



RESEARCH ARTICLE

THE CLINICOPATHOLOGICAL STUDY OF LESIONS OF NASAL CAVITY, PARANASAL SINUSES AND NASOPHARYNX

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ABSTRACT

Introduction: A variety of non-neoplastic and neoplastic lesions involve the nasal cavity (NC), paranasal sinuses (PNS) and nasopharynx (NP) and these are very common lesions encountered in clinical practice. Among this granulomatous and neoplastic lesions are important for both ENT surgeon and Pathologist. Exact diagnosis of the lesions can affect treatment as well as prognosis.

Objectives: To study the clinical and histopathological features of various lesions of NC, PNS and NP.

Methods: In the present prospective study, total number of 50 cases (male 35, female 15; age group ranging from less than 1 y to 76 y) of space occupying lesions of NC, PNS and NP over the period of 24 months (from September 2009 to September 2011) with presenting history of lesions in NC, PNS and NP to ENT department were investigated and included. All tissues after fixation in 10% buffered formalin, processed and then stained with Hematoxylin & Eosin to study various histopathological patterns. Photographic documentation of macroscopic appearance of lesions and histopathological correlation of clinical diagnosis was done.

Results: The non-neoplastic lesions are more common than neoplastic lesions in age group of 20-30 years with male predominance. Among NC, PNS and NP masses, there were 41 (82%) non-neoplastic and 09 (18%) neoplastic lesions. Inflammatory polyps (89.5%) were the most common among the non-neoplastic masses; squamous cell carcinoma (46.15%) was the commonest out of all malignant masses.

Conclusion: It is difficult to comment on nature of polyps, by clinical examination and gross examination of specimen and hence histopathological examination is mandatory for diagnosis and management.

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INTRODUCTION

A variety of Non-neoplastic and neoplastic lesions of nasal cavity (NC), paranasal sinuses (PNS) and nasopharynx (NP) are very commonly encountered in routine clinical practice (Zafar, 2008). These lesions are quite impossible to differentiate clinically and they are mostly clinically diagnosed as nasal polyp (Dasgupta, 1997). They are a common finding in all the age groups. Common presenting symptoms of sinonasal lesions are nasal blockade, nasal discharge, epistaxis, facial swelling, orbital and ear symptoms (Somani, 2004). Although, clinical complaint of a mass in nose seems to be a simple problem but it gives rise to a large number of differential diagnosis in the mind of treating physician and diagnosing pathologists.

They can range from simple nasal polyps to infective polypoidal granulomatous lesions to malignant lesions. Nasal polyps are the most common cause of nasal obstruction with 04% prevalence rate (Hedman, 1999). Their exact pathogenesis is unknown but they have an association with allergy, asthma, infections and aspirin sensitivity (Hedman, 1999). Benign lesions of sinonasal region are common and lack of appreciation of these lesions can lead to radical surgeries. They have long clinical history with frequent local recurrence and thus relatively significant morbidity. Malignant lesions in NC, PNS and NP accounts for not more than 3% of head and neck malignancies and less than 1% of all the malignant tumours (WHO, 2005). Due to varieties of histopathological types and grades of malignancies, it is very important to study their clinical and pathological aspects (Tondon, 1971 and Khan, 2006). The aim of this prospective study was to categorize these lesions into non neoplastic and neoplastic and to study their clinical and histopathological patterns and to compare their incidences.

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Tables 1. Incidence of NC, PNS and NP lesions

Year	Total no. of Lesions	Total no. of Lesions of NC, PNS and NP
Sep. 2009 to Sep. 2010	1210	22 (1.82%)
Sep. 2010 to Sep. 2011	1173	28 (2.39%)
Total	2383	50 (2.10%)

