Original Research Article

Histopathological profile of sinonasal lesions with brief clinical correlation: experience in a tertiary care centre

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Abstract

Background: Sinonasal lesions are a common finding in Otorhinolaryngology out patient department. Most commonly they present withnasal obstruction. Clinically many of these lesions resemble eachother but they have multiple differential diagnosis ranging from congenital, inflammatory, traumatic to neoplastic causes that needs histopathological confirmation. **Objectives:** This study was undertaken to study the various histopathological patterns of sino-nasallesions, theirclassification and relative distribution of various lesions with regard to age and sex in our setting**. Material and Methods:** This was a retrospective study of Sino-nasal lesions specimens thatwas received at histopathology section of Department of Pathology, Hamdard Institute of Medical Science andResearch andover a period of two years from June 2014 to May 2016. **Results:** A total of 62 cases of sino-nasal lesions were reported during the study period. Ageranged from 5 years to 75 years with malepredominance. Among all the lesions forty five (45) were non-neoplastic, ten (10) benign and seven (7) were diagnosedas malignant tumors. Inflammatory polyp was the commonest non-neoplastic lesion while Sinonasal Papilloma was the commonest benign lesion and Sinonasal carcinoma was themost common malignancy. **Conclusions:** Sino-nasal lesions comprises of wide spectrum of lesions but their presenting clinicalmanifestations are very limited. Hence, on the basis of clinical picture various nonneoplastic, benign and malignantlesions may mimic each other. Histopathological diagnosis forms the mainstay of diagnosis in these lesions whichmay even reveal clinically unsuspected rare malignancies as seen in our study.

Keywords: Sino-nasal lesion, Nasal Polyp, Neoplastic and Nonneoplastic, Histopathology

Introduction

The nasal passage and paranasal sinuses collectively termed Sino-nasal area serves as host to a variety of diseasedconditions known as sino-nasal lesions that are commonly seen in Otorhinolaryngology outpatient department. Sinonasal area along with nasopharynx constitute the functional unit that is lined by stratified squamous epithelium, pseudostratified columnar epithelium and intermediate (transitional) epithelium andis principally involved infiltering, humidifying and adjusting temperature of inspired air [1,2]. Exposure of these areas to various infectiveagents, chemicals, antigens, mechanical and many other influences leads to development of variety of non-neoplastic and neoplastic lesions [3]. These lesions vary widely depending on the age, occupation and addiction habits and other environmental factors related to the patients. Thus, they provide a challenging as well as interestingarea for an in-depth study of theselesions. Most of these patients present with complaints of nasal obstruction [4]. Other symptoms include nasal discharge, epistaxis, disturbances of smell. These sinonasal lesions can have various differential diagnosis that may becongenital, inflammatory, neoplastic or traumatic. Among these, Polyps including in flammatory and allergic arethe most common sinonasal lesion. They are common cause of nasal obstruction and have prevalence of about 4% of general population [5]. Other non-neoplastic lesions are

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bacterial and fungal infections. Benigntumours like papilloma, haemangioma, angiofibroma are relatively common, but malignant neoplasms are rare. Malignant tumours account for 0.2% to 0.8% of total malignancies and only 3% of all malignant tumours of upperaerodigestive tract [6]. Squamous cell carcinoma is the most common microscopic type of sinonasal neoplasmaffecting the nasal skin and nasal cavities [7]. Adenocarcinomas of various types comprise 10% to 20% of allprimary malignant neoplasms of the nasal cavityand paranasal sinuses [8]. Adenoid cystic carcinoma usuallyoccurs in the maxillary sinus and nasal cavity [8]. NHLs of the sinonasal tract are heterogeneous diseases that can beclinically aggressive [9]. Presumptive diagnosis of these lesions can be achieved with the aid of clinical presentationand imaging techniques but histopatho-logical examination remains the mainstay of final definitive diagnosis [10]. The present study was undertaken to analyze the spectrum of Sinonasal lesions, their age and sex distribution, briefclinical presentation and histopathological diagnosis.

