

## Original Research Article

# Clinicopathological profile of sinonasal masses-a tertiary care centre study in rural India

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## ABSTRACT

**Background:** A variety of mass lesions occur within the paranasal sinus (PNS) and nasal cavity and thus it becomes mandatory for otorhinolaryngologist to elicit detailed history and thorough examination before reaching a final diagnosis. This is retrospective study of all sinonasal masses who were undergone surgical management in the institute of rural India and so in the environment.

**Methods:** This is a retrospective observational study of 70 patients with sinonasal masses treated at a rural tertiary care hospital in rural western Maharashtra from period of Jan 2016 to May 2018. History, clinical assessment and histopathological examination (HPE) was done in all cases as per hospital record supplemented by radiological investigation as per requirement. The patients were grouped as per their histopathological diagnosis as non-neoplastic/inflammatory and neoplastic.

**Results:** A total of 70 patients were analysed age ranging (11-70 years). Majority of the patients were in the age groups 21-40 years (47%). There were 43 (61%) male and 27 (39%) female with M:F ratio 1.6:1. On HPE, 50 (71%) cases were non neoplastic/inflammatory and 20 (29%) cases were neoplastic lesions. HPE revealed that 50 (71%) cases were non neoplastic and 20 (29%) cases were neoplastic lesions.

**Conclusions:** Sinonasal masses have various differential diagnoses. They are fairly common with male predominance. Benign conditions show a peak during 2<sup>nd</sup> to 4<sup>th</sup> decade of life while malignancy increasing with the age after 4<sup>th</sup> decade. In non-neoplastic lesion, Allergic nasal polyp is the commonest histological pattern seen while in malignant lesions squamous cell carcinoma is noted with 100% male predominance.

**Keywords:** Sinonasal mass, Polyp, Neoplastic, Retrospective

## INTRODUCTION

The nose is the most distinguished part of the face having exquisite and functional significance. The existence of any mass in the nose and PNSs may look like a simple problem; however, it generates many queries regarding the differential diagnosis. The etiology and pathogenesis of sinonasal masses is still controversial in many cases. Thus, it becomes mandatory for otorhinolaryngologist to elicit detailed history and thorough clinical and radiological examination before reaching a final

diagnosis, so that correct and timely intervention is done. Most patients present with complaints of nasal obstruction, nasal discharge, sneezing, disturbances of smell, epistaxis, ophthalmic complaints like epiphora, proptosis, diplopia and visual disturbances. Facial swelling, pain headache and snoring with sleep apnoeic spells are not infrequent findings in patients with massive sinonasal masses. The patient will experience nasal polyp to be unpleasant disease which severely interferes with the quality of life.<sup>1</sup> Classically these masses are caused by combination of allergy and infection.<sup>2</sup> These lesions may

be small or can be extensive from vestibule to nasopharynx. They are mainly classified as non-neoplastic and neoplastic and further in benign and malignant among the neoplastic lesions. Sinonasal masses or tumors can remain clinically silent for months to years. In the general population, the prevalence of Nasal polyp is considered to be around 4%. Neoplasms affecting the PNS and nasal cavities are rare in comparison with sinonasal inflammatory disease but benign neoplasia of the nose and PNS is relatively not uncommon.<sup>2</sup> Malignancies of the nose and PNS account for less than 1% of all malignancies and about 3% of all head and neck malignancies.<sup>3</sup> Tandon et al and Dasgupta et al took considerable efforts to study sinonasal masses in the Indian population.<sup>23,13</sup> Still, an analysis of the sinonasal masses in the rural population of India has been lacking. This study is aimed to evaluate clinicopathological profile and management of sinonasal masses in rural India.

**METHODS**

This is a retrospective analytical review of 70 IPD patients with sinonasal masses managed at Smt. Kashibai Navale Medical College and hospital, a rural tertiary care hospital in western Maharashtra from period of January 2016 to May 2018. History, clinical assessment and essential investigations was done in all cases as per hospital record supplemented by radiological investigation like X-ray PNS, computed tomography scan (CT scan) PNS and magnetic resonance imaging as per requirement. After investigations, biopsy was taken and sent for HPE. Definitive management was done as per HPE report. Patient’s bio data, clinical profile and histological diagnosis and operative procedures were analysed. The patients were grouped as per their histopathological diagnosis as non-neoplastic/inflammatory and neoplastic. Data was analysed using Microsoft office excel 2007. Ethical clearance was obtained for this study from institutional ethics committee.

