

## Orbital complications of ENT diseases- A retrospective study

Dr. Palak Gupta<sup>1</sup>, Dr. Anchal Gupta<sup>2\*</sup>, Dr. Vikrant Mahajan<sup>3</sup>, Dr. Padam Singh Jamwal<sup>4</sup>

<sup>1</sup> Postgraduate, <sup>2</sup> Senior Resident, <sup>3</sup> Senior Resident, <sup>4</sup> Professor

<sup>1</sup>Department of Ophthalmology, <sup>2</sup>Department of ENT, Head and Neck Surgery <sup>3</sup>Department of Radiodiagnosis,

<sup>4</sup>Department of ENT, Head and Neck Surgery

SMGS Hospital, Government Medical College, Jammu, Jammu and Kashmir, India

### \*Corresponding Author:

**Dr. Anchal Gupta**

Senior Resident Department of ENT and Head and Neck Surgery, SMGS Hospital, Government Medical College Jammu

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### ABSTRACT

**Background:** Orbital complications are fairly common in Otorhinolaryngology practice because of close proximity of orbit to adjacent ENT regions.

**Materials and methods:** This retrospective observational study was conducted at Department of ENT, SMGS Hospital, Government Medical College, Jammu, for a period of two years from January 2018 to January 2020. 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.

**Results:** Out of 42 patients, M:F ratio of 1.3:1 was seen. The most common ENT complaints included nasal obstruction and nasal discharge. Most common orbital complaint proptosis followed by reduced vision. The most common ENT disease causing orbital complications was sinonasal tumors followed by sinonasal and facial infections. Among the sinonasal tumors the most common tumor causing orbital complications was carcinoma maxilla followed by angiofibroma.

**Conclusion:** Correct diagnosis, adequate antibiotic therapy, and surgical intervention are important for management of orbital and ophthalmic complications in various ENT diseases. Cooperation between Ophthalmologist and the Otolaryngologist is clearly desirable for proper management of these cases.

**Keywords:** Complications, ENT, orbital

### INTRODUCTION

Many ENT diseases have ophthalmic manifestations, as many head and neck structures are related to eyes in many ways. The close proximity of orbit with nose, paranasal sinuses and skull base makes it susceptible to the disease from this area. The orbit shares a common wall with floor

of frontal sinus (roof of orbit), lamina papyracea of the ethmoid labyrinth (medial wall of the orbit), roof of maxillary sinus (floor of the orbit) and anterolateral wall of the sphenoid sinus (orbit Apex). These walls are really thin enabling infections and tumors to travel from either direction.

These bony walls are perforated by various foramina that transmit nerve and blood vessels all of which provide potential routes of invasion in to the eye. The whole venous system in this area is valve less consequently a two way pathway of infection between orbit nasal cavity and paranasal sinus becomes a reality.

Ocular and orbital symptoms can be presentation of wide variety of infective and neoplastic conditions of nasal cavity, paranasal sinuses and nasopharynx. Infectious agent can be bacterial, viral or fungal. 75% of bacterial infections in the orbit are caused by sinusitis.<sup>1</sup> Rhinosinusitis is a relatively common clinical condition. Among rhinosinusitis complications, orbital complications are the most frequent and associated with the ethmoid sinusitis in younger patients. Orbital complications include preseptal cellulitis, orbital cellulitis, subperiosteal abscess, orbital abscess and cavernous sinus thrombosis.<sup>2</sup>

Complications involving structures other than the orbit are comparatively rare. These include intracranial complications and bony erosion. Usually they present along with the orbital complications but may in rare cases occur as an isolated complication.

Many epithelial, mesenchymal tumors and tumor like lesions can develop in nose, paranasal sinuses and nasopharyngeal region have potential to extend in to the orbit by mean of bone erosion, extension along neural and vascular pathways and through surface lines bony dehiscence in the orbital walls. Among the benign tumours, inverted papillomas and osteoma may present with proptosis. But usually malignant tumours of the nose and paranasal sinuses erode the orbital walls and present with orbital complications. Ocular symptoms are present in 25% of patients with maxillary sinus carcinoma; however, only 5% of patients report ocular disturbances at initial presentation.<sup>3</sup>

## **MATERIALS AND METHODS**

This retrospective observational study was conducted at Department of ENT, SMGS Hospital, Government Medical College, Jammu, for a period of two years from January 2018 to January 2020. 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.