Materials and Methods

Place of Study: The study was conducted in the department of Pathology at Hamdard Institute of Medical Scienceand Researchover a period of 2 years from Jun 2014 to May 2016

Type of Study: Retrospective Study.

Sampling Methods: Clinical data was retrieved from histopathology requisition form / hospital records of patients presenting with sino-nasal lesion.

Sample collection: All the specimens (biopsies/surgical specimens) that were received in our histopathology section were fixed in 10% formalin, embedded in paraffin, sectioned at 3-5µ and stained with hematoxylin and eosin. Special stains like Ziehl Neelsen (ZN) and Periodic acid Schiff (PAS) stains were done wherever necessary.

Inclusion criteria: All the specimens of lesions of nasal cavity, paranasal sinuses and nasopharynx receivedat histopathology section of pathology were included in the study.

Exclusion Criteria: Previously treated cases of sinonasal disease with recurrence were excluded from the study.

Statistical Method: Descriptive statistical measures were utilized to present the data.

A total of 62 cases of sinonasal lesions fulfilling these criteria were finally included in this study. Histologically the nasal masses were classified into nonneoplastic masses and neoplastic masses. Nonneoplastic masses were further subdivided as allergic and nonallergic types, and neoplastic masses were divided as benign and malignant lesions.

Results

A total of 62 cases presented as sinonasallesions. Amongst these, 37 were malewhile 25 cases were female. An overall male predominance was noted with M:F= 1.48:1(Table I). Male preponderance was more marked in malignant lesions and the male to female ratio was 2.5:1 (Table I). Sino-nasallesions were commonest in the 11-20 years (16 cases) followed by equal numbers in31-40 and 41-50 year agegroup comprising 14 cases each (Table II). Maximum number of non-neoplastic masses were also seen in 11-20 yeargroup (14 cases) followed by 31-40 year age group (11 cases). Malignant tumors were most commonly encounteredequally in 41-50 and 51-60 year age (2 cases). Forty-five (45) non-neoplastic lesions, ten (10) benign lesions and seven (7) malignant tumors were diagnosed. Most of the sino-nasal lesion presented with nasal obstruction whichwas the commonest symptom followed by nasal discharge and epistaxis. Facial pain was noted in occasional cases. Inflammatory polyp (including allergic) was the most common nonneoplastic lesion with 33 cases (73.3%). Two cases of Mucormycosis, two cases of Tuberculosis and one case of Adenoid Hypertrophy were also reported amongnon-neoplastic lesion. Among the benign lesion, Sinonasal Papilloma was the most commonly encountered lesionwith 5 cases including two cases of Inverted Papilloma (50%). Two cases of Haemangioma, one each of Angiofibroma, Schwannoma and Neurofibroma were also diagnosed histopathologically. Among the malignancies, Sinonasal carcinoma was the most common comprising of two cases (28.5%). We also encountered few raremalignancies which included one case each of Nonkeratinizing undifferentiated nasopharyngeal carcinoma, Basaloid Squamous cell carcinoma, Adenoid cystic carcinoma, Teratocarcinosar coma and Non Hodgkin's Lymphoma during our 2 years study (Table III).

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Table-I: Distribution of Sino-nasal lesion according to gender:

Types of Masses	Male	Female	Male : female Ratio	Total
Non Neoplastic	25	20	1.25 : 1	45
Neoplastic Benign	07	03	2.33 : 1	10
Neoplastic Malignant	05	02	2.5 : 1	07
Total	37	25	1.48 : 1	62

Table-II: Age and Gender wise distribution of Sino-nasal Lesion:

Age (Years)	Non neoplastic		Neoplastic Benign		Neoplastic Malignant		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
0-10	02	00	00	00	00	00	02	00
11-20	05	09	01	01	00	00	06	10
21-30	04	02	01	01	01	01	06	04
31-40	06	05	03	00	00	00	09	05
41-50	06	03	02	01	02	00	10	04
51-60	01	01	00	00	02	00	03	01
61-70	01	00	00	00	00	00	01	00
71-80	00	00	00	00	00	01	00	01
Total	**25**	**20**	**07**	**03**	**05**	**02**	**37**	**25**