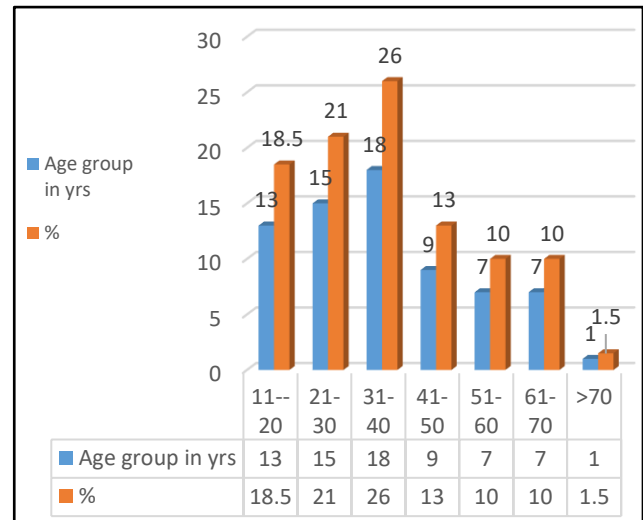
**RESULTS**

A total of 70 patients were analysed age ranging (11-70 year) (Table 1).

**Table 1: Age distribution (n=70).**

Age group (years)	No. of patients	Percentage (%)
< 20	13	18.5
21-30	15	21
31-40	18	26
41-50	9	13
51-60	7	10
61-70	7	10
>70	1	1.5

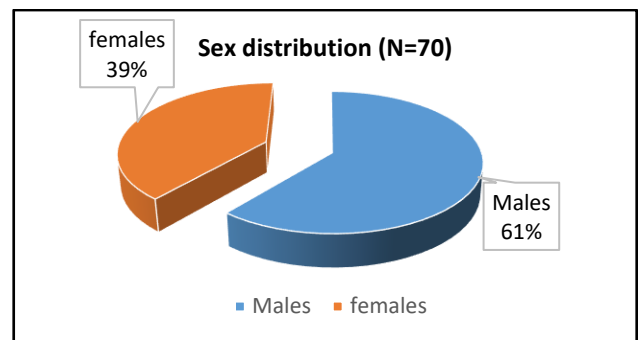
Majority of the patients were in the age groups 21-40 year 33 (47%) (Figure 1).



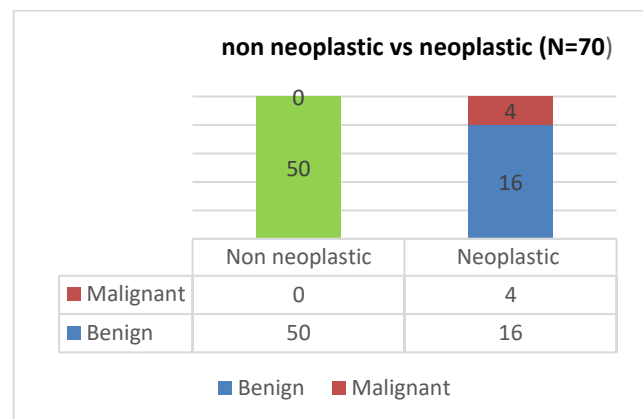
**Figure 1: Age distribution.**

There were 43 (61%) male and 27 (39%) female with M:F ratio 1.6:1 (Figure 2).

On HPE, 50 (71%) cases were non neoplastic/inflammatory and 20 (29%) cases were neoplastic lesions (Figure 3).



**Figure 2: Sex distribution.**



**Figure 3: Non neoplastic vs neoplastic masses.**

Out of 43 male there were 31 non neoplastic and 12 found neoplastic. All 4 malignant lesions found in males only. Whereas out of 27 females 19 were non-neoplastic and 8 were neoplastic with no malignant lesions (Table 2).

Non-neoplastic polypoidal masses were common in the age group 11 to 40 years (Table 3). In neoplastic lesions, benign masses were also found common in the age range of 11 to 40 years. While malignant neoplastic masses were more common after the third decade of life.

Unilateral nasal masses were observed in 52.9% (n=37) patients while the 47.1% (n=33) patients had bilateral nasal masses (Table 4).

All the benign as well as malignant neoplastic masses presented unilaterally.

Among non-neoplastic nasal masses, 66% were multiple and 34% presented as a single mass. All benign and malignant nasal masses were found to be single. The most common site of origin of the Polypoidal masses was the middle meatus (n=49) (70%) followed by the lateral wall of the nasal cavity (n=18) (16.1%) and septum (n=3) (4.2%).

