



OTORHINOLARYNGOLOGICAL PATHOLOGY WITH ASSOCIATED OPHTHALMOLOGICAL FEATURES – A BRIEF DISCUSSION

ENT

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ABSTRACT

Ophthalmological complication due to otorhinolaryngological pathology is quite common as the anatomical structure of the eye is closely related to the nose and paranasal sinuses. Therefore any patient presenting with diplopia, orbital cellulitis, proptosis, decrease in visual acuity, periorbital swelling, and facial nerve palsy should be suspected of underlying otolaryngological pathology.

Material And Methods: This is a clinical study carried out in the department of Otorhinolaryngology Gauhati Medical College and Hospital from May 2019 –January 2020 . A total of 40 patients of otorhinolaryngology disease with ophthalmological manifestation were included in the study.

Results: The most common otorhinolaryngological pathology causing ophthalmological manifestation were sinonasal mass and the most common ophthalmological feature was diplopia followed by proptosis.

Conclusion: Early diagnosis and management is very important to prevent dangerous complication like blindness and intracranial spread. Therefore, proper cooperation between ENT and EYE surgeon is much required in all Eye manifestations of ENT origin to find out the actual disease process and to treat accordingly.

KEYWORDS

Otorhinolaryngology, Pathology, Ophthalmological, Features .

INTRODUCTION

The orbit, surrounded on three sides by the paranasal sinuses, is an area of considerable interface between otorhinolaryngologists and ophthalmologists. Inflammation, infection and neoplasia can spread in both directions. The medial wall of the orbit is of most significance to the otorhinolaryngologist. It is composed of the frontal process of the maxilla , the lacrimal bone, the lamina papyracea of the ethmoid and the body of the sphenoid. Roof is formed by the frontal bone. The inferior wall formed by orbital surface of the maxilla, the zygomatic and the palatine bone [1].

The average volume of the adult orbit is 30mL, 70 percent of which is occupied by retrobulbar and peribulbar structures. The finite capacity of the bony orbit means that increase in tissue volume usually result in anterior displacement of the orbital contents. The commonest example of this is thyroid eye disease where hypertrophy of the extraocular muscles and fat produce at least cosmetic embarrassment and at worst corneal exposure, ulceration and even prolapse of the globe. Involvement of the muscles may lead to diplopia and compression of the optic nerve at the orbital apex leading to visual loss [2].

Veins from the orbit, nose and paranasal sinuses and adjoining facial regions drain to cavernous sinus through valveless communications [3.] The cavernous sinuses receive venous blood from the facial veins via ophthalmic veins which empty into the inferior petrosal sinuses, then into the internal jugular veins and the sigmoid sinuses [4]. Orbital complications may arise from infections of the upper lip, septum of nose and adjacent areas (dangerous area of the face), through the direct extension of the pathology of the nose, paranasal sinuses, and nasopharynx into the orbit or involvement of the nerves supplying the orbit. Therefore, a clear knowledge about the anatomical relationship of nose & PNS to the eye is very important in understanding the symptoms, spread of diseases and also in the treatment plan (Jones) [5].

Orbital symptoms can be a presentation of various infective and neoplastic conditions of the nasal cavity, paranasal sinuses, and nasopharynx, or even trauma. The infectious agent can be bacterial, viral, or fungal. Out of the many complications of rhinosinusitis, ophthalmological complications are the most frequently encounter [6]. Orbital Complication of rhinosinusitis can be classified according to

chandler classification.

- 1)Preseptal cellulitis
- 2)Postseptal cellulitis or orbital cellulitis without abscess
- 3)Subperiosteal abscess
- 4)Orbital or intraperiosteal abscess
- 4)Cavernous sinus thrombosis [6].

AIMS AND OBJECTIVE

Objective- To study various Otorhinolaryngological diseases with associated ophthalmological features

-To evaluate the etiologic factors, diagnosis , management , the severity of ophthalmological complication due to ENT disorder and early intervention by the ophthalmologist.

METHOD AND MATERIAL

This is a clinical study carried out in the department of otorhinolaryngology Gauhati Medical College and Hospital from May 2019–January 2020. A total of 40 patients of otorhinolaryngological disease with orbital manifestation were included in the study in all age groups.

Most of the Patient initial assessment was done in otorhinolaryngology OPD and some were referred from ophthalmology OPD at Gauhati Medical College and Hospital. Patients underwent Detailed history and Careful clinical examinations of ENT and Head-Neck and Orbital regions and recorded in a proforma.