Table-III: Histopathological findings of different Sino-nasal lesion according to gender and percentage

Types of Lesion	Histopathological Findings	Number of Cases (% by Type of lesion)	Number of Cases (% of Total)
Non Neoplastic	Inflammatory Nasal Polyp	28(62.2)	28(45.16)
	Allergic Polyp	05(11.1)	05(8.06)
	Granulomatous Lesion	03(6.66)	03(4.83)
	Tuberculosis	02(4.44)	02(3.22)
	Mucormycosis	02(4.44)	02(3.22)
	Rhinosinusitis	01(2.22)	01(1.61)
	Adenoid Hyperytrophy	01(2.22)	01(1.61)
	Nasolabial cyst	01(2.22)	01(1.61)
	Non specific	02(4.44)	02(3.22)
	Total	45(100)	45(72.58)
Neoplastic Benign	Nasal Papilloma	05(50)	05(8.06)
	Haemangioma	02(20)	02(3.22)
	Angiofibroma	01(10)	01(1.61)
	Neurofibroma	01(10)	01(1.61)
	Schwannoma	01(10)	01(1.61)
	Total	10(100)	10(16.12)
Neoplastic Malignant	Sinonasal Carcinoma	02(28.5)	02(3.22)
	Naspharyngeal Carcinoma	01(14.3)	01(1.61)
	Teratocarcinosarcoma	01(14.3)	01(1.61)
	Basloid squamous carcinoma	01(14.3)	01(1.61)
	Adenoid cystic carcinoma	01(14.3)	01(1.61)
	Non Hodgkin's Lymphoma	01(14.3)	01(1.61)
	Total	07(100)	07(11.29)
	Total No. of cases	62(100)	62(100)

Discussion

Sino-nasal lesions form a complex group of lesions with a broad spectrum of clinical and histopathological features. A totalnumber of 62 cases were included in our study. Age of the patientsranged from 5 years to 75 years. In thepresent study, sino-nasal lesions were predominant in males, demonstrating a male to female ratio of 1.48:1. Themale preponderance was more marked in malignancies (M:F= 2.5:1). Many authors have observed similar male preponderance [7,11,15], while only in few studies sino-nasal lesions were more common in females[12]. The mostcommon age groups for sino-nasal lesions in our study was second decade followed by 3rd and 4th decade. Similar finding was observed by A.Lathi et al [7]. In our study non-neoplastic, benign and malignant nasal lesions were commonly encountered in 11-20 year, 31-50 year and 41-60 year age group respectively which was in concordance with Parajuli et al [13]. Lathi et al concluded that malignant nasal masses are rarely encountered before fourth decade of life [7]. Nasal obstruction was the most common clinical presentation, followed by rhinorrhoea. Similar presenting features were observed in other studies [4,12,14].

In our study, inflammatorypolyps (including allergic) were the most common nasal non-neoplastic masses. This observation was similar to several other studies [7,11,15,16]. Nasal polyps result from chronic inflammation of thenasal and sinus mucous membranes. Their exact pathogenesis is not known, however a strong association withallergy, infection, asthma and aspirin sensitivity has been implicated [5,17]. Microscopically, the epithelial lining ofnasal masses is of the respiratory type unless squamous metaplasia hasoccurred [18].

Among other non-neoplastic lesions included in our study were mucormycosis (4.4%) which on microscopy showedbroad non-septate hyphae that were arranged irregularly (Figure 1) and were positive for PAS stain. This wascomparable with the study of Uma R et al and Bhattacharya et al who reported one case each of Mucormycosis [19,20]. Among granulomatous lesion two cases of Tuberculosis (4.44%) were found which on microscopy revealed multiple epithelioid cell granulomas along with caseous necrosis and revealed Acid fast bacilli on ZNstain. Similarly Ngairangbam et al and Waldman et al reported one case each of tuberculosis [16,21]. Due toits rarity and nonspecific clinical presentation, clinical diagnosis of nasal tuberculosis may be missed that may lead todelay in proper treatment.In such cases histopathology of the nasal lesions play an important role in the timely diagnosis of sinonasal tuberculosis [22]. Our study did not show any case of rhinoscleroma and rhinosporidiosisunlike the study of Lathi et al [7].

