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ENT
KEYWORDS: Transnasal, orbital decompression, csf leak, Diplopia

TRANSNASAL ENDOSCOPIC ORBITAL DECOMPRESSION- OUR STUDY AT TERTIARY CENTER

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INTRODUCTION

The large number of cases with Proptosis due to E.N.T. lesions produces high morbidity. This motivated us to carry out a study of such cases and its surgical treatment through Endoscopy.

The close proximity of sinuses and nasal cavity to orbit leads to various signs and symptoms early in the course of disease. The spread of infective and neoplastic lesions of paranasal sinuses and nasal cavity to orbit is easy due to various fissures and foramina as well as thin bony walls separating them.

Factors like reporting of a patient to hospital, complex anatomy, inadequate means of diagnosis and limitations of surgical treatment contribute a lot in delay in diagnosis and treatment.

This study provides guidance to endoscopic approach for orbital decompression done trans nasally in cases of proptosis/ exophthalmos due to either increase in intra orbital volume or external pressure on the orbit by PNS lesions.

AIMS OF STUDY :

1. To know the incidence of orbital involvement in various PNS pathologies.
2. To create more orbital volume by removing one or more of its walls.
3. To relieve compression on orbit and thus to allow the eye to return to normal position and function.

MATERIAL & METHODS :

Endoscopic orbital decompression

The endoscopic technique allows for unmatched visualization of critical anatomic regions including the skull base and orbital apex and avoids external or sublabial incisions.

The entire medial orbital wall as well as the medial portion of the orbital floor is removed with endoscopic decompression.

Technique:

Position:

The patient is positioned in the supine position, and topical vasoconstrictionis achieved with topical oxymetazoline (0.05%) pledgets. The eyes are maintained within surgical field, protected with scleral shields. Image guidance systems may be used at the surgeons discretion.

Anaesthesia:

Local injection of lidocaine 2% with 1:100,000 epinephrine is administered along the lateral nasal wall in the region of the maxillary line (a bony eminence that extends from the anterior attachment of the middle turbinate to the root of the inferior turbinate).

Procedure:

After standard preparation and infiltration of the nasal cavity and lateral nasal wall, an uncinectomy (Fig.5) is performed. The natural ostium of the maxillary sinus is identified and enlarged into the area of posterior fontanelle with straight through-biting Blakesly forceps and microdebrider.

It is essential to create the largest possible antrostomy (Fig. 6). because this gives access to the floor of orbit and after the decompression prevents obstruction of ostium if significant prolapse of fat occurs. If the antrostomy is small, blockage of the antrostomy and resultant sinusitis may develop.

An axillary flap is performed and the frontal recess cleared of cells with identification of frontal ostium. A total sphenoethmoidectomy (Fig.7,8) is performed with identification of the sphenoid sinus ostium. This ostium is enlarged into the posterior ethmoids, allowing entry into the sphenoid through the posterior ethmoids. The skull base is identified and cleared so that the entire lamina papyracea is visible.

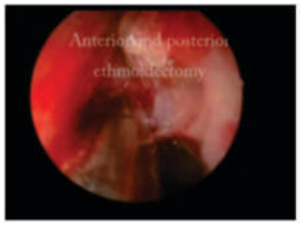


Fig .7

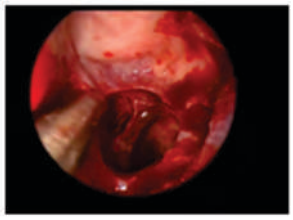


Fig.8

The hard bone of the frontal process of maxilla is palpated with Freer's elevator and the soft lacrimal bone identified. This soft lacrimal bone may be left and the junction of the lacrimal bone and lamina papyracea is identified. If there is doubt about the lacrimal bone this may be flaked off and the lacrimal sac palpated to

accurately identified the lacrimal sac.

The blunt end of the Freer's elevator is then gently pushed through the lamina papyracea and the thin bone forming the lamina papyracea is flaked off.

Great care must be taken to preserve the orbital periosteum at this early stage because a tear of the orbital periosteum with prolapse of orbital fat can obscure the remaining lamina papyracea and make this more difficult. Care should also be taken not to remove the bony lamina papyracea for at least 1.5 cm below the frontal ostium. This bone is left in place to prevent prolapsed of orbital fat obstructing the outflow tract of the frontal sinus. If chronic frontal sinusitis results after endoscopic transnasal orbital decompression this can be difficult to treat.