### ***Statistical study***

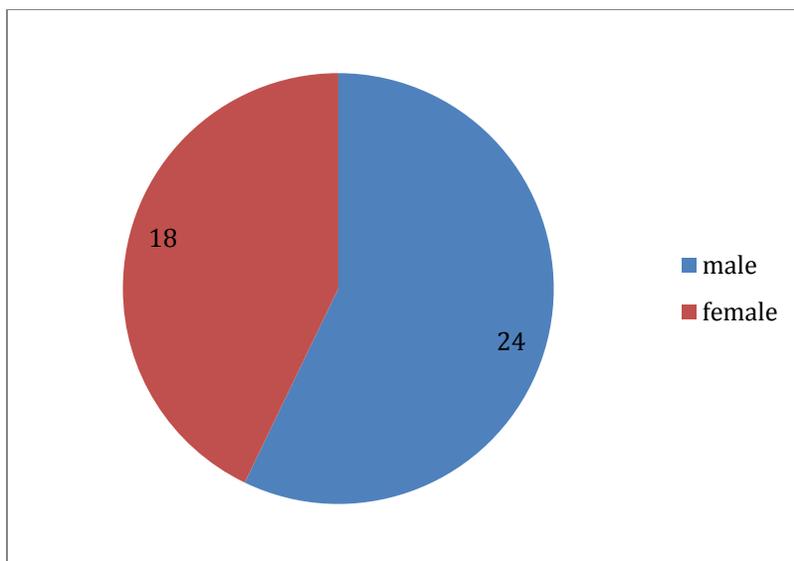
Data was collected using proforma and data collected included patients demographics. Data obtained underwent standard statistical analysis. Data were shown as mean± standard deviation and number of cases.

## **OBSERVATIONS AND RESULTS:**

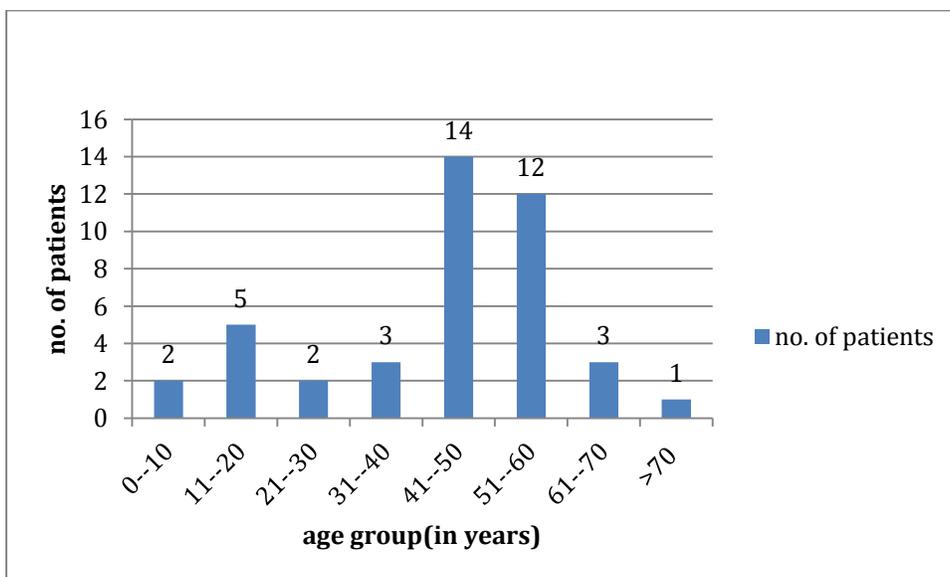
42 patients were studied. The following observations were made.

### **Age and sex distribution of patients**

Out of 42 patients, there were 24 males and 18 female patients with M:F ratio of 1.3:1.[ Figure 1]. The age range of patients was 8-76 years. The mean age at presentation was 46±2.8 years. Maximum (14,33.33%) patients were in the age group of 41-50 years, followed by 51-60 years(12,28.57%). Lowest age recorded was 8 years and maximum age was 76 years.[Figure 2]



**Figure 1:** Sexwise distribution of patients.



**Figure 2:** Agewise and sexwise distribution of patients.

**ENT complaints**

The most common ENT complaints included nasal obstruction in 20 (47.6%) cases, discharge in 15 (35.7%) cases, epistaxis and facial swelling in 8 (19.1%) and 5(11.9%) cases respectively. Table 1 is showing incidence of different ENT complaints.