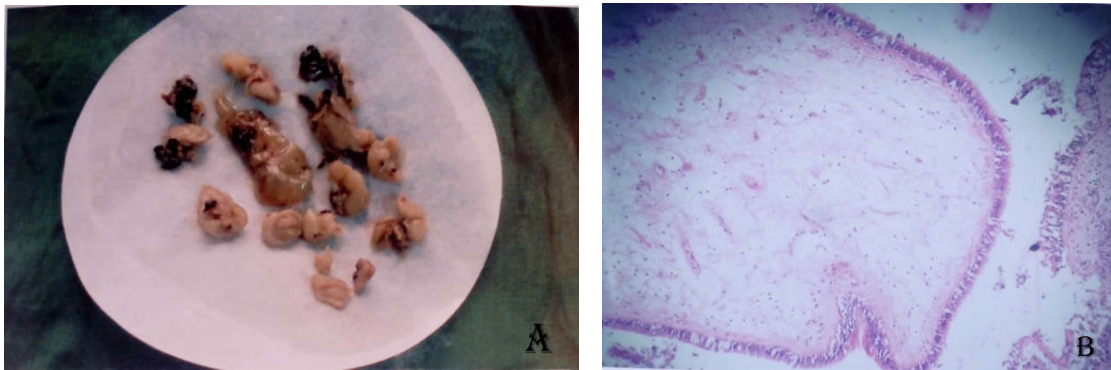
Table 2. Frequency of lesions in NC, PNS and NC

Anatomic site of lesion	Number of Cases
Nasal Cavity	42 (84%)
Paranasal Sinuses	06 (12%)
Nasopharynx	02 (4%)
Total	50

Table 3. Histopathological diagnosis of non-neoplastic lesions of nose and paranasal sinuses

S. No.	Non-neoplastic lesions (n= 41)	Neoplastic lesions (n=09)			
		Benign	No. of Cases (n= 04)	Malignant	No. of Cases (n= 05)
1	Inflammatory Polyp 19 (46.34%)	Angiofibroma	1 (25%)	Squamous cell carcinoma	2 (40.00%)
2	Rhinosporidiosis 09 (21.95%)	Capillary hemangioma	1 (25%)	Transitional cell carcinoma	1 (20.00%)
3	Rhinoscleroma 06 (14.63%)	Inverted papilloma	1 (25%)	Adenocarcinoma	1 (20.00%)
4	Allergic Polyp 04 (9.76%)	Nasal glioma	1 (25%)	Undifferentiated carcinoma	1 (20.00%)
5	Epidermal Cyst 01 (2.44%)				
6	Mucormycosis 02 (4.88%)				
	Total N=50 41 (82%)		04 (08%)		05 (10%)

n= number of cases

**Fig. 1. Gross photograph of polyps (A) & Photomicrograph of polyps comprised of loose mucoid stroma and mucous glands lined by respiratory epithelium. (Fig.B. H&E, 10X view)**

MATERIALS AND METHODS

In the present prospective study a total number of 50 cases (male 35, female 15; age group ranging from less than 1 y to 76 y) of space occupying lesions of NC, PNS and NP over the period of 24 months (from September 2009 to September 2011); presenting with history of lesions in NC, PNC and nasopharynx to ENT department were investigated and managed. All tissues after fixation in 10% buffered formalin, processed and then stained with Hematoxylin & Eosin to study various histopathological patterns. Photographic documentation of macroscopic appearance of lesions and histopathological correlation of clinical diagnosis was done.

RESULTS

A total 50 cases presented as NC, PNS and NP masses over a period of 2 years are included in present study. The incidence of lesions presenting as masses in NC, PNS and NP is 2.10% cases per year. An overview is presented in Tables 1. Amongst all lesions 41 are non-neoplastic and 09 were neoplastic. Average numbers of non-neoplastic lesion are 20.5 per year.

Among total 50 cases, there were 42 cases of NC, 06 cases of PNC and 02 cases of nasopharyngeal masses included. Table 2 Histopathological examination revealed, out of total there were 41 (82.00%) non-neoplastic and 09 (18.00%) neoplastic lesions affected the NC, PNS and nasopharynx. Non-neoplastic (41 cases) outnumbered neoplastic lesions (09 cases) in the ratio of 4.56:1. In the present study, the age distribution of patients ranged from 2 months to 75 y (mean age – 29.1 y). Most common age group affected was 21-30 yrs followed by 11-20 yrs. Taking into consideration all the lesions males were predominantly affected (M:F – 2.3:1). The most common presenting symptoms were nasal obstruction and rhinorrhoea in 50 patients (100%) followed by Headache (76%) and epistaxis (52%). Other less common complaints were recurrent rhinitis and facial swelling. Among 41 non-neoplastic lesions, inflammatory polyp was the commonest one with 19 cases (46.34%) followed by rhinosporidiosis in 09 cases (21.95%), rhinosclerosis in 06 cases (14.63%), allergic polyps in 04 cases (9.76%), Mucormycosis in 02 cases (4.88%), and one case of epidermal cyst (2.44%). (Table 3) Inflammatory polyp was most frequently encountered in sinonasal region with a peak in third and fourth decades of life.