The remaining bone of lamina papyracea is removed up to the skull base and posterior as far as the sphenoid sinus.(Fig.9)

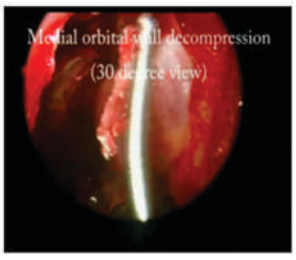


Fig.9 **Fig.10**

After removal of the orbital periosteum this is sufficient for orbital decompression for intraorbital haemorrhage or for a small reduction in proptosis cosmetic exophthalmos from Graves' disease (~ 2 mm).(Fig.10)

If a greater amount of decompression and globe retrogression is required further decompression can be achieved by removal of the posterior half of the orbital floor. The bone thickens at the transition from the medial orbital wall to the floor of the orbit. Angled curettes and Blakesely forceps are used to fracture this bone and removed to it.

The infraorbital nerve is identified as it runs along the floor of the orbit (roof of the maxillary sinus). The posterior floor of the orbit is removed up to the infraorbital nerve. Only the posterior half of the orbital floor can be assessed through the maxillary antrostomy.

Fig.11 **Fig.12** **Fig.13**

The average amount of globe retrogression with the removal of both medial wall and floor of the orbit is 5mm. (Fig.11)

The orbital periosteum is either incised in a series of horizontal incisions or removed entirely(Fig.12,13). Retention of a medial strip of orbital periosteum may reduce the incidence of postoperative diplopia.

RESULTS

The goals of orbital decompression vary depending upon the indication for the procedure. In patients with compressive optic neuropathy, restoration of visual deficits is the key outcome, while in patients with corneal exposure or severe proptosis, ocular recession may be the primary end point.

The reported incidence of improvement following endoscopic orbital decompression for Graves' orbitopathy ranges from 22% to 89%. This wide variation in results reflects the diverse patient populations and definitions of improvement.

Postoperative deterioration of visual acuity occurs in less than 5% of patients. Ocular recession as a result of endoscopic decompression alone averages 3.5 mm (range 2–12 mm). The addition of concurrent lateral decompression to the endoscopic procedure provides an additional 2 mm of globe recession.

Procedure in cases of complicated Rhino sinusitis

1. At the beginning of the procedure, any purulence in the middle meatus should be collected in a sterile fashion and the specimen sent for cultures.

2. The initial manoeuvre is uncinectomy and maxillary sinus antrostomy..

3. If there is no disease, or if there is minimal mucosal thickening in the maxillary sinus, a formal maxillary antrostomy may not be necessary, and the maxillary sinus outflow tract is best left undisturbed.

4. The bulla ethmoidalis is then penetrated and removed with through cutting instruments or with a microdebrider. Care should be taken to avoid injury to the middle turbinate and medial orbital wall, especially when using powered instrumentation. The blade of the microdebrider should be pointing perpendicular to the medial orbital wall. The lamina papyracea is then skeletonized with through-cutting instruments in preparation for the drainage of the orbital abscess.

Sometimes, pus can be seen streaming from the orbit at the completion of the ethmoidectomy, usually occurring through a natural dehiscence or a crack in the lamina papyracea, especially when orbital pressures are elevated. Purulence should be collected and sent for cultures.

5. Drainage of the orbital collection is initiated by cracking the lamina papyracea with a Cottle or freer elevator. This step is omitted if there is spontaneous drainage of pus from the orbit. The 30-degree telescope may be used to perform this maneuver.

6. Bone from the lamina papyracea is elevated gently with a Cottle or freer elevator and removed until adequate drainage of a subperiosteal abscess into the middle meatus is achieved. Complete drainage of the abscess may be confirmed by placing gentle pressure on the eye.

7. The nasal cavity is then irrigated with normal saline. If the middle turbinate is sitting in a lateral position and there is a risk of scarring to the decompressed orbit, a middle-turbinate medialization technique may be performed. Alternatively, a piece of gelfilm or gelfoam may be placed.

Nasal packing is avoided.

Additional steps

1. Posterior ethmoidectomy is indicated if there is significant posterior ethmoid disease and extension of the abscess toward the orbital apex. It may also be necessary to achieve wide exposure and decompression of the medial orbital wall, especially if the orbital pressures continue to be elevated substantially. This step is sometimes necessary when dealing with intraorbital abscesses, but is needed rarely in subperiosteal abscess drainage. Posterior ethmoidectomy begins with perforating the basal lamella on its superior and lateral aspect back to the face of the sphenoid.
The medial orbital wall is skeletonized and elevated carefully. In the case of a subperiosteal abscess, care should be taken not to violate the periorbita.
2. Presence of isolated sphenoid or frontal sinus disease in patients who have orbital abscesses is extremely rare, especially in the pediatric population. Therefore, sphenoidotomy and frontal sinusotomy are undertaken only on rare occasions.

