

## Original Research Article

# Clinico-pathological and radiological assessment of benign nasal masses

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## ABSTRACT

**Background:** Sinonasal masses are uni or bilateral with variable and with multiple etiological factors. Benign masses are common in comparison to malignant in this region. Some of the benign masses e.g. juvenile angiofibroma and inverted papilloma cause local bony destruction. Preoperative radiological assessment is desirable for proper surgical Management. The purpose of the study was to assess the clinical and radiological findings of sinonasal masses and the correlation of the clinical and radiological findings with the histopathology.

**Methods:** This prospective study was carried out on 50 cases of intra nasal masses. After clinical examination, these patients were subjected to radiology. The parameters assessed were the origin, extension, involvement of adjacent structure. Subsequently, all the cases were subjected to surgery i.e. polypectomy, medial maxillectomy, excision with the help of nasal endoscope. Thereafter, the histopathological findings were correlated with clinical and radiological findings.

**Results:** Total 50 cases of intra nasal benign masses were included in the study. Among them 36 (72%) cases were of nasal polyps, out of which 29 (80.5%) were inflammatory polyps and 7 (19.4%) were allergic polyps. Among inflammatory polyps, 23 (79.3%) were males and 6 (20.69%) were females. Among allergic polyps 4 (57.14%) were males and 3 (42.85%) were females. The other findings were 5 (10%) cases of angiofibroma, 5 (10%) cases on inverted papilloma, 3 (6%) cases of haemangioma and 1 (2%) cases of chondrosarcoma.

**Conclusions:** Considering the result obtained, the most common sinonasal lesions were inflammatory polyps. Others in order in order of frequency were allergic polyp, angiofibroma, inverted papilloma, haemangioma and chondrosarcoma.

**Keywords:** Polyp, Angiofibroma, Inverted papilloma, Computed tomography, Functional endoscopic sinus surgery

## INTRODUCTION

A variety of neoplastic, non-neoplastic and inflammatory conditions involve the sinonasal cavity and these are encountered in day to day clinical practice. Incidence of these lesions is often stated to be between 1% and 4% of the population.<sup>1</sup> Sinonasal masses can be divided into two main categories: non neoplastic and neoplastic, which in turn are further divided into benign and malignant. Benign neoplasia of the nose and paranasal sinuses is relatively not uncommon. The benign nasal masses

include nasal polypi, inverted papillomas, osteomas, haemangiomas, angiofibromas, meningocele and meningoencephalocoele. The prevalence rate of nasal polyposis is about 2%.<sup>2</sup> Antrochoanal polyp is the most common choanal polyp arising from one of the paranasal sinuses.<sup>3</sup> Various pathological events ranging from non-neoplastic to malignant sinonasal tumors may mimic a simple mass. Common causes of nasal obstruction are inflammatory polyps, with a prevalence of 4% in general population.<sup>4</sup> Benign tumors are relatively common, but malignant neoplasms are rare, relating to 0.2-0.8% of all

carcinomas and only 3% of those in the upper aero digestive tract.<sup>5</sup> Sinonasal lesions display a complex spectrum of histopathological features. Most of them present as polypoid masses and are difficult to distinguish clinically; they are labelled as nasal polyps. Histopathology is essential in management of these lesions. The majority of sinonasal pathology is inflammatory and neoplasms comprising of 3% of head and neck tumors.<sup>6</sup> Almost all sinonasal masses present with varying symptoms of nasal obstruction, epistaxis, nasal discharge, loss of smell or change in perception of smell, oral symptoms, facial swelling, orbital symptoms and ear symptoms.<sup>7</sup> A detailed history, clinical examination, diagnostic nasal endoscopy and advanced imaging (CT scan) are required to make a presumptive diagnosis. CT scan with coronal cuts is preferable prior to surgery and indeed mandatory if endoscopic sinus surgery is to be performed. The scan will show anatomical variations including any alterations brought by the disease. However in case of extensive disease, suspicion of fungal disease, neoplasm, encephalocele or if in defining optic nerves or carotid arteries in relation to sinuses, axial cuts are necessary along with coronal cuts. Evidence of thickened mucosa, sinus opacification and bone erosion can be seen in X-ray PNS.

