IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 11, Issue 4 (Nov.- Dec. 2013), PP 87-92
www.iosrjournals.org

Ophthalmic Manifestations in ENT Diseases & Surgical Procedures

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Abstract
Objective: *A prospective study was conducted in the department of ENT to see the incidence, Prevalence, Symptoms, signs and etiopathogenesis in relation to ophthalmic manifestations in ENT diseases and various ENT surgical procedures (iatrogenic).*
Material and methods: *35 cases were selected from IN and OUT patients of the department between July 1st 2008 to June 30th of 2009. 26 cases of orbital complications were due to various ENT diseases and 9 cases were of ENT surgical procedures with orbital complications. The standard otolaryngological and ophthalmological examination was carried out and thereafter proper hematological, radiological and histopathological examinations were done. After reaching the diagnosis, proper management was carried out.*
Result :*35 cases of orbital complications were reported in ENT Department. Out of which, 29 cases were due to various ENT diseases and 6 cases were iatrogenic, caused by various ENT surgical procedures. Commonest ENT disease responsible for orbital complication is sinonasal tumours. Carcinoma maxilla was the most common tumour responsible for the orbital complications. Sinonasal tumours involving eye were found in wide age group range of 11 to 75 years, with higher incidence in males. Incidence of sinusitis complicating orbit is decreasing. Variety of ENT surgical procedures can involve orbital . Total maxillectomy has higher incidence of orbital complications.*
Conclusion: *A variety of ENT diseases & surgical procedures can present with orbital complications due to anatomical association of orbit with the surrounding head and neck structures. Orbital involvement must be ruled out whenever an ENT patient presents with orbital complaints .Rapid diagnosis and treatment is necessary for preserving vision and life in these patients. Teamwork between ophthalmologist and the otolaryngologist is required for the appropriate management of such lesions.*

I. Material And Methods

The present prospective study was carried out in Department of otorhinolaryngology of N.S.C.B. Medical College, Jabalpur during period of July 1st 2008 to June 30th 2009, and comprised of 35 cases. The cases were selected from IN and OUT patients Of the Department, who had orbital complications due to various ENT diseases and ENT surgical procedures. The patient was made comfortable and a detailed history of his /her complaints was taken under the various heading mentioned in the proforma. The standard procedure of otolaryngological and ophthalmic examination was carried out on each patient. Initial clinical examination of orbit was done in ENT department then referred to ophthalmology for further assessment. Beside routine hematological investigations, thyroid function test, radiological investigations like x ray skull, PNS, orbit, CT SCAN of head and neck, FNAC and biopsy for histopathology were done. After making diagnosis the proper management was done.

II. Result

Etiopathogenesis

Total, 35 cases of orbital complications were reported in ENT Department. Out of which, 29 cases were due to various ENT diseases and 6 cases were iatrogenic, caused by various ENT surgical procedures. Commonest ENT disease responsible for orbital complications was various sinonasal tumors, comprising 19 cases, in which Ca maxilla constituted 7 cases, angiofibroma 3 cases, sinonasal inverted papilloma and lymphoma 2 cases each, Olfactory neuroblastoma,midline granuloma,and rhinosporodiosis 1 case each.

Fungal Sinonasal infections constituted 2 cases, Bacterial Sinonasal infections constituted 1 case. Atrophic rhinitis with nasal myasis constituted one case, Facial palsies due to various reasons constitued 4 cases. Grave disease constituted 2 cases and Iatrogenic cases were 6 in number.

Table A. Incidence of orbital complications due to various ENT diseases And procedures.

Etiopathogenesis	No of cases
Sinonasal tumours	19
Sinonasal infection	3
Atrophic rhinitis with myasis	1
Graves disease	2
Ca parotid	1
CSOM	3
Iatrogenic	6

Table B. Sinonasal tumours with orbital complications

Sinonasal tumours	No of cases
Ca maxilla	7
Angiofibroma	3
Sinonasal papilloma	2
Sinonasal lymphoma	2
Fibrous dysplasia	2
Olfactory neuroblastoma	1
Mid line granuloma	1
rhinosporodiasis	1

III. Age Distribution

Orbital complications due to various ENT diseases were is found in age group of 11-75 years. Orbital involvement in sinonasal tumours was seen in age group range of 11-75 year.

The youngest patient was of fibrous dysplasia and oldest patient was of carcinoma maxilla. Orbital involvement in ca maxilla was found in age group of 35-75 years. Inverted papilloma was found in age group of 40-45 years. Fibrous dysplasia involved orbit in age group of 11-35 years .Orbital pathology due to fungal sinonasal infection was found in age group of 60-65 years. Graves disease involved orbit in age group of 20-50 years. Various ENT diseases causing orbital symptoms secondarily due to facial palsies were found in age group of 22-55 years. Iatrogenic causes responsible for orbital pathology were found in age group of 13-75 years.

Table C. Age incidence in study group.