3. Incision of the periorbita is usually necessary to drain an intraorbital abscess (Fig. 14) by sickle knife under the guidance of telescope. This manoeuvre usually affords good drainage of most extraconal abscesses. The intraoperative measurement of orbital pressures is extremely helpful and often dictates the extent of orbital decompression.

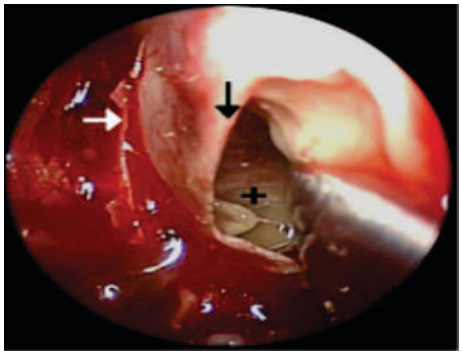


Fig. 14. Endoscopic view of a left extraconal intraorbital abscess that was drained using the transnasal endoscopic approach. The lamina papyracea (white arrow) has been widely decompressed. The periorbita (black arrow) has been incised to expose and drain an extensive intraorbital collection (+).

Postoperative care

In adults, postoperative care is performed as in routine sinus surgery.

Patients are instructed to perform twice-daily nasal saline irrigations. Endoscopic debridement is performed after 1 week, to remove debris and crusts, and may be repeated as needed.

Complications

Diplopia is not an uncommon occurrence following orbital decompression with 15% to 63% of postoperative patients reporting new-onset diplopia or worsening of preexisting symptoms. This complication is believed to be a result of a change in the vector of pull of the extraocular muscles. Decompressive surgery rarely alleviates preexisting diplopia. Patients who have diplopia following decompressive surgery often require strabismus surgery for correction. All patients should be informed of the possibility of postoperative double vision, as well as the potential need for further surgical intervention if this persists.

Several methods to decrease postoperative diplopia have been reported. Multiple authors have described the preservation of a strut of inferomedial bone between the decompressed floor and medial wall.

When this strut is maintained, however, it is technically difficult to remove the orbital floor through a purely endoscopic technique. The maintenance of a facial sling in the region of the medial rectus has also been demonstrated to decrease the incidence of postoperative diplopia. This technique provides similar support as the medial strut technique, but allows for endoscopic access to decompress the medial orbital floor. The concept of a balanced decompression (concurrent medial and lateral decompression) has also been suggested as a means to decrease postoperative diplopia.

When operating for compressive optic neuropathy, techniques designed to limit diplopia may also limit the extent of decompression, and postoperative diplopia is often accepted as a concession to improved visual acuity.

Postoperative **bleeding** following decompression is best managed through endoscopic identification and direct cauterization of the bleeding site. Nasal packing is generally not used to avoid pressure on the exposed orbital apex and optic nerve.

Postoperative **infection** is minimized through the use of postoperative antibiotics with staphylococcal coverage.

A large maxillary antrostomy and limited bone removal in the frontal recess region minimize the risk of developing postoperative sinusitis.

Epiphora may develop if the maxillary antrostomy is extended too far anteriorly with transection of the nasolacrimal duct. This complication is treated with an endoscopic dacry ocystorhinostomy.

Leakage of cerebrospinal fluid and **blindness** are very rare complications that have been reported following non-endoscopic decompression techniques.

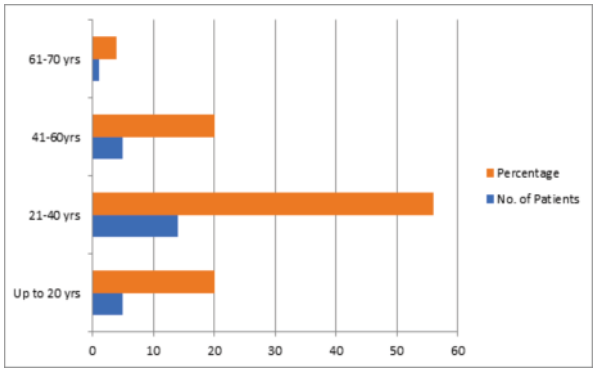


Chart No. 1 Age Distribution

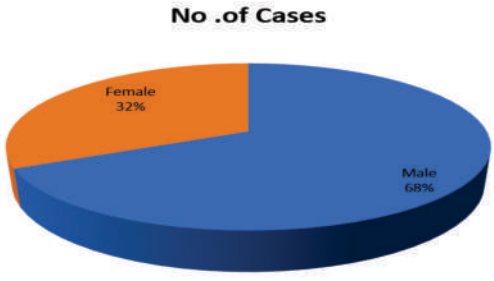


Chart No. 2 Sex Incidence

OBSERVATIONS AND DISCUSSION

- This is about a series of twenty five consecutive patients of proptosis due to mainly nasal or paranasal lesions :

