

## A CLINICOPATHOLOGICAL AND RADIOLOGICAL STUDY OF SINONASAL MASS

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### Abstract

A mass in nasal cavity is a condition commonly encountered by the Otorhinolaryngologists. A diverse group of lesions may present themselves as such masses.

### Keywords:

*sino-nasal mass, clinical presentation, histopathology, radiology .*

This study is intended to clinically differentiate the various conditions presenting as sino-nasal mass, to understand their exact nature by clinical evaluation, histopathological examination & radiological findings learn the relative incidence of individual conditions encountered, and discuss various diagnostic approaches.

A prospective study of total 200 patients with sino-nasal masses presenting between the periods of 01 September 2011 to 31 August 2014 in Gauhati Medical College and Hospital, Assam was done. All patients were subjected to detailed history and clinical examination. All necessary investigations were done. The final diagnosis was made after the histopathological examination of the excised masses. Finally the incidence, clinical & radiological features and histopathological correlation of all the nasal masses were ascertained.

### Introduction

Sino-nasal masses are common condition in an ENT outpatient department. Most patients present with complaints of nasal obstruction, nasal discharge, epistaxis or disturbances of smell. A sinonasal mass can have various differential diagnoses. They may be congenital, inflammatory, allergic, neoplastic (benign or malignant) or traumatic in nature. Congenital masses are predominantly mid line swellings and include dermoids, glioma and encephaloceles as common diagnoses. Non-neoplastic nasal mass commonly included allergic, inflammatory or fungal polyps. This condition is well known with little improvement in its treatment modality, although it is a common condition; the exact aetiopathological correlation is still unknown. Benign mass include haemangioma, angiofibroma, mucocele and inverted papilloma. Malignant masses may arise or extend into the nose and para-nasal sinuses from oro-pharynx or nasopharynx. Certain haematological malignancies may also present as sinonasal mass. However, to date an analysis of the sinonasal masses in the rural population of India has been lacking.

### Materials and methods

The study was carried out at ENT department, Gauhati Medical College & Hospital, which is a tertiary care hospital in Assam, India. The ENT department of the hospital predominantly receives patients from Assam and also from rest of the north eastern states. All patients diagnosed with sinonasal masses during the period from 01 September 2011 to 31 August 2014 were included. The criteria for selection of cases were mainly based on history and clinical examination. Detailed history was taken considering the patients' complaints, mainly nasal obstruction, mass in the nose, epistaxis, rhinorrhoea, hyposmia and deformity of nose and face. Occupational history, personal habits and socioeconomic status of patients were documented. Clinical examinations were carried out as per standard protocols. Diagnostic nasal endoscopy was done for all the cases. Appropriate radiological (CT and/or MRI) & laboratory investigations were done. Pre-operative biopsy was taken from those cases who showed no bleeding on nasal endoscopy & histopathological examination of the excised specimen was done to confirm diagnosis. Patients were

treated either by pharmacotherapy, surgery, radiotherapy or chemotherapy or a combination as appropriate. Patients were asked for regular follow up.

**Results**

During the study period, 200 patients presented with sinonasal masses, and confirmed by various investigations. Sino-nasal masses were non-neoplastic in 116 (58 %) subjects and neoplastic in 84 (42 %) subjects. The age ranges of the patients were 8 to 70 years. Non-neoplastic masses were common in the age group 11 to 40 years. Benign neoplastic masses were common in the age range of 11 to 50 years, while malignant neoplastic masses were common after third decade of life.

Nasal obstruction was the most common (169 cases - 84.5 %) presenting complaint. Rhinorrhoea (95 cases – 47.5%), hyposmia (78 cases – 39 %), intermittent epistaxis / blood tinged discharge (73 cases- 36.5%), headache (61 cases – 30.5 %), swelling over face & external nasal deformity (45 cases – 22.5%) and proptosis (22 cases- 11 %) were other common symptoms. Unilateral nasal masses were observed in 67 % patients, while the remaining patients had bilateral nasal masses. The most common site of origin of the masses was the middle meatus (61.5%) followed by the lateral wall of the nasal cavity (13%) & nasopharynx (11%). Mucoïd discharge was found to be common in non-neoplastic masses. All patients with malignant neoplastic masses presented with blood stained discharge or intermittent epistaxis.