Depending on the individual clinical assessment, the treatment of nasal polyps consists of mixture of observation, medical and surgical treatments. At first the patients are treated medically and later considered for surgery. The key objectives of the treatment are to remove or to considerably reduce the size of the nasal polyps to ease the nasal obstruction, enhancement in the sinus drainage and reinstatement of the olfaction. Recurrences are common, in both treatments particularly in patients with asthma.<sup>8</sup> Depending on the type of nasal mass, surgical removal and histopathological examination shall be done. A complete histopathological examination is necessary to decide the nature of any particular lesion for final diagnosis and management accordingly. Histopathological examination of removed tissue either by biopsy or surgically excised specimen should be carried out in all cases.

The study was conducted with the aim to assess the clinical and radiological findings of sinonasal masses and to find out the correlation of the clinical and radiological findings with the histopathology.

## **METHODS**

This study was conducted in between November 2013 to April 2015 on 50 patients having sinonasal mass attending in the Department of Otorhinolaryngology, Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana, Ambala. A detailed history was taken with special reference to age, sex, residence, occupation, family history, past history, allergic disorders and any addictive habits. Detailed clinical examination

local and general was done with special reference to nose and paranasal sinuses.

50 cases were included in the study. Exclusion criteria were patients with malignancy, foreign body, rhinoliths. Inclusion criteria were all the patients presented with clinically and radiologically benign nasal mass.

These cases were subjected to routine biochemical and haematological evaluation. Nasal endoscopy, X-ray PNS, CT scan, non-enhanced or enhanced MRI, FNAC and biopsy were done. The tissue was routinely processed for histopathological section and was stained by haematoxylin and eosin stain.

Details of specific investigations include

### **1. Radiology**

- a) X-ray PNS Water's view was done to see the deviation of nasal septum, opacity of sinuses and bony erosions.
- b) CT PNS was done to see the extent of tumour, bony destruction or displacements.
- c) X-ray soft tissue nasopharynx lateral view: In suspected cases of angiofibroma it was done to see soft tissue mass in the nasopharynx.

### **2. Pathology**

The tissues were routinely processed for histopathological sections of 5 microgram thickness and were stained by haematoxylin and eosin stain. Special staining by reticulin, PAS, von Giesen, Masson's trichrome were undertaken wherever applicable.

### **Treatment**

Conservatively patients were given antihistaminic and steroids for control of allergy and infection. Steroids were given as sprays or orally.

### **Surgical procedure**

The patients was admitted a day before surgery. Surgery was done under general anaesthesia. 2% xylocaine with adrenaline (1:100000) was infiltrated in the nasal cavity as and when required.

Intranasal polypectomy and FESS (functional endoscopic sinus surgery), medial maxillectomy were the surgical procedures implemented in the study. These surgeries were performed according to the type of nasal mass.

Data was collected and statistically analysed by using Chi-square test

## **RESULTS**

A prospective study of 50 cases included the lowest and highest age at presentation was 7 years and 73 years

respectively, with the mean age of 29.04 years. The mean age for male was 28.07 years and that of female was 32.08 years. Male to female ratio was 3.1:1. It was seen that out of the total 50 cases majority (76%) were males while (24%) were females (Figure 1).

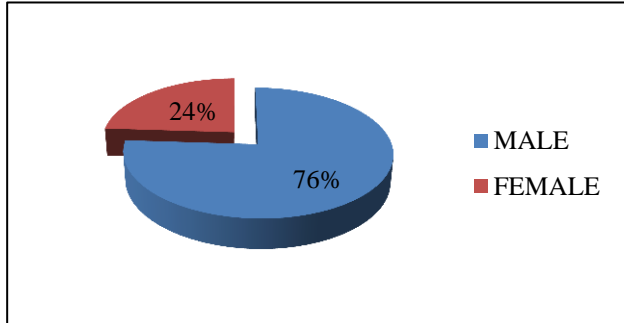


Figure 1: Distribution of cases according to gender.

Majority (30%) of the cases were in the age group of 21 to 30 years, followed by 28% in 11 to 20 years age group. It was also seen that percentage of people belonging to 31 to 40 years group was 18% (Figure 2). There was no statistically significant association between age and gender ( $p=0.234$ ). It was observed that majority of cases presented with nasal obstruction (98%) with average duration of 6 months, followed by nasal discharge (72%) with average duration of 4 months. About 40% cases presented with post nasal drip with average duration of 3 months followed by 30% cases of headache with average duration of 3.5 months, 26% cases presented with epistaxis with average duration of 1 month, 22% cases presented with anosmia with average duration of 2 months, 18% cases presented with sneezing with average duration of 3 months and 4% cases presented with recurrent URTI with average duration of 1 month (Figure 3).

