invasive fungal hyphae^{18,19,20}

Fewer relevant data is available on the subject of treating these fronto-ethmoidal lesions with proptosis. Some surgeons do Lynch Howarth approach while others prefer endoscopic approach. Still a lot of research work is required in this regard. Endoscopic sinus surgery is now frequently used newer technique. But it is costly and not available in every centre. That is why some surgeons still prefer external ethmoidectomy approach for the treatment of nasal polypi, especially to avoid recurrence, with good results.²¹ Saeed²² showed 97% success rate and Baig²³ 100% success rate with external ethmoidectomy regarding recurrence of nasal polypi. The current study evaluated the improvement of proptosis and vision after Lynch Howarth external ethmoidectomy approach. As we don't have the facility of endoscopic sinus surgery, so we preferred this approach with good results. Qureshi²⁴ performed Lynch Howarth external ethmoidectomy in 10 patients with polyposis and proptosis. Two patients (20%) had change in colour vision, indicating that the eye was at risk. These two patients underwent an emergency external ethmoidectomy procedure to save the eye. The results were remarkable with improvement of proptosis in all patients (100%) which is quiet high, while our study has showed improvement of proptosis in 70.83% cases. Aziz⁶ conducted similar study on 70 patients with proptosis due to frontoethmoidal disease. He noted improvement in protosis in 42 patients (60%), which is comparable with our study. Sheikh²⁵ also reported a single case with marked improvement in vision and dystopia after external ethmoidectomy approach. Thus external ethmoidectomy operation via Lynch Howarth approach provides a direct and in depth view of the ethmoids and orbit. Centers where endoscopic sinus

surgery is not available, this approach could be practiced. It offers not only access and illumination to this area but as mentioned earlier also a good perception of depth in ethmoids and orbit, to prevent complications like, hemorrhage and blindness. Although this technique has the disadvantage of external scarring but this can be minimized with meticulous suturing techniques. The scar also fades with passage of time.

CONCLUSION:

External ethmoidectomy approach has given remarkable results in improvement of the proptosis and vision. Orbital complications due to ethmoid disease should be timely diagnosed and treated to save the eye and prevent external deformity.

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