Proptosis & deviation of nose due to maxillary mass



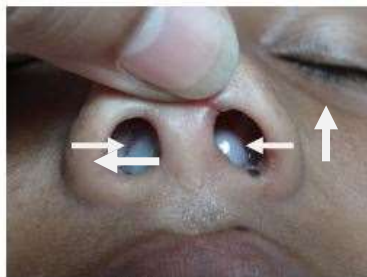
Fronto-ethmoidal mucocele



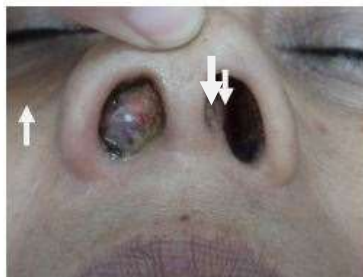
faciomaxillary deformity due to maxillary carcinoma



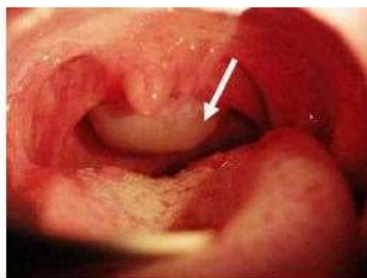
nasal deformity due to right sided capillary haemangioma



Bilateral sinonasal



right sided capillary haemangioma



Antro-choanal polyp with oro-pharyngeal extension

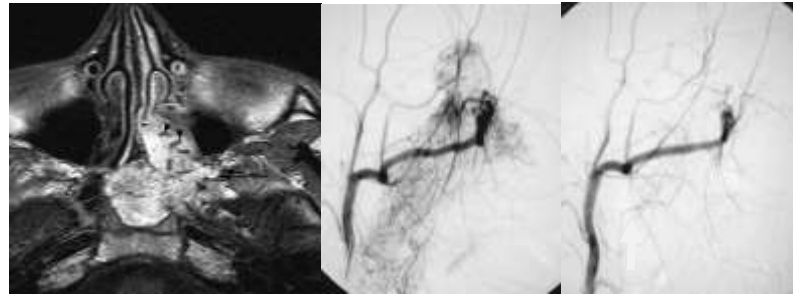


nasopharyngeal angiofibroma with oro-pharyngeal extension producing palatal bulge

Diagnostic nasal endoscopy is a valuable tool in diagnosis and planning management for sinonasal diseases. The most common finding was sinonasal polyposis (105 cases-52.5 %). Associated diseases like sinusitis, synechia, DNS with/without spur were better seen with endoscopy. 22 patients (11%) had associated diseases mentioned above which were not commented upon imaging studies. All pre-operative biopsies taken during the study were under endoscopic guidance. It was found difficult to use in cases of extensive diseases occupying whole of the nasal cavity, where CT gave much better detail of extent of disease in such cases. It gave no information regarding local spread like involvement of orbit, temporal, infra-temporal or intracranial regions.



