

Frequency of Improvement of Proptosis for an Underlying Fronto-Ethmoidal Disease after Lynch Procedure

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ABSTRACT

Objective: To determine the frequency of improvement in proptosis after Lynch procedure in patients with fronto-ethmoidal lesions.

Material and methods: It was a descriptive case series study. The study was carried out in the department of ENT unit-I, Mayo Hospital affiliated with the King Edward Medical University, Lahore. The duration of the study was for Six months (4th MARCH, 2010 to 3rd September, 2010). A Sample size of 70 cases was calculated with 95% confidence level, 11% margin of error and taking expected percentage of improvement (cured) cases of proptosis to be 71%.

Results: In this study 70 patients, with fronto-ethmoidal disease and associated proptosis were included. There proptosis was measured using exophthalmometer. Both pre-operative and post-operative proptosis was measured. And the results showed the mean age of the patients was 38.14±8.64 years with age range of 32(25-57) years. There were 50 males and 20 females in this study. So, the male to female ratio in this study was 2.5:1. The mean preoperative proptosis was 24±2.76 mm with range of 9(19-28)mm. The mean post-operative proptosis was 19.54±2.06 mm with range of 6(18-24)mm. After surgical procedure of Lynch, in 42(60%) patients the proptosis was corrected and in 28 (40%) of the patients the problem persist with mean proptosis of 21.85±1.2mm.

Key words: Proptosis, Fronto-Ethmoidal disease, Lynch procedure

INTRODUCTION

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 proptosis¹. Two thirds of the wall of the orbit consists of thin bony plates of the paranasal sinuses. Any lesions in them are likely to affect the orbit and at times cause forward displacement of the globe by decreasing the orbital volume. This forward displacement of the eyeball is called proptosis. Pre-requisite for diagnosing proptosis is an exophthalmometer of an accurate design².

The ethmoidal sinus lies between the orbit and the nose, in the ethmoidal labyrinth. The lateral wall of the labyrinth which makes the medial wall of the orbit is a paper thin and so is also called lamina papyracea. The frontal sinus appears as excavations into the diploe between the outer and inner tables of the frontal bone. Frontal sinus forms the medial part of the roof of the orbit. The important relations in both the ethmoid and frontal sinuses are its close proximation with the orbits. The cause of proptosis is mainly the disease in the fronto-ethmoidal sinuses³. The fronto-ethmoidal diseases causing proptosis

usually present as nasal polypi and mucocoeles⁴. Surgical intervention done to treat an underlying fronto-ethmoidal disease causes improvement in proptosis. The external frontoethmoidectomy gains its widest applications in treating patients with fronto-ethmoidal lesions.

Timely diagnosis and early surgical treatment in all fronto-ethmoidal lesions is very essential as eye is at stake. In Pakistan the improvement in proptosis post operatively after lynch procedure in all fronto ethmoidal diseases have not been done in detail.

This study is designed to give information about the improvement of proptosis in patients who undergo lynch procedure for an underlying front ethmoidal disease. This not only would identify the use of an early surgical intervention for relieving proptosis, but would also prevent and save the eye from end results of ophthalmic complications like blindness⁵.

MATERIAL AND METHODS

This was a descriptive case series study. The study was carried out in the department of ENT unit-I, Mayo Hospital affiliated with the King Edward Medical University, Lahore. The duration of study was Six months (4th March, 2010 to 3rd September, 2010). A Sample size of 70 cases was calculated with 95% confidence level, 11% margin of error and taking expected percentage of improvement (cured) cases

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of proptosis to be 71%. Non-probability purposive sampling technique was used.

Inclusion criteria:

- All patients were selected irrespective of age and sex.
- Patients with fronto-ethmoidal disease and associated proptosis measured using exophthalmometer were included in the study.
- Diagnosis of the fronto-ethmoidal disease was made on the basis of clinical examination and computed tomography scans of nose, paranasal sinuses and orbit.
- Patients with pre-operative proptosis of 19-28 mm (millimeter) were included in the study.

Exclusion criteria:

- Patients presenting with proptosis, due to any ophthalmic condition such as orbital tumor and orbital fractures were excluded from the study after an ophthalmic consultation.
- Patients who were not fit for surgery and those who refused from surgery were also excluded from the study.
- Seventy patients were admitted through out patient department of Otorhinolaryngology unit-I, Mayo Hospital after fulfilling the inclusion criteria. All 70 patients with fronto-ethmoidal disease and proptosis included in the study were assessed by clinical examination and computed tomographic scans of nose, paranasal sinuses and orbit.

All ethical issues were addressed. Social demographic data including name, age, sex and hospital registration number were recorded in a pre-designed proforma attached as annex-1 at the end. Surgical management (Lynch Procedure) was instituted accordingly by a single surgeon. Patients were followed up for assessment at the out-patient department after 2 weeks of surgery for measurement of proptosis post-operatively. The main outcome was measured by the returning back of proptosis to normal value of 18mm, which was considered as a cured case.

The data was entered and analyzed on SPSS version 10. Quantitative variables like age were presented as mean±standard deviation. Qualitative variables like gender and improvement in proptosis (returning to normal value of 18mm) was presented calculating frequency and percentage. Data was stratified for pre-operative proptosis to address effective modifies.