Etilogy	Age group
Sinonasal tumours	11-75 years
Ca. Maxilla	35-75 years
Inverted papilloma	40-45 years
Fibrous dysplasia	11-35 years
Sino-nasal infections	60-65 years
Graves disease	25-50 years

IV. Sex Distribution

Among total cases (ENT diseases + Iatrogenic), male cases were more than female cases comprising 19 males to 16 females. The patients where orbital pathology was due to ENT diseases, Male –female ratio was 16:9. Sex incidence in sinonasal tumors was 9: 6 (male: female). There was 4: 3 male –female ratio in carcinoma maxilla. Inverted papillomas and sinonasal lymphomas with orbital complications were present exclusively in males (2: 0). Fibrous dysplasia and graves disease had equal incidence in males and females (1: 1). Sinonasal infections were found in males only (3: 0). Iatrogenic orbital complications had males and females ratio of 6:3.

Table D. Sex Incidence in study group.

Etiology	Male	female
Total cases	19	16
ENT diseases	16	9
Sinonasal tumours	9	6
Carcinoma maxilla	4	3
Inverted papillomas	2	0
sinonasal lymphomas	2	0
Sinonasal infections	3	0
Iatrogenic	6	3

V. ENT Complaints

Common ENT manifestations in cases were nasal obstruction (14 cases) found in almost every case of sinonasal tumour except fibrous dysplasia; facial swelling (13 cases) found mainly in carcinoma maxilla and fibrous dysplasia; facial ulcer/growth(4 cases) were seen in carcinoma maxilla and midline granuloma ;nasal discharge was seen in 12 cases of different sinonasal tumours; Epistaxis was present in 9 cases including carcinoma maxilla, rhinosporodiosis and inverted papilloma; Neck swelling was seen in 3 cases of carcinoma maxilla . On examination common findings in these cases were nasal mass (13 cases), deviated nasal septum due to tumor mass (13 cases). palatal lesions (3 cases) and decreased mouth opening (3 cases) were found in patients of carcinoma maxilla.

TABLE E. Incidence of ENT manifestations.

ENT manifestations	No of cases
Nasal obstruction	14 cases
Nasal discharge	12 cases
Facial swelling	13 cases
Facial ulcers	4 cases
Nasal bleed	9 cases
Oral lesions	3 cases
Neck swelling	2 cases

VI. Orbital Complaints

Common orbital complaint found to be proptosis , seen 15 cases. Maximum no of proptosis cases were due to ca maxilla (7 cases) followed by angiofibroma (3 cases),graves disease(2 cases) & sinonasal inverted papilloma (2 cases) . Total vision loss was present in 6 cases;

Figure.1: Carcinoma maxilla involving orbit

Figure.2: Ectropion post maxillectomy

vision loss cases were due to carcinoma maxilla (4 cases) followed by fungal sinusitis(1 case) and atrophic rhinitis with nasal myasis (1 case). Ectropion was seen in 6 cases of maxillectomy procedure. Inability to close eye was seen in 18 cases,15 of these cases were due to proptosis and 3 cases were due to CSOM because of facial nerve palsy. Gross destruction of eye ball was seen in a case of atrophic rhinitis with nasal myasis and a mid line granuloma. Diplopia was seen in 3 cases (2 cases of maxilla and 1 case of maxillectomy procedure).

Table F. Incidence of ophthalmic manifestations.

`Ophthalmic manifestations	No of cases.
Inability To Close Eye	18 cases
Orbital Pain	
Diplopia	2 cases
Red Eye	
Proptosis	15 cases
Ectropion	6 cases
Total Vision Loss	6 cases
Gross Destruction Of Eye Ball	2 case

VII. Discussions

Many ENT diseases & various ENT procedures have ophthalmic manifestations, as anatomy of orbit and head & neck is closely related. The orbit is surrounded by paranasal sinuses. As walls between them are thin, infections and tumors can travel from either direction, moreover bony walls have various channels for nerves and blood vessels all of which provide potential routes of invasion in to the orbit. The venous system in this area is valveless due to which there is increased chance of cross infection between orbit, nasal cavity and paranasal sinuses . In this study we observed that sinonasal tumours are maximally responsible for the orbital complications eg carcinoma of PNS, malignant melanoma ,carcinoma nasopharynx, inflammatory polyp , pyocoel,osteomas,fibrousdysplasia, ossifying`fibroma, angiofibromas, mucoceles , olfactoryneuroblastomas ,sarcomas and ameloblastoma .

Carcinoma maxilla: Among sinonasal tumours carcinoma of maxilla is maximally responsible for orbital complications. In 2/3rd cases of carcinoma maxilla malignancy is diagnosed only after patient manifest ocular symptoms[1]. papirella et al 1991 observed that Ocular symptoms are found in 25% of patients with carcinoma maxilla. T4 tumors with orbital invasion present with bad prognosis as compared to other T4 tumours[13].

