

# Polypoidal masses in nasal cavity among patients in a tertiary level: a clinico-pathological spectrum

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## Abstract

**Introduction:** Polypoidal mass in nose and paranasal sinuses are very common, that bulges or projects downwards from the normal nasal surface. The aim of the present study was to determine the incidence of nasal polypoidal mass and clinical and pathologic data of a group of consecutive cases. **Materials and Methods:** Clinico-pathological study of 92 consecutive cases of nasal polypoidal mass from single institution was performed for a period of 3 years. Clinical examination, routine investigations, Chest X ray PA were taken for all patients. Excised tissues were routinely processed for histopathologic examination. **Results:** Analysis of 92 polypoidal lesions in the nose and paranasal sinuses with clinical diagnosis of nasal polyps, revealed 52 cases were non-neoplastic and 40 were neoplastic; 34 (85%) were benign and 6 (15%) were malignant. True nasal polyps both inflammatory and allergic together comprised 49 cases of the 52 polypoidal lesions in the nasal cavity. Angiofibroma and capillary hemangioma were the most frequent benign tumour accounting for 30/34 (44%). The most common malignant tumour was squamous cell carcinoma 5/6 (83.3%). **Conclusion:** Majority of polypoidal mass in the nasal cavity were non-neoplastic, with histopathological examination being the easiest method for identification and distinguishing the type of sinonasal polypoidal masses.

**Keywords:** Nasal Polyps; Nasal cavity; Histopathological; Non-neoplastic; Neoplastic

## Introduction

Nasal polyps, commonly known as polypoidal masses, arises from the mucous membrane of nose and paranasal sinuses. These are most commonly encountered lesion in clinical practice [1]. These polypoidal masses are associated with various signs and symptoms such as nasal obstruction, rhinorrhea, blood stained nasal discharge, epistaxis, facial swelling, oral, orbital and ear symptoms etc [2].

Sinonasal area is exposed and influenced by various infective mechanical and chemical agents, chemicals, and antigens. The deleterious exposures of these agents to sinonasal area leads to the formation of tumour like and neoplastic conditions [3]. They can range from simple nasal polyps to infective polypoidal granulomatous lesions to malignant lesions [4]. Nasal polyps are smooth, shiny and movable swellings clinically. It is quite difficult to differentiate between

simple nasal polyps, polypoidal lesions caused by specific granulomatous diseases and polypoidal neoplasms clinically [5]. Therefore, it is essential that these lesions must be examined histopathologically. Histopathologic analysis of such masses shows a wide spectrum of lesions when removed from nose and nasal sinuses [5].

Nasal polypoidal masses can be non-neoplastic and neoplastic masses which are further subdivided into benign and malignant lesions. Most common lesions of sinonasal region are benign and lack of appreciation of these lesions can lead to radical surgeries [6]. Benign lesions present with long clinical history with frequent local recurrence and thus cause relatively significant morbidity. Malignant lesions in nasal cavity, paranasal sinuses and nasopharynx accounts for not more than 3% of head and neck malignancies and less than 1% of all the malignant tumours. They have tendency for Africans, Japanese and Arabians geographically and are rarely seen in Americans and Western Europeans [7]. It

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is very important to study their clinical and pathological aspects as they vary histopathologically and have grades of malignancies. Diagnosis of polypoidal masses can be made by nasal endoscopy, radiologically and histopathologically as the clinical symptoms of these lesions are similar. Provisional diagnosis is usually made by clinical features along with imaging techniques, but a histopathologic examination remains the gold standard for making a definitive diagnosis [1]. In light of this information, the present prospective study was undertaken to categorize these lesions into non neoplastic and neoplastic and to identify the incidence of nasal polypoidal mass in male and female, observe the signs and symptoms and correlation of clinical features of excised polypoidal mass histopathologically and radiologically.

## Materials and Methods

The present prospective study was conducted at Bundelkhand Medical College and Hospital which is a tertiary care hospital in Sagar, Madhya Pradesh, India. The ENT department of the hospital predominantly receives patients from casualty officers, general practitioners and also transfer from other nearby hospitals. The study was conducted from October 2014 to October 2017 and performed in full accordance with ethical principles. Ethical approval was obtained from the Institutional Ethical Committee of the medical college. A total of 92 patients of all age groups of both sexes presenting with nasal polypoidal masses were recruited. Patients were informed for participation and written informed consent was obtained.

## Results

A total of 92 consecutive cases clinically diagnosed as nasal polypoidal mass were sent for histopathological analysis and revealed that 52 cases were non-neoplastic lesions and that 40 were neoplastic lesions. Among the 40 neoplastic lesions, 34 (85%) were benign and 6 (15%) were malignant in nature. Demographic details of the study population is shown in Table 1. Distribution of symptoms among patients is shown in Table 2.

