

## Clinical study of tumors of nose and paranasal sinuses-an observational study

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### Abstract

**Background:** Tumors of nasal cavity and sinuses account for 0.2-0.8% of all carcinomas. These tumors show a great diversity in their presentation, clinical features, histology and treatment options. Tumors often simulate symptoms of chronic sinusitis and other chronic inflammatory diseases, with a resultant delay in diagnosis. This clinical study is carried out with an objective of knowing the various clinical manifestations of the tumors of Nose and Para nasal sinuses and various diagnostic methods available for the detection of these tumors, so as to aid in the adequate management. **Methods:** This is a Prospective clinical study conducted on patients attending the ENT Hospitals attached to autonomous Medical College, Bahraich, UP during the study period from June 2017 to June 2019. Fifty consecutive cases were analyzed. **Results:** There are 23 benign and 27 malignant tumors in the study. Diagnostic nasal endoscopy and Biopsy were very valuable in the assessment and management of these tumors. All Benign tumors were treated surgically and malignant tumors were treated with a combination of surgery, radiotherapy with or without chemotherapy. **Conclusion:** Real improvements in the prognosis are unlikely to occur unless the disease is diagnosed at an early stage. This can be achieved by educating the general public about the symptomology of these tumors and encouraging the general practitioners to exercise more caution when they encounter patients with innocuous appearing nasal symptoms.

**Key words:** Tumor, Maxillectomy, Orbital Exenteration, Metastasis, Obturator.

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### Introduction

Nose occupies a functionally vital, cosmetically pleasing and anatomically central position in the human face. It is rather paradoxical that patient with tumors of Nose and Paranasal sinuses present to the clinician in advanced stage of their disease. Benign and malignant tumors of Nose and Paranasal sinuses, although rare according to statistics, are a very important group for a head and neck surgeon.

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Tumors of nasal cavity and sinuses account for 0.2-0.8% of all carcinomas. These tumors show a great diversity in their presentation, clinical features, histology and treatment options. Tumors often simulate symptoms of chronic sinusitis and other chronic inflammatory diseases, with a resultant delay in diagnosis[1,2]. Benign tumors are rare compared to malignant tumors of Nose and Paranasal sinuses. A high proportion of these tumors are locally advanced involving the bony structures of the upper jaw and base of skull in addition to soft tissues of orbit, face and oral cavity. By the time lesions attain sufficient size to evolve symptoms; it may be impossible to ascertain its site of origin. Fortunately, despite the fact that majority of the patients have advanced disease at presentation, propensity for distant metastasis is rare. Better imaging techniques, nasal endoscope delineate the tumor

precisely and help in better management. In order to achieve tumor ablation the tumor should be mapped accurately in the pre-operative stage. In achieving this clinical and radiological examinations complement each other. The final staging is however possible only after surgical exposure. The wide variability of surgical and radio therapeutic techniques, duration of follow up, methods of reporting survival, and until recently absence of accurate staging system have all made the management of these tumors difficult [3-5].

#### Aims and objectives

To study the various clinical manifestations of the tumors of Nose and Paranasal sinuses.

To study various diagnostic methods available for the detection of these tumors, so as to aid in the adequate management of these tumors.

#### Materials and methods

##### Source of data

The study is conducted on patients attending the Autonomous Medical Institute attached with tertiary ENT Bahraich, UP during the study period from June 2017 to June 2019. Fifty consecutive cases are analyzed.

#### Inclusion criteria

Tumors of Nose and Paranasal sinuses, confirmed by histopathological examination after taking a thorough history, clinical examination, relevant investigations are included in the study.

#### Exclusion criteria

Patients who had primary tumors elsewhere in the body are excluded from the study. Conditions that involve the Nose and Paranasal sinuses like nasopharyngeal angiofibroma, rhinosporidiosis, nasopharyngeal malignancies are also excluded from the study.

#### Results

##### Incidence

Fifty cases of Tumors of the nose and paranasal sinuses diagnosed at the department of E.N.T, Autonomous Medical College, Bahraich, UP from June 20017 to June 2019 were included in this study. Out of them, there were 23 benign tumors and 27 malignant cases. A total of 60,000 cases attended the E.N.T O.P.D during the study period. The incidence of nose and paranasal sinus tumors was 0.08%.