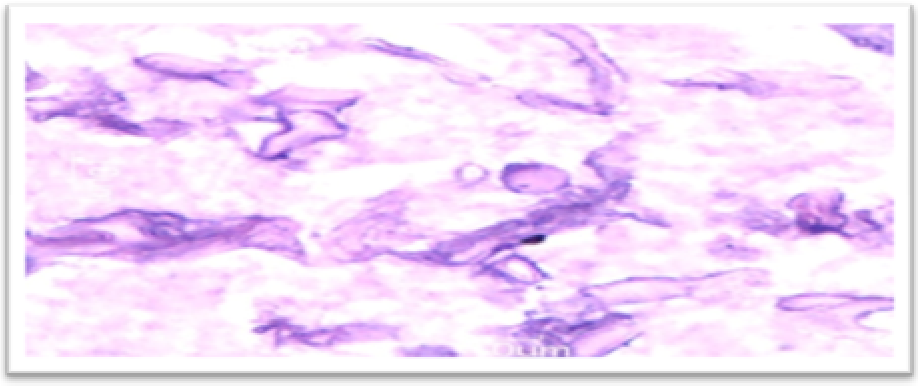

Figure-1: Photomicrograph showing broad aseptate hyphae with irregular branching (H&E Stain; 40x)

Among benign lesions, sino-nasal papilloma was the most common lesion including its morphological variant. Wereportedfive (50%) cases of sino-nasal papillomaincluding 3 cases of squamous and 2 cases of inverted papilloma [Figure 2] which is a morphological variant of sino-nasal papilloma. This was similar to the study by Amit et alwho reported one case of Inverted papilloma andtwo cases of Sinonasal papilloma [23]. Narayana Swami et alreported 13% of inverted papilloma in his study [24]. Sinonasalpapillomas account for 0.5–4% of all nasal tumors [25]. Transformation of sinonasalpapillomas into malignancy has been described in inverted papilloma andoncocyticpapillomas, but not in exophyticpapillomas [26]. Hemangioma (2 cases) were reportedin 20% of the benign lesions. Both of them were found to be arising from nasal septum. Similar findingswere reported by other authors too [12.27].

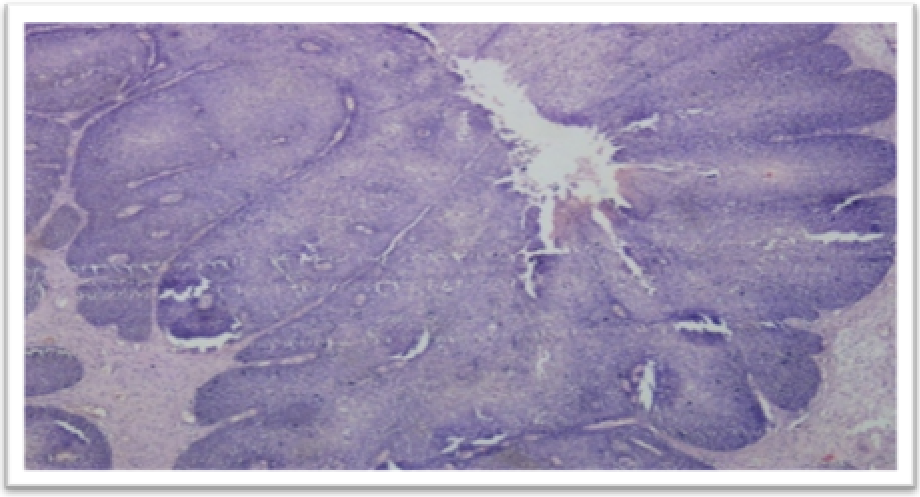

Figure-2: Photomicrograph showing inward growth of hyperplastic epithelium enclosed by basement membrane into underlying stroma(H&E Stain ; 4x).

