Clinical, histopathological, and radiological features of unilateral nasal mass in Saudi Arabia: A retrospective study

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Context: Nonneoplastic and neoplastic lesions of the nasal cavity are common conditions in routine clinical practice among almost all age group of people. Aims: This study examines the clinicopathological and radiological profiles of the unilateral nasal mass in an Ear, Nose, and Throat (ENT) clinic of AlHada Armed Forces Hospital. Settings and Design: The study design involves an ENT clinic of AlHada Armed Forces Hospital, Taif, Saudi Arabia. Subjects and Methods: A retrospective examination of patients’ records was done to investigate the clinicopathological and radiological profiles of unilateral nasal masses between 2016 and 2018. Statistical Analysis Used: Descriptive statistics included mean, standard deviation, frequencies, and percentages, and inferential statistics such as independent t-test and Chi-square were carried out using the Statistical Package for the Social Sciences software (Version 20.0 IBM SPSS Corp., Armonk, NY, USA). Results: Nasal polyps were the most common diagnosis seen in seven (35%) cases, and the most common symptom was nasal obstruction (N: 12; 60%). Histopathological examination revealed that inflammatory lesions were more common (N: 13; 65%) than that of nonneoplastic masses (N: 7; 35%). In two patients with nasal polyps (n = 7), the radiological diagnosis was not correlated with the histopathological findings. Conclusions: Most of our cases of unilateral nasal mass were inflammatory nasal polyps followed by allergic fungal sinusitis. Clinicians should use caution in relying on radiological findings, and all lesions should undergo a pathological examination.

Key words: Clinicopathological, computed tomography, histopathological, nasal mass, tumor

INTRODUCTION

Sinonasal mass is a lesion within the nasal cavity and paranasal sinuses (PNSs) that may be congenital, inflammatory, neoplastic (benign or malignant), or traumatic in nature. [1-3] Unilateral nasal disease with or without nasal masses/polyps is much more likely than bilateral disease to represent proliferative diseases and usually is treated by surgical excision. Indeed, some authors suggest that any unilateral nasal mass should always be considered neoplastic until proven otherwise. [4,5] Several characteristics help in differentiating benign from malignant diseases, including clinical presentations, gross appearance, tumor location and extension, and radiological parameters, among others. [6,7] Classically, benign neoplasms show permeative invasion and lack of bony destruction, and aggressive neoplasm destroys and invades adjacent tissues. [8,9] However, a careful histopathological examination is required to decide the nature of any particular lesion. [10] Due to the complex nasopharyngeal region, patients with unilateral mass have a variety of symptoms such as nasal congestion or blockage, rhinorrhea, lacrimation, anterior or posterior nasal drainage, purulent discharge, epistaxis, a foul odor, headaches, and facial or cheek swelling. [11]
The majority of sinonasal masses are nonneoplastic, and neoplasms are rare accounting for only 3% of all head-and-neck tumors and <1% of all malignancies.[12] Polyps are a common cause of blockage of the nasal cavity in the general population, with a prevalence of 1%–4% of the population. They are often bilateral and multiple, with a tendency to recur, more prevalent in young adults and children, and in men rather than women.[13–15] We performed a retrospective study of patients with unilateral nasal masses in our clinic to analyze the clinicopathological and radiological profiles in the light of the literature.

SUBJECTS AND METHODS

A retrospective study was performed examining the age, sex, lesion location, initial symptoms, and the histological findings for patients with a unilateral nasal mass on computerized tomography (CT) attending an ear, nose, and throat (ENT) clinic at AlHada Armed Forces Hospital in the Western region of Saudi Arabia between 2016 and 2018. To identify the eligible patients, we reviewed 1887 CT scans during a period of 3 months. We included only participants who had pathological confirmation of diagnosis, and participants with bilateral pathology on CT were eliminated.

Age, sex, and medical history were retrieved from the patient medical records, whereas the location, opacification, bone dehiscence, heterogeneity, calcification, and extension of the masses were based on the findings from imaging examinations. The determination of malignancy was identified based on the pathological findings of surgically resected specimens. Descriptive statistics methods (mean, standard deviation [SD], distributions of frequencies, and proportions) were used for the measurement of clinical metrics. Sociodemographic and clinical characteristics of included patients were stratified by the side of the mass, whereas radiological and histopathological findings were stratified by the gender. Data were analyzed using Microsoft Office Excel 2016. This study was approved by the Institutional Review Board of AlHada Armed Forces Hospital Department of ENT.

RESULTS

Medical records, results of histopathological analyses, and computed tomographic images of a total of 20 cases of unilateral nasal mass were collected and analyzed. In our study, we found male preponderance with a male–female ratio of 11:9 in all lesions; the difference was not statistically significant (P = 0.714). The mean (SD) age of enrolled patients was 31.7 (10.64) years. No statistically significant difference was found between males and females in terms of age (P = 0.186). Twelve patients (60%) had right-sided lesions, which were seen in a much older age group [Table 1]. All patients were symptomatic; the most common symptom was nasal obstruction (N: 12; 60%) followed by nasal discharge (N: 3; 15%) and orbital symptoms (N: 3; 15%). Facial pain and headache were only seen in one case of the right-sided lesion. Of note, no statistically significant difference was detected between different symptoms (P = 0.682).

Regarding radiological examination, the location, shape, opacification, bone dehiscence, heterogeneity, calcification, and extension of the masses were determined by noncontrast PNS CT. It was observed that eight participants (40%) had an opacification while five cases (25%) had masses; the difference was not statistically significant (P = 0.795). Moreover, 17 participants (85%) were involved in all sinuses without any marked difference between different types (P = 0.246). Three males and two females (25%) had the features consistent with nasal polyps (P = 0.033). Fungal sinusitis was detected in three cases (15%), whereas antrochoanal polyps were detected in two participants (10%) (P = 0.033). In addition, bone dehiscence found in six participants (30%) (P = 0.089), whereas heterogeneity was found in two participants (10%), respectively, (P = 0.769) [Table 2].

