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HISTOPATHOLOGICAL EXAMINATION OF SINONASAL LESIONS AND IHC CORRELATION IN DIFFICULT CASES: A STUDY ON ADULT PATIENTS IN A TERTIARY CARE HOSPITAL

Pathology

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ABSTRACT

Background: The purpose of this study was to classify various types of non-neoplastic and neoplastic lesions presenting as sinonasal mass and characterized their histopathological profile as well as immunohistochemical (IHC) properties in certain cases. **Method:** The present study was done in the Department of Pathology, Gauhati Medical College and Hospital for a period of 1 year from march 2019 to February 2020. Histopathological study of total 51 cases of sinonasal lesions was done after tissue processing following standard protocol. Immunohistochemical examination was performed in difficult cases to make accurate diagnosis. **Result:** Out of 51 cases, 33 were male and 18 were female. Nonneoplastic, benign, malignant sinonasal lesions were commonly encountered in 19-28 yrs, 39-48 yrs and 49-58 yrs respectively. Out of these 51 cases, 24 (47.06%) were nonneoplastic, 14 (27.45%) were benign and 13 (25.49%) were malignant in nature. Polyp was the most common nonneoplastic lesion. Among the benign lesions, capillary haemangioma was most commonly encounterd. Squamous cell carcinoma was the most common malignant lesion. IHC was required in four difficult cases. **Conclusion:** sinonasal lesions can be nonneoplastic or neoplastic lesions and histopathological examination remains the mainstay in differentiating these lesions.

KEYWORDS

Sinonasal Lesion, Histopathology, Polyp, immunohistochemistry (IHC).

INTRODUCTION

The nose is the most important organ of the body and most prominent part of the face, which is the body's primary organ of smell and also involved in filtering, humidifying and adjusting the temperature of inspired air.

The nasal cavity, paranasal sinuses and nasopharynx form a functional unit that is reflected in the commonality of the pathological processes that involves the region.

This is particularly the case for the first two sites, which are often grouped under the term "Sinonasal".(1) Nonneoplastic and neoplastic lesions of nasal cavity and paranasal sinuses are commonly encounterd in routine clinical practice.(2)

The large number of diseases affecting these structures is due,in major part,to the many specialized tissue,each with own aberrations that exist in the region.(3) Common presenting symptoms of sinonasal lesions are nasal blockade, nasal discharge, epistaxis, facial swelling, orbital and ear symptoms.They are common finding in all age groups.(4)

Polypoidal lesions are very frequently encountered in clinical practice. Nasal polyps are not true neoplasms. Their formation is associated with inflammation, allergy, or mucoviscidosis. (1) It may be due to the most frequently occurring simple nasal polyp or polypoidal lesions due to a variety of other pathologic entity ranging from infective granulomatous diseases to polypoid neoplasm including malignant ones.(5)

Every type of tumour can occur in this area so it is essential to know the pathology of tumours in general. The presenting features, symptomatology and advanced imaging technique help to reach a presumptive diagnosis but histopathological examination remains the mainstay of final definitive diagnosis. (6)

With the vast forms of lesions presenting in these areas, it is essential to resort to immunohistochemistry (IHC) for exact lineage of the diverse histological presentations.(7)

MATERIALS AND METHOD

Study sample:
Specimens and biopsies of sinonasal lesions retrieved from incident cases for routine histopathological examination from the Department of Otorhinolaryngology and Head and Neck surgery, Gauhati Medical College and Hospital, Guwahati, India from March 2019 to February 2020 formed the source of the study.

Study design
Cross sectional study.

Sample size: 51

Study period:
One year.

Inclusion criteria:
1) Cases of adult age group population.
2) Both nonneoplastic and neoplastic sinonasal lesions.

Exclusion criteria:
1) Congenital and primarily intracranial sinonasal lesions.
2) Lesions of the nasopharyngeal region and lesions arising from the external nose.

Study method
The study comprised of 51 cases of sinonasal lesions. The detailed clinical history including age, clinical signs and symptoms, duration, and results of relevant investigations done were collected from the patient's case file.

After surgery, the specimens were collected and fixed in 10% formalin solution in the operation theatre. The gross appearances of the specimens were noted and any special features were recorded. The tissue was then sectioned and processed in the conventional manner.