Patients underwent various Investigations : Diagnostic nasal endoscopy - done in all cases of sinonasal mass, dacryocystitis , nasal bone trauma or whenever necessary. CT Scan of nose and paranasal sinuses ,HRCT mastoid –done in cases of temporal bone trauma, and unsafe CSOM, MRI with or without angiography, Fine needle aspiration cytology, Biopsy and histopathological examination of the suspected mass . Topodiagnostic test and Pure tone audiometry was done in all the patients with facial nerve palsy .

Treatment Plan:

Medical, Surgical if there is any progression or lack of resolution with medical therapy over 48 hrs- surgery is recommended, Regardless of approach- any abscess should be drained and the underlying sinus disease should be addressed. Most cases of chandler stages I-IV,

recover well with conservative treatment.

Sinonasal neoplasms causing proptosis were managed surgically and surgical approach was chosen depending on the location and extension of the mass.

Supportive treatment like moxifloxacin, methylcellulose eye drop was given to cases with a total loss of vision.

Orbital cellulitis cases mostly responded well with iv antibiotics.

Patients with facial paralysis due to cholesteatoma underwent a modified radical mastoidectomy. Mastoidectomy with facial nerve decompression was done in facial palsy due to temporal bone trauma

Exclusion Criteria:

Bell's palsy, post operative case of septorhinoplasty has been excluded from the study.

RESULTS AND OBSERVATION

The study was conducted on 40 patients, both inpatient and outpatient department of Otorhinolaryngology of Gauhati Medical College and Hospital. Details of the demographic data given in tables 1 & 2.

Table 1: Distribution Of Patients According To Sex

Gender	No of patients	Percentage
Male	28	70%
Female	12	30%

Table 2: Distribution Of Patients According To Age

Age group	No patients	Percentage
5-15	10	25%
16-25	0	00
26-35	0	00
36-45	20	50%
46-55	7	17.5%
56-65	3	7.5%

Table 3: Different ENT Disorder Causing Eye Complication

ENT DISORDER	No OF PATIENTS	PERCENTAGE
1) SINONASAL MASS CAUSING ORBITAL COMPLICATION	19	47.5%
-Squamous cell carcinoma of the nasal cavity	4	10%
-Fibrous dysplasia	3	7.5%
-Inverted papilloma	3	7.5%
-Chronic fungal sinusitis	3	7.5%
-Nasopharyngeal carcinoma	3	7.5%
-Esthesioneuroblastoma	1	2.5%
-Maxillary carcinoma	2	5%
2) TRAUMA CAUSING ORBITAL COMPLICATION	7	17.5%
-Temporal bone trauma	4	10%
-Penetrating hard palate injury with blindness	1	2.5%
-Nasal bone fracture with associated orbital fracture causing ehymosis with diplopia	2	5%
3) INFECTIVE CAUSE OF ORBITAL MANIFESTATION	4	10%
-Nose Furunculosis / facial cellulitis	2	5%
-Zygomaticotemporal bone osteomyelitis	1	2.5%
-DNS with Chronic dacryocystitis	1	2.5%
4) ENDOCRINE CAUSE	3	7.5%
- Endocrine orbitopathy	3	7.5%
5) OTOLOGIC CAUSE OF ORBITAL MANIFESTATION	3	7.5%
-ASOM	1	2.5%
-CSOM with cholesteatoma causing facial nerve palsy	1	2.5%
-ASOM (unsafe) with petrositis	1	2.5%
6) ORBITAL COMPLICATION	3	7.5%

OF FESS		
7) ALLERGIC CAUSE OF ORBITAL MANIFESTATION	1	2.5%
-Angioneuritic edema of the dorsum of the nose	1	2.5%

Table 4. Different Orbital Manifestation Due To Otorhinolaryngological Pathology

Orbital features	No of patients	percentage
Diplopia	25	67.5%
Proptosis	20	50 %
Periorbital ehymosis / edema	16	40%
Facial palsy	9	22.5%
Blindness	2	5%
Epiphora	6	15%
Ptosis	1	2.5%
Cavernous sinus thrombosis	2	5%

Table 5. Sinonasal Mass Causing Orbital Complication (n=19)

Disease	No of patients	Percentage
-Squamous cell carcinoma of the nasal cavity	4	10%
-Fibrous dysplasia	3	7.5%
-Inverted papilloma	3	7.5%
-Chronic fungal sinusitis	3	7.5%
-Nasopharyngeal carcinoma	3	7.5%
-Esthesioneuroblastoma	1	2.5%
-Maxillary carcinoma	2	5%

Surgical management of sinonasal mass causing diplopia and proptosis was done using a different approach(Lateral rhinotomy approach, endoscopic approach and, Caldwell-Luc approach) depending on the extension of the tumor. In our hospital most often lateral rhinotomy approach was used. On exploration, it was found that there was only a compression effect on the orbit by the mass without any invasion into orbit and eye swelling was reduced immediate postoperative period.