The main observations in this study are documented as follows:

Table No. 1 Age Distribution of Cases

Age in Yrs.	No. of Patients	Percentage(%)
Up to 20	5	20
21-40	14	56
41-60	5	20
61-70	1	4

In our study most common age affected was between 20-40 yrs. Our observation compared with other investigator was:

Investigator	Age Group
Toronto Hospital for sick children	Up to 20
Queen Mary Hospital	28-69
Desmond Wee	25-65
In Our Study	Up to 70(most common b/w 20-40yrs)

In our study patients presented with mostly between 20-40 yrs due to infective etiology.

Table No. 2 Sex Incidence

Sex	No. Of cases	Percentage
Male	17	68
Female	8	32

In our study male predominance (68%) was observed.

Age: The series comprised of variable age patients. The youngest patient was 11 yrs old and oldest was 65 yrs old.

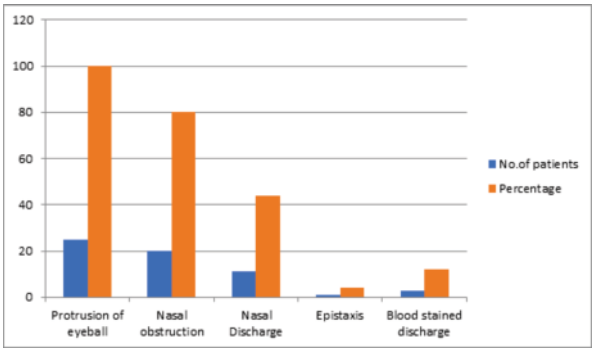


Chart No. 3 Chief Complaints

Table No. 3 Chief Complaints

Complaint	No.of patients	Percentage
Protrusion of eyeball	25	100
Nasal obstruction	20	80
Nasal Discharge	11	44
Epistaxis	1	4
Blood stained discharge	3	12

Frazell El and Lewise J.S. in the series of 416 patients of cancers of nose and P.N.S. have described the incidence of epistaxis in 51 patients (12.5%).

Their presentation of Symptomatology of 416 patients was as follows:

Nasal Obstruction	146	35%
Facial swelling	104	25%
Pain	61	14.6%
Epistaxis	51	12.5%
No symptoms	37	9%
Mass in Palate	17	4%

Comparison of various investigator of symptomatology given below:

Symptoms	Frazell	Lenworth	In our study
Proptosis	416	79	25
Nasal Obstruction	146	16	20
Nasal Discharge	146	11	14
Facial Swelling	104	12	0
Pain	61	8	8
Epistaxis	51	8	1

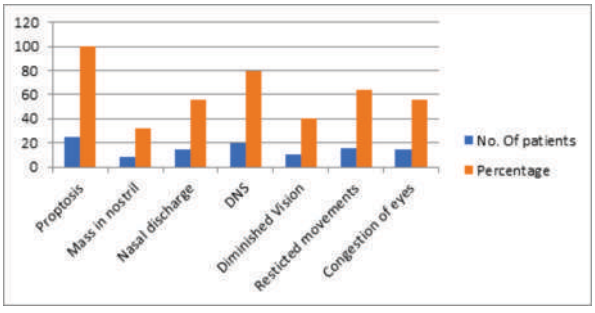


Chart no. 4 Clinical Findings

Table no. 4 Clinical Findings

Findings	No. Of patients	Percentage
Proptosis	25	100
Mass in nostril	8	32
Nasal discharge	14	56
DNS	20	80
Diminished Vision	10	40
Restricted movements	16	64
Congestion of eyes	14	56

The most common clinical findings in our study was proptosis and nasal discharge and DNS associated with other concurrent findings like congestion of eyes.

Table No.5 Investigations

Investigation	No. Of cases IX done	Positive	Percentage
X-Ray P.N.S.	19	19	100
CT PNS with Orbit	25	25	100
MRI	8	8	100

According to clinical findings we investigate each patient for further management and evaluation.

