

Original Research Article

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## Squamous cell carcinoma of maxillary sinus: a comparison of clinico-radiological staging with pre-operative staging

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### ABSTRACT

**Background:** The nasal cavity and paranasal sinuses are the site of origin of more complex, histologically diverse group of tumors which include neoplasms derived from mucosal epithelium, seromucinous glands and haematolymphoid cells. This study aimed to assess the incidence and prognosis of maxillary sinus malignancy.

**Methods:** A total 25 (16 males, 09 females) malignancy cases between age group 11-70 years. All the cases were undergone with detailed clinical examination. The TNM staging system was followed to detect and standardize the disease stage. CT scan was used to identify the growth and extent of tumor.

**Results:** Majority cases were between the age group 41-50 years (40%). Epistaxis was the commonest clinical symptom in 72% cases followed by nasal obstruction (68%), oral related symptoms (56%), oedema in cheeks (44%) and auditory disturbances in 16% cases. The TNM Staging system showed that 76% cases had T3 lesions, 16% had T4 lesions and 8% had T2 lesions. Nasal symptoms are commonly associated with malignancies and were belongs to T3 stage and few under T4.

**Conclusions:** Maxillary sinus malignancy is an aggressive tumor normally diagnosed at the advanced stage, with minimal prognosis and reduced survival rate. Surgery in combination with radiotherapy followed by chemotherapy remains the best treatment modality.

**Keywords:** Paranasal air sinus, Maxillary sinus malignancy, Clinical staging, Radiological staging, prognosis

### INTRODUCTION

Nasal cavity and paranasal air sinus malignancies are uncommon, which accounts less than one percent of all human malignancies and 3% in malignancies to head neck region, being the maxillary sinus the most frequent origin of primary malignant tumors of the paranasal sinuses.<sup>1,2</sup> The incidence of Paranasal sinus malignancies occurs twice as of in males as in females and are of the diagnosed in patients 50-70 years of age.<sup>3,4</sup> Paranasal sinus malignancies are asymptomatic in early stages, but difficult in advances stages and generally detected in an advanced state, in 90% of all cases, at stages T3/T4.<sup>5</sup>

Environmental factors such as industrial pollutants, dust smoke and adhesives are leading causes for development of disease.<sup>6</sup>

Squamous cell carcinoma is the most frequent histological type and more than 75% paranasal sinus malignancies are epithelial in origin.<sup>7,8</sup> Paranasal sinus malignancies have a poor prognosis and are often difficult to treat. Due to its close proximity to vital structures of head, neck regions, complete surgical resection of paranasal tumors is a challenging task to the surgeons.

With the above facts, the present study was designed to assess the incidence of symptoms, prognosis and comparison of clinical and radiological staging with the postoperative staging of maxillary sinus malignancies.

**METHODS**

The present study was conducted in the Department of E.N.T., Mallareddy Medical College, Hyderabad, during June 2016 to December 2017. A total 25 patients attending the out-patient department presenting with signs and symptoms of malignant tumor of maxillary sinus were recruited for further screening.

Cases histologically conformed with squamous cell carcinoma of maxillary sinus were included and cases with benign tumors of the head and neck, secondary involvement of the paranasal air sinuses by tumors of distant area, tumors arising from the major salivary gland and nasopharyngeal lesions were excluded from the study. Tumors were classified as per International union for cancer control (UICC) classification.

All the cases were undergone with detailed clinical examination i.e. presence of intra nasal mass, examination of maxillary teeth, alveolar sulcus, and visualization of nasopharynx and then subjected to diagnostic nasal endoscopy and CT scan. In CT scan, attenuation values in the range 30-90 HU were considered positive for growth and their extent noted. The TNM staging system was followed to detect and standardize the disease stage.

Cases were reported to regular follow up at end of 6months, 12 months and 18 months. Follow up data was extracted in to Microsoft excel sheet to compare peroperative values with clinical and radiological findings.

**RESULTS**

A total 25 cases, i.e. 16 males, 09 females were between age group 11-70 years were included. Majority cases were between age group 41-50 years (40%), followed by 51-60 years (28%) (Figure 1).

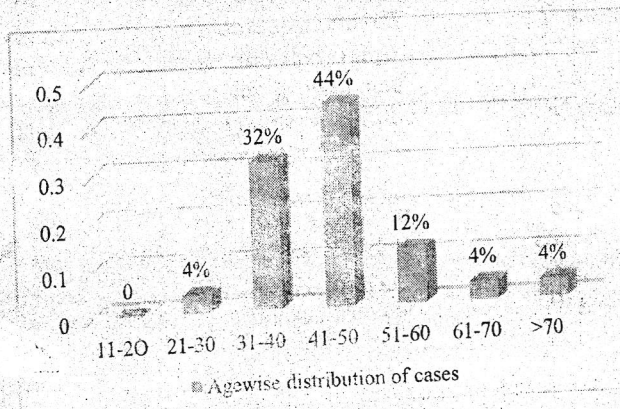


Figure 1: Age wise distribution of cases.

