Original Article

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ENT Disorders Presenting with Ophthalmological Manifestations: An Overview

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Abstract

Background: It is important to diagnose the condition early and manage aggressively. It is often difficult to cure orbital cellulitis due to late treatment and may cause blindness if left untreated because of optic nerve compression. Both orbital abscess and cavernous sinus thrombosis may lead to intracranial spread of infection, such as meningitis or cerebral abscess with high morbidity and possible mortality. **Subjects and Methods:** A total number of 124 cases of ophthalmological manifestation caused by various ENT diseases, mostly paranasaltumourextensions; nasopharyngeal tumour and furunculosis of nose were analyzed in a retrospective study in relation to their age, sex, clinical, radiological and histopathological profile. **Results:** Direct nasal endoscopy (DNE), Fibre optic Flexible nasopharyngoscopy was Useful. HRCT scan was considered as the most dependable investigating tool. Different modalities of medical and surgical treatment have been adopted according to location and nature of diseases. **Conclusion:** A close co-operation and team effort required between otorhinolaryngologist and ophthalmologist to overcome this kind of challenges.

Keywords: Ophthalmological Manifestation, ENT dieases, Paranasaltumour, Orbital Cellulitis, Cavernous sinus thrombosis(CST), Lamina Papyracea, Diagnostic nasal endoscopy(DNE), Flexible Fibreoptic nasopharyngoscopy, High Resolution CT Scan(HRCT).

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Introduction

Being an adjacent structure of the Nose and paranasal sinus region, involvement of the orbit and thereof ophthalmological manifestation are fairly common in the practice of Ophthalmology. Orbital complication may arise from infections of "dangerous area"(Dangerous area of face comprises of upper lip, lower part of nose and adjacent area) of face. This area has been so named because furuncles, infections of the nose and injuries around the nose, especially those that become infected can readily spread to cavernous sinus resulting in Cavernous sinus thrombosis (CST).Cavernous sinus thrombosis (CST) is generally a fulminant process with high rates of morbidity and mortality. Direct extension of the pathology of nose, paranasal sinuses and nasopharynx into the orbit, involvement of the nerves supplying the orbit and adnexa or deposition of retro orbital fat as in exophthalmic goiter. Although the incidence of orbital complication of inflammatory sinonasal diseases have decreased in recent times due to advent of newer generation broad spectrum antibiotics, infection of nasal vestibule causing preseptal orbital cellulitis still remains a very prevalent problem. Orbital cellulitis, on the other hand is an emergency condition .It is important to diagnose the condition early and manage aggressively. It is often difficult to cure orbital cellulitis due to late treatment and may cause blindness if left untreated because of optic nerve compression. Both orbital abscess and cavernous sinus thrombosis may lead to intracranial spread of infection, such as meningitis or cerebral abscess with high morbidity and possible mortality. The serious risk of complication in such cases was observed by Hodges et al[1], who studied the outcome of orbital cellulitis in a developing country . They found a high rate of complications, 52% blind on admission, with no improvement on treatment and a mortality of 4% because of cavernous sinus thrombosis. These result indicated the delay in receiving treatment in this population. Orbital infliction due to sinonasal and nasopharyngeal masses are also on the rise. Anterior facial vein begins at the side of root of nose through the union of supra-orbital and frontal veins. The vein drains upper lip, septum of noseand adjacent areas. The anterior facial vein communicates with the cavernous sinus through the ophthalmic veins. It also communicates with cavernous sinus via deep facial vein which connects the pterygoidplexus with anterior facial vein [Figure 1].

Few anatomical implications are noteworthy in this respect [Figure 2] firstly due to close proximity of ethmoidal labyrinth to the orbit separated only by paper thin lamina papyracea which acts as a poor barrier to the spread of sinus

diseases to the orbit. Secondly veins from the orbit, nose and paranasal sinuses and adjoining facial regions drain to cavernous sinus either directly or indirectly through valveless communications. Thirdly the orbital septum is a thin membrane that originates from the orbital periosteum and inserts into the anterior surfaces of the tarsal plates of the eyelids. The septum separates the superficial eyelid from the deeper orbital structures, and it extending into the orbit. Preseptal cellulitis differs from orbital cellulitis in that it is confined to the soft tissues that are anterior to the orbital septum. Fissures and foramina of the bony orbit are also natural pathways for spread of pathology of nose, PNS and nasopharynx to orbit.