After completion of processing, they paraffin blocks were prepared and cut in rotatory microtome to give sections of 3- 5µ thickness.

The sections were stained by conventional Haematoxylin and Eosin, mounted in DPX and examined under Light microscope and their special features were noted.

The technique for IHC included antigen retrieval in citrate buffer in a microwave oven, blocking endogenous peroxidise with 3% hydrogen peroxide, incubating with desired primary monoclonal antibody. Positive and negative controls were run with each batch of slides. The immunostained slides were examined for nuclear and cytoplasmic staining.

RESULTS

Out of 51 specimens received during the 1 year study, neoplastic lesions (52.94%) outnumbered the nonneoplastic lesions (47.06%). Youngest patient affected was 19 years and oldest was 78 years.

Table 1: Distribution of nonneoplastic and neoplastic lesions

Nonneoplastic lesions		Neoplastic lesions			
		Benign		Malignant	
No of cases	Percentage (%)	No of cases	Percentage(%)	No of cases	Percentage (%)
24	47.06%	14	27.45	13	25.49

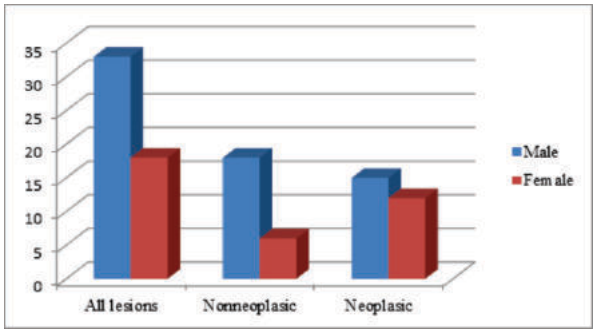

Figure 1: Gender distribution

Table 2: Distribution of lesions in the various age groups

Age group(yrs)	All lesions	Nonneoplastic lesion	Neoplastic lesion	
			Benign	Malignant
19-28	8	9	0	0
29-38	7	1	4	3
39-48	12	3	6	3
49-58	15	8	3	4
59-68	5	3	0	2
69-78	2	0	1	1

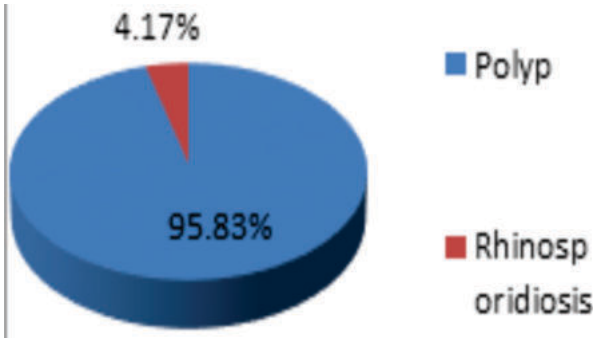

Figure 2: Histopathological typing of nonneoplastic lesions

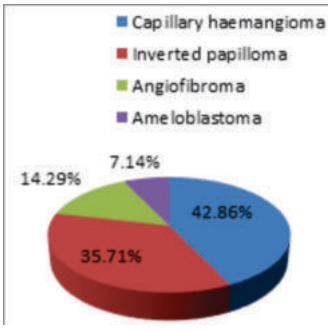

Figure 3: Histopathological typing of benign lesions

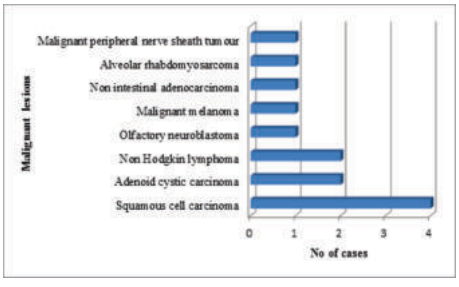

Figure 4: Histopathological typing of malignant lesions

Polyp was the most common nonneoplastic lesion with 23 cases(95.83%). One case of rhinosporidiosis was also reported. Among the benign lesions capillary haemangioma(42.86%) was the most commonly encounterd lesion followed by inverted papilloma and angiofibroma. Squamous cell carcinoma was the most common malignant lesion followed by adenoid cystic carcinoma and non Hodgkin lymphoma.