RESULTS

In this study 70 patients, with fronto-ethmoidal disease and associated proptosis were included. There proptosis was measured using exophthalmometer. Both pre-operative and post-

operative proptosis was measured. And the results turned out to be as under.

The mean age of the patients was 38.14±8.64 years with age range of 32 (25-57) years. (Table 1). There were 50 males and 20 females in this study. So, the male to female ratio in this study was 2.5:1. (Table 2)

The mean preoperative proptosis was 24±2.76 mm with range of 9 (19-28) mm. (Table 3). The mean post-operative proptosis was 19.54±2.06 mm with range of 6 (18-24) mm. (Table 4)

After surgical procedure of Lynch, in 42(60%) patients the proptosis was corrected and in 28(40%) of the patients the problem persist with mean proptosis of 21.85±1.2mm (Table 5)

Table 1: Descriptive statistics of age of patients (n=70)

Mean	38.14
Std. Deviation	8.641
Range	32
Minimum	25
Maximum	57

Table 2: Frequency table of gender (n=70)

Gender	Frequency	%age
Female	20	28.6
Male	50	71.4

Table 3: Descriptive statistics of Proptosis preop (n=70)

	Preoperative mm
Mean	24
Std. Deviation	2.76
Range	9
Minimum	19
Maximum	28

Table 4: Descriptive statistics of proptosis postop (n=70)

	Postoperative mm
Mean	19.5429
Std. Deviation	2.06198
Range	6.00
Minimum	18.00
Maximum	24.00

Table 5: Descriptive Statistics of corrected Proptosis (n=70)

Final outcome	Frequency	%age
Cured	42	60.0
Not cured	28	40.0

DISCUSSION

The abnormal forward displacement of the eyeball is called proptosis. It is measured by an exophthalmometer of an accurate design².

The cause of proptosis in Otorhinolaryngology is mainly the disease in the frontal and the ethmoidal sinuses³. The fronto-ethmoidal disease causing proptosis usually present as nasal polypi and

mucocoeles⁴. Because of the close proximity of the orbit and the paranasal sinuses and various connecting fissures and foramina between the two, these frontoethmoidal lesions present with proptosis¹.

The external approach using the Lynch procedure has been the traditional route for management of all such cases of frontoethmoidal lesions with proptosis. Lynch procedure gains its widest application in all the patients with nasal polypi and mucocoeles. When the acute inflammatory disease has extended into the orbit, this approach provides both orbital drainage and decompression and permits the removal of the disease, from both the frontal and ethmoidal sinuses. Lynch procedure is also a cosmetically acceptable incision, as it is not a deforming.

Tremendous research work has been done internationally and a lot of published material is available on fronto-ethmoidal lesions associated with proptosis. But still our literature is scanty on the subject of treating these fronto-ethmoidal lesions with proptosis and describing the need for surgical intervention in its treatment. We need lots of research work in this regard. Fewer relevant data is available on the subject under discussion. Seventy patients with fronto-ethmoidal lesions causing proptosis were included in the study. They were investigated specifically by CT scan of nose, paranasal sinus and orbit (to see the origin of the disease from frontoethmoidal sinus). Preoperative proptosis was measured using exophthalmometer. Adequate sinus surgery using the lynch procedure was carried out as a first step in the management of the patient. Our findings simulate in this regard with the local researchers.

Nausheen Quershi in 2007 performed Lynch procedure on 10 patients presenting with nasal polyps causing proptosis. Two patients (20%) had change in colour vision indicating that the eye was at stake. These two patients had an emergency Lynch procedure performed to save the eye, while the rest of the patients were electively prepared for the Lynch operation. The results were remarkable with disappearance of proptosis in all the 10 patients (100%) and returning back of the eyeball to the normal distance⁶.

Mohan and Sen in 1971 discussed 5 patients presenting with Fronto ethmoidal mucocoeles those were treated by Lynch procedure, 3 patients (60%) showed absolute recovery with returning of the eyeball to normal distance of 18mm from lateral orbital rim using exophthalmometer. While 2 patients (40%) of proptosis were not fully corrected⁷.

Similarly Akeem and Aderemi in 2007 discussed 12 cases of Fronto-ethmoidal mucocoeles being

treated by Lynch procedure with (70%) results⁸. It is thus strongly recommended that every case of fronto-ethmoidal disease should be thoroughly scrutinized with detail history, clinical examination and specific investigation like CT scan of nose, paranasal sinuses and orbit.

Lynch procedure applied for the removal of the disease from the fronto-ethmoidal sinuses in all such cases of proptosis is of wide value. As it not only regresses the proptosis but also saves the eye form other ophthalmic complications. Proper diagnosis and early surgical intervention in all such cases can change the whole line of action of treatment and minimize the fatal consequences.

CONCLUSION

Keeping in view the result of our study, we have arrived at the conclusion that lynch procedure done in all cases of fronto-ethmoidal diseases presenting with proptosis show marked improvement in the degree of proptosis. Many local and international studies have narrated that Lynch procedure by far is the most successful procedure for the improvement in proptosis in all such cases of fronto-ethmoidal disease.

After surgical procedure of Lynch in 70 patients, the result showed 42(60%) of the patients with corrected proptosis and in 28(40%) of the patients the problem persist with mean proptosis of 21.85 ± 1.2 mm.

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