So, anatomical relationship of nose and paranasal sinuses to the orbit is of important not only in understanding the symptoms and spread of diseases but also in planning management (Jones[2]).

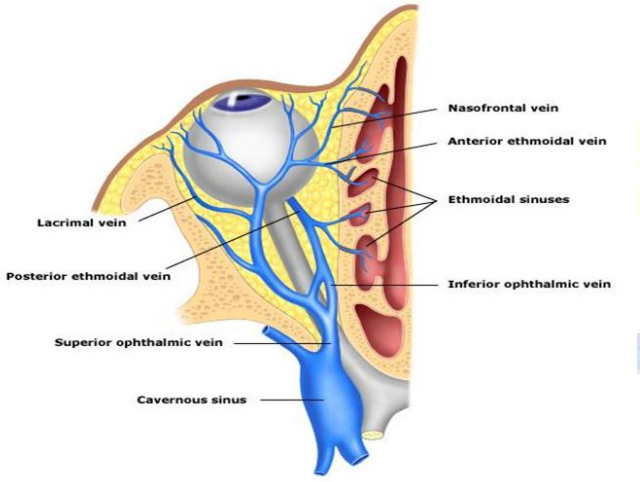

Figure 1: Venous Plexus around the Nose and Eye communicating with Cavernous Sinus

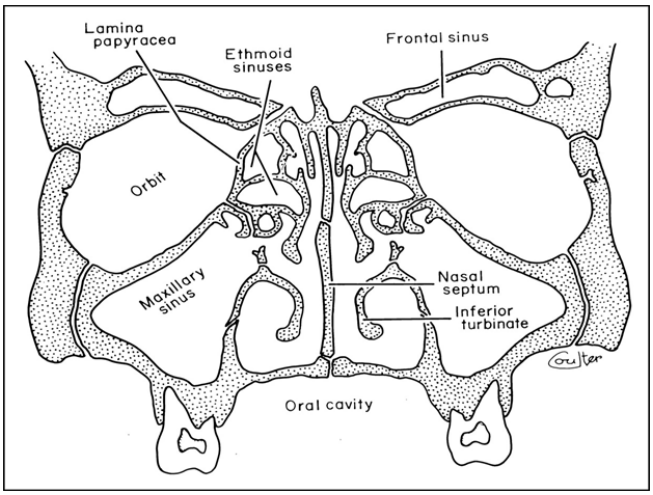

Figure 2: Anatomical relationship of Orbit to the Ethmoidal Sinus

Subjects and Methods

A hospital based retrospective study was carried out in the Ophthalmology and ENT department. The patients with some clinical ophthalmological manifestations due to any ENT & head –neck disease were taken up for the study. A total number Of 124 cases admitted in ENT ward were taken up for our study. A total of patient's studied during the period of which 90 were male and 34 were female (male: female ratio begins2.64:1). Patients were in between 4 and 84 years of age (mean age of presentation 32.3 years). All the eye condition were diagnosed by Ophthalmologist. Detailed history, thorough clinical examination of ENT and head- neck region were done and recorded in a Performa. Diagnostic nasal endoscopy with proper local anaesthesia and vasoconstriction with 4% Xylocaine with1:200000 adrenaline nasal packs was done in all cases . Necessary investigations like X-rays of nose and paranasal sinuses , High resolution ultrasound with Doppler study , High Resolution CT scans and MRI with or without angiography, Fine needle aspiration cytology, Biopsy and Histopathological examination of the suspected mass whenever necessary ensured in every case [Table 1]. Pure tone audiometry with or without impedence audiometry were done in suspected bell's palsy and cases of Otitis media. Schirmer's test done in Bell's palsy cases. Electrophysiological tests of facial nerve were not done routinely. Data were tabulated to find out incidence of different ENT diseases as well as incidence of various ocular manifestation (Table 2). Orbital complication of sinusitis were classified according to standard CHANDLER'S classification (1970), which includes preseptal cellulitis, orbital cellulitis without abscess, orbital cellulitis with abscess, subperiosteal abscess, orbital cellulitis with intraperiosteal abscess and cavernous sinus thrombosis.

Exclusion Criteria

Allergic rhinitis cases presenting with red eyes and excessive lacrimation due to chronic dacryocystitis and dry eye syndrome were excluded.

Bell's palsy cases were diagnosed only after excluding other causes and steroids along with antiviral medication. In some cases Neurologist opinion also taken.