Four malignant sinonasal lesions were difficult to diagnose by histopathological examination alone. Three of them were poorly differentiated carcinoma and required IHC was further categorisation. IHC was required for another tumour diagnosed as small round cell tumour in HPE for further evaluation.

Table 3: Showing IHC results in difficult to diagnose cases by histopathological examination

HPE diagnosis	IHC markers done	Positive for	Final diagnosis
Small round cell tumour	CK,synaptophysin,chromogranin,NSE,Vimentin Cd45, Cd99, myogenin,myoD1	Chromogranin Synaptophysin, NSE	Olfactory neuroblastoma
Poorly differentiated carcinoma	Desmin,myogenin,myo D1, Cd56, CK,EMA, LCA,P40,P63, Chromogranin A,S100, calretinin,NUT	Desmin,myogenin, myo D1,CD 56-strongly positive synaptophysin-focal and weak positive	Alveolar rhabdomyosarcoma
Poorly differentiated malignant tumour	CD99,HMB45,Melan A,CK5/6,P63,S100,CK,NSE,INI,Desmin,Ki67,synaptophysin	S100,NSE-strong positive Synaptophysin-weak focal positive CD99-weak positive	Malignant peripheral nerve sheath tumour(MPNST)
Poorly differentiated tumour	CD3,CD4,CD5,CD7,CD8, Granzyme B,CD20,CD45,CD138, pancytokeratin,CD56, Ki67	CD3,CD8,CD45,Granzyme B,Ki67-diffusely positive CD56-Focal positive	Non Hodgkin lymphoma, extranodal NK/T cell lymphoma, nasal type

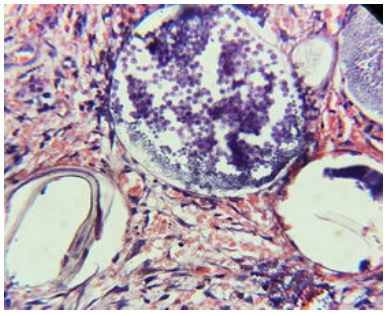

Figure 5: Microscopic appearance of rhinosporidiosis (40X, H & E)

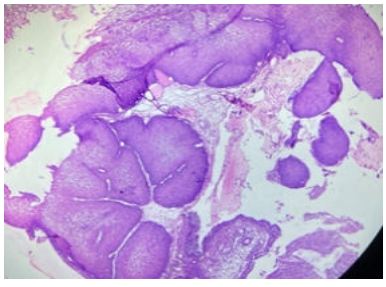

Figure 6: Photomicrograph of inverted papilloma (4 X, H & E)

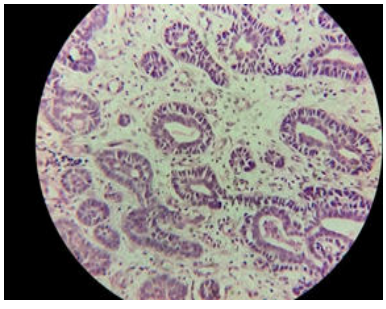

Figure 7: Photomicrograph of sinonasal ameloblastoma (40 X, H & E)

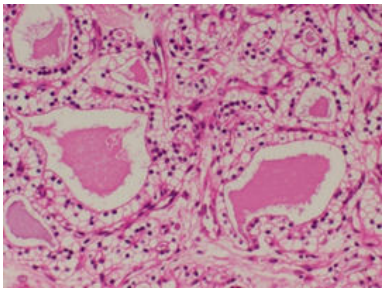

Figure 8: Photomicrogarph of sinonasal non ITAC (40 X, H & E)

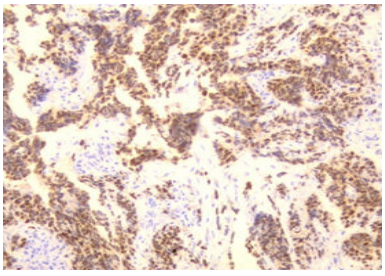

Figure 9: showing myo D1 positivity in case of alveolar RMS (40 X, IHC)