**Table-1: Age distribution for non-neoplastic & neoplastic masses.**

Age group (years)	Non-neoplastic (n=52)	Neoplastic (n=40)
0-10	6 (11.6%)	4 (10%)
11-20	13 (25%)	14 (35%)
21-30	10 (20%)	8 (20%)
31-40	10 (20%)	6 (15%)
41-50	9 (15%)	3 (7.5%)
51-60	5 (9%)	1 (2.5%)
61-70	--	2 (5%)
71-80	--	2 (5%)
<b>Total (92)</b>	<b>52 (56.5%)</b>	<b>40 (43.4%)</b>
<b>Male/Female</b>	<b>30/22</b>	<b>31/9</b>

**Inclusion criteria:** Patients of all agegroups presenting with nasal symptoms and whom anterior rhinoscopy revealed polypoidal mass in either or both nasal cavity projecting outwards from the normal mucosal surface, with a broad base (sessile) or a slender stalk (pedunculated).

**Exclusion criteria:** Patients presenting with congenital nasal mass and with a nasal mass of intracranial origin such as basalmeningocele, basal meningo-encephalocele and nasalglioma. A comprehensive history, clinical evaluation including anterior and posterior rhinoscopy with nasal endoscopy of the patients were performed wherever necessary.

Other routine investigations undertaken were complete blood picture, X-ray of paranasal sinuses, X-ray of skull, lateral view for any soft tissue shadow, CT scan for deeper invasion and suspected cases of malignancy. With prior consent of the patient, excision of the polypoidal mass was done.

All surgically excised polypoidal masses were subjected to histopathological examination. Excised tissues were routinely processed for histopathologic examination by staining with hematoxylin and eosin stain. Special stains like Periodic Acid Schiff (PAS) were used wherever required.

**Statistical analysis:** Descriptive statistical analysis was done using SPSS Version 17.0 (SPSS Inc., Chicago, IL, USA). Frequency and percentage calculation was done as required for the variables.

**Table-2: Distribution of symptoms in Non-Neoplastic and Neoplastic Masses.**

Symptoms	Non-Neoplastic (n=52)	Neoplastic (n=40)
Nasal obstruction	50 (96%)	35 (87.5%)
Rhinorrhea	45 (86.5)	20 (50%)
Post nasal discharge	42 (80%)	08 (20%)
Sneezing	40 (77%)	05 (12.5%)
Headache	36 (69.2%)	16 (40%)
Smell disturbance	30 (57.6%)	--
Nasal mass	30 (57.6%)	30 (75%)
Epistaxis	10 (19.2%)	38 (95%)

**The Non-neoplastic lesions-** True nasal polyps (49) were the commonest non-neoplastic lesions which were encountered in this study, followed by two cases of rhinosporidiosis and one case of rhinolith (Table 3). The true nasal polyps were further subdivided into allergic nasal polyps and inflammatory polyps. The allergic nasal polyps have eosinophils infiltrating the stroma, whereas the inflammatory polyps have an edematous fibrous stroma with a pseudocyst formation and infiltration with lymphocytes and plasma cells. There were 31 patients with inflammatory nasal polyps and 18 patients with allergic nasal polyps. These were common in younger patients, who were in the age range of 11-45 years. On taking all the cases of non-neoplastic lesions together, it was seen that there were 30 males against 22 females and the average age was 39 years (7-71 years).

**Table-3: Distribution of non-neoplastic nasal mass (n= 52)**

	No. of cases	Percentage
Nasal Polyp	49	94.2
Rhinosporidiosis	02	3.84
Rhinolith	01	1.92

**Table-4: Distribution of benign neoplasm (n=34)**

Type	No. of cases	Percentage
Capillary hemangioma	15	44
Angiofibroma	15	44
Inverted papilloma	03	9
Ossifying fibroma	01	3

**Table-5: Histopathology of malignant neoplasm (n=6).**

Histopathology	No. of cases	Percentage
Well differentiated Squamous cell carcinoma	05	83.3
Olfactory neuroblastoma	01	16.6

**The neoplastic lesions-** Thirty four cases of benign and six cases of malignant tumors were seen. Angiofibroma and capillary hemangioma were the most common benign tumors. There were 15 cases of each 44% (30/34). Angiofibromas were seen in the younger age group (11-40 years). Capillary hemangioma was also predominantly seen in men (4/6) who were in the age group of 30-70 years. Next in frequency were three cases of inverted papilloma; these cases were seen in elderly females who were aged 50-60 years. The other important benign tumors were one case of ossifying fibroma (Table 4). Histopathological examination of malignant neoplasm revealed that well differentiated squamous cell carcinoma was predominant (83.3%) followed by olfactory neuroblastoma (16.6%) (Table 5).

## Discussion

Polypoidal mass in the nasal cavity comprises a wide group of lesions with a variety of histopathologic features [8]. It includes various non-neoplastic lesions mainly allergic and inflammatory ones, as well as a number of neoplastic tumefactions in the nose and nasal sinuses. These lesions are quite impossible to differentiate clinically, therefore labelled as "nasal polyp" [9].