**Table 1 : Showing the incidence**

No. of neoplasm	Total No. of O.P.D. cases	Incidence
50	60,000	0.08%

#### Age distribution

**Table 2: Showing decade-wise age distribution at presentation**

Age (years)	No. of benign tumours	% of benign tumors	No. of malignant tumors	% of malignant tumors	Total no. of tumors	% of tumor
0-10	2	8.6	0	0	2	4
10-20	1	4.3	1	3.7	2	4
20-30	4	17.3	0	0	4	8
30-40	5	21.7	0	0	5	10
40-50	6	26.1	5	18.5	11	22
50-60	4	17.3	8	29.6	12	24
60-70	1	4.3	11	40.7	12	24
70-80	0	0	2	7.4	2	4
Total	23	100	27	100	50	100

For benign tumors, the peak incidence was in the fourth decade whereas for malignant tumor it was in the sixth decade.

**Sex distribution:** In this study there were (32) male patients and (18) female patients in the ratio of 1.7:1.

**Table 3 : Showing the sex distribution of patients**

Sex	Nasal		Paranasal		Total
	Benign	Malignant	Benign	Malignant	
Male	12	0	2	18	64%
Female	9	0	0	9	36%
Total	21	0	2	27	100%

**Socio –Economic Status****Table 4 : Showing S E Status**

S.E. Status	Benign	Malignant	Total	Percentage
Upper	0	0	0	0
Upper-middle	11	1	12	24
Middle-lower	0	1	1	2
Upper-lower	5	7	12	24
Lower-lower	7	18	25	50
Total	23	27	50	100

Most of the patients belonged to the lower-lower and upper-lower socioeconomic groups, with only one from lower middle socio-economic group.

Occupation of patients: Most of the patients belonged to low and middle socioeconomic groups with no fixed occupational exposure. No specific agent with respect to the occupational exposure was ascertainable.

**Personal habits****Table 5 : Showing habits among the patients**

Habit	Benign		Malignant		Total	
	No	%	No	%	No	%
Smoking	6	26	8	29.6	14	28
Snuff	1	4.3	1	3.7	2	4
Tobacco chewing	2	8.6	10	37	12	24
Alcohol	0	0	3	11.1	3	11

Smoking was the most prevalent habit whereas snuff using was the least common.

**Clinical features :** The symptoms at the time of presentation had their frequency as follows:

**Table 6 : Showing the presenting symptoms**

Symptoms	Benign		Malignant		Total	
	No	%	No	%	No	%
Nasal obstruction	12	52.1	24	88	36	72
Bleeding per nose	21	91.3	27	100	48	96
Nasal discharge	0	0	0	0	0	0
Headache	1	4.3	2	7.4	3	6
Swelling of face	2	8.6	19	70.3	21	42
Mass per nose	5	21.7	3	11.1	8	16
Watering of eye	0	0	6	22.2	6	12
Loss of vision	0	0	0	0	0	0
Protrusion of eye ball	0	0	6	22.2	6	12

The commonest presenting symptom among benign and malignant groups was bleeding per nose, being present in 91.3% and 100% of patients respectively.

**Subsite distribution:** Out of the 50 tumors studied, 23 were benign and 27 were malignant tumors. Nasal

cavity was the most common site for benign tumors whereas the maxillary antrum was the most common site for malignant tumors.

**Table 7: Showing the subsite distribution**

Site	Benign		Malignant		Total	
	No	%	No	%	No	%
Nasal cavity	21	91.3	0	0	21	42
Maxillary antrum	1	4.3	26	96.3	27	54
Ethmoid	0	0	1	3.7	1	2
Frontal sinus	1	4.3	0	0	1	2
Total	23	100	27	100	50	100

**T stage of malignant tumors at presentation:** Out of the 27 malignant tumors, most of the cancers were in T3 stage.

**Table 8 : T-staging at presentation**

T-staging	No.	%
T1	0	0
T2	1	3.7
T3	20	74.1
T4	6	22.2
Total	27	100

**Cervical metastasis:** Three cases out of the 27 malignancies had nodal involvement.

**Systemic metastasis:** There was no evidence of systemic metastasis.

**Histology:** There were a variety of histological types encountered in the study as follows:

#### Benign Tumors

**Table 9 : Showing the incidence of Histological types of Benign Tumors**

Histology	Nasal		Paranasal		Total	
	No	%	No	%	No	%
Haemangioma	14	60.8	0	0	14	60.8
Inverted papilloma	7	30.4	0	0	7	30.4
Osteochondroma	0	0	2	8.8	2	8.8
Total	21	91.2	2	8.8	23	100

The most common variety was the Haemangioma accounting for 60.8% of benign tumors.

#### Malignant tumors

**Table 10: Showing the incidence of Histological types of malignant tumor**

Histology	Nasal		Paranasal		Total	
	No	%	No	%	No	%
Squamous cell carcinoma	0	0	18	66.6	18	66.6
Lymphoma	0	0	1	3.7	1	3.7
Adenocarcinoma	0	0	1	3.7	1	3.7

Chondrosarcoma	0	0	2	7.4	2	7.4
Teratocarcinosarcoma	0	0	1	3.7	1	3.7
Transitional cell carcinoma	0	0	4	14.8	4	14.8
Total	0	0	27	100	27	100

Squamous cell carcinoma was the most common histology among malignant tumors. It formed 66.6% of the total malignant tumors.