Sinonasal polyposis

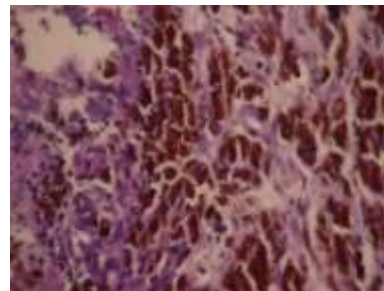
CECT showing contrast enhancement in nasopharyngeal angiofibroma  
Absence of blushing after embolisation

Radiologically, haziness followed by mucosal thickening, are the commonest X-ray findings. Detection of a sino-nasal mass using plain and contrast enhanced CT on nose & PNS is much more confirmatory and detailed. The most common findings were sinonasal polyposis (105 cases -52.5 %) followed by vascular lesion like angiofibroma or haemangioma (44 cases-22%). Apart from tumour detection, it is helpful in demonstrating tumour extension, bone destruction, site of origin & various features showing type of lesion. It is an invaluable guide in appreciating anatomical variation for planned surgical procedures. Pre-operative embolisation was done in 1 case of nasopharyngeal angiofibroma with satisfactory results. Most commonly found anatomical variations in this study was uncinata process variation followed by presence of concha bullosa. Plain X-rays were of limited use and gave inconclusive results.

Histopathological examination revealed that 56.2% (59 cases) of the polyps to be allergic, while 43.8% (46 cases) were inflammatory in nature. Among benign neoplastic lesions, angiofibroma (24 cases) was the most common followed by haemangioma (20 cases). 9 of the angiofibroma were recurrent with one previous surgery & 2 cases had recurrence in follow up period. Mucocele and inverted papilloma were only seen in 10 cases each Squamous cell carcinoma represented 5.5% all sinonasal neoplastic lesions. Two case each of adenoid cystic carcinoma, sinonasal mucosal melanoma and lymphoma were reported during the study. On case of schwannoma was also seen. No adenocarcinoma were reported.

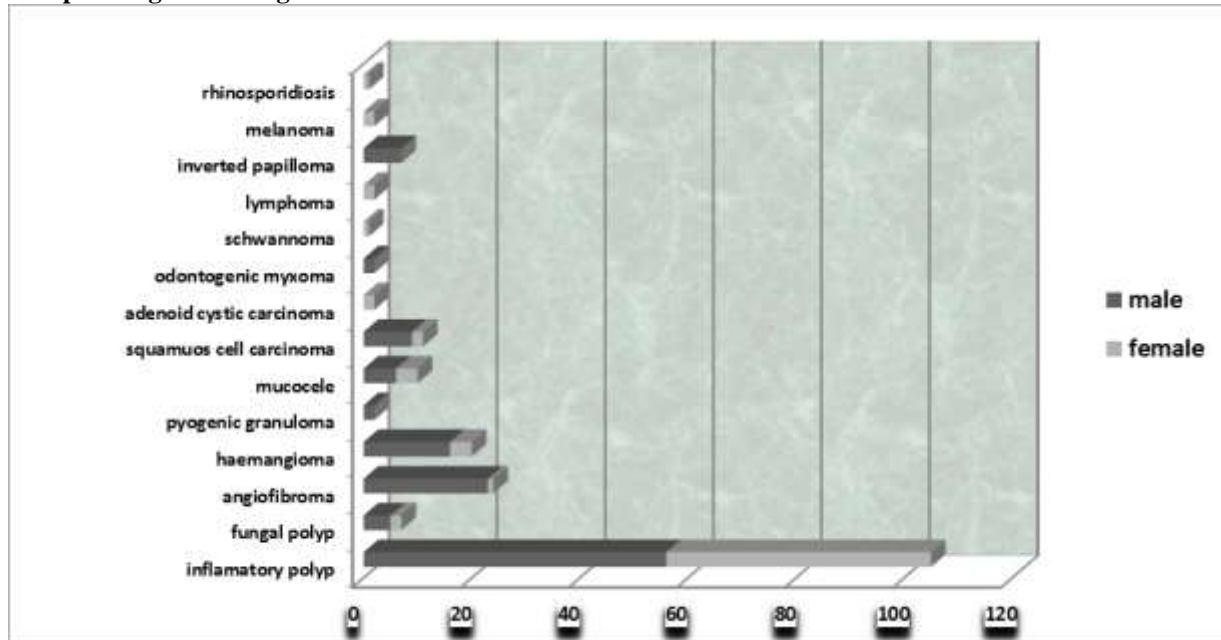


lymphoma IHC



Melanoma

Surgery was the major mode of treatment in all cases. It included Caldwell-Luc operation (5.1%), polypectomy (15.4%), excision of mass (29.5%) and functional endoscopic sinus surgery (FESS) (47.8%). Malignancies were treated with radiotherapy. All benign neoplastic masses were treated by excision of the mass by either lateral rhinotomy approach or intra-oral approach.