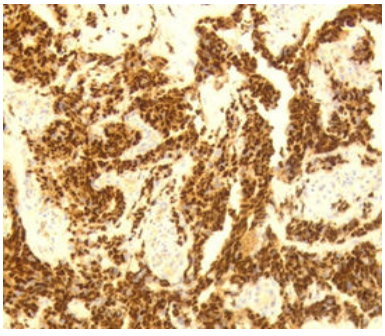

Figure 10: Showing myogenin positivity in case of alveolar RMS (40 X, IHC)

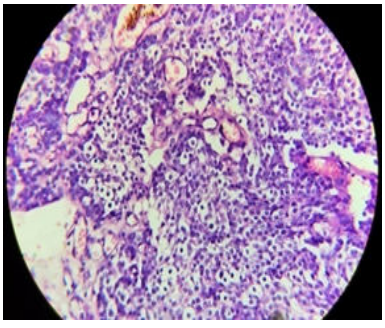

Figure 11: Microscopic appearance of ONB (40 X, H & E)

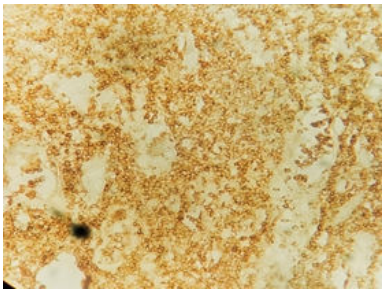

Figure 12: Showing CD 45 immunopositivity in case of NHL (40 X, IHC)

DISCUSSION

Polyps are a common cause of nasal obstruction in adults, with a prevalence of about 4% in the general population.(8) Polyp is a general term used to describe prolapsed pedunculated mucosa that bulges or projects downwards from the normal surface and is macroscopically visible. Nasal polyps are characterised by bulging of oedematous mucosal connective tissue covered by respiratory epithelium.(9)

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 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.(10)

In the present study, nonneoplastic, benign, malignant sinonasal lesions were commonly encountered in 19-28 yrs, 39-48 yrs and 49-58 yrs respectively. It was observed in most of the studies that mean age was least for nonneoplastic lesions; it increased for benign lesions and was highest for malignant lesions. In this study, male predominance was observed in nonneoplastic, benign and malignant lesion which was consistent with the studies done by **Humayun AHP et al**[11], **Kulkarni AM et al**[12], **Ahmed N et al**[13].

In the present study, polyp (95.83% of nonneoplastic lesions) was found to the most common nonneoplasic lesion followed by rhinosporidiosis. These findings were similar to the studies conducted by, **Raj JA et al(14)**, **Ahmed N et al(13)**, **Agarwal P et al(15)**, **Parmar NJ et al(6)** who found polyp as the most common non neoplastic lesion.

In the present study, benign lesions outnumbered malignant lesions in neoplastic category. These findings were similar to the findings of studies done by **Raj JA et al**[14], **Maru AM et al(16)**, **Ahmed N et al**[13] and **Agarwal P et al**[15].

In the present study, lobular capillary haemangioma(42.86% of benign lesions) was found to be the most common benign lesion. While this finding was consistent with the findings of many studies, **Bist SS et al**[17] and **Raj JA et al**[14] found that angiofibroma was the most common benign sinonasal lesion.

In the present study, squamous cell carcinoma was found to be the most common malignant lesion which is consistent with the studies done by **Humayun AHP et al**[11], **Kulkarni AM et al**[12], **Danesh-Sani SA et al**[18]. In contrast to these, Mane **PS et al**[19] had found SNUC as the most common malignant lesion and **Parmar NJ et al**[6] had found basal cell carcinoma as the most common malignant lesion. In the present study, 1 case of MPNST was found which is an uncommon tumour in sinonasal region. **Koivunen P et al**[20] had found 7 cases of malignant schwannoma (MPNST) in their study.

CONCLUSION

During the present study, it was evident that varieties of lesion affect sinonasal region which included nonneoplastic and neoplastic lesion. Non-neoplastic lesions outnumbered the neoplastic lesions. Inflammatory nasal polyps were most common lesion. Non-neoplastic lesions and benign tumours affected predominantly middle age group and neoplastic lesions were common in elderly patients. Males were predominantly affected. Correlation of clinical, radiologic, and pathologic modalities is of utmost important for accurate diagnosis. A thorough histopathologic evaluation is an essential part of work up of patients with sinonasal mass, so that a correct and timely intervention can be justified.

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