HPE (Table 6) revealed that 50 (71%) cases were non neoplastic and 20 (29%) cases were neoplastic lesions. Most common non-neoplastic lesion was ethmoidal polyp 33 (47%) of allergic nature followed by antrochoanal polyp i.e. inflammatory polyp 16 (23%) and Rhinosporidiosis 01 (1.5%). In neoplastic masses 15 were benign and 04 were malignant. Among benign neoplastic lesions, inverted papilloma was the most common (n=6) followed by angiofibroma (n=4) and haemangioma (n=3).

Also found some rare sinonasal masses like Monomorphic Adenoma and Xantogranuloma each one cases respectively. Squamous cell carcinoma represented 75% (n=3) of all sinonasal malignancies (n=4) and also noted one case of transitional cell carcinoma of maxillary sinus which is an unusual case.

Surgery was the major mode of management in all cases. It included (23%), endoscopic excision of mass (24.0%) and functional endoscopic sinus surgery (FESS) (47%). Chemotherapy and/or radiotherapy were considered as the treatment of choice in 8% of patients. All 33 patients with bilateral ethmoidal polyps underwent FESS followed by steroid therapy. Malignancies were treated with endoscopic excision with medial maxillectomy followed by radiotherapy/chemotherapy.

**Table 2: Incidence of nasal masses grouped according to gender.**

Type of mass	Male	Female	Total
<b>Non neoplastic</b>	31	19	50
<b>Neoplastic</b>			
Benign	08	08	16
Malignant	04	00	04
<b>Total</b>	43	27	70

**Table 3: Distribution of nasal masses according to age.**

Age (years)	Non-neoplastic/ inflammatory	Neoplastic		Total
		Benign	Malignant	
11-20	08	05	00	13
21-30	11	04	00	15
31-40	14	03	01	18
41-50	07	01	01	09
51-60	07	00	00	07
61-70	03	02	02	07
>70	00	01	00	01
<b>Total</b>	50	16	04	70

**Table 4: Unilateral vs Bilateral.**

Type of mass	Non neoplastic masses	Neoplastic masses		Total
		Benign	Malignant	
<b>Unilateral masses</b>	17	16	4	37
<b>Bilateral masses</b>	33	0	0	33

**Table 6: Histopathological diagnosis.**

Nature of lesion	Number (N)	Percentage (%)
<b>Non neoplastic masses</b>		
Antrochoanal polyp	16	23
Ethmoid polyp	33	47
Rhinoporioidis	1	1.5
Total	50	71.5
<b>Benign neoplastic masses</b>		
Angiofibroma	4	6
Inverted papilloma	6	8
Haemangioma	3	4
Monomorphic adenoma	1	1.5
Xanthogranuloma	1	1.5
Mixed benign (pleomorphic)	1	1.5
Total	16	22.5
<b>Malignant neoplastic mass</b>		
Sq. cell carcinoma	3	4
Transitional cell carcinoma	1	1.5
Total	4	6

## DISCUSSION

Sinonasal masses had predilection for males, demonstrating a male to female ratio of 1.6:1. It was higher (male-to female ratio of 1.7:1) in the study by Zafar et al from India, while a study from Nigeria revealed an opposite ratio showing female preponderance (M:F ratio of 1:1.2).<sup>7,8</sup> A British review of nasal polyposis reported a ratio at 2:1 (M:F).<sup>2</sup> The 2<sup>nd</sup> to 4<sup>th</sup> decades of life are the most vulnerable period for development of sinonasal masses. Bakari et al had reported a peak incidence of 33 years, while for Zafar et al the mean age of presentation was 22.5 years.<sup>7,8</sup> Nasal polyps result from chronic inflammation of the nasal and sinus mucous membranes and are the most common tumours of the nasal cavity. Their exact pathogenesis is not known, however a strong association with allergy, infection, asthma and aspirin sensitivity has been implicated.<sup>2,12</sup>

Found 71.4% of the sinonasal masses to be non-neoplastic and this proportion of non-neoplastic lesions has been reported in previous studies.<sup>7,8,13</sup> Nasal polyp was the most common non-neoplastic mass and was similarly documented by those authors.