Orbital Cellulitis cases were mostly managed conservatively with IV antibiotics. Neoplastic conditions of nose and paranasal sinuses were managed surgically.

Patients with facial nerve palsy due to cholesteatoma underwent complete canal wall down tympanomastoidectomy under operating microscope also facial nerve decompression done wherever necessary.

Patient's age, sex, clinical presentation, diagnosis &evaluation, complications, grading of facial nerve paralysis according to conventional House-Brackman staging system and management have been analyzed.

Results

Table 1: Investigations

Investigation	Cases	Percentage
Diagnostic Nasal Endoscopy (DNE)	124	100
X Ray PNS	80	64.51
USG	30	24.1
HRCT	44	35.84
MRI	5	4.03
FNAC	24	19.35
Biopsy & HPE	54	43.54

Table 2: Clinical Presentation

Clinical presentation	Number	Percentage
Proptosis due to sinonasal masses	26	20.96
Preseptal cellulitis (Furunculosis \ facial cellulitis)	24	19.35
Lagophtholmous	38	30.64
Otitis Media	14	11.29
Bell's Palsy	8	6.45
Mucoepidermoid carcinoma of parotid	8	6.45
GlomusJugulare	2	1.61
Trauma	2	1.61
Parapharyngeal mass	4	3.22
Cavernous sinus thrombosis (from furuncle)	14	11.29
Orbital Cellulitis (Furunculosis and Rhinosinusitis)	8	6.45
Ptosis due to cranial neuropathy	2	1.61
Orbital apex syndrome	2	1.61
Orbital fungation due to ethmoidaltumours	2	1.61
Exophthalmos due to thyroid ophthalmopathy	4	3.22
Orbital swelling due to nasal myiasis	4	3.22

Most common clinical manifestation was proptosis 26 cases among 124 patients. Causedmost commonly by orbital extension of sq. cell ca of maxillary sinus. Other causes were sinonasal haemangioma, nasopharyngeal angiofibroma, nasopharyngeal rhabdomyosarcoma, frontal sinus cyst, frontoethmoidalmococele, adenoid cystic carcinoma, nasopharyngeal carcinoma, infected gaint Haller cell extending in to orbit and fibous dysplasia of ethmoid sinus each one case.

Surgical management done in cases of sinonasaltumours causing proptosis.Surgical approach in each case chosen depending on the location and extension. Lateral rhinotomy incision with or without Caldwell-Luc approach done to gain wide exposure of the tumour . Frontal mucocele excised through external approach and ethmoidalmucocele addressed through endoscope. Almost in all cases there was only a pushing effect on the orbit by the tumour without any invasion in to orbit and immediately after the surgeryproptosis is reduced.

Preseptal Orbital cellulitis 24 cases were the second most common clinical presentation of which 14 cases were due to furunculosisof the nose and 10 cases were due to facial cellulitis.

Eight cases of orbital cellulitis in which six cases were due to furunculosis of the Nose and two cases were sequelae of frontoethmoidalrhinosinusitis.

Lagophthalmos was another important clinical manifestation found in 38 (30.64%) of cases were due to facial nerve paralysis of which 12 cases were CSOM (AAD) type., 8 case due to Bell's palsy, 8 were due to mucoepidermoidCa of parotid and four cases of Otitis media andglomusjugulare, embryonalrhabdomyosarcoma of middle ear and mastoid, old temporal bone trauma with secondary infection, parapharyngeal mass with facial nerve palsy two cases each.

Among the Otitis media cases maximum were males with Gr IV facial paralysis having Lagophthalmos. Preliminary Tarsorrhaphy was done in 2 cases to prevent corneal ulceration because of weak Bell's phenonmenon. All underwent modified radical mastoidectomy and on surgical exploration cholesteatoma found eroding the facial canal.

Two of the patients with history of short duration ear discharge suffering from ASOM with (gr III HB) facial nerve palsy subsided with a course of treatment with appropriate medications.

Fourteen cases of orbital cellulitis were diagnosed having cavernous sinus thrombosis, resulting from furunculosis of nose. Four cases found to be having Thyroid ophthalmopathy causing exophthalmos. Four cases of nasal myiasis secondary to atrophic rhinitis found having reactionary periorbital swelling.

Discussion

Almost two-third of the osseous orbital wall is made up of sinus walls hence orbit is frequently involved in the diseases of nose and paranasal sinuses.[3,4] Valveless venous communications existing in this area may also partly responsible for such occurrence.