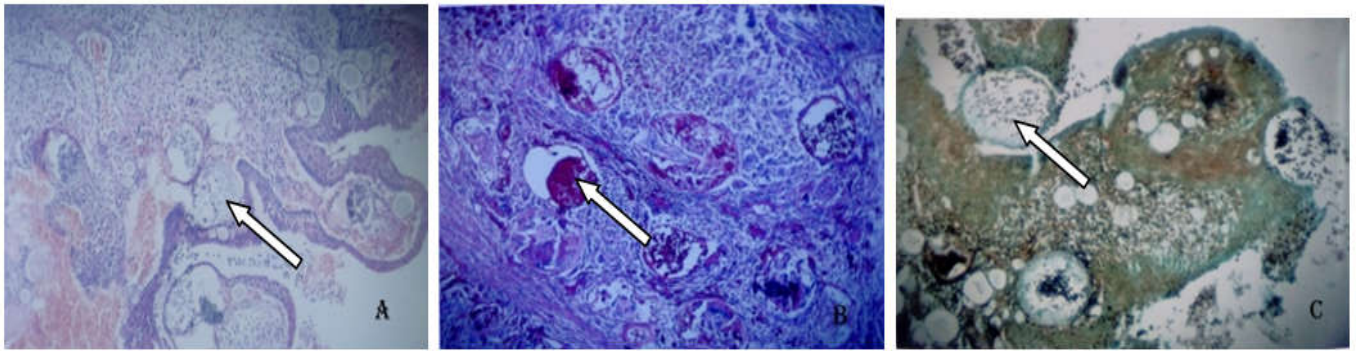


Fig. 2A, B & C - Photomicrograph of Rhinoscleritis showing many globular sporangia containing numerous spores [H&E (FigA), PAS (FigB) & Gram Stain (FigC)]

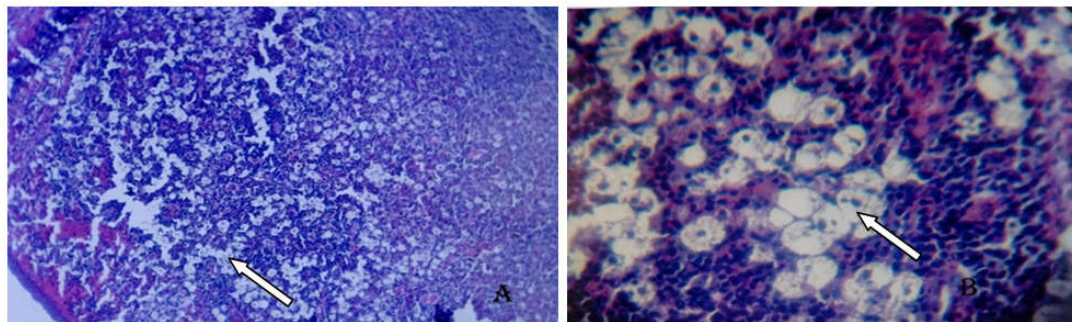


Fig. 3. A&B - Photomicrograph of Rhinoscleroma showing various Mikulicz cells (arrow) and plasma cells. (H&E, 10X&40X view)