**Histopathological findings of sino-nasal masses****Discussion**

Sinonasal masses had predilection for males, demonstrating male to female ratio of 1.6:1. The 2nd to 4th decades of life are the most vulnerable period for development of sinonasal masses. Most of the earlier studies also showed similar results. Malignancies have been reported generally after the 4th decade of life in other studies while present study has maximum reports from 3<sup>rd</sup> decade.

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. We found 58% of the sinonasal masses to be non-neoplastic. Higher proportions of non-neoplastic lesions have been reported in previous studies<sup>2 4 6</sup>. True nasal polyps are subdivided into allergic nasal polyps, showing abundant eosinophils in the stroma in addition to inflammatory cells, & inflammatory nasal polyps, where there is a paucity of eosinophils. Allergic & inflammatory polyps were 56.2 & 43.8% respectively. This trend was also seen considering the two forms of the polyps in the present study.

Angiofibroma, which was the most common benign lesion in our study, were evident in 24 patients (12%) which is much higher than similar studies. 9 of the angiofibroma were recurrent with one previous surgery & 2 cases had recurrence in follow up period, Haemangioma is not regularly seen in the nasal cavity, though if it occurs, is predominantly capillary and is found attached to the nasal septum. Cavernous haemangioma is rarely seen in the sinonasal tract<sup>8</sup>. Among the benign lesions, capillary haemangioma (10%) was second most common lesion in our study. All cases were found to be arising from the maxillary antrum except one case each arising from nasal septum and from nasal floor. Inverted papilloma is the most common morphological variant of all sinonasal papilloma usually encountered. Inverted papilloma formed 3.5% of all sinonasal masses, which was much lower than the findings of other studies. Though it is a benign lesion but clinically it behaves as a potentially notorious pathology if not treated adequately and followed adequately.

Malignancy of sinonasal tract is rare<sup>9</sup>. The maxillary sinus is the most common site of origin<sup>10</sup>, while the most common histological type is squamous cell carcinoma<sup>11</sup>. It is rarely encountered before the 4th decade of life. It formed 10.3% of all lesions and 43.6% of neoplastic masses in our study. Histological investigation revealed

squamous cell carcinoma in 57.1% of all malignant neoplastic sinonasal masses.. In this study, all the tumours originated in the maxillary sinus except 2 cases, which were nasopharyngeal carcinoma extending into sinuses & nasal cavity, eroding the lateral wall of nasal cavity, one of which had intracranial extension. Findings were similar to other studies.<sup>12</sup>

In recent times, diagnostic nasal endoscopy has evolved as a routine mode of investigation. It can readily diagnose pathologies missed by routine ENT check-ups and even by proper radiological methods. In this study, in patient with positive CT findings, it was useful in delineating type of soft tissue obscuring the middle meatus and knowing the state of nasal mucosa & type of nasal discharge. Some of the associated diseases like DNS with/without spur, turbinate hypertrophy, sinusitis and adenoid hypertrophy. Despite several advantages, it has its own sets of limitations. Role of endoscopes are limited to biopsy in malignant cases. Any mass completely occupying the nasal cavity prevents introduction of the endoscope. Also, nasal endoscopy is considered as an invasive procedure by many patients and they were hesitant about it on first suggestion. With proper counselling, due to its cost effectiveness & ease of use, it can be used as an office procedure in less extensive non-malignant cases as first line of investigation.

