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ORIGINAL ARTICLE

ORBITAL MANIFESTATIONS OF SINUS DISEASE

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ABSTRACT: AIM: To study the orbital manifestations in patients with sinus disease. **METHODS**: Patients with paranasal sinus disease presenting to OPD at Government ENT Hospital, AMC, Visakhapatnam from January 2012 to June 2014 were screened for orbital manifestations. Out of these, thirteen patients with orbital disease were referred to GREH, AMC, Visakhapatnam and were thoroughly investigated and managed appropriately. **RESULTS**: Out of the 14 patients 4 were female and 10 were male. Age ranged from 19 years to 70 years. 5 had maxillary sinus disease (4 - carcinoma and 1 case of mucormycosis). Frontal sinus disease was seen in two patients, one fibrous dysplasia and one malignancy. Five patients had ethmoidal sinus disease of which three patients were found to have ethmoidal sinus tumour (Malignant melanoma, Squamous cell Carcinoma). More than two sinuses were involved in 2 patients. **CONCLUSIONS**: Early screening of patients with sinus disease by an Ophthalmologist can help in preventing severe vision threatening orbital complications.

KEYWORDS: Orbits, Paranasal sinuses, Sinusitis, Orbital cellulitis, Paranasal sinus tumours, proptosis.

INTRODUCTION: Anatomically, the orbital cavity has an intimate topographical relationship to the surrounding paranasal sinuses. Hence orbit may be involved in majority of expanding or bone eroding lesions originating in the sinuses and in the nasopharynx. The anatomic basis of ophthalmic complications in paranasal sinus disease is that the orbit is nearly completely surrounded by sinuses, except laterally; the separating bones are very thin, with numerous suture lines.

There is a direct communication between the ethmoidal cells and the orbit by the anterior and posterior ethmoidal vessels. Orbital contents such as extra ocular muscles and the optic nerve are in close relationship to the sinuses. Orbital veins lack valves, allowing for free communication between facial vein and the cavernous sinus.[1],[2] Orbital complications of sinusitis include edema, orbital cellulitis, subperiosteal abscess, orbital abscess, cavernous sinus thrombosis and in advanced stage intracranial complications such as meningitis and brain abscess.[1],3],[4]

Group	Chandler	Maloney
First	Inflammatory oedema	Preseptal cellulitis
Second	Orbital Cellulitis	Subperiosteal abscess
Third	Subperiosteal abscess	Orbital cellulitis
Fourth	Orbital Abscess	Orbital Abscess
Fifth	Cavernous sinus thrombosis	Cavernous sinus thrombosis

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Group	Chandler	Maloney

Table 1: Classifications of Orbital Infection and Inflammation[1],[3][5]

Similarly, significant number of orbital tumours originate from paranasal sinuses.[6] In many patients proptosis may be the only presenting symptom.[6]

MATERIALS AND METHODS: Patients with paranasal sinus disease presenting to OPD at Government ENT Hospital, AMC, Visakhapatnam from January 2010 to June 2014 were screened for orbital manifestations. Out of these, fourteen patients with orbital disease were referred to GREH, AMC, Visakhapatnam and were thoroughly evaluated. Patients with endocrine ophthalmopathy like thyroid ophthalmopathy were excluded. Extensive history was taken and general examination was done with the collaboration of other departments wherever necessary.

Visual acuity was tested using Snellen's chart, anterior segment was evaluated using slit lamp. Posterior segment was evaluated by direct / indirect ophthalmoscopy as appropriate. B-scan ultrasonography / CT scan / MRI were done wherever necessary. Appropriate specimens were sent for culture and sensitivity in suspected infectious conditions. Appropriate antibiotic / anti-fungal treatment was given according to standard protocols. In suspected tumours, complete surgical excision was done at ENT / Neurosurgery departments and specimens were sent for histopathological examination and the diagnosis was confirmed.

Disease	No. of patients
Orbital inflammation following ethmoiditis	2 (14.28%)
Fungal granuloma	3 (21.42%)
Total	**5 (35.71%)**

Table 2: Aetiology in cases with infectious causes

RESULTS: Out of 14 patients examined, 10 (71.42%) were males and 4 (28.58%) were females. Age group ranged from 19 to 70 years. Right eye was affected in 8 (57.14%) patients, while left eye was affected in 6 (42.86%) patients. Orbital manifestations were secondary to frontal sinus disease in 2 (14.28%) patient, ethmoid sinus disease in 5 (35.71%), maxillary sinus disease in 5 (35.71%) patients. In 2 (14.28%) patients, more than 2 sinuses were involved. Distribution of aetiology is shown in chart 1 and 2 and in table 2.