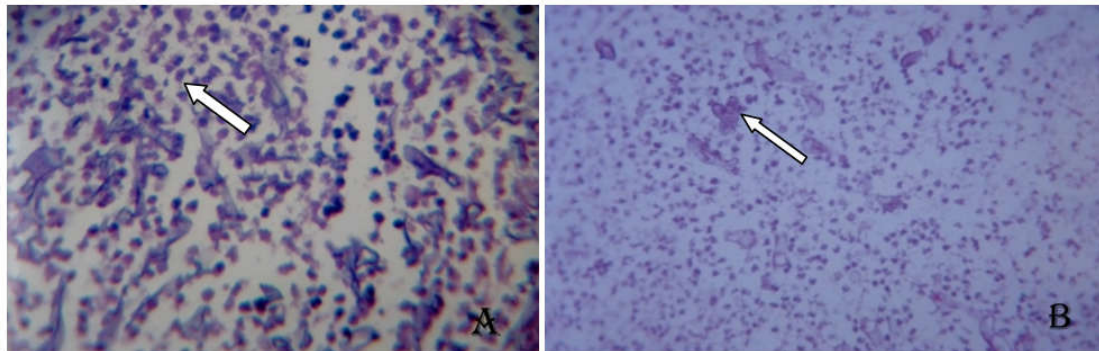


Fig. 4A&B. Photomicrograph of Mucormycosis showing broad, nonseptate hyphae (arrow) (Fig. A H&E, 40X view, Fig.B PAS)

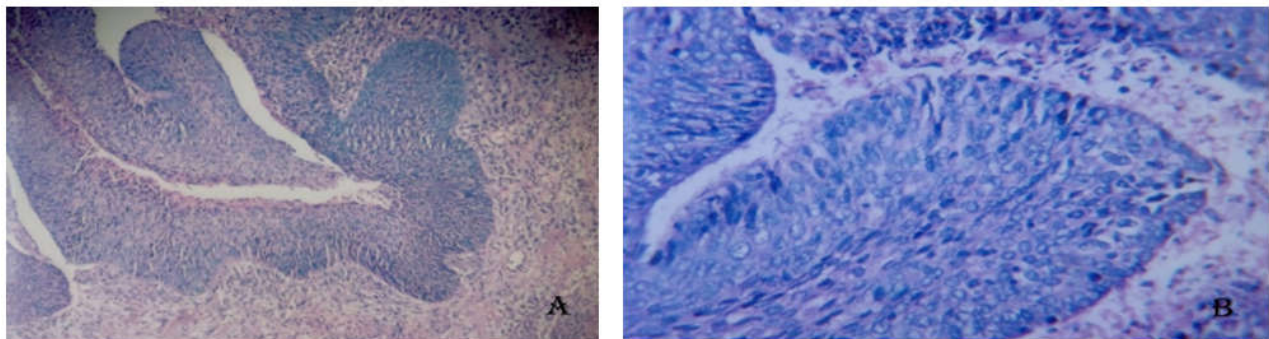


Fig. 5A & B. Photomicrograph of Inverted Papilloma showing invaginations of squamous epithelium into the underlying stroma. (H&E, 10X&40X view)

These polyps presented with the symptoms of nasal obstruction, sinusitis, headache and nasal discharge. Microscopically, these polyps comprised of loose mucoid stroma and mucous glands lined by respiratory epithelium (Fig.no.1B). Inflammatory infiltrate of lymphocytes, plasma cells, neutrophils and eosinophils was noticed in this loostroma.

Allergic polyps show more eosinophilic infiltrate as compared to other inflammatory cells and it also correlates with history of allergic disease. Rhinosporidiosis was most frequently seen in second and third decade and in microscopic examination, showed many diagnostic globular sporangia containing numerous spores (Fig. 2A, B&C). Rhinoscleroma was mainly

seen in second and fourth decades with male predominance. (Fig.no.3A&B) Epidermal cyst found in only one case of 32 year male. Mucormycosis fungal infection was seen in two cases with 51 and 75 year old males both are working as a farmer and both were presented with foul smelling discharge and on microscopy exhibited inflammation of neutrophils and histiocytes in the granulation tissue. (Fig.no.4A&B) Out of 09 neoplastic lesions, there were 04 (44.44%) cases of benign tumors and 05 cases (55.56%) of malignant tumours affect NC, PNC and NP. Among the benign tumour, there were one cases of each of angiofibroma (25%), capillary hemangioma (25%), inverted papilloma (25%) and nasal glioma (25%).

cell carcinoma was the most common malignant lesion, observed in 7th decades. Histologically, tumour cells were arranged in nests, masses or groups with the evidence of squamous differentiation in form of intracellular keratin, intercellular bridges and extracellular keratin pearls. (Fig. 6A&B). Next malignant neoplastic lesions were one case each of transitional cell carcinoma, Adenocarcinoma and Undifferentiated carcinoma. Transitional cell carcinoma (Fig.no.8A&B) and Undifferentiated carcinoma (Fig.no. 9A&B) both were seen in 58 years and 70 years old female cases respectively. Adenocarcinoma was seen in 47 years old male case.

