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Original Research Article

The clinicopathological and radiological features of unilateral nasal mass in adults, a tertiary hospital experience

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ABSTRACT

Background: Aim and objectives of the study were to analyze and study the diverse presentations of unilateral nasal mass and to identify the suggestive features of neoplastic pathology in adult's population at a tertiary referral hospital.
Methods: A retrospective analysis of 90 patients presented with unilateral sinonasal mass, reported to the Rhinology and Skull Base Clinic at the department of ENT in King Fahad Specialist Hospital, Dammam. The parameters include patient history, clinical assessments and histopathological examinations, which were supplemented with radiological investigations.In addition, demographic information and histopathological examinations for patients, who underwent surgical excision was analyzed for correlation with clinical diagnosis.
Results: The reported cases are 55 males and 35 females with a median follow-up period of 12 months, ranging from 2-72 months. Nasal obstruction is the major symptom 34 (38%), 25 (27.8%) cases were reported with nasal mass and clinical diagnosis indicates 18 (20%) cases of malignancy. Type of disease and gender demonstrates low significance (p=0.023), whereas the diagnosis with age is highly significant (p=0.005).
Conclusions: Carcinoma, inflammatory polyposis, inverted papilloma and allergic fungal sinusitis were the highest histological diagnosis. The clinical diagnosis and the suggestive features of radiological findings mostly resembled the histological findings. In contrary to the resemblance, the histological finding reveals the general diagnosis of nasal mass to the precise diagnosis, especially the fatal conditions like carcinoma. The high rate of malignancy and its suggestive radiological findings indicates that the specialists should consider the cases with caution to carryout histological analysis to rule out the probability of neoplasm.

Keywords: Clinicopathological, Unilateral nasal mass, Neoplastic pathology

INTRODUCTION

Nasal polyps or nasal masses are benign lesions on the epithelial linings of nasal mucosa and the paranasal sinuses with unidentified etiology, which leads to inflammation of its vicinities. The clinical conditions of these polyps are chronic inflammation, infections, recurrent allergies and if the polyps are grown larger it can obstruct the passage which may even interfere with normal breathing. The Otolaryngologists very frequently come across cases presented with conditions like unilateral sinonasal symptoms, nasal polyps or sinus opacity. However, a study indicates that the prevalence of nasal polyps was reported to be 4% by a study.[1] A review indicates that nasal polyps are commonly seen in non-allergic asthma patients (13%) than allergic asthma (5%)

cases.[2] The symptoms of nasal polyps include watery anterior rhinorrhea with or without mucous dripping. Hyposmia and or anosmia are yet another complication of sinonasal polyps. Pain is quite unusual, but may precipitate along dorsum of the nose, at the forehead and may spread the cheeks. The symptoms may become further complicated based on the size and location of the polyp and it aggravates if the blockage become prominent and the sinuses gets infected.[3] The condition is uncommon in children and is observed commonly in adults, but its etiology is not known, but usually with allergic conditions.[4] The polyps are usually noticed on the middle meatus, which may have the influence of the anatomic factors. Further, chronic inflammations in the nasal cavity may also be a reason for the development of such polyps.

These nasal masses are edematous tissues, usually formed in the middle meatus, which then prolapses into the nasal cavity. The cell structure of these polyps is characterized by ciliated columnar epithelium with thickened basement membrane, which will be infiltrated with plasma cells. Clinical diagnosis of the condition is based on the symptoms and clinical examination of nose, but often uses diagnostic tests like, nasal endoscopy, imaging studies and allergy tests. Histopathological investigations are uncommon if these tissues are bilateral in nature, but it requires histopathological examinations if it is presented unilaterally to rule out different types of malignancies.[5] A retrospective review of histological findings of nasal polyp illustrates that 1.1% of the cases were with malignancy and concluded that all such specimens should undergo histological examination to confirm whether the growth is malignant.[6] A study describing the histopathological findings of a series of cases observed neoplasm of sinonasal polyps was 2.3%, which is higher than reported in literature and the observation was that the cases were inverted papilloma, whereas others were considered as incidental in bilateral nasal polyps. Despite the low incidence, the study recommends to conduct histopathologic examinations in all cases not to skip the fatal pathologies. [7]

The literature thus points out the need of attention, even though unilateral sinonasal symptoms are usually treated without risk, in some cases it may be a signal to sinonasal neoplasms with subtle symptoms, mimicking inflammatory pathology. Moreover, unattended benign lesions in the sinonasal vicinity may often lead to frequent recurrence and radical surgeries. Irrespective of its significant morbidity and commonality, research on unilateral sinonasal conditions is sparse, which emphasizes the need of research in this area.

METHODS

A retrospective analysis of 90 patients presented with unilateral sinonasal mass, reported to the Rhinology and Skull Base Clinic at the department of ENT in King Fahad Specialist Hospital, Dammam. The cases reported from January 2009 till December 2018 were analyzed. The parameters include patient history, clinical assessments and histopathological examinations, radiological investigations (computed tomography and magnet resonance imaging). In addition, demographic information was obtained and the histopathological examinations of tissues for patients, who underwent surgical excision was analyzed for correlation with clinical diagnosis.

Ethical approval

The study secured ethical clearance from the Institute for Research and Medical Consultations (IRMC) at the organization. A proposal letter explaining the purpose, methods, and anticipated benefits and risks of the study was reviewed along with the questionnaire to obtain an approval from the IRMC. Furthermore, the data collector informed the respondents of the benefits and risks of the study prior to their participation.