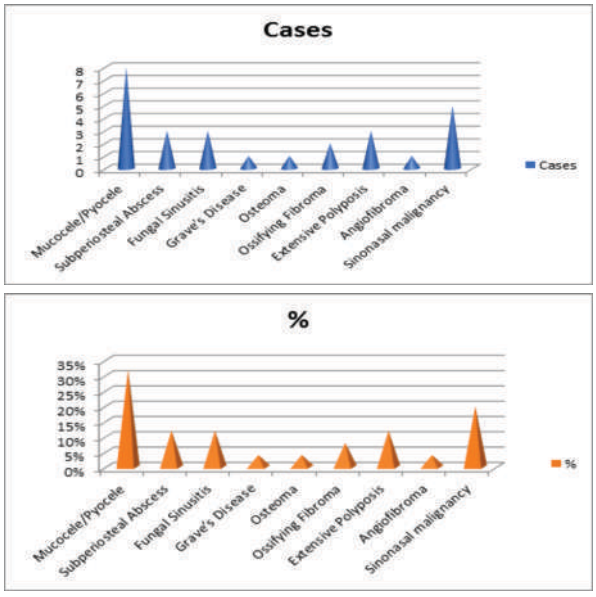


Chart No. 5 Frequency of Individual lesions

Table No. 6 Frequency of Individual lesions

No.	Diagnosis	Cases	%
1	Mucocele/Pyocele	8	32%
2	Subperiosteal Abscess	3	12%
3	Fungal Sinusitis	3	12%
4	Grave's Disease	1	4%
5	Osteoma	1	4%
6	Ossifying Fibroma	2	8%
7	Extensive Polyposis	3	12%
8	Angiofibroma	1	4%
9	Sinonasal malignancy	5	20%

So in our study most of the cases were mucocele/ pyocele , extensive polyposis with complicated rhino- sinusitis.

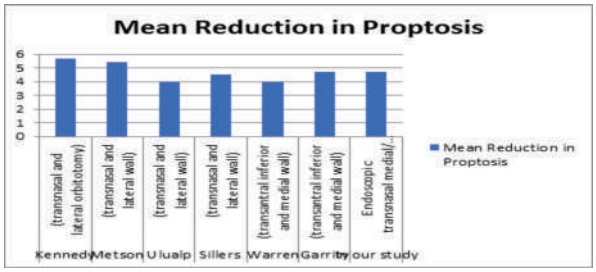


Chart No. 6 Comparison of Surgical Approaches

Table No. 7 Surgical Approaches

Indication	Surgery
Fronto-ethmoidal mucocele	Drainage of mucocele and widening of frontal ostium.
Invasive fungal sinusitis	removal of medial orbital wall.
Graves disease	Removal medial orbital wall and allowing orbital contents to prolapse in to sinus cavity.
Subperiosteal abscess	Removal of lamina and drainage of abscess.

In our study according to pathology were doing endoscopic transnasal orbital decompression thorough various approaches given below:

Comparison of technique wtih other investigator:

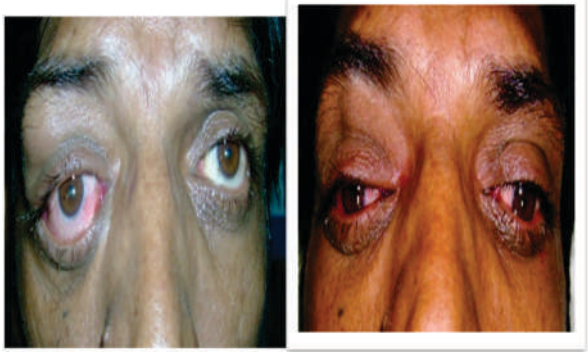
Investigator	Procedure	Mean Reduction in Proptosis
Kennedy	(transnasal and lateral orbitotomy)	5.7
Metson	(transnasal and lateral wall)	5.4
Ulualp	(transnasal and lateral wall)	4.0
Sillers	(transnasal and lateral wall)	4.5
Warren	(transantral inferior and medial wall)	4.0
Garrity	(transantral inferior and medial wall)	4.7
In our study	Endoscopic transnasal medial/ inf./lat. Wall decompression	4.72

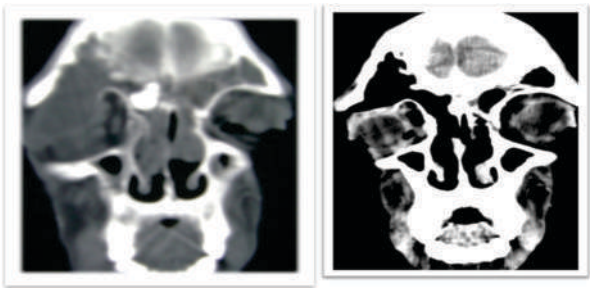
Table No. 8 Comparison between Pre-op and Post-op Findings in our study

AETIOLOGY	PREOP SYMPTOMS	POST OP (CLINICALLY)	ENDO SCOPICALLY
Fronto-ethmoidal mucocele	Proptosis Diplopia Swelling	improved	Well healed ethmoidal cavity and frontal recess visible.
Invasive fungal sinusitis	Proptosis headache Nasal block Discharge	improved	Fungus removed n normal phisiology established
Graves disease	Signs of hyperthyroidism Proptosis Visual loss Corneal ulcer	Dec prop Vision better Ulcer resolved	Orbital content present in nasal cavity
Subperiosteal abscess	Proptosis Fever Headache	improved	Ethmoid cavity visualized.