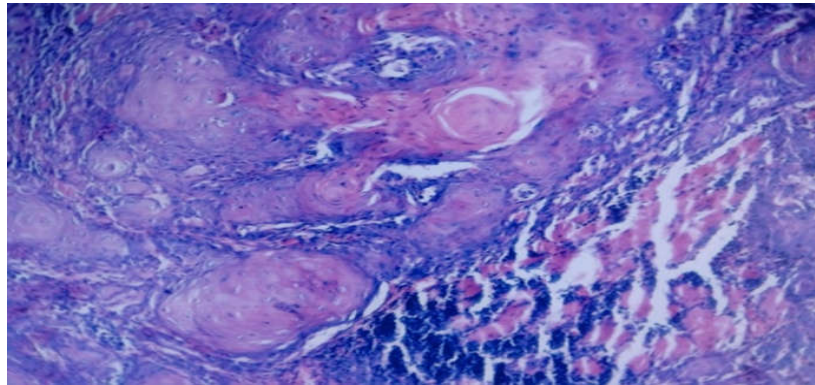


Fig. 6. Photomicrograph of Squamous Cell Carcinoma showing tumour cells arranged in nests, masses or groups with the evidence of squamous differentiation in form of intracellular keratin, intercellular bridges and extracellular keratin pearls. (H&E, 10X view)

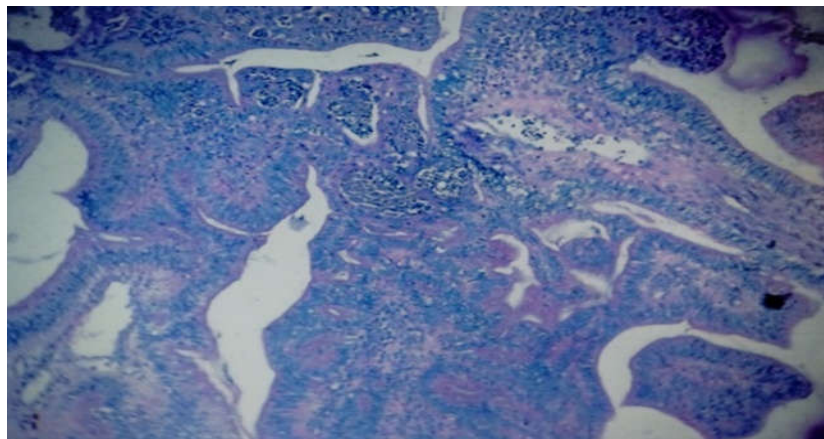


Fig. 7. Photomicrograph of Adenocarcinoma showing a well differentiated seromucinous type with tubulopapillary architecture. (H&E, 10X view)

A case of inverted papillomas presented in 55 year old male with nasal obstruction, mass and epistaxis. Microscopically, they were composed of invaginations of squamous epithelium into the underlying stroma. (Fig.no.5A&B) Angiofibromas was seen in 15 years old male with the microscopy of intricate mixture of blood vessels and fibrous stroma. A case of nasal glioma was seen in a 2 year old female child presenting with a firm, non-compressible polypoidal mass in nasal cavity. Microscopically, this mass was composed of astrocytic neuroglial tissue, interlacing with fibrous and vascular connective tissue, which is lined by respiratory mucosa. Other benign lesions, lobular capillary hemangioma seen in 18 year male with characteristic microscopic picture. Among 05 malignant cases, squamous cell carcinoma constituted majority of two cases (40.00%) followed by one case each of transitional cell carcinoma (20.00%), adenocarcinoma (20.00%) and undifferentiated carcinoma (20.00%), Squamous

Microscopically, adenocarcinoma revealed a well differentiated seromucinous type with tubulopapillary architecture (Fig.no.7A).

