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 with nasal obstruction. Clinically many of these lesions resemble each other 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-nasal lesions, their classification 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 that was received at histopathology section of Department of Pathology, Hamdard Institute of Medical Science and Research and over 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. Age ranged from 5 years to 75 years with male predominance. Among all the lesions forty five (45) were non-neoplastic, ten (10) benign and seven (7) were diagnosed as malignant tumors. Inflammatory polyp was the commonest non-neoplastic lesion while Sinonasal Papilloma was the commonest benign lesion and Sinonasal carcinoma was the most common malignancy. Conclusions: Sino-nasal lesions comprises of wide spectrum of lesions but their presenting clinical manifestations are very limited. Hence, on the basis of clinical picture various nonneoplastic, benign and malignant lesions may mimic each other. Histopathological diagnosis forms the mainstay of diagnosis in these lesions which may 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 diseased conditions 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 and is principally involved in filtering, humidifying and adjusting temperature of inspired air [1,2]. Exposure of these areas to various infective agents, 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 interesting area for an in-depth study of these lesions. 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 be congenital, inflammatory, neoplastic or traumatic. Among these, Polyps including inflammatory and allergic are the 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
bacterial and fungal infections. Benign tumours 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 upper aerodigestive tract [6]. Squamous cell carcinoma is the most common microscopic type of sinonasal neoplasms affecting the nasal skin and nasal cavities [7]. Adenocarcinomas of various types comprise 10% to 20% of all primary malignant neoplasms of the nasal cavity and paranasal sinuses [8]. Adenoid cystic carcinoma usually occurs in the maxillary sinus and nasal cavity [8]. NHLs of the sinonasal tract are heterogeneous diseases that can be clinically aggressive [9]. Presumptive diagnosis of these lesions can be achieved with the aid of clinical presentation and imaging techniques but histopathological 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, brief clinical presentation and histopathological diagnosis.

Materials and Methods
Place of Study: The study was conducted in the department of Pathology at Hamdard Institute of Medical Science and Research over a period of 2 years from Jun 2014 to May 2016

Type of Study: Retrospective Study.

Results
A total of 62 cases presented as sinonasal lesions. Amongst these, 37 were male while 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). Sinonasal lesions were commonest in the 11-20 years (16 cases) followed by equal numbers in 31-40 and 41-50 year agegroup comprising 14 cases each (Table II). Maximum number of non-neoplastic masses were also seen in 11-20 year group (14 cases) followed by 31-40 year age group (11 cases). Malignant tumors were most commonly encountered equally 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 which was 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 among non-neoplastic lesion. Among the benign lesion, Sinonasal Papilloma was the most commonly encountered lesion with 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 rare malignancies which included one case each of Nonkeratinizing undifferentiated nasopharyngeal carcinoma, Basaloid Squamous cell carcinoma, Adenoid cystic carcinoma, Teratocarcinosarcoma and Non Hodgkin’s Lymphoma during our 2 years study (Table III).
### 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 | Male | Female |
| 0-10        | 02   | 00     | 00   | 00     | 00   | 00     | 02   | 00     | 02   | 00     |
| 11-20       | 05   | 09     | 01   | 01     | 00   | 00     | 06   | 10     | 06   | 10     |
| 21-30       | 04   | 02     | 01   | 01     | 01   | 01     | 06   | 04     | 06   | 04     |
| 31-40       | 06   | 05     | 03   | 00     | 00   | 00     | 09   | 05     | 09   | 05     |
| 41-50       | 06   | 03     | 02   | 01     | 02   | 00     | 10   | 04     | 10   | 04     |
| 51-60       | 01   | 01     | 00   | 00     | 02   | 00     | 03   | 01     | 03   | 01     |
| 61-70       | 01   | 00     | 00   | 00     | 00   | 00     | 01   | 00     | 01   | 00     |
| 71-80       | 00   | 00     | 00   | 00     | 00   | 01     | 00   | 01     | 00   | 01     |
| Total       | 25   | 20     | 07   | 03     | 05   | 02     | 37   | 25     | 62   | 62     |

### 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 Hypertrophy                        | 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)                      |
|                 | Nasopharyngeal 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 total number of 62 cases were included in our study. Age of the patients ranged from 5 years to 75 years. In the present study, sino-nasal lesions were predominant in males, demonstrating a male to female ratio of 1.48:1. The male 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 most common 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 rhinorrhea. Similar presenting features were observed in other studies [4,12,14].