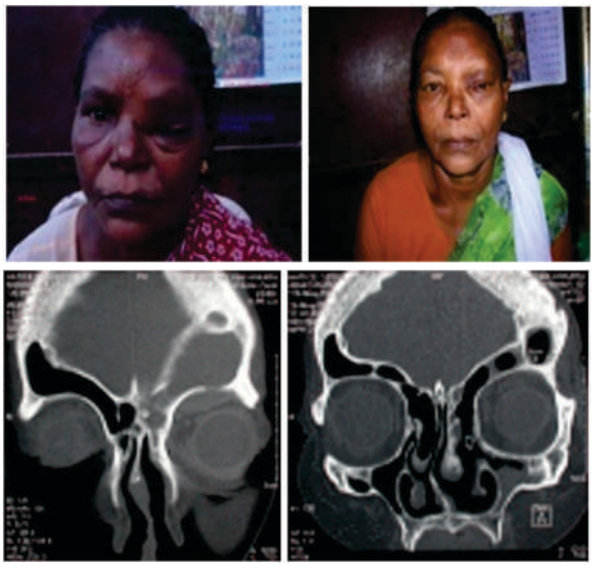
Pre And Post Op Photographs
(Fig 15)

Frontal mucocele with osteoma
Pre-op Post-op

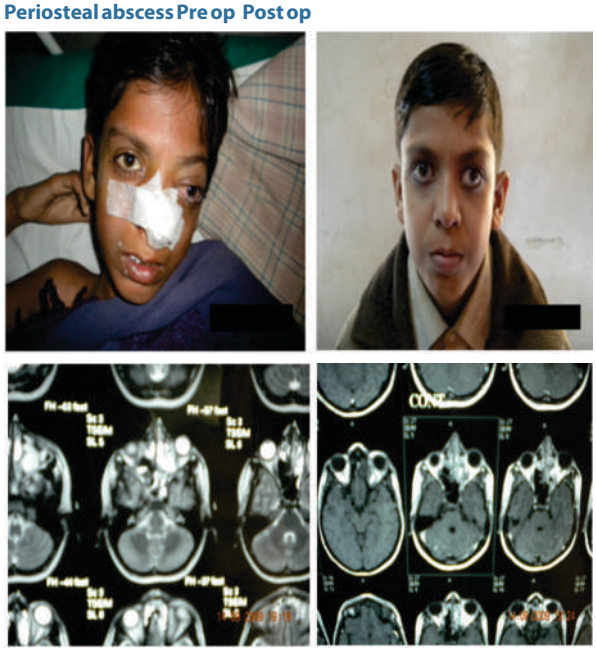




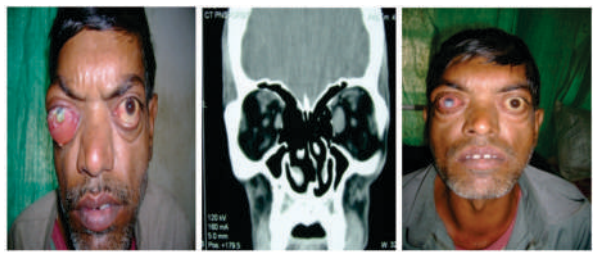
Mucocele(Pre& Post Op)

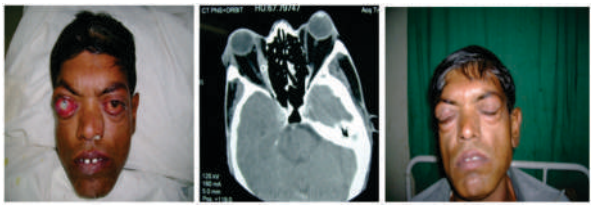


Periosteal abscess Pre op Post op



Grave's Disease pre-op post-op





This is a small series but shows a variety of lesions involving the orbit. As such this series of consecutive cases of 25 patients of proptosis due to nasal and paranasal sinus lesions may be considered a small one to bring out authentic conclusions but due to its specificity it does point out many interesting facts.