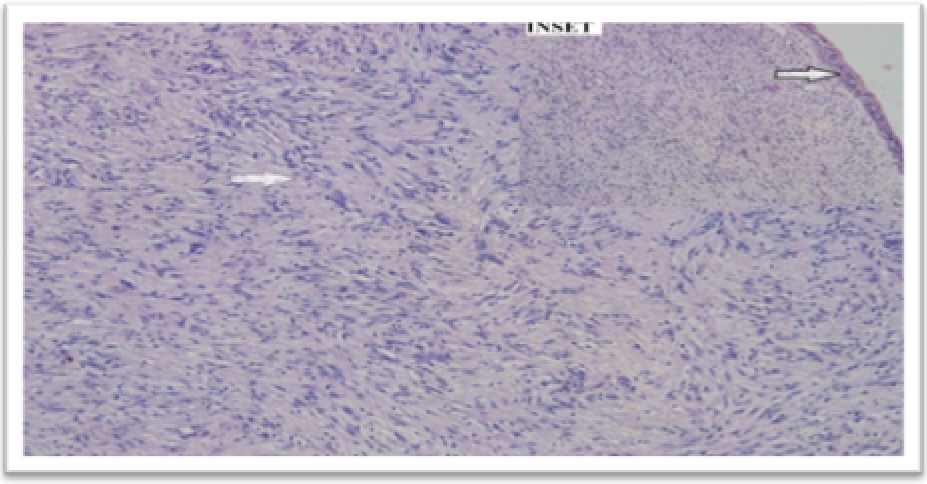

Figure-3: Photomicrograph showing hypercellular Antoni A areas and hypocellular Antoni B areas. Arrow indicates Verocay Bodies (H & E Stain;10 xs). Inset: Arrow indicates Respiratory epithelium (H&E Stain; 4x)

A single case of Angiofibroma was reported in a 16 year old male child that constituted 10% of benign sinonasallesions in our study. This corresponds with the study ofA Lathi et al [7]. Wealso reported oneunusual case of schwannoma (Figure 3) in a 40 year old male patient presenting as mass in right nasal cavity with clinical suspicionof inverted papilloma. Gulaeria et al also reported one case of Schwannoma [27]. Schwannomas of the sino-nasaltract are very infrequent, representing less than 4% of the schwannomas of the head and neck region [28]. One caseof Neurofibroma were also detected in a 16 year female which is also infrequent in these locations. Battacharya et alalso reported a single case of neurofibroma in hisstudy [20].

Among malignantneoplasms a total of 7 cases were reported. Four cases were seen after the age of 40 years whiletwo cases were in the 21-30 years age group. Male: Female ratio was 2.5 :1. Two cases of Sinonasal carcinoma including one Nonkeratinizing Squamous cell carcinoma and one Papillary variant of intestinal type Adenocarcinoma (Figure 4) were reported. Intestinal-type adenocarcinoma (ITAC) are responsible for less than 4% of the total malignancies of this region [29]. These tumors are common in workers in the hardwood and shoeindustries. IHC was also done in this case which showed positivity for CK20. Papillary ITAC may have the bestprognosis, as it typically behaves as locally destructive lesion with a limited tendency for regional or distantmetastases [8,30].