Lateral rhinotomy with excision of the mass was done in cases of inverted papilloma.

Chronic invasive fungal sinusitis cases underwent functional endoscopic sinus surgery followed by antifungal treatment postoperatively.

Out of the 3 cases of fibrous dysplasia, two patient variants of ossifying fibroma underwent lateral rhinotomy where medial maxillectomy was done. Patient symptom subsides drastically 3 weeks after the surgery. A female case of fibrous dysplasia with associated hypothyroidism was referred to endocrinology department for further management.

Nasopharyngeal carcinoma with intracranial extension was referred to state cancer institute for further management .

Table 6. Trauma Causing Orbital Complications (n=7)

Disease	No of patients	Percentage
-Temporal bone trauma	4	10%
-Penetrating hard palate injury with blindness	1	2.5%
-Nasal bone fracture with associated orbital fracture causing ehymosis with diplopia	2	5%

All the temporal bone fracture cases were males and had Gr. IV facial palsy.

Two cases of facial palsy due to temporal bone trauma showed total recovery after 21 days of iv steroid and physiotherapy. One case of

facial palsy due to temporal bone trauma underwent mastoid exploration with facial nerve decompression. Postoperatively facial paralysis was found to be improved. One case did not show any sign of improvement even after mastoid exploration with facial decompression and injectable steroid.

Out of the two cases of nasal bone fracture with the associated orbital fracture, one case underwent nasal bone reduction under general anesthesia, the other case was managed conservatively till the edema subsides followed by surgical intervention.

Hard palate penetrating injury causing blindness of the right eye underwent primary repair of the wound under general anesthesia

Table7. Otologic Cause Of Orbital Complications (n=3)

Disease	No of patients	Percentage
-ASOM	1	2.5%
-CSOM with cholesteatoma causing facial nerve palsy	1	2.5%
-ASOM (unsafe) with petrositis	1	2.5%

Single case of CSOM with cholesteatoma induced lower motor neuron facial palsy underwent modified radical mastoidectomy. Intraoperatively it was found that the mastoid part of the facial canal was eroded. The patient was continued on steroid with physiotherapy postoperatively, on follow up patient showed little improvement in eye closure.

A case of acute suppurative otitis media with inadequate eye closure (grade 3 according to House Brackmann,) showed symptom subsides after a 2week course of tab amoxicillin+clavulanic acid, tab levocetirizine and xylometazoline. In the case of petrositis patient symptoms subsides with conservative management.

Table 8. Infective Cause Leading To Orbital Manifestation (n=4)

Disease	No of patients	Percentage
-Nose Furunculosis / facial cellulitis	2	5%
-Zygomaticotemporal	1	2.5%

Table 9. Various Otorhinolaryngological Pathology With Associated Ophthalmological Features

Diagnosis	Ocular manifestation							
	Proptosis	Facial paralysis	Epiphora	Loss of vision	Diplopia	Ptosis	Periorbital edema or ecchymosis	Cavernous sinus thrombosis
Squamous cell carcinoma of nasal cavity	4		4		4		4	
Fibrous dysplasia	4		1		3			
Inverted papilloma	3				3			
Chronic fungal sinusitis	3				3			
Nasopharyngeal carcinoma		3		1				
Esthesioneuroblastoma					1		1	
Maxillary carcinoma	2				2		2	
Temporal bone trauma		4						
Hard palate penetrating trauma				1		1		
Nasal bone fracture with associated orbital fracture causing periorbital ecchymosis and diplopia					2		2	
ASOM		1						
CSOM with cholesteatoma causing facial nerve palsy		1						
CSOM(unsafe) with petrositis causing diplopia					1			
Furunculosis nose/facial cellulitis					2		2	2
FESS complication					3		3	
Zygomatigo- temporal bone osteomyelitis							1	
Thyroid orbitopathy	3				3			
Chronic dacryocystitis			1					
Angioneurotic edema of dorsum of the nose							1	
TOTAL	20	9	6	2	27	1	16	2

bone osteomyelitis with periorbital swelling		
-DNS with Chronic dacryocystitis	1	2.5%

One case of cavernous sinus thrombosis recovers and symptoms subside immediately after a few days of iv antibiotics, the other case was shifted to neurosurgery due to associated subdural hemorrhage.