Among 9 (64.28%) patients with neoplasms, 3 (21.42%) had ethmoidal sinus tumours, 2 (14.28%) had squamous cell carcinoma of ethmoid sinus, while one patient (7.14%) had malignant melanoma of ethmoidal sinus. 1 patient (7.14%) had frontal sinus carcinoma and 1 patient (7.14%) had dysplasia of frontal sinus. 3 (21.42%) patients had squamous cell carcinoma of maxillary sinus. 1 patient (7.14%) had squamous cell carcinoma that involved maxillary, ethmoid and sphenoid sinuses. The 2 patients with orbital cellulitis presented with fever, pain & redness of the affected eye. Two out of three patients with fungal granuloma had predisposing conditions like severe uncontrolled diabetes mellitus and HIV infection respectively.

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They presented with rapidly increasing proptosis and poor general condition. One female patient with maxillary sinus fungal granuloma (Mucormycosis) had ptosis with limitation of all extra ocular muscle movements along with proptosis. The other two patients with fungal granuloma are male. One of them is HIV positive presenting with rapidly progressing proptosis, swelling of the right cheek and limitation of all extra ocular muscle movements in right eye.

This too was found to be mucormycosis. Among paranasal sinus neoplasms causing orbital manifestations, 3(21.42%) had ethmoidal sinus tumours, another 3 (21.42%) had maxillary sinus tumours, while 1(7.14%) patient had frontal sinus malignancy. More than two sinuses were involved in 1(7.14%) patient. All these patients presented with proptosis, diplopia, redness and diminished vision. Two patients with orbital cellulitis following ethmoiditis were managed medically with a combination of cephalosporins and aminoglycosides and showed good response.

Among the 3 patients with sinus fungal granuloma, one patient was treated with intravenous Amphotericin B and responded well to treatment, while the remaining two underwent functional endoscopic sinus surgery (FESS) along with parenteral anti-fungal therapy and showed good post-operative recovery. One patient with fibrous dysplasia of frontal sinus underwent excision of dysplastic bone and craniofacial reconstruction. Among the remaining 8 patients with tumours, one patient with malignant melanoma of ethmoid sinus was referred to higher centres for further management. Complete tumour excision was done through transcranial / Caldwel-Luc approach in the remaining 7 patients. Radiotherapy and chemotherapy were given wherever necessary.

DISCUSSION: In our study, males were found to be more commonly affected. Age distribution ranged from 19 years to 70 years. It was variable and no specific pattern could be seen. The most common ophthalmic presenting feature was proptosis whereas nasal obstruction and or epistaxis were common presenting features in ENT department. In a study by Frazell E. L. and Lewise J. S of 416 cases of malignancy of the nose and PNS, the symptomatology showed high incidence of nasal obstruction, facial swelling and epistaxis as the presenting complaint.[6] These two findings are comparable to that of our study. Inflammatory orbital complications were seen in 2 patients and responded well to standard medical treatment.[8,9] These 2 patients with orbital cellulitis were young males and concur with the findings of Pjerin Radovani et al.,[8],[10]

Among the benign neoplastic lesion, fibrous dysplasia was the only lesion noted when compared to Venugopal et al., who state that angiofibroma was the most common benign tumor causing proptosis followed by inverted papilloma, chondroma of ethmoid, ossifying fibroma and fibrous histiocytoma.[7] Among malignant tumours, squamous cell carcinoma was found to be the most common histological type. This is in agreement with studies by Frazell E. L. et al., Venugopal et al and several other previous studies.[11,7,6,12] All the cases of malignancy underwent total maxillectomy with radiotherapy and chemotherapy wherever indicated. The patient with angiofibroma underwent radiation therapy.

CONCLUSIONS: Despite good antibiotic treatment, orbital complications can occur in patients with paranasal sinus disease. A high index of suspicion is needed in these cases to avoid serious complications. Similarly, a thorough ENT evaluation should be done in every patient with proptosis followed by appropriate radiological investigation to ensure early diagnosis and appropriate treatment.

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Fig. 1: Right Maxillary Sinus carcinoma

Fig. 2: Left Ethmoid Sinus Carcinoma

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Fig. 3: CT showing Ethmoidal sinus malignancy extending into Left orbit

Fig. 4: Right Ethmoid sinus carcinoma

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