Clinical data and investigation reports were entered in the Proforma of the study and patients were treated both surgically and conservatively according to the expert guidelines. A small number of cases were randomly chosen for the study hence no attempt was made by us to reach statistically significant conclusions.

According to the study by Syed secondary tumours from the paranasal sinuses is the third most common cause of proptosis in adults after Grave's orbitopathy and pseudotumours of orbit.[3] In our study we found four cases of exophthalmos caused by thyroid orbitopathy.

The neoplastic lesions of nose and paranasal sinuses were found to be the commonest cause of proptosis in our series.Sinha V et.al, also found similar results and concluded that proptosis is the commonest clinical presentation in malignant tumours of nose and paranasal sinuses.[5]

Various studies on orbital involvement in sinonasal diseases reported that the squamous cell carcinoma of maxillary sinus mostly involves the orbit.[3,6,7] Our findings are similar to the findings of most of similar studies.

In Henderson's series of 465 cases of orbital tumours, 7% originated from the paranasal sinuses and 60% of these were antral carcinomas[8]. Johnson et al., found 59.49% of the cases of paranasal sinus tumour had

clinical, radiographic or operative evidence of orbital involvement and of which 70% had orbital involvement during initial presentation[7]. Whereas our study involved all cases where orbit was already involved and proptosis was the presenting feature in all the cases of sinus tumours.In a study by Syed in 1995 proptosis seen in 98% patients with frontoethmoidal mucoceles[1]. Whereas in present study we found four cases of mococele three ethmoidal and one frontal with proptosis as presenting feature 3.22%. Zeyadetal[9], in their study said that orbital cellulitis following secondary to furunculosis of nose is a rare occurrence whereas in present study all the cases of orbital and facial cellulitis are secondary to nasal furunculosis. Zeyadetal.[9], also stated that early diagnosis and prompt management of furunculosis of nose may reduce the incidence of orbital cellulitis. Elango S et al., in their study found that orbital complications due to sinusitis was in the range of 0.5 to 3.9% and found ethmoidal sinus involvement affects more than maxillary sinusitis.[10] Whereas study by Syed in 1995 states that 60% to 80% of orbital complications is secondary to paranasal sinusitis.[3] Various studies have shown that 30% of suspected preseptal cellulitis has orbital involvement which can only be detected by CT scan[2]. Whereas in our study CT scan was only advised when there was a deterioration of vision or progression of disease in spite of appropriate treatment. All the cases of preseptal or frank orbital cellulitis cases in this series resolved with early diagnosis with CT Scan and appropriate medical management. Ophthalmic manifestations observed were swelling of eye ball, redness, chemosis, proptosis, diplopia, ophthalmoplegia and diminished vision. Dangerous area of the face is the triangular area involving the upper lip and lower part of nose, infection or more commonly furunculosis of this area resulted in cavernous sinus thrombosis in the present study. Various studies opined that cavernous sinus thrombosis is most often associated with Sphenoid and ethmoid sinusitis.[11] Ramanand Y et al., has described facial nerve palsy has not been reported in the literature.[12] Straub J et al., mentioned facial nerve palsy in cavernous sinus thrombosis is very rare and pathophysiology of which little is known.[13] Debangshu Gosh et al., reported a case of bilateral involvement of cavernous sinus thrombosis also with unusual unilateral lower motor neuron type of facial nerve palsy in that patient.[14]

Conclusion

Due to improved techniques like Diagnostic nasal endoscopy (DNE) and HRCT scan early diagnosis of orbital complications has become possible. Availability of newer generation of broad spectrum antibiotics and surgical techniques like endoscopic sinus surgery(ESS), Orbital complications are effectively managed to save the eyesight. The key to Early diagnosis are high index of suspicion of early orbital involvement by ophthalmologist and subjecting the patient for thorough ENT checkup especially by diagnostic nasal endoscopy(DNE) under local anesthesia with decongestion by 4% Xylocaine 1:200000 adrenaline nasal packs done as an office procedure using 0^0 rigid nasal endoscope. HRCT can be done in selective cases to rule out complications.The early management by a team comprising of Ophthalmologist, Otorhinolaryngologist and Neurologist opinion in some cases of neurological involvement may achieve good results without much morbidity and mortality in such cases of orbital complications due to ENT Disorders.

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