Table 1: Common clinical symptoms noted at the time of clinical examination of cases.

Clinical symptoms	Total number of cases	
	Number	Percentage (%)
Epistaxis	18	72
Nasal Obstruction	17	68
Oral related	14	56
Auditory disturbance	04	16
oedema on cheeks	11	44

Histological classification of carcinomas

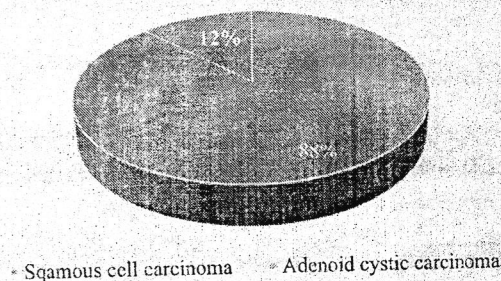


Figure 2: Histological classification of maxillary sinus malignancy.

In the view of clinical symptoms, epistaxis is more prevalent in 72% cases, followed by Nasal obstruction in 68% cases, oral related clinical symptoms in 56% cases, swelling of cheeks in 44% cases and auditory disturbances in 16% cases (Table 2). Histologically, Squamous cell carcinoma was seen in 88% cases and adenoid cystic carcinoma in 12% cases (Figure 2).

Table 2: Determination of stage of the disease by TNM Staging system in related to signs and symptoms.

Signs and symptoms	T1	T2	T3	T4
Orbital	NIL	NIL	10	05
Nasal	NIL	03	15	11
Oral	NIL	04	10	07
Facial	NIL	NI	11	04
Other neurological	NIL	NI	01	02

Based on Broder's grading system, in this study, 72% cases had well differentiated squamous cell carcinoma, followed by moderately differentiated in 12% cases, poorly and undifferentiated in 16% cases. Bony erosion with soft tissue accumulation was seen in 92% cases by CT scan. Determining the stage of disease by the TNM Staging system showed that 76% cases had T3 lesions, 16% had T4 lesions and 8% had T2 lesions. None of the cases had T1 lesions.

Postoperatively, patients were followed up to 18 months. According to clinical staging, total cases of T2 stage were survived up to 18 months. In T3 staging, 12 cases were

surviving at first 6 months follow up, 11 survived for 12 months follow up and 10 survived for 18 months follow up. In T4 staging, 05 cases were surviving at first 6

months follow up, 05 survived for 12 months follow up and 03 survived for 18 months follow up.

**Table 3: Correlation between pre-operative staging with clinical and radiological staging in cases.**

Preoperative stage	Clinical Stage				Radiological stage			
	T1	T2	T3	T4	T1	T2	T3	T4
T1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
T2	Nil	03	Nil	Nil	Nil	04	Nil	Nil
T3	Nil	01	11	Nil	Nil	01	09	Nil
T4	Nil	Nil	05	05	Nil	Nil	05	06
Total	25				25			

## DISCUSSION

Cancers to the nasal cavity and paranasal air sinus is infrequent, accounting less than 1% of total human malignancies and only 3% of those occurring in the head and neck region.<sup>1</sup> This study focused on maxillary sinus malignancy, which accounts less than 2% of malignancies in ear, nose and throat. A total 25 malignancy cases were recruited between 11-70 years of age.

In majority cases, epistaxis was the commonest clinical symptom in 72% cases followed by Nasal obstruction (68%), oral related symptoms (56%), oedema in cheeks (44%) and auditory disturbances in 16% cases. Fasunla et al, found that epistaxis and swelling of the face as the first and fourth common clinical symptoms.<sup>9</sup> But works by Bush, et al, Gao, et al found auditory disturbance was a rare clinical symptom associated with maxillary carcinoma.<sup>10,11</sup> Based on Broder's grading system, in this study, 72% cases had well differentiated squamous cell carcinoma, followed by moderately differentiated in 12% cases, poorly and undifferentiated in 16% cases.

In this study, nasal symptoms are commonly associated symptom with maxillary tumors. Dominant number of cases with nasal symptoms were belongs to T3 stage and few under T4. Cases with oral symptoms come under T3 and T4 due to involvement of Hard palate and the floor of maxilla. The Correlation between pre-operative staging with clinical and radiological staging correlates well with T2 and T3 tumor.

Postoperatively, patients were followed up to 18 months. According to clinical staging, total cases of T2 stage were survived up to 18 months. In T3 staging, 12 cases were surviving at first 6 months follow up, 11 survived for 12 months follow up and 10 survived for 18 months follow up. In T4 staging, 05 cases were surviving at first 6 months follow up, 05 survived for 12 months follow up and 03 survived for 18 months follow up. Study by Tiwar, et al, stated post operative and post operative radiotherapy survival rate was 64%.<sup>12</sup>

## CONCLUSION

Maxillary sinus squamous cell carcinoma is an aggressive tumor normally diagnosed at the advanced stage and most patients present an unfavorable prognosis and reduced survival rate. Nasal related clinical symptoms are common and belong to the T3 stage. Surgery in combination with radiotherapy followed by chemotherapy remains the best treatment modality.

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