DISCUSSION

The average number of specimen received lesions of NC, PNS and NP was 25 cases per year; which represent about 2.10% of surgical pathology material received in department. The incidence of non-neoplastic masses of NC, PNS and NP was 20.5 cases per year. This is consistent with the findings of Dasgupta *et al.* (1997) who reported an incidence of 17.4 cases per year. However, the incidence reported by Tondon *et al.* (1971) was 10 cases per year. In the present study, these masses had predilection for males demonstrating a male to female ratio of 2.3:1 similar to a study by Zafar *et al* and Hassan *et al.* (2008)

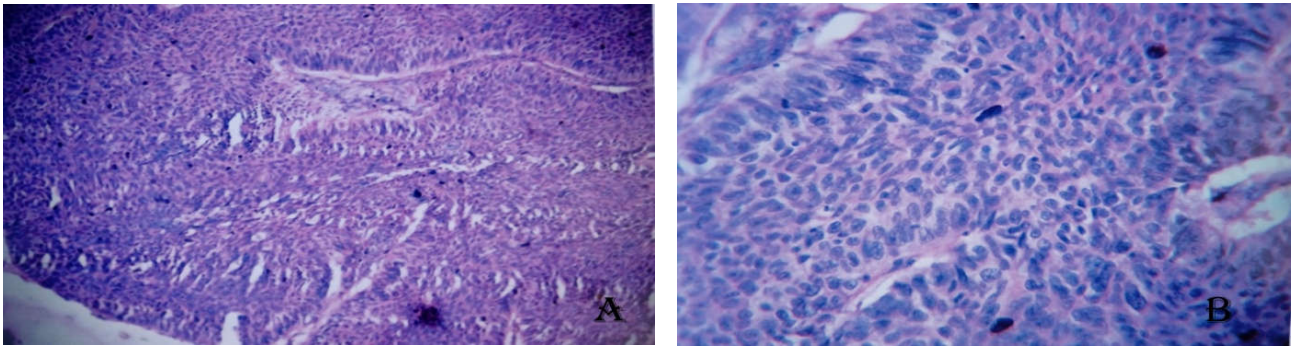


Fig. 8 A&B- Photomicrograph of Transitional Cell Carcinoma (H&E 10X&40X view)

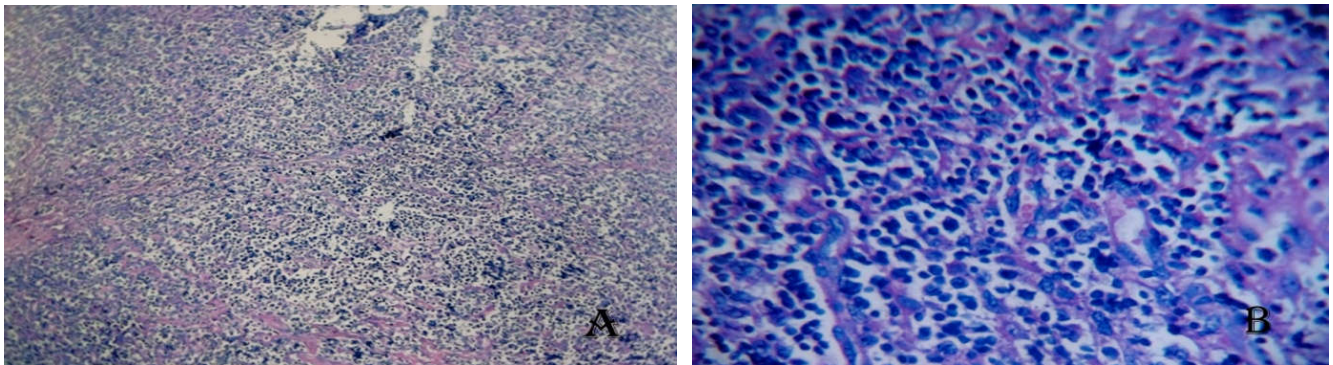


Fig. 9A&B - Photomicrograph of Undifferentiated Carcinoma (H&E 10X&40X view)

In the present study nasal obstruction and rhinorrhea are the most common clinical features which correlates with Panchal *et al.* (2005) In the present study, the proportion of non-neoplastic is 41 (82%) and neoplastic is 09 (18%) which correlates with study of Hassan *et al.* (2002) There is higher incidence of neoplastic lesions in Zafar *et al.* (2008) (39.6%). It is important to differentiate the various non-neoplastic lesions from neoplastic lesions because of different treatment modality and emotional burden on the patient. Among the non-neoplastic lesions, nasal polyp was the commonest. The incidence of inflammatory nasal polyp in this study (46.34%) is similar to the observations by Zafar *et al.* (2008) (49.58%) and Hassan *et al.* (2002) (49.37%). Out of 23 cases of nasal polyps 19 (82.60%) present in nose and 4 (17.39) in paranasal sinuses. Most common site for nasal polyps is nasal cavity which is consistent with Hassan *et al.* (2002) Proportion of allergic nasal polyps is about 17.39% as compared to inflammatory nasal polyps (82.61%) but in Dasgupta *et al.* (1997) there is higher number of allergic polyps seen. It is might be due to regional geographical variation. Rhinosporidiosis is endemic in Asian countries.