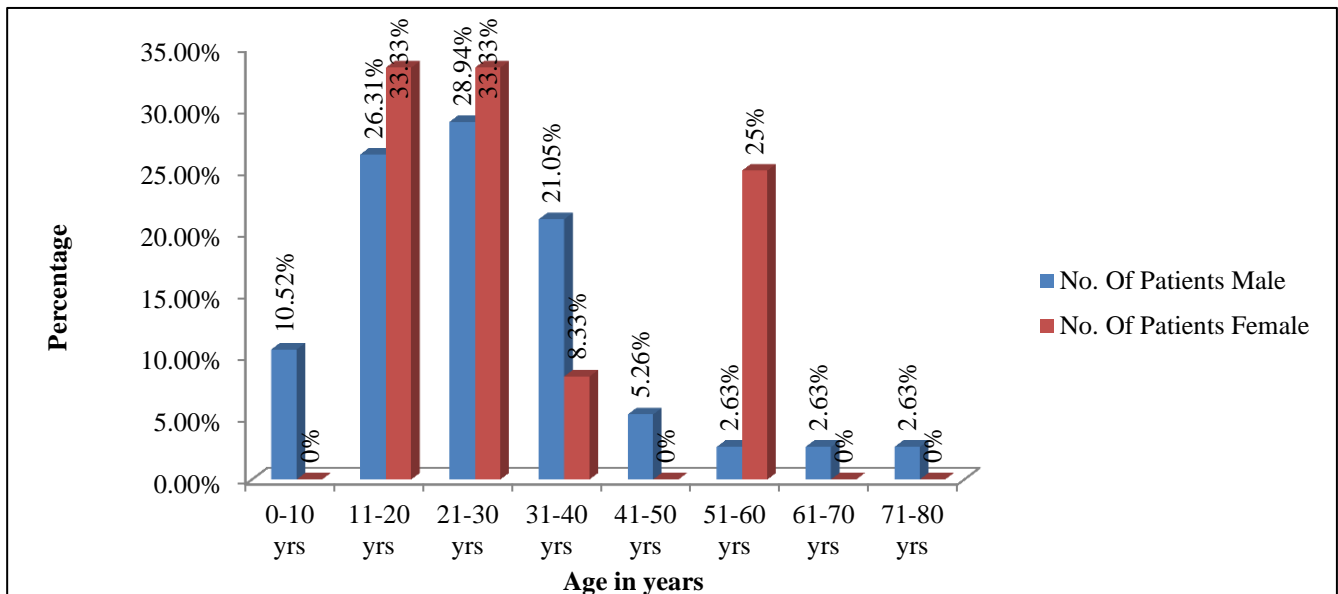


Figure 2: Age and gender distribution of the study population.