Many authors have given their analysis of such cases of proptosis. The Toronto Hospital for sick children breaks up the diagnosis of 257 children of proptosis as follows compare with our study:

Etiology	Percentage in above study	In our study(%)
Inflammatory	30%	72%
Vascular disease	19%	04%
Local Neoplasm	16%	20%
Metabolic Disease	14%	--
Development Anomalies	09%	--
Gen. Systemic Disease	07%	04%
Miscellaneous	01%	--
Unknown	04%	--

But **in our study** most cases were due to infective and inflammatory aetiology and some had vascular aetiology. Our study gave special attention to sinus lesions and its relation to orbit but above study lacked it. In above study inflammatory causes (30%) highest on list, does not specify P.N.S. origins. Similarly vascular causes are also likely to be orbital or paraorbital.

Palmer compiled 8 series and subdivided the relative frequency of proptosis in 2073 cases on the basis of aetiology as follows:

Vascular disorders	15.4%
Inflammation	13.1%
Lymphoma	8.9%
Metastatic disorders	6.9%
Meningioma	5.6%
Neuroma	5.2%
Other Tumours	27.6%
Undiagnosed	5.4%

As we have not included the cases where pathological lesions do not arise from nasal or paranasal region, the etiological break up of proptosis is likely to be different due to various local orbital lesions which are not related to P.N.S. directly.

In Hendersen's series of orbital tumours 89 out of 465 (19%) were secondary orbital tumours and 7% out of 465 originated from sinuses. In his series 12 out of 20 (60%) antral carcinomas first presented because of symptoms and signs of orbital invasion.

In our series maximum patients are below 45 yrs. The presentation was mainly due to ophthalmic symptoms rather than E.N.T. symptoms. This could be because of our condition for inclusion of case of P.N.S. lesion was Proptosis.

The breakup of E.N.T. Symptoms in our series was as follows:

Complaint	No.of patients	Percentage
Nasal obstruction	20	80
Nasal Discharge	11	44
Epistaxis	1	4
Blood stained discharge	3	12

Looking at these E.N.T. symptoms we can see that symptoms of nasal obstruction and discharge topped the list. As has already been discussed in case selection that only those cases were selected whose lesion causes proptosis after arising from P.N.S. , Nasopharynx and Nasal cavity. Now it is obvious that one nose at least will be blocked when the lesion is situated in nasal cavity or in nasopharynx and reaching posterior nares.

As such there are two main possibilities of lesions from these E.N.T. sites invading orbit. Infection and Neoplasm spreading the orbit.

Those neoplasm which can invade the orbit from sinuses may progress on the nasal side also to cause nasal obstruction.

About epistaxis or blood stained discharge, the malignant lesion have given rise to epistaxis and also lesions like angiofibroma which were locally eroding.

The incidence of nasal obstruction and facial swelling was high in above study. **In our study** proptosis and nasal obstruction due to various P.N.S. pathologies most likely.

Due to proptosis there is possibility of lagopthalmos and there for depending on the amount of exposure keratitis there are symptoms of diminished vision and congestion of eyes.

The presentation of diplopia is due to mechanical restriction of the movement of eye. In all these patients the orbit is filled with extra mass and therefore eyeball is pushed forward resulting in proptosis. Further there would be mechanical obstruction also to the movement of affected eyeball and as the other may be freely mobile or less involved , there would be dissociation of the axis of eyes and diplopia results.

According to Lenworth N. ; Proptosis is more often seen when it is possible to diagnose nasal or paranasal sinus origin tumour. i.e. When tumour is significantly advanced for these patients pressure atrophy of optic nerve may be responsible for ophthalmic symptoms.

Discussion In Different Types Of Cases In Our Series

As we have selected mainly cases of proptosis with P.N.S. and nasal lesions ; for this we have two very large series of 230 cases of proptosis by Silva (1966) and other by Reese and Jones (1962) who have given aetiologies as follows:

Diagnosis	Silva series	Rees and Jones series	In Our Study
Peudotumour	26	18	1
Mucocele	25	6	8
Dermoid cysts	18	11	-
Meningioma	15	7	-
Orbital Retinoblastoma	15	0	-
Ca Palpebral extension	14	0	-
Haemangioma	13	28	-
Endocrine ophthalmopathy	11	37	1
Malignant lymphoma	11	22	-
Carcinoma from sinuses	11	0	1
Tumours of lacrimal gland	10	17	-
Melanoma	9	0	-
Tumours of peripheral nerve	8	7	-
Undifferentiated Sarcoma	6	2	-
Osteoma	4	2	1
Fibrosarcoma	4	0	-
Rhabdomyosarcoma	4	5	-
Osreosarcoma	3	0	-
Glioma of Optic nerve	3	8	-
Metastatic	3	8	-
Aneurysm	3	5	-
Lymphangioma	2	10	-

Fibrous Dysplasia	1	1	2
Lipoma	1	1	-
Haemangiosarcoma	1	5	-
Neuroblastoma	1	0	-
Sarcoidism	0	2	-
Other aetiology	0	23	11

Now if we look at this series, neoplasm predominate as causes of proptosis.