Tondon *et al.* (1971) reported the incidence of rhinosporidiosis as 24% in his study whereas in our study, it was 21.42%. The incidence of rhinoscleroma in our study (14.28%) was higher than that observed by Tondon *et al.* (1971) Zafar *et al.* (2008) and Dasgupta *et al.* (1997) In their study, a younger peak age of presentation was noted (20–29 years) which is consistent with our study. Fungal infection (Mucormycosis) incidence is about 4.76% in our study which correlates with Zafar *et al.* (2008) (3.45%). Regarding age, current study revealed 2nd and 3rd decades of life were the most vulnerable period as observed by Bakari *et al.* (2010) and Zafar *et al.* (2008) Malignant lesions have been generally reported in 6th-7th decades in concordance with Patel *et al.* (2005) Nasal glioma is a congenital malformation of choristoma of mature glial tissue discontinuous with intracranial component and presents with respiratory abnormalities.

It is a rare lesion, accounting for only one case, in two year of age, similar to as observed in a study from Nepal (Parajuli and Tuladhar, 2013); Rahbor *et al.* (2003) observed in their review study of nine cases of nasal glioma that the mean age of presentation was nine months. Nasal papilloma is said to be a commonly occurring benign neoplastic lesion. We have observed only one case of inverted papilloma, forming 25 % of all benign neoplastic masses, correlates with findings of Humayun *et al.* (2010) (33.33%). We have reported one case of angiofibroma in 15 year male, presenting with profuse recurrent epistaxis as the chief complaint, comparable to the finding of three cases by Parajuli *et al.* (2013). They are typical lesions reported in young people with histological findings of blood filled spaces separated by fibrous tissue. Capillary hemangiomas constituted 25% of benign neoplasms. Dasgupta *et al.* (1997) was observed slightly higher incidence (47.7%).

These lesions presented as bleeding nasal polyps. Malignant lesions of NC, PNS and NP are rare. (Zimmer and Carrau, 2006) Malignant polypoidal lesions may presents as simple nasal polyps or chronic inflammatory masses, causing delay in the diagnosis. Squamous cell carcinoma is the commonest histological type. (Lathi *et al.*, 2011) In our study, squamous cell carcinoma constituted 40% comparable to Modh *et al.* (2013) and Panchal *et al.* (2005) It was more common in 7th decades of life as documented by Ghosh and Bhattacharya. (1966) We found one case each of transitional cell carcinoma (20%), Adenocarcinoma (20%) and undifferentiated carcinoma (20%). Panchal *et al.* (2005) found three cases each of transitional cell carcinoma (6.1%) and adenocarcinoma (6.1%) and 05 cases of undifferentiated carcinoma (10.2%). The controversy may be due to more number of malignant cases in study of Panchal *et al.* (2005) In the present study, various lesions of NC, PNC and NP were classified into non-neoplastic and neoplastic lesions and compared with previous studies. A high incidence of malignant lesions was observed in our study. Among non-neoplastic lesions, inflammatory polyp was the most common lesion. Among malignant neoplastic lesions,

squamous cell carcinoma was most common malignant lesion. Surgical excision is the main modality of treatment in most of non-neoplastic and benign neoplastic masses and wide surgical excision, radiotherapy or chemotherapy in malignant masses. Regular follow up is necessary for early detection of recurrence or metastases.

Conclusion

The purpose of present study is to present various differential diagnoses of sinonasal masses with their histopathological correlation. Though non-neoplastic polyps are most common lesion of nasal cavity and paranasal sinuses, suspicion of malignancy is always ruled out by histopathological examination. So histopathological study of every lesions of sinonasal cavity is mandatory.

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