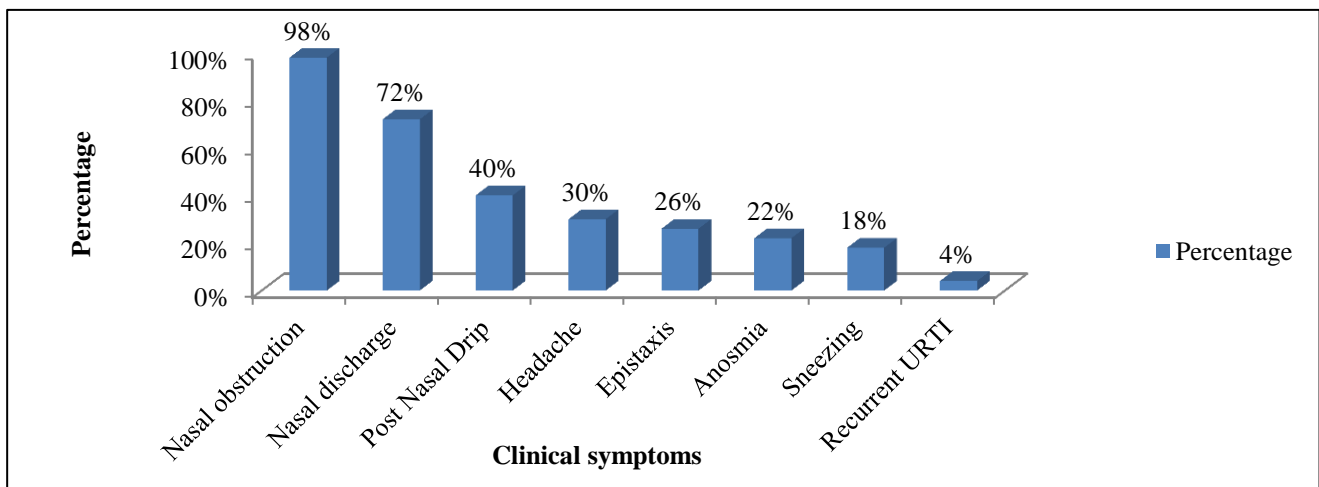
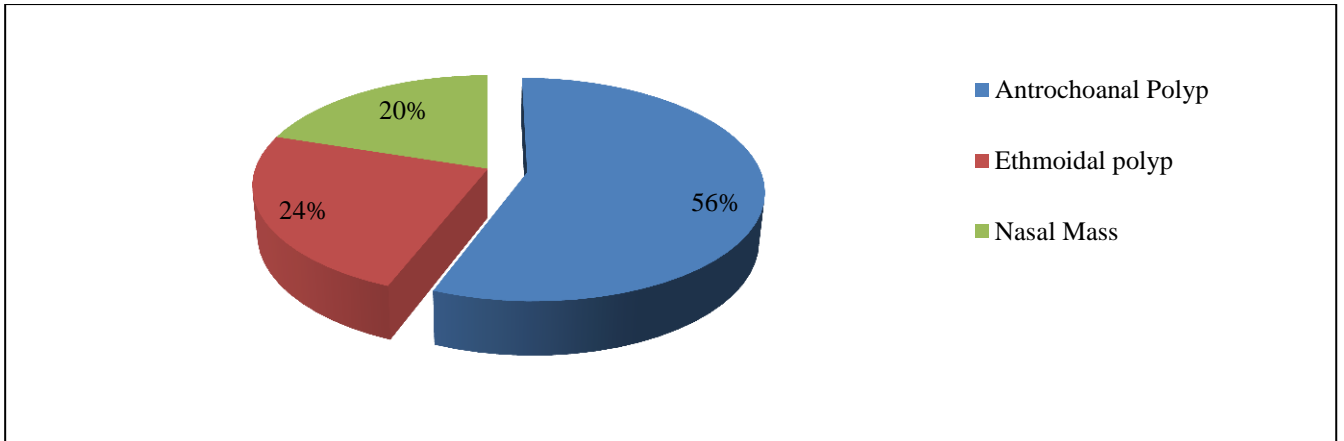
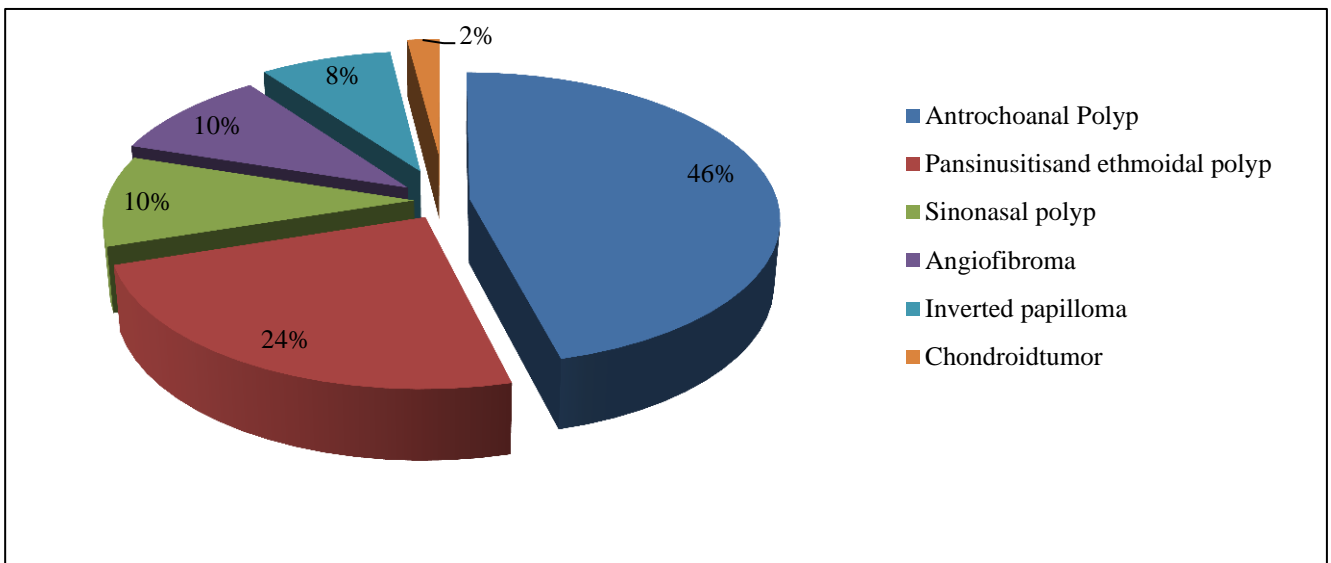