**Table 1:** ENT complaints

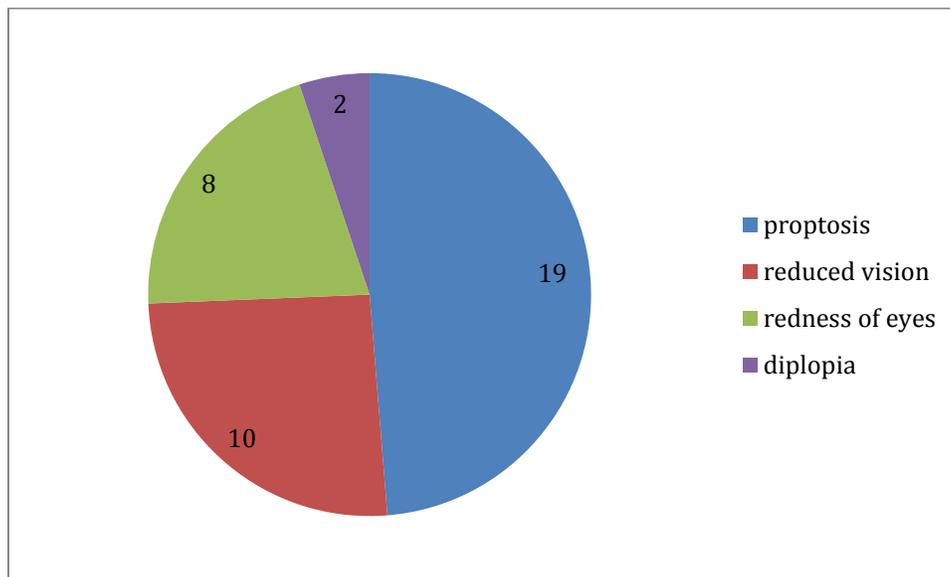
|                   |           |
|-------------------|-----------|
| Nasal obstruction | 20(47.6%) |
| Nasal discharge   | 15(35.7%) |
| Epistaxis         | 8(19.1%)  |
| Facial swelling   | 5(11.9%)  |

| ENT Complaint | No. of patients |
|---------------|-----------------|
|---------------|-----------------|

**Orbital complaints**

Among 42 patients, most common clinical presentation was proptosis caused by orbital extension of squamous cell carcinoma of maxillary sinus, inverted papilloma, nasopharyngeal angiofibroma, nasopharyngeal carcinoma and frontoethmoidal mucocele. Ophthalmic complaints

included proptosis in 19(45.23%) cases, reduced vision in 10(23.8%) cases, redness of eyes and diplopia in 8 (19.04%) and 2 (5.26%) cases respectively. Figure 3 shows incidence of orbital complaints.



**Figure 3: Incidence of orbital complaints.**

**Orbital complications due to various ENT diseases**

The most common ENT disease causing orbital complications was sinonasal tumors seen in 20(47.61%) patients. Among the sinonasal tumors the most common was carcinoma maxilla seen in 8 patients followed by angiofibroma(4 patients), nasopharyngeal carcinoma(3 patients), inverted papilloma(2 patients), fibrous dysplasia (2 patients) and olfactory neuroblastoma(1 patient). 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 The sinonasal and facial infections e.g. fungal and bacterial rhinosinusitis caused orbital complications in 13 (30.95%) patients. 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 is also there. It causes Ocular symptoms like proptosis ,lid retraction, optic nerve compression , diplopia , exposure keratopathy, glaucoma severe congestive

changes (Chemosis ,scleral injection). In our study orbital complications were caused in 2(4.76%) patients. Other diseases like frontoethmoidal mucoceles(2 patients), CSOM(2 patients), carcinoma parotid, carcinoma temporal bone and rhinosporidiosis caused orbital complications in 1 patient each.[Table 2, Table 3]