Case of zygomaticotemporal abscess. Incision and drainage of the abscess was done followed by conservative treatment (iv antibiotics according to the culture and sensitivity report) given where the symptoms and swelling subside in 7 days.

A Case of deviated nasal septum with chronic dacryocystitis planned for endoscopic dacryocystorhinostomy and septoplasty were also included in the study.

Allergic Cause Leading To Orbital Complication (n=1)

A single case of angioneurotic edema of the dorsum of the nose presented with swelling and redness of the dorsum of the nose extending to the periorbital region. This case was diagnosed after ruling out all the other possible cause, radiological findings were insignificant, the diagnosis was made base on the history of insect bite. It was found that the swelling and redness reduced drastically on steroid medication along with antibiotics.

Endocrine Cause (n=3)

Thyroid Orbitopathy is not frequently encountered at our hospital though the cases of thyroid swelling/ goiter is quite common.

During the period of this study, 3 cases of endocrine orbitopathy with thyrotoxicosis presented with thyroid swelling, proptosis, and associated signs and symptoms of thyrotoxicosis, patients were initially referred to endocrinology department for management of thyrotoxicosis. Surgical intervention (hemithyroidectomy) was planned when the patients became euthyroid. Postoperative follow up of the patient showed improvement in the orbital symptoms. Orbital complication of FESS (n=3)

Three cases were included in the study, out of which 2 were a postoperative case of an ethmoidal polyp and 1 was a case of fungal sinusitis.

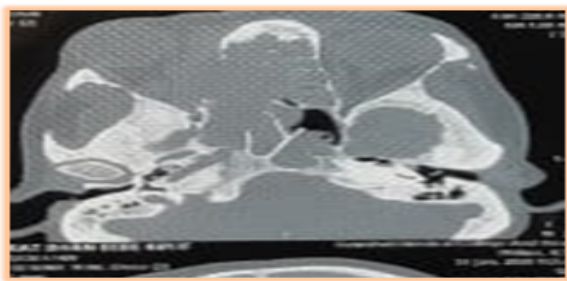


Figure 1. Axial Ct Scan Of A Case Of Sinonasal (mass Squamous Cell Carcinoma) With Intraorbital Spread. Showing Proptosis.



Figure 2. A Case Of Esthesioneuroblastoma With Proptosis Of The Right Eye.



Figure 3. Picture Showing A Patient With Facial Nerve Palsy With Incomplete Left Eye Closure.

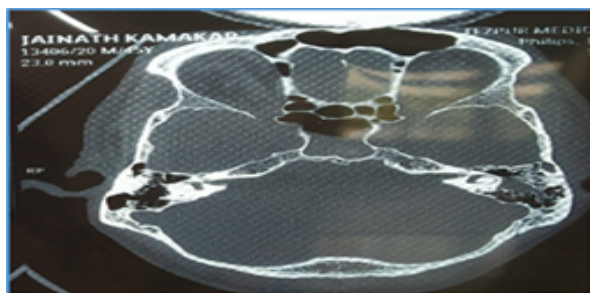


Figure 4. Axial Cut High Resolution Ct Scan Mastoid Showing Temporal Bone Fracture Longitudinal Type With Bony Fragment Impinging The Facial Nerve.

DISCUSSION

In our series 40 patients were selected for the study; 28 males and 12 females, with a male to female ratio of 2.3:1. Similar to our study H. Chahed in his study also found a higher incidence in men, 23 men, and 6 women [7]. While in the study conducted by Sajid et al he found that male with female ratio was 4:1 [8]. Contrary to our study, Yi-Sheng Chang in their study found the incidence of the female is higher than male [9].

The youngest patient in our study was 6 year of age male, a case of juvenile ossifying fibroma. Our study was similar to that conducted by Kumar et al which he also found the youngest age group was 6 years old [3].

In our study, we found that the most common otorhinolaryngological pathology causing orbital manifestation was due to sinonasal mass. Similar to our study various study also shows that sinonasal mass is the most common otorhinolaryngological pathology involving the orbit. Henderson's series of 465 cases of orbital tumors, 7% showed sinonasal origin, 60% of these were antral carcinoma [10]. Similarly, Kumar et al also found most of the eye involvement was due to sinonasal tumors (47.37%).

We found that the most common presenting features of orbital involvement were diplopia comprised of 27 patients. Similar to our findings Jones et al in his study also found that diplopia was the most common ophthalmological complaint caused by ENT pathology [11].