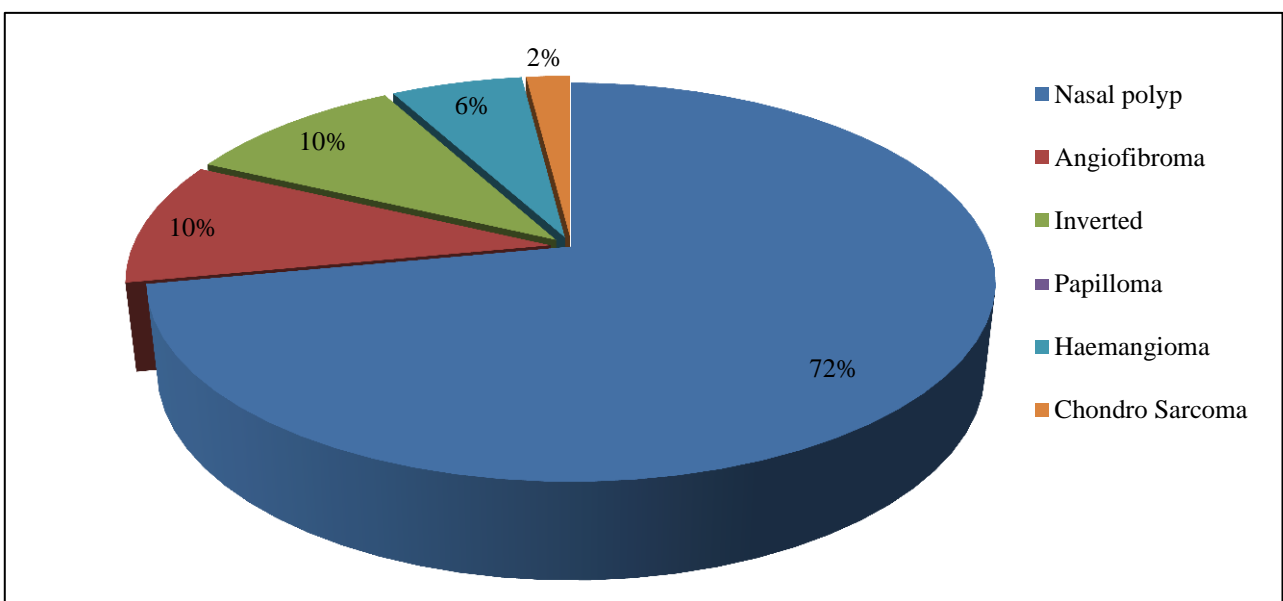
Figure 3: Distribution of clinical symptoms with duration.