Fibrous dysplasia: it is benign self lesion which occurs exclusively in first two decades of life it occurs most often in maxilla, sphenoid and frontal bone. periorbital swelling and asymmetry are common presenting sign of lesion may encroach the orbit from the walls of sinuses[2] .

Angiofibroma: it is benign but locally destructive tumor. it is not unusual for angiofibroma to extend into the orbit. Approximately 10% of patient have proptosis at the time of presentation.[3] it may involve the orbit via the inferior orbital fissure.

Inverted papilloma: it is a locally aggressive sinonasal tumour that arises from the outlining schnedirean respiratory membrane. 7 % of these cases invades orbits[4] .True violation in to the orbital fat is rare[5] . Compression of orbital contents can cause visual loss.

Rhinoscleroma: Cases of rhinoscleroma with invasion in to the orbit is rare the first case of orbital involvement by rhinoscleroma was reported by HARA[6] in 1957 .

Bacterial sinusitis: 75% of bacterial infections in the orbit are caused by paranasal sinusitis[7,] (Spread is mainly due to preformed pathways & Valve less veins. But in our study we found that incidence of orbital infection due to sinusitis is decreasing, probably due to common use of antibiotics. Orbital bacterial infection is classified by chandlers system in to preseptal and post septal infections. Acute sinusitis is mainly responsible for orbital infection in children while in adults it is due to exacerbation of chronic sinusitis. Imaging evalution is done by CT and MRI. patient with pre septal infection can treated on outpatient basis but post septal infections needs hospitalization and aggressive treatment is started. Surgery is indicated when there is decrease in visual acquity or more advanced disease.

Fungal sinusitis: Sino-nasal fungal infections, in particular mucour mycosis spreads to involve the orbit. In this study we had 2 cases due to fungal infection, both of these cases were due to mucourmycosis and patients were diabetic.

Atrophic rhinitis :VN chatuervedi 1973 reported a case of orbital cellulitis due to maggots in the eye and nose with atrophic rhinitis.

Graves disease : Graves' ophthalmopathy is an inflammatory reaction in which there is increased no of T cells and associated edema . Orbital fat and mucopolysaccharies is increased ,inflammation of orbital muscles also there. It causes Ocular symptoms like proptosis ,lid retraction, optic nerve compression , diplopia , exposure keratopathy, glaucoma severe congestive changes (Chemosis ,scleral injection).

Petrositis: It may have ophthalmic manifestations due to involvement of VI nerve causing diplopia and retroorbital pain due to V nerve involvement.

VIII. Iatrogenic

Various ENT surgical procedures can cause ophthalmic complications:
FESS: Various nasal Endoscopic surgical procedures can cause orbital complications Surgery may cause orbital haemorrage due to damage to ethmoidal arteries , Diplopia due to involvement of rectus muscles after breaching lamina papyracea. , injury to nasolacrimal duct can occur causing epiphora , Vision loss can also occur[8]

Caldwell-luc operation: It may cause injury to inferior orbital wall , inferior rectus and inferior oblique muscles, nasolacrimal duct and can cause blindness by direct trauma to optic nerve or due to pressure effect of orbital hemorrhage. Kylander[9] reported the development of ophthalmic complications in 2 out of 61 cases with intraocular hemorrhage without blindness. Griffiths and smith observed blindness and ocular motility disturbance in 2 patient following caldwell luc [10]procedure.

Bilateral neck dissection: Blindness can result following bilateral neck dissection due to posterior ischemic optic neuropathy[11].

Nasal septum correction: A case of blindness has been reported by central artery occlusion following nasal septum correction [12.]

Antral Puncture: It may cause – orbital injury and cellulitis.
Maxillectomy: In maxillectomy inferior orbital wall is damaged causing ophthalmic problems like enopthalmos , orbital dystopia, diplopia and ectropion. In this study we found six cases of maxillectomy related orbital problems.
Facial nerve damage: Facial nerve damage can occur in many ENT procedures like mastoid surgery, stapedectomy, Tympanoplasty, parotid surgery and can manifest as inability to close Eye, epiphora, dryness, exposure keratitis and corneal ulcers.

IX. Conclusion

A variety of ENT diseases & surgical procedures can present with orbital complications due to anatomical association of orbit with the surrounding head and neck structures. Orbital involvement must be ruled out whenever an ENT patient presents with orbital complaints like proptosis, ophthalmoplegia, neurologic dysfunction of eye, chemosis, or epiphora. Previously, sinonasal infections were the commonest cause for orbital complications in ENT patients but nowadays sinonasal tumours are the most common cause of orbital complications. This shift in etiology is due to common use of antibiotics. Iatrogenic orbital complications are not uncommon. Rapid diagnosis and treatment is necessary for preserving vision and life in these patients. Teamwork between ophthalmologist and the otolaryngologist is required for the appropriate management of such lesions.

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