Ethmoidal and antrochoanal polyps are generally allergic and inflammatory in nature, respectively. This trend was also seen considering the two forms of the polyps in the present study. Rhinosporidiosis, an endemic disease in India, Sri Lanka and a few African nations was also diagnosed and treated.<sup>15</sup> Found only case of rhinosporidiosis, which is similar with Pradhananga et al had encountered only one case during their two-year study period.<sup>14</sup>

Inverted papillomas are comparatively rare, but this morphological variant is the most commonly encountered lesion of all sinonasal papillomas.<sup>17</sup> The other two morphological forms are exophytic (everted) squamous cell papilloma and cylindrical cell papilloma. Observed inverted papilloma as most common benign mass n=6 (37%). Inverted papilloma formed 37% of all benign neoplastic masses, which was marginally higher from the findings of Humayun et al and Bakari et al. Inverted papilloma was associated with squamous cell carcinoma of the sinonasal cavity in 6 (21.4%) of the 28 cases studied by Califano et al in USA.<sup>8,11,20</sup>

Haemangioma is not regularly seen in the nasal cavity, though if it occurs, is predominantly capillary and is found attached to the nasal septum.<sup>16</sup> Among the benign lesions, found 25 % cases of haemangiomas. All cases were found to be arising from the cartilaginous part of the nasal septum. This finding corresponds to the observation of Pradhananga et al.<sup>14</sup> A study of haemangioma from Japan reported a usual origin of capillary type from the nasal septum and of the cavernous variety from the lateral nasal wall.<sup>18</sup>

Juvenile angiofibroma forms 0.5% of all head and neck tumors in Europe.<sup>19</sup> Observed Angiofibroma, evident in 4 patients, while Pradhananga et al reported 9 cases of angiofibroma over a period of two years in Nepal.<sup>14</sup> Maxillary sinus Xanthogranuloma and monomorphic adenoma found to rarest type of benign tumor hardly reported anywhere in world.

The incidence of sinonasal malignancy is approximately 3.5 per 100000 populations per year.<sup>21</sup> The maxillary sinus is the most common site of origin, while the most common histological type is squamous cell carcinoma.<sup>22,23</sup> It is rarely encountered before the 4<sup>th</sup>

decade of life. It formed 8% of all lesions and 25% of neoplastic masses in this study. Histological investigation revealed squamous cell carcinoma in 75% (n=3) of all malignant neoplastic sinonasal masses, and only 1 slide was identified to be transitional cell carcinoma which is an unusual.

Pradhananga et al reported 6.3% of their sinonasal masses to be malignant, while for Fasunla et al malignant sinonasal tumors constituted 59.4% of the 138 sinonasal neoplasms seen.<sup>14</sup>

Svane-Knudsen et al have similarly reported squamous cell carcinoma to be the most commonly encountered malignancy of sinonasal tract in Denmark.<sup>24</sup>

A Polish study by Zylka, Bień, Kamiński et al reported 71-80 years to be the most commonly affected age group for malignancies of the sinonasal tract where we observed 61-70 years as the most commonly affected age group.<sup>25</sup>

Male-to-female ratio of sinonasal carcinoma is 2:1 found all cases of malignancies in males only. It may be due to lesser study duration. More duration and sample size are needed in this regard.<sup>29</sup>

Non-neoplastic inflammatory polyps were usually unilateral and single, while allergic polyps were usually bilateral and multiple in agreement with the analysis of Frosini et al.<sup>26</sup>

Unilateral presentation was seen in 52.9% of cases. This was little bit low with the observations of Bakari et al where bilateral sinonasal masses were seen in 44.7% of cases, and unilateral lesions in 55.3% of patients.<sup>8</sup>

HPE is conclusive in diagnosing the polypoidal lesions, describing both etiology and cellular details. It is the only means of determining the nature of the disease, i.e. inflammatory or neoplastic. Most of non-neoplastic and benign neoplastic nasal masses require surgical excision, while malignant neoplastic nasal masses require wide surgical excision, radiotherapy or chemotherapy either alone or in combination.

## CONCLUSION

Sinonasal masses have various differential diagnoses. Malignancy should be distinguished from non-malignant lesions. Sinonasal masses are fairly common with male predominance. Benign conditions show a peak during 2<sup>nd</sup> to 4<sup>th</sup> decade of life while malignancy increasing with the age after 4<sup>th</sup> decade. Preoperative diagnosis based on proper clinical examination is consistent with histopathological diagnosis in most cases. In non-neoplastic lesion, allergic nasal polyp is the commonest histological pattern seen in the environment. In malignant lesions squamous cell carcinoma is the most common tumor of the sinonasal tract we noted with 100% male predominance. It can be due to short duration of study.

So, there is need of longer duration and large sample size to evaluate the pattern of malignant lesions. All non-neoplastic lesions were efficiently removed endoscopically found to be best modality of treatment and has almost replaced more invasive conventional surgeries like Caldwell Luc approach, Weber Ferguson approach.

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