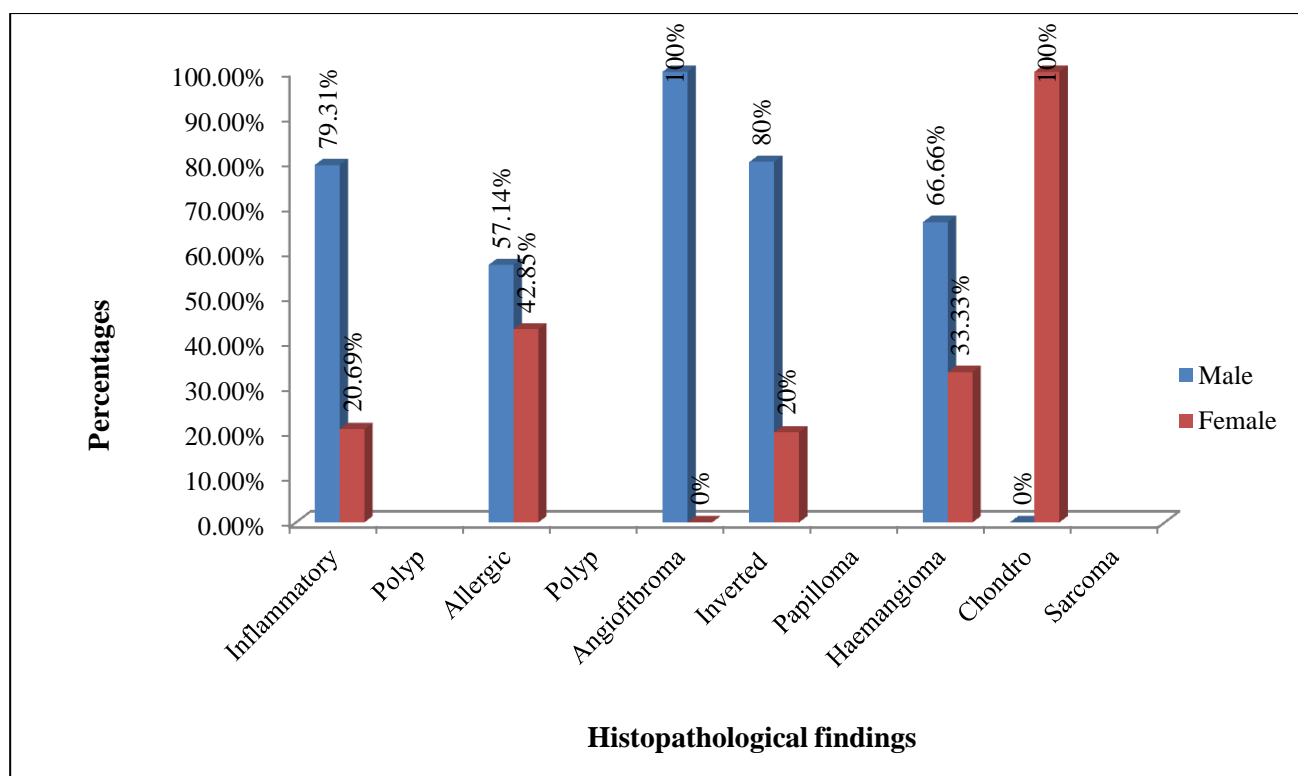
**Figure 4: Distribution of cases according to clinical diagnosis.**



**Figure 5: Distribution of findings according to radiological diagnosis.**



**Figure 6: Distribution of cases according to histopathological diagnosis.**



**Figure 7: Gender distribution according to histopathological diagnosis.**

Out of 49 cases of nasal obstruction, 37 (74%) cases were males from which 27 (72.97%) were unilateral and 10 (83.33%) were bilateral. Among 49 cases, 12 (24.48%) were females from which 10 (27.02%) were unilateral and 2 (16.6%) were bilateral. Out of 36 cases of nasal discharge 29 (80.55%) were males from which 18 (78.26%) were unilateral and 11 (84.61%) were bilateral. Among nasal discharge 7 (19.44%) were females from which 5 (21.74%) were unilateral and 2 (15.39%) were bilateral. The cases presenting with post nasal drip were 20 (40%), from which 15 (75%) were males and 5 (25%) were females. The cases presenting with headache were 15 (30%) from which 11 (73.33%) were males and 4 (26.66%) were females; the cases presenting with epistaxis were 13 (26%) from which 10 (76.92%) were males and 3 (23.07%) were females; anosmia were 11 (22%) from which 8 (72.72%) were males and 3 (27.27%) were females; sneezing were 9 (18%) from which 7 (77.77%) were males and 2 (22.22%) were females; recurrent URTI were 2 (4%) from which 1 (50%) were males and 1 (50%) were females. The majority of cases were clinically diagnosed as antrochoanal polyp 28 (56%) followed by 12 (24%) cases of ethmoidal polyp and 10 (20%) with nasal masses (Figure 4). It was observed that 46% of cases were diagnosed with Antrochoanal polyp, 24% were diagnosed with pansinusitis and ethmoidal polyp and 10% people each were diagnosed with sinonasal polyp and angiofibroma according to the CT scan (Figure 5). The percentage of people diagnosed with inverted papilloma and chondroid tumor were 8% and 2% respectively. The final diagnosis was obtained from histopathology. Among total 36 (72%)

cases of nasal polyps, 29 (80.5%) were Inflammatory polyp, 7 (19.45) were allergic polyp. 5 (10%) cases of angiofibroma, 5 (10%) cases of inverted papilloma, 3 (6%) cases of haemangioma and 1 (2%) case of chondro sarcoma were seen (Figure 6). Out of the total 29 cases diagnosed with inflammatory polyp 79.31% were males and 20.69% were females. Among 7 cases diagnosed with allergic polyp 57.14% were males and 42.85% were females, from 5 cases diagnosed as angiofibroma 100% were males and no female was seen. From 5 cases of inverted papilloma 80% were males and 20% were females, from 3 cases of haemangioma 66.66% were males and 33.33% were females and from chondrosarcoma 100% were females (Figure 7).