**Table 2:** Orbital complications due to various ENT diseases

| ENT diseases                    | No. of patients |
|---------------------------------|-----------------|
| Sinonasal tumors                | 20(47.61%)      |
| Sinonasal and facial infections | 13(30.95%)      |
| Grave’s disease                 | 2(4.76%)        |
| Carcinoma parotid               | 1(2.38%)        |
| Carcinoma temporal bone         | 1(2.38%)        |
| Frontoethmoidal mucocele        | 2(4.76%)        |
| Rhinosporidiosis                | 1(2.38%)        |

|      |          |
|------|----------|
| CSOM | 2(4.76%) |
|------|----------|

**Table 3:** Sinonasal tumors causing orbital complications

| Sinonasal tumors         | No. of patients |
|--------------------------|-----------------|
| Carcinoma maxilla        | 8               |
| Inverted papilloma       | 2               |
| Angiofibroma             | 4               |
| Nasopharyngeal carcinoma | 3               |
| Olfactory neuroblastoma  | 1               |
| Fibrous dysplasia        | 2               |

**DISCUSSION**

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.

Out of 42 patients, there were 24 males and 18 female patients with M:F ratio of 1.3:1.[ Figure 1]. The age range of patients was 8-76 years. The mean age at presentation was 46±2.8 years. Maximum(14,33.33%) patients were in the age group of 41-50 years, followed by 51-60 years(12,28.57%). Lowest age recorded was 8 years and maximum age was 76 years. Malik et al found the similar results with number of men were more common than women by a ratio of 2: 1.<sup>4</sup> Sinha et al in their study showed higher incidence in males (35 males: 15 females).<sup>5</sup>

The most common ENT complaints included nasal obstruction in 20 (47.6%) cases, discharge in 15

(35.7%) cases, epistaxis and facial swelling in 8 (19.1%) and 5(11.9%) cases respectively. Most common ENT finding in these patients was nasal mass. Frazell and Lewise studied 416 cases of malignancy of the nose and paranasal sinuses, the symptomatology showed high incidence of nasal obstruction (35%), facial swelling (25%) and epistaxis (12.5%) as the presenting complaint.<sup>6</sup>In a study done by Sinha et al, ENT complaints included nasal obstruction in 42% cases, epistaxis in 28% cases and facial swelling and blood stained discharge in 12% and 6% cases respectively.<sup>5</sup>

Among 42 patients , most common clinical presentation was proptosis caused by orbital extension of squamous cell carcinoma of maxillary sinus, inverted papilloma, nasopharyngeal angiofibroma, nasopharyngeal carcinoma and frontoethmoidal mucocele. Ophthalmic complaints included proptosis in 19(45.23%) cases, reduced vision in 10(23.8%) cases, redness of eyes and diplopia in 8 (19.04%) and 2 (5.26%) cases respectively. Sinha et al, found proptosis in100% cases, reduced vision in 14% cases red eye in 6% cases and double vision in 2% cases.<sup>5</sup> Sinha et al concluded that proptosis is the commonest clinical presentation in neoplastic lesions of nose and paranasal sinuses.<sup>5</sup>

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orbital complications were caused in 2(4.76%) patients. Other diseases like frontoethmoidal mucocoeles(2 patients), CSOM(2 patients), carcinoma parotid, carcinoma temporal bone and rhinosporidiosis caused orbital complications in 1 patient each. Henderson's series of 465 cases of orbital tumours, 7% originated from sinonasal region and 60% of these were antral carcinomas this finding is comparable to that of my study in which major case of orbital involvement was sinonasal tumours (47.37%).<sup>7</sup>

A study conducted by Sayed, showed sinonasal infections both bacterial and fungal a major case of orbital involvement (17 cases) followed by sinonasal tumours (11 cases), in sin nasal tumours commonest cause was carcinoma maxilla which is similar to our study.<sup>8</sup> Sinonasal tumours were the commonest cause of proptosis in study done by Sinha *et al*.<sup>5</sup>

#### CONCLUSION

A variety of ENT diseases can present with orbital complications due to close anatomical relation of orbit with the surrounding ENT and head and neck structures. Orbital complications must be suspected whenever any ENT patients present with complaints of proptosis, diplopia, vision loss and epiphora etc. Early diagnosis and treatment is crucial for preserving vision and life of these patients.

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