In this series the second most common presenting features of orbital involvement was proptosis (20 cases). Similarly in the study

conducted by Kumar et al on 38 patients, he found that 17 (44.73%) patients show proptosis as presenting features [3]. In the study conducted by Sinha [12], he found that proptosis (100%) is the most common clinical manifestation due to ENT pathology which is different from our findings.

We encountered 16 patients with periorbital ecchymosis /edema which is referred by Maloney as preseptal cellulitis [13], Radovani et al. [14] in his study complication of sinusitis found that out of the total 35 cases; 15 patients presented with features of palpebral inflammatory edema.

Most of the patients in our series responded well to conservative treatment. In cases of periorbital edema with associated proptosis patients showed improvement in symptoms after the tumor was removed.

Another important eye manifestation due to ENT lesions was found to be facial palsy (lower motor neuron type) comprised of 9 total cases, out of which – 4 patients are due to temporal bone trauma, 1 case due to acute suppurative otitis media, 1 case of cholesteatoma induce facial palsy. Nasopharyngeal carcinoma comprised of 3 cases. Kumar A et al [3] in his study found that facial palsy due to various diseases constituted 6 cases. Benjamin et al. [15] in their study found 70 % of facial paralysis occurs as a result of Bell's palsy, while we found that trauma was the most common cause of facial palsy. This may be because in our study Bell's palsy was excluded.

Cavernous sinus thrombosis comprised of 2 cases. This occurs most often due to delayed treatment where the infection has gained access to the cavernous sinus via orbital veins. Radovani in his study recorded one case of cavernous sinus thrombosis [14] which is similar to our findings.

In our series, both cases of cavernous sinus thrombosis occur as a result of facial cellulitis. Whereas in the study conducted by Sayed et al he stated that furunculosis of the nose causing orbital complication is rare [16]. Various studies also found cavernous sinus thrombosis occurs most commonly from the nasal origin. Few studies show that cavernous sinus thrombosis can result from sphenoid and ethmoid pathology [17].

In this study 2 patients presented with blindness; 1 case presented with right internal ophthalmoplegia and ptosis of the right side of the eye due to penetrating trauma of the hard palate following a history of fall on sharp object (wooden stick), 1 case reported with total blindness of the right eye due to nasopharyngeal carcinoma with intracranial extension. While the other cases of nasopharyngeal carcinoma vision was found to be normal.

Single case of deviated nasal septum with chronic dacryocystitis presented with epiphora was also included in the study who underwent endoscopic dacryocystorhinostomy with septoplasty.

Summary:

Orbital complication due to any cause (infective, neoplastic, trauma, etc) is still a very serious threat to function of the eye, functional and cosmetic impairment of the face (which can affect the patients quality of life) or life-threatening complications like blindness and intracranial complications. Therefore, hospital admission should be advice even for an early stage of orbital complication. Aggressive treatment, close monitoring for severity and prognosis of the disease is necessary to avoid unwanted complication.

CONCLUSION

Various ENT diseases can present with eye complications due to close anatomical relation of the eye with the surrounding head and neck structure. Sinonasal mass especially squamous cell carcinoma of the nasal cavity was the most common cause of ophthalmological complications. The most common ophthalmological manifestations of sinonasal mass were diplopia. Any patient presenting with diplopia, orbital cellulitis, proptosis, decrease in visual acuity, periorbital swelling, and facial paralysis should be suspected of underlying otorhinolaryngological pathology. Early diagnosis and management are very important to prevent life-threatening complications like blindness and intracranial spread. Proper cooperation between ENT and EYE surgeon is much required in all Eye manifestations of ENT origin to find out the actual disease process and to treat accordingly.

CONSENT:

Written and informed consent was taken from the patient ,patient's guardians regarding the use of his/her pictures, clinical findings, reports of the investigations that were conducted and intra-operative findings.

CONFLICTS OF INTEREST : None.

FUNDING: None.

KEY POINTS:

- 1.The orbit, surrounded on three sides by the paranasal sinuses.
- 2.Ophthalmological features due to otorhinolaryngological pathology is quite common.
- 3.Sinonasal mass is the most common ENT pathology causing orbital manifestation.
- 4.Diplopia is the most common orbital features.
- 5.Blindness is unusual complication of otorhinolaryngological pathology
- 6.Early diagnose and management is very crucial to prevent unwanted complication like blindness and intracranial extension.
- 7.Proper cooperation between ENT and EYE surgeon is much required in all Eye manifestations of ENT origin to find out the actual disease process and to treat accordingly.

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