## DISCUSSION

The present study was carried out on fifty patients of intra nasal masses who undergone detailed clinical, radiological and histopathological evaluation.

### Age and sex distribution

The study was conducted on patients of intra nasal masses in the age group of 0-80 years. Maximum 15 (30%) of the cases were found in the age group of 21-30 years. There were 38 males and 12 females (ratio 3.1:1) in the present study showing male predominance over females, similar to a study by Garg et al with ratio 1.98:1, Majumdar et al with 1.57:1, Raj Jyothi et al with ratio 1.2:1, with 1.75:1, Gupta et al with ratio 1.35:1. It can be explained by the fact that males are often exposed to dust,

infection and smoking habits, hence have more outdoor functioning as compared to females.<sup>9-12</sup> Chamyal (1992) did a study of 15 years duration on nasal polyyps is in children and found that the incidence of nasal polyyps in children was less than 1% of all nasal cases attending the ENT centres. However, the incidence rose sharply and ranged upto 6 to 9% in cases associated with mucoviscidosis.<sup>13</sup>

### Presenting symptoms

The main presenting symptoms recorded in our study was nasal obstruction (98%) followed by nasal discharge (72%) cases which is in accordance with previous studies (Table 1). According to Garg et al, (87.07%) cases presented with nasal obstruction and (69.39%) presented with nasal discharge. In a study conducted by Majumdar et al, (100%) cases presented with nasal obstruction and (53.39%) cases presented with nasal discharge. Raj Jyothi et al illustrated that (78.69%) cases presented with nasal obstruction and (44.26%) cases presented with nasal discharge. In a study conducted by Gupta et al, 94% cases presented with nasal obstruction and 90% cases presented with nasal discharge.<sup>9-12</sup>

**Table 1: Comparative studies showing presenting symptoms.**

Previous studies	Nasal obstruction (%)	Nasal discharge (%)
Garg et al <sup>9</sup>	87.7	69.39
Majumdar et al <sup>10</sup>	100	53.39
Raj Jyothi et al <sup>11</sup>	78.69	44.26
Gupta et al <sup>12</sup>	94	90
Present Study	98	72

### Comparison of inflammatory and allergic polyyps

In our study, the majority cases were inflammatory polyyps (58%) followed by Allergic polyp (14%) in concordance with Garg et al, who observed (89.5%) of inflammatory polyyps and (18.18%) of allergic polyyps. According to Majumdar et al, (47.36%) cases were diagnosed inflammatory polyyps and (49.47%) cases with allergic polyyps. Raj Jyothi et al observed that (51.52%) cases were diagnosed inflammatory polyyps and (48.48%) cases were diagnosed as allergic polyyps, whereas Dafale et al reported (56.08%) cases with inflammatory polyyps and (41.93%) with allergic polyyps. Gupta et al observed that (69.56%) cases were diagnosed as inflammatory polyyps and (17.39%) as allergic polyyps.<sup>9-12,14</sup>

### Comparison of angio-fibroma

In our study from 50 cases, 5 (10%) cases were diagnosed Angiofibroma (Table 2) which was in line with previous studies. Majumdar et al reported (4.31%) cases, Dafale et al reported (2.85%) cases and Gupta et al reported (5.43%) cases.<sup>10,12,14</sup>

**Table 2: Comparison of incidence of angiofibroma in various studies.**

Previous studies	Angiofibroma (%)
Majumdar et al <sup>10</sup>	4.31
Raj Jyothi et al <sup>11</sup>	50
Gupta et al <sup>12</sup>	5.43
Dafale et al <sup>14</sup>	2.85
Present Study	10

### Comparison of inverted papilloma

In our study (10%) cases were diagnosed inverted papilloma (Table 3), which is in line with study conducted by Majumdar et al, in which (5.88%) cases were seen. Dafale et al and Gupta R et al diagnosed (4.28%) and (6.52%) cases respectively.<sup>10,12,14</sup> Garg et al diagnosed (45.56%) cases and Raj Jyothi et al diagnosed (16.67%) cases.<sup>9,11</sup> In a study conducted by Khan et al (2006), histopathological examination of 240 cases found the incidence of inverted papilloma was 15 cases (26.78%).<sup>15</sup>