In an Indian series of 31 patients presented by Mohan H. Sen D and Gupta New Delhi, also about orbital affection in the nasal and paranasal neoplasm stated that 21 were malignant and 10 were benign.

In our series 8 cases of mucocele/pyocele which are histologically seen as cyst lined by respiratory type of pseudo stratified ciliated columnar epithelium and containing scattered inflammatory cell in the wall. Infact a pyocele is formed when a mucocele becomes secondarily infected. Three main theories: (1) Pressure erosion (2) Cystic degeneration of glandular tissue (3) Active bone resorption and regeneration. Most common site is frontoethmoid. Aetiological factors mainly infections and nasal polyps.

Optic nerve can tolerate considerable stretching with upto 20 mm of axial proptosis but when further displacement occurs, vision is compromised.

In above cases surgical drainage relives proptosis along with antibiotic coverage.

A subperiosteal abscess may result from an acute episode of frontal rhinosinusitis. It is abscess formation deep to the periosteum of orbital bones, usually the lamina papyracea. Pt. Presenting with proptosis . In our cases all patients were treated by antibiotic coverage with surgical drainage via frontal recess and by removal of lamina papyracea.

In cases of orbital cellulitis which is secondary to ethmoid rhinosinusitis, endoscopic ethmoidectomy with removal of lamina papyracea and perinasal drainage of orbital abscess was done.

Inflammatory polyps of nasal sinuses are considered as pedunculated pieces of the oedematous upper respiratory mucosa.

They can arise from any part of the nasal cavity and sinus mucosa. It can begin from one of sinus and enters the nasal cavity and when extensive can push the orbit leading to proptosis. Surgical treatment by middle meatus antrostomy, anterior and posterior ethmoidectomy, frontal recess clearance and sphenoidotomy by endoscopic route relived the proptosis. Pre and post operative topical and systemic steroid and antibiotics were given.

Chronic invasive fungal rhinosinusitis is occurring mostly in immunocompetent patients like diabetes mellitus. Most common fungus seen is Aspergillus species. All 3 patients have diabetes mellitus and was treated by thorough debridement with surgical drainage and antifungals with antibiotics and antidiabetic drugs.

Graves' disease is an autoimmune disorder in which there are antibody mediated effects on ocular muscle. In our series pt presented with bilateral proptosis with exposure keratitis with abscess in Rt. Eye. Visual acquity decreased and eye movements restricted in all directions. Clinical features suggestive of thyrotoxicosis. With medical and surgical management via endoscopic transnasal orbital decompression proptosis, Visual acquity and and eye movements improved.

Other cases are nasal mass like osteoma , ossifying fibroma, angiofibroma and sinonasal malignancy was removed by this approach and proptosis was improved in all subjects.

After this discussion it is expected that the impact of the exact amount of clinical significance, symptomatology, clinical presentation , investigations, confirmation of diagnosis helpful in surgical management of these patients.

CONCLUSION

- Males are more common affected than females in cases of proptosis.
- Majority of cases are presented with protrusion of eyeball, nasal obstruction and nasal discharge.
- Most common cases are extensive nasal polyposis with or without fungal sinusitis, mucoceles/pyoceles.
- Mucopus along with DNS are most common NE findings.
- Endoscopic approach is least invasive and better approach in these cases for post op complications and outcome of patients.
- Endoscopic orbital decompression is a very precise and safe procedure to regain normal physiological functions by removing the pathology and restoring anatomy.
- Orbital decompression is an effective method for reduction of proptosis, for eye complications from exposure of cornea and visual loss.
- Mean Reduction in Proptosis obtained in this approach was 4.7 mm.
- Grave's disease required combine management medical in the form of methyl prednisolone 15mg\kg and orbital decompression in the form of removal of medial orbital wall.
- In Invasive fungal sinusitis along with meticulous surgical treatment, medical mx in form of Amphotericin B should be given.
- An experienced surgeon along with a well equipped centre are required for successful outcome
- In patients with mucocele\pyocele postop improvement in the form of relieve of diplopia & reduction of proptosis was obtained on table.
- Post-operative care & regular follow up is very important for all patients.

Conflict of interest

The author declare that they have no conflict of interest.

Ethical Approval

All procedures performed in this study involving human participants were in accordance with the ethical standard.

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