**Investigations:** X-RAY PNS: X-ray of the paranasal sinuses were taken in all the cases and showed different findings. The most common among the findings was opacification.

**Table 11 : Showing incidence of various findings in X-RAY**

Findings	No. of patients	Percentage
Opacification	29	58
Bone destruction	15	30
Reported as inflammatory lesion	3	6
Reported as normal	3	6

C.T. scan of the nose and P.N.S: C.T. scan of the nose and P.N.S were performed in most of the cases. It showed the extensions of the tumor and gave an idea of

the nature of the tumor. 9 cases appeared to have orbital involvement, 3 cases found to have infratemporal fossa extension.

**Table 12 : Showing extensions on C.T. scan**

Extension	No.	%
Orbital	9	18
Intracranial	0	0
Nasopharyngeal	0	0
Infratemporal fossa	3	6

**Diagnostic nasal endoscopy:** D.N.E showed evidence of tumor and helped to differentiate from inflammatory lesions.

**Biopsy:** Biopsy was done in all the cases

**Treatment:** Among benign tumors, all patients were treated by surgery. Most of the malignant cases were treated by surgery, radiotherapy, chemotherapy or a combination of these. The surgical procedure included excision in benign tumors. Medial maxillectomy to total maxillectomy with or without orbital exenteration in malignant tumors. The surgical approaches included lateral rhinotomy and the Weber-Fergusson incision. Ophthalmological opinion was taken in cases with intraorbital extension. A dose of 4500-6000 Gy was given as 5 fractions per week for a period of 4 weeks. Cobalt-60 Tele-therapy radiation was used. Combined chemotherapy and radiation was used in 2 patients. 8

Patients with the malignant tumors underwent a non-surgical treatment in the form of radiotherapy and /or chemotherapy [6-9].

**Orbital exenteration:** Five cases had clinical evidence of orbital involvement and nine cases appeared to have orbital involvement on C.T. scan. After preoperative examination orbital exenteration was carried out in patients, after considering various parameters like age, type of malignancy, breach of the periorbital.

**Complications:** Complications were minimal and included wound infection (6) cases, orocutaneous fistula (2) cases, mucositis of hard palate (4) cases.

**Follow-up:** Follow-up period was for 24 months. Patients were followed up after 1-month post treatment and then at 3 months, 6 months, 12 months and 24 months. Recurrences were noted among 3 patients in malignant series during follow-up and was treated with

radiotherapy. 5 patients lost for follow up. There was 1 death in the malignant series. In the benign series there was no evidence of recurrence in any patient and the follow-up was uneventful.

The various modalities of treatment adopted were as follows:

**Table 13 : Showing the treatment modalities**

Modality of treatment	Benign		Malignant		Total	
	No	%	No	%	No	%
Surgery alone	23	100	1	3.7	24	48
Surgery +RT/CTRT	0	0	15	55.5	15	30.0
RT/CTRT	0	0	8	29.6	8	16.0
Chemotherapy	0	0	3	11.1	3	6
Lost for treatment	0	0	4	14.3	4	14.3
Total	23	100	27	100	50	100

### Discussion

The Tumors of the Nose and Paranasal Sinuses are rare. There were a total of 50 tumors in our study extending

for a period of 24 months. Benign tumors were seen in the nasal cavity whereas the malignant tumors were more common in the Paranasal Sinuses

**Table 14: Comparison of various incidences among Indian studies**

Author	Region	Percentage
Singh K	Ludhiana	0.3
Present study	Bangalore	0.08

The incidence of Benign and Malignant Sino-Nasal tumors in present study is 0.08%, which is similar to the study conducted by Singh K

**Table 15: Showing common age groups at presentation**

Study	Age group	Percentage
Bahadur et al	5 <sup>th</sup> & 6 <sup>th</sup> decade	51
Present study	5 <sup>th</sup> to 7 <sup>th</sup> decade	48

The Malignant tumors ranged from the 1st decade to the 8th decade. Maximum incidence was in the 6th decade followed next by 5th decade. This may be due to various factors like prolonged exposure to environmental carcinogens, decrease immune system

function etc. The present study correlates with other Indian studies like the ones by Sharma et al and Bahadur et al. Most of the foreign studies have a peak in the 7th decade.