**Table 3: Comparison of incidence of inverted papilloma in various studies.**

Previous studies	Inverted papilloma (%)
Garg et al <sup>9</sup>	45.46
Majumdar et al <sup>10</sup>	5.88
Raj Jyothi et al <sup>11</sup>	16.67
Gupta et al <sup>12</sup>	6.52
Dafale et al <sup>14</sup>	4.28
Present Study	10

### Comparison of haemangioma

In our study only (6%) cases were diagnosed haemangioma (Table 4) which is in line with a study conducted by Majumdar et al, in which (5.75%) cases were diagnosed.<sup>8</sup> But according to Garg et al (18.18%) cases were seen and according to Raj Jyothi et al (16.67%) cases were seen.<sup>9,11</sup> In our study only 1 (2%) cases of chondrosarcoma were seen.

**Table 3: Comparison of haemangioma with previous studies.**

Previous studies	Haemangioma (%)
Garg et al <sup>9</sup>	18.18
Majumdar et al <sup>10</sup>	5.75
Raj Jyothi et al <sup>11</sup>	16.67
Present Study	6

## CONCLUSION

The study was conducted on 50 patients of intranasal masses of either sex between 7-73 years age group in the Department of Otorhinolaryngology, Maharishi



Markandeshwar Institute of Medical Sciences and Research, Mullana, Ambala. All patients underwent CT scan paranasal sinus (coronal and axial view). FESS was done in all patients to remove the disease and histopathological analysis was done. The histopathological findings were compiled and evaluated, based on which following conclusions were made:

1. The age of patients varied from 7-73 years with mean age of 29.04 years. The mean age for male was 28.07 years and that of female was 32.08 years.

2. The sex distribution showed male preponderance with ratio between males and females 3.1:1.

3. The most common presenting symptom was nasal obstruction (98%). Others in order of frequency were nasal discharge (72%), post nasal drip (40%), headache (30%), epistaxis(26%), anosmia(22%), sneezing(18%) and recurrent URTI(4%).

4. CT (PNS) scan and nasal endoscopy were complementary to each other to see mucosal disease pattern and planning of management.

5. CT scan was more sensitive in picking up mucosal disease while endoscopy was more sensitive to diagnose deviated nasal septum.

6. According to clinical diagnosis majority cases were antrochoanal polyp followed by ethmoidal polyp and nasal mass.

7. According to radiological diagnosis majority cases were antrochoanal polyp followed by pansinusitis and ethmoidal polyp, sinonasal polyp, angiofibroma, inverted papilloma and chondroid tumor..

8. Considering the results obtained by histopathology, the most common sino nasal lesions were inflammatory polyps (80.5%). Others in order of frequency were allergic polyp (19.4%), angiofibroma(10%), inverted papilloma(10%), haemangioma(6%) and chondro sarcoma(2%).

Although the majority of nasal polyps sent for histopathology are inflammatory, secondary to infection or allergy, a variety of benign and malignant lesions of nose may present as polypoidal masses, hence all polyps need histopathological examination.

CT scan as an imaging modality is quite satisfactory in combination with proper diagnostic nasal endoscopies for knowing the nature and extent of disease and planning surgical management. Medical management is not often adequate and has a limited role in most of the cases. Surgery is the treatment of choice for benign lesions, while a combination of surgery and radiotherapy is helpful in malignant conditions.

Masses of nasal cavity and paranasal sinus are a common problem in today's environment as diagnostic and therapeutic dilemma. Due to overlapping presentation of lesions of this region with more commonly encountered inflammatory and infectious diseases, role of histopathological examination needs to be understood and is mandatory for proper treatment of patients and it still remains the gold standard for diagnosis in most cases.

Correlation of clinical, radiologic and pathological modalities is of utmost important for accurate diagnosis.

All these modalities are complementary to each other. Most importantly is a through histopathological evaluation, an essential part of work up of patients with sinonasal mass, so that correct intervention can be made. In view of all these significant findings, we reemphasize the need for proper pre-operative assessment in every patient in order to accomplish a safe and effective endoscopic sinus surgery.

The prevalence of various sinonasal masses as determined by our study correlated well with that of other authors studying similar patient groups. More studies with larger number of patients are needed to further verify this.

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