Histopathologic examination of such polypoidal masses shows a wide spectrum of lesions ranging from non-neoplastic to neoplastic tumors including the benign and malignant neoplasms. Inability of clinicians to differentiate between neoplastic and non-neoplastic, benign or malignant ones results in delay in diagnosis and treatment planning [10].

In the present study, there was a more predilection towards males as compared to females in both non-neoplastic and neoplastic groups which is similar to study conducted by Tondon et al and Dasgupta A et al [9, 11]. The most vulnerable period for the development of the nasal masses were between 11-40 years. In a study by Drake Lee et al [12], peak incidence at 21-40 years was observed, while Zafar et al [1] reported mean age of 22.5 years. The frequency of nasal polypoidal mass increases with age similar to findings in our study, peaking in individuals aged 50 years or more [13], however our study showed a peak incidence of 11-20 years which is relatively lower than findings by other previous workers [13]. Malignancy was also seen between 20-40 years age.

In the present study, the predominant symptoms of non-neoplastic masses were nasal obstruction (96%), rhinorrhoea (86.5%), postnasal discharge (80%), sneezing (77%), headache (69.2%) and smell disturbances (57.6%) in descending order. The predominant symptoms of neoplastic masses were nasal obstruction (87.5%) and epistaxis (95%) with more than half number of cases presenting with nasal mass. Similar findings such as nasal obstruction, rhinorrhea, epistaxis, headache, hyposmia were observed by Lathi et al [14] with 97.3%, 49.1%, 17.9%, 16.9%, 31.3%, respectively; by Bist et al [15] with 87.27%, 69.06%, 50%, 60.9%, 68% respectively. These findings were corroborated by other researchers as well [9, 16, 17]. Allergic symptoms such as rhinorrhea, itchy nostrils, excessive sneezing was present in more than 50% of the patients which indicates that allergy still plays a major role in nasal polyp in our environment.

Nasal polyps are the most common tumors of the nasal cavity which results from chronic inflammation of nasal and sinus mucous membranes. Exact pathogenesis of nasal polyps is not known, however a strong association with infection, allergy, asthma and aspirin sensitivity has been reported [18, 19]. In our study, non-neoplastic polypoidal masses (56.5%) were more common than neoplastic, with bilateral being more predominant over unilateral. Benign were more common than non-neoplastic among the unilateral masses. However, previously a study reported high incidence of benign non-neoplastic lesions of about 77.6% and 2.6% of malignant [20]. Malignant polypoidal masses were comparatively rare. Of them, inflammatory polyp was predominant one histopathologically, followed by allergic polyp. In our study, 15 cases each of angiofibroma and capillary hemangioma, 3 cases of inverted papilloma and 1 case of hemangioma was observed.

Rhinosporidiosis is a rare disease in the western world but an endemic disease in India, Sri Lanka and a few African nations [18]. We observed 2 such cases, while similar cases of rhinosporidiosis were reported by Lathi et al [13] and Pradhananga et al [15] reported only one case during their two year study period. Though comparatively rare, inverted papilloma is the most commonly encountered lesion of all sinonasal papillomas [15].

Histopathological examination describes both etiology and cellular details, thus plays conclusive role in diagnosing the polypoid lesions. It is the only means of determining the nature of the disease, i.e. inflammatory or neoplastic. For understanding type of pathology, extension of lesion and associated sinus pathology, radiological investigations may play important role. Surgical excision is required for most of the non-neoplastic and benign neoplastic nasal masses, while malignant neoplastic nasal masses require wide surgical excision, radiotherapy or chemotherapy either alone or in combination [21]. Regular follow-up is necessary for early detection of recurrence or metastases. The prognosis for malignant lesions is relatively poor and associated with late diagnosis, difficult surgical anatomy and a lack of effective adjuvant modalities of treatment [22]. The limitation of the present study is smaller sample size. Further longitudinal multicentred clinical studies with larger sample sizes must be carried with clinical and histopathological analysis to confirm the results of this study.

## Conclusion

Nasal polypoidal mass can occur from various pathologic entities which includes infective granulomatous to polypoidal neoplasms. Neoplastic and the non-neoplastic masses maybe indistinguishable from each other which lead to the delay in proper diagnosis and treatment. Correlation of clinical, radiologic, and pathologic features is of utmost important for accurate diagnosis, as they are related to each other. The present study helped us to know the prevalence and the distribution of the polypoidal lesions in the nasal cavity and it emphasizes that nasal polyps should be subjected for histopathological evaluation; a failure to do so will delay the appropriate treatment.

**Clinical Significance:** Many studies reported the prevalence and distribution of nasal polypoidal masses but very few studies have been done in the Madhya Pradesh region. So, the present study shows the prevalence, distribution and pattern of nasal polypoidal lesions in the Bundelkhand region of Madhya Pradesh and this data could add to National data bank for further evaluation and treatment planning.

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## Authors' Contributions

NB: Conceived of this work, performed literature search, collected and analyzed data and reviewed the manuscript have given final approval of the version to be published.

DK: Performed literature search, collected and analyzed data and prepared the manuscript. All authors have read and approved the final manuscript for publication.

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