**Table 16: Comparative analysis of sex incidence of malignant sinonasal tumors**

Study	M:F
Hopkin et al[3]	1.3:1
Bahadur et al[2]	1.4:1
Buchanan et al[4]	1.3:1
Present study	1.7:1

A Male preponderance was observed in our study which is consistent with most of the studies. This can be due to genetic variations and more frequent exposure to carcinogens in males. The high incidence among the low socio-economic groups can be attributed to poverty, ignorance, illiteracy and lesser access to medical facilities. Nasal symptoms like nasal obstruction,

headache and facial pain are common in general practice and were often treated without any attempt made for finding an etiologic diagnosis. Bleeding from nose and Nasal obstruction are the most common symptoms in our study, which is similar to the studies conducted by V.J. Lund & D.J. Howard and Jackson et al[5]

**Table 17: Showing distribution of symptoms among patients with sinonasal tumors**

Symptoms	V.J.Lund&D.J.Howa[5] (%)	Jacobsen et al[6](%)	Present Study(%)
Nasal obstruction	70	63	72
Bleeding per nose	90	94	96
Nasal discharge	10	9	0
Headache	14	10	6
Swelling of face	35	40	42
Mass per nose	8	14	16
Watering of eye	10	8	12
Loss of vision	1	4	0
Protrusion of eyeball	10	14	12

**Table 18: Showing the site of origin of malignant tumors**

Site	Jacobsen et al[6](%)	Gariola et al[7](%)	Present study(%)
Nasal cavity	40	44	42
Maxillary antrum	54	52	54
Ethmoid	3	1	2
Frontal sinus	2	3	2
Total	100	100	100

Most of the Malignant tumors in our study arise from Maxillary sinus which is similar to the studies conducted by Jacobson et al and Gairola et al[7]

**Table 19: Comparative analysis of T staging of Malignant tumors**

T-staging	Sharma et al[8] (%)	Gariola et al[7](%)	study (%)
T1	0	3	0
T2	2.5	3.1	3.7
T3	65	70	74.1
T4	40	30	22.2

Up to 90% were diagnosed in the late stages (T3/T4). This is consistent with many Indian studies showing late stage presentation.

**Table 20: Comparative analysis of Malignant tumors of Nose and Paranasal Sinus**

Histology	Gariola et al[7](%)	Robin et al[9](%)	Present study(%)
Squamous cell carcinoma	60	65	66.6
Lymphoma	4	2.1	3.7
Adenocarcinoma	4	4.1	3.7
Chondrosarcoma	5.2	8.2	7.4
Teratocarcinosarcoma	2	4	3.7
Transitional cell carcinoma	10	8	14.8

Various histological types were encountered in our study. Immunohistochemistry was helpful in confirming the rare tumors like teratocarcinoma in our study. Haemangioma was the most common benign tumor in our study. Squamous cell carcinoma was the most common malignant tumor in our study, which is similar to the other studies. Transitional cell carcinoma was the second most common malignant tumor in our study. C.T. scan was helpful in determining the extent of the tumor, the nature of the tumor, bony destruction and staging of the tumor. Diagnostic nasal endoscopy was helpful in taking biopsy from the exact site. As Cobalt-60 radiation was used in our hospital, no standard comparison could be made with most of the studies, which have used radiotherapy in the form of linear accelerator. Complications were minimal and included wound infection (6) cases, orocutaneous fistula (2) cases, mucositis of hard palate (4) cases. Follow-up period was for 24 months. Patients were followed up after 1-month post treatment and then at 3 months, 6 months, 12 months and 24 months. Recurrences were noted among 3 patients in malignant series during follow-up and was treated with radiotherapy. 5 patients lost for follow up. There was 1 death in the malignant series. In the benign series there was no evidence of recurrence in any patient and the follow-up was uneventful. The calculation of survival rates was difficult in malignant tumors because of the limited number of patients and short duration of the study.

#### Conclusion

The tumors of Nose and Paranasal sinuses can present in any age. Benign tumors are common in third and fourth decades, whereas the Malignant tumors are common in fifth and sixth decades in our study. Squamous cell carcinoma is the most common malignant tumor and Haemangioma is the most common benign tumor in our study. In both Benign and Malignant tumors bleeding from nose and nasal obstruction are the most common presenting symptoms. These symptoms need a detailed clinical evaluation. Nasal endoscopy and C.T. scan are very important in the diagnosis and management of these tumors. A combined modality of treatment appears to be the best approach in the management of malignant tumors. Surgery is the treatment modality of choice for benign tumors. The calculation of survival rates was difficult in

malignant tumors because of the limited number of patients and short duration of the study. Real improvements in the prognosis are unlikely to occur unless the disease is diagnosed at an early stage. This can be achieved by educating the general public about the symptomology of the tumors and encouraging the general practitioners to exercise more caution when they encounter patients with innocuous appearing nasal symptoms.

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