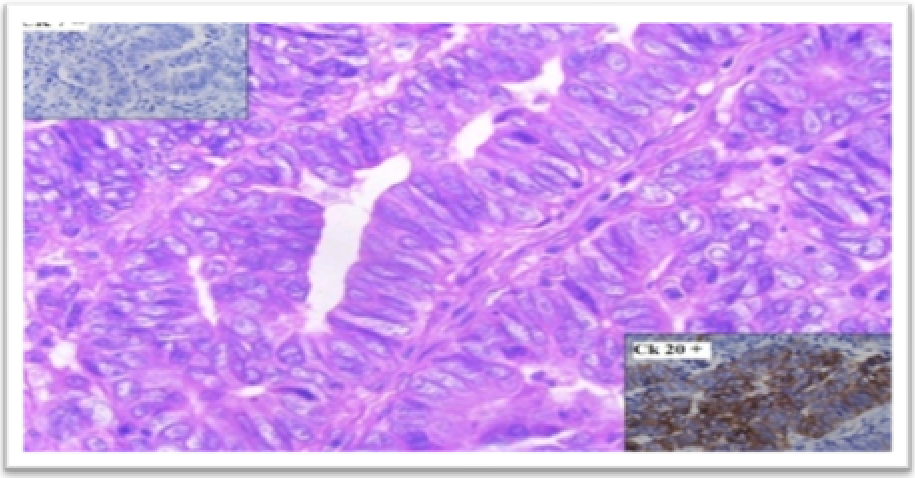

Figure 4: Photomicrograph showing papillary arrangement oftumor cells that are composed of pseudostratified columnar cells with abundant eosinophilic cytoplasm (H & E Stain; 40x). **Inset**Above: Immunostaining with CK 7 shows uniform negativity. **Inset below**: Immunostaining with CK 20 shows strong positivity.

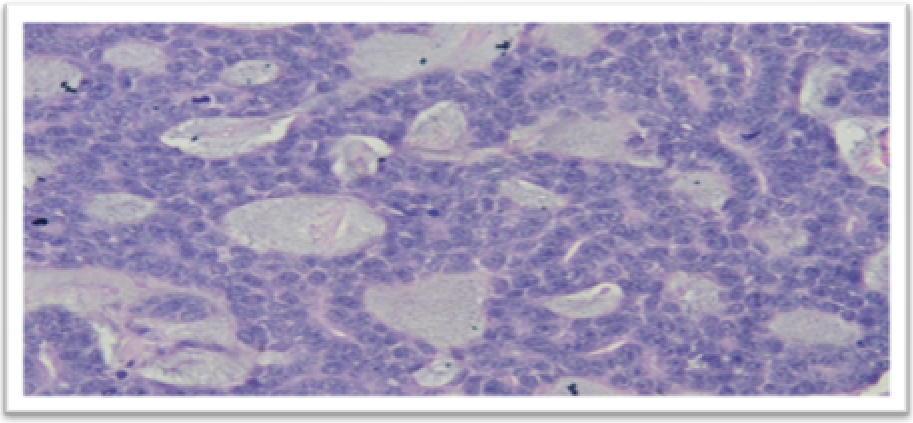

Figure 5 : Photomicrograph showing predominantly cribiform arrangement of with dark compact angular nuclei surrounding pseudoglandular spaces filled with basement material(H&E Stain ; 40x)

One case of undifferentiated nasopharyngeal carcinoma was seen in a 28 year old female. A single case of Adenoid cystic carcinoma (Figure 5) was reported in a 42 yearold male patient who presented with Right nasal obstructionand facial pain. PAS and Mucin stains were positive in this case. One case of basaloid squamous carcinoma wasreported in a 75 year female. Another single rare case of Sinonasalteratocarcinosarcoma was reported in a 26 year male and one case ofNon-Hodgkin's lymphoma was reported in a 58 year male during the study period. These arevery uncommon neoplasms of sino-nasal region. Guleria et al reported two cases of nasopharyngeal carcinoma, fourcases of Adenoid cystic carcinoma and one case of Non hodgkin's Lymphoma in hisstudy [27].

Thus thisstudy helped us in providing an insight into the varied clinicopathological spectrum of nasal masses.

Conclusions

Sino-nasal lesions comprise of wide spectrum of lesions but their presenting features are mostly overlapping andlimited in number. As a result, they pose diagnostic dilemma, as clinically even benign and malignant sinonasallesions may appear as non-neoplastic thus leading to delay in proper diagnosis and early treatment. Hencehistopathological evaluation forms essential part of work up that helps in arriving at definitive diagnosis. Ashighlighted in our study, itmay even reveal lesions such as tuberculosis that are rare in this location and clinicallyunsuspected rare malignancies which were not suspected initially by the clinicians.Thus histopathology

is a simpleand cost effective tool that help in categorization of different sino-nasal lesions according to various parameters.

Author inclusion criteria - Dr. Nehal was responsible for the literature search and drafting of manuscript. Dr. Sabina was involved in reviewing, editing and interpretation of smears. Dr. Jaseem was involved in reviewing of the manuscript. Dr. Sujata was involved in reviewing the manuscript and also its editing.

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