Only three patients (15%) underwent a radiologist magnetic resonance imaging (MRI) (P = 0.413), and one patient (5%) had an inconclusive diagnosis after CT scan. Of note, in two patients with nasal polyps (n = 7), the radiological diagnosis was not correlated with the histopathological findings.

All patients had pathological confirmation of diagnosis at the time of the study. Specimens were accessed by an endoscopic biopsy that has been performed under general anesthesia. In addition, the treatment plan was established according to the histological results.

Histopathological examination revealed that inflammatory lesions were more common (N: 13; 65%) than that of nonneoplastic masses (N: 7; 35%). The most common inflammatory mass was nasal polyps followed by osteochondromas. Among the nonneoplastic masses, 20% had allergic fungal sinusitis. Fungal ball and ameloblastoma were

| Variable | Right | Left | Total | P* |
|----------|-------|------|-------|----|
| Age, mean (SD) | 34.50 (9.06) | 27.50 (12.04) | 31.70 (10.64) | 0.186† |
| Gender, n (%) | | | | |
| Male | 7 (58.33) | 4 (50.00) | 11 (55.00) | 0.714 |
| Female | 5 (41.67) | 4 (50.00) | 9 (45.00) | |
| Symptom, n (%) | | | | |
| Nasal obstruction | 7 (58.33) | 5 (62.50) | 12 (60.00) | 0.682 |
| Nasal discharge | 2 (16.67) | 1 (12.50) | 3 (15.00) | |
| Orbital symptoms | 1 (8.33) | 2 (25.00) | 3 (15.00) | |
| Facial pain | 1 (8.33) | 0 (0.00) | 1 (5.00) | |
| Headache | 1 (8.33) | 0 (0.00) | 1 (5.00) | |

*Chi-square test, †t-test. SD: Standard deviation
both observed in one case of a female participant (11.11%). Only one patient (5%) had antrochoanal polyps [Table 3].

**DISCUSSION**

The clinical approach to cases with unilateral nasal mass is challenging owing to the wide range of underlying causes. A thorough assessment of patients’ age, clinical features, histological evaluation, and CT scan findings assist in better management. In this study, the total mean age of presentation in our study was 31.7 (10.64) years, whereas the mean age for left-sided and right-sided lesions was 27.5 (12.04) and 34.5 (9.06) years, respectively. It was observed in other studies that the mean age is related to the risk of malignancy. While benign unilateral lesions are more common among young adults and children, malignant lesions are seen in patients after 40 years of age.\(^{[16-18]}\) In our study, no malignant neoplasms were seen after a histopathological examination.
As previously reported in other observational studies, sinonasal masses were more prevalent among men in our review.[1,19]

Masses in the nasal cavity are a heterogeneous group of lesions with a broad spectrum of histopathological features.[1,3] Nonneoplastic and neoplastic lesions are almost impossible to differentiate clinically due to the broad range of clinical presentation. Nasal obstruction (N: 12; 60%), predominantly unilateral, was a predominant presenting symptom in our study. This finding is in accordance with studies reported by Lathi et al. and Singh et al.[20,21] In another study carried out by Nair et al., nasal obstruction was the most common symptom in both the inflammatory and neoplastic groups.[4] Facial pain and headache were associated with the blockage of the anterior ethmoid sinus in 15% of the participants and anterior sinuses in 10%. Nasal discharge (N: 3; 15%) and orbital symptoms (N: 3; 15%) were reported too.

In our study, the most frequently seen nasal mass lesion was nasal polyps (35%), followed by allergic fungal sinusitis (20%). These findings are consistent with the results reported in other descriptive studies.[1,2,11,22] However, in a study realized by Erkul et al., contrary to our results most frequently unilateral nasal mass was antrochoanal polyp was detected.[23] Nasal polyps exact pathogenesis is not known, but they have a strong association with allergy, asthma, aspirin sensitivity, and infection.[24,25] In our study, nasal polyps were mainly associated with allergies and infection. Fungal sinusitis comprised 15% of cases similar comparable to reported by Singh et al.[26]

CT scan is the most frequently used radiological modality to evaluate the unilateral nasal pathology because of its wider availability, easy access, and lower cost.[26] Noncontrast PNS CT scan was used for radiological evaluation in this study. Although false positivity was noted more in sinusitis, mucocele, and osteoma, the overall relationship between the CT scan findings and the histopathology examination was strong. Fungal sinusitis usually appears as a bilateral disorder but may demonstrate as a unilateral sinonasal polyp.[26] On CT scan, we can detect delicate lesions in the central part of the sinus due to the metabolic deposition of calcium.[27] On another hand, an inverted papilloma on CT scan usually appears as a mass originating from the middle meatus and reaching the maxillary antrum and the nasal cavity.[28,29]

In our study, CT scan failed to evaluate the fungal ball and to differentiate between different benign neoplastic lesions. MRI was available only in three patients (15%), which represent a limitation of this study due to that contrast-enhanced MRI may detect perineural spread and dural invasion in greater detail than CT scan.[30]

**CONCLUSION**

Most of our cases of unilateral nasal mass were inflammatory nasal polyps followed by allergic fungal sinusitis. Clinician should use caution in relying on radiological findings, and all lesions should undergo a pathological examination.

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**Conflicts of interest**

There are no conflicts of interest.

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