In our study, inflammatory polyps (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 the nasal and sinus mucous membranes. Their exact pathogenesis is not known, however a strong association with allergy, infection, asthma and aspirin sensitivity has been implicated [5,17]. Microscopically, the epithelial lining of nasal masses is of the respiratory type unless squamous metaplasia has occurred [18].

Among other non-neoplastic lesions included in our study were mucormycosis (4.4%) which on microscopy showed broad non-septate hyphae that were arranged irregularly (Figure 1) and were positive for PAS stain. This was comparable 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 ZN stain. Similarly Ngairangbam et al and Waldman et al reported one case each of tuberculosis [16,21]. Due to its rarity and nonspecific clinical presentation, clinical diagnosis of nasal tuberculosis may be missed that may lead to delay 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 rhinosporidiosis unlike 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. We reported five (50%) cases of sino-nasal papilloma including 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 al who reported one case of Inverted papilloma and two cases of Sinonasal papilloma [23]. Narayana Swami et al reported 13% of inverted papilloma in his study [24]. Sinonasal papillomas account for 0.5–4% of all nasal tumors [25]. Transformation of sinonasal papillomas into malignancy has been described in inverted papilloma and oncocytic papillomas, but not in exophytic papillomas [26]. Hemangioma (2 cases) were reported in 20% of the benign lesions. Both of them were found to be arising from nasal septum. Similar findings were reported by other authors too [12,27].
A single case of Angiofibroma was reported in a 16 year old male child that constituted 10% of benign sinonasal lesions in our study. This corresponds with the study of A Lathi et al [7]. We also reported one unusual case of schwannoma (Figure 3) in a 40 year old male patient presenting as mass in right nasal cavity with clinical suspicion of inverted papilloma. Gulaeria et al also reported one case of Schwannoma [27]. Schwannomas of the sino-nasal tract are very infrequent, representing less than 4% of the schwannomas of the head and neck region [28]. One case of Neurofibroma were also detected in a 16 year female which is also infrequent in these locations. Battacharya et al also reported a single case of neurofibroma in his study [20].

Among malignant neoplasms a total of 7 cases were reported. Four cases were seen after the age of 40 years while two 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 shoe industries. IHC was also done in this case which showed positivity for CK20. Papillary ITAC may have the best prognosis, as it typically behaves as locally destructive lesion with a limited tendency for regional or distant metastases [8,30].
Figure 4: Photomicrograph showing papillary arrangement of tumor 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 year old male patient who presented with Right nasal obstruction and facial pain. PAS and Mucin stains were positive in this case. One case of basaloid squamous carcinoma was reported in a 75 year female. Another single rare case of Sinonasal alterotocarcinosarcoma was reported in a 26 year male and one case of Non-Hodgkin’s lymphoma was reported in a 58 year male during the study period. These are very uncommon neoplasms of sino-nasal region. Guleria et al reported two cases of nasopharyngeal carcinoma, four cases of Adenoid cystic carcinoma and one case of Non-hodgkin’s Lymphoma in his study [27].

Thus this study 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 and limited in number. As a result, they pose diagnostic dilemma, as clinically even benign and malignant sinonasal lesions may appear as non-neoplastic thus leading to delay in proper diagnosis and early treatment. Hence histopathological evaluation forms essential part of work up that helps in arriving at definitive diagnosis. As highlighted in our study, it may even reveal lesions such as tuberculosis that are rare in this location and clinically unsuspected rare malignancies which were not suspected initially by the clinicians. Thus histopathology
is a simple and cost effective tool that helps 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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