Radiological investigations may also help in understanding the type of pathology, extension of lesion and associated sinus pathology. CT scans are far more diagnostic than plain X-rays and had effectiveness comparable to endoscopes. It is to be used as first line tool for diagnosis of malignant cases where extent of disease is important factor for further management. It is also to be required prior to surgery to correctly map out the anatomy. 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.

Regular follow-up is necessary for early detection of recurrence or metastases. The outcome for malignant lesions is relatively poor and associated with late diagnosis, difficult surgical anatomy and a lack of effective adjuvant modalities of treatment. FESS offers a definite advantage over other procedures and is now the preferred modality. Complete surgical resection followed by adjuvant radiotherapy is an effective and safe approach in the treatment of sinonasal cancer and associated with better survival.

## Conclusions

Sinonasal masses have various differential diagnoses. Malignancy should be distinguished from non-malignant lesions. Benign conditions show a peak during second to fourth decade of life, while malignancy is generally observed only after the 4th decade. Polyps are the most common benign lesion, while squamous cell carcinoma is the most common malignant tumour of the sinonasal tract. Nasal obstruction is the most common symptom. CT scan as an imaging modality is quite satisfactory in combination with proper diagnostic nasal endoscopies for knowing the nature and extent of the disease & planning surgical management. Medical management is often not 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.

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## Reference

1. Lathi, M.M.A. Syed, P. Kalakoti, D. Qutub, S.P. Kishve, et al. Clinico-pathological profile of sinonasal masses: a study from a tertiary care hospital of India. ACTA otorhinolaryngologica ita lica 2011;31:372-377
2. Zafar U, Khan N, Afroz N, et al. Clinicopathological study of non-neoplastic lesions of nasal cavity and paranasal sinuses. Indian J Pathol Microbiol 2008;51:26-9.

3. Humayun AHM, Zahurul Huq AHM, Ahmed SMT, et al. Clinicopathological study of sinonasal masses. Bangladesh J Otorhinolaryngology 2010;16:15-22.
4. Bakari A, Afolabi OA, Adoga AA, et al. Clinico-pathological profile of sinonasal masses: an experience in national ear care center Kaduna, Nigeria. BMC Research Notes 2010;3:186.
5. Tondon PL, Gulati J, Mehta N. Histological study of polypoidal lesions in the nasal cavity. Indian J Otolaryngology 1971;13:3-11.
6. Dasgupta A, Ghosh RN, Mukherjee C. Nasal polyps-histopathological spectrum. Indian J Otorhinolaryngology, Head Neck Surg 1997;49:32-7.
7. Pradhananga RB, Adhikari P, Thapa NM, et al. Overview of nasal masses. J Inst Med 2008;30:13-16.
8. Iwata N, Hattori K, Tsujimura T. Hemangioma of the nasal cavity: a clinicopathological study. Auris Nasus Larynx 2002;29:335-9.
9. Zimmer LA, Carrau RL. Neoplasms of the nose and paranasal sinuses. In: Bailey BJ, Johnson JT, Newland SD, editors. Head & Neck Surgery - Otolaryngology. 4th ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2006.
10. Fasanla AJ, Lasisi AO. Sinonasal malignancies: a 10-year review in a tertiary health institution. J Natl Med Assoc 2007;99:1407-1410.
11. Weymuller EA, Gal TJ. Neoplasms of the nasal cavity. In: Cummings CW, Flint PW, Harker LA, et al. editors. Otolaryngology - Head and Neck surgery. 4th ed. Mosby; 2005.
12. Svane-Knudsen V, Jorgensen KE, Hansen O, et al. Cancer of the nasal cavity and paranasal sinuses: a series of 115 patients. Rhinology 1998;36:12-4.
13. Zylka S, Bień S, Kamiński B, et al. Epidemiology and clinical characteristics of the sinonasal malignancies. Otolaryngol Pol 2008;62:436-41.

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