RESULTS

A total of 90 patients reported to the rhinology clinic with unilateral sinonasal polyps consist of 55 (61.1%) males and 35 (38.9%) females with mean age of 46.1 (SD 16.9), ranging from 19 to 88 years, of them 30 (33.3%) were smokers. The median follow-up period of patients was 12 months with minimum period of 2 months to a maximum period of 72 months (Table 1). The common presenting symptoms (Figure 1) were nasal obstruction 34 (38%), nasal discharge 15 (17%), epistaxis 12 (14%), headache 9 (10%) and hyposmia 7 (8%).

Table 1: Demography (n=90).

Variables	N (%)
Gender (%)	
Male	55 (61.1)
Female	35 (38.9)
Age in years	
Mean (SD)	46.10 (16.9)
Minimum - Maximum	19-88
Follow-up in months	
Median	12.0
Minimum-maximum	2.0-72.0
Smoking	
Yes	30 (33.3)
No	60 (66.7)

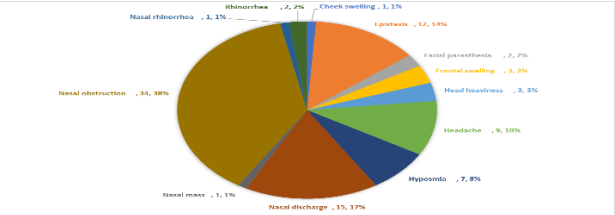

Figure 1: Presenting symptoms.

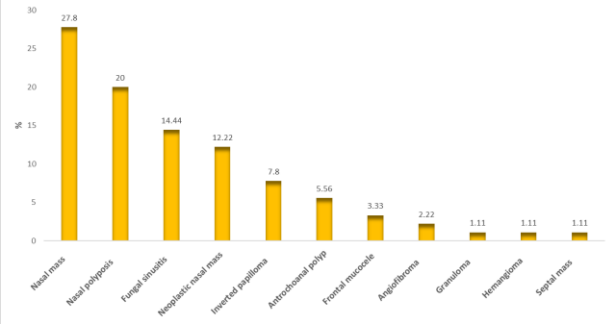

Figure 2: Clinical diagnosis.

Table 2: Histopathological findings.

Histopathological findings	Frequency
Allergic fungal sinusitis	10
Invasive fungal sinusitis	4
Granulomatous sinusitis	2 (1 fungal granulomatous and 1 rhinoscleroma)
Inflammatory polyposis	12
Mucocele	7
Meningocele/ meningoencephalocele	7
Inverted papilloma	10
Fibrous dysplasia	3
Antrochoanal polyp	4
Carcinoma	13 (7 SCC, 4 adenoid cystic carcinoma and 2 adenocarcinoma)
Sarcoma	4 (2 pleomorphic sarcoma, 1 Ewings sarcoma and 1 kaposi sarcoma)
Multiple myeloma	1
Juvenile angiofibroma	2
Osteoma	3
Capillary hemangioma	1
Schwanoma	2
Craniopharyngoma	2
Giant cell tumor	1
Infratemporal Papilloma	1
Pyogenic granuloma	1

The clinical diagnosis (Figure 2) illustrates that nasal mass was the leading clinical diagnosis 25 (27.8%), followed by nasal polyposis 18 (20%), fungal sinusitis 13 (14.44%), neoplastic nasal mass 11 (12.22%), inverted papilloma 7 (7.8%) and antrochoanal polyp 5 (5.56%). All surgical specimens were sent for histopathological examinations to confirm the final diagnosis (Table 2) and carcinoma (n=13) is the most common condition, (7 squamous cell carcinoma (SCC), 4 adenoid cystic carcinoma and 2 adenocarcinoma). This was followed by inflammatory polyposis (n=12), allergic fungal sinusitis (n=10), inverted papilloma (n=10), 7 mucoceles and 7 meningoceles and 3 cases of osteoma. Malignant soft tissue tumors sarcoma (n=4) and multiple myeloma (1) were observed. 11 other cases of different benign tumors were identified.

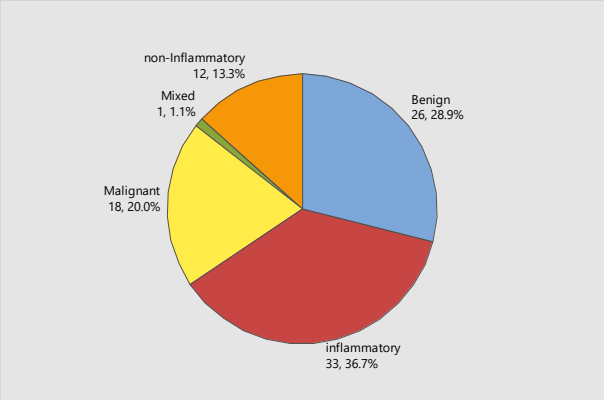

Figure 3: Type of disease.

The disease conditions were classified into different types (Figure 3) and it is observed that 33 (36.7%) were inflammatory in nature, followed by benign tumors 26 (28.9%), 18 (20%) malignant cases, non-inflammatory 12 (13.3%) and mixed type 1 (1.1%)

Table 3: Other characteristics.

Characteristics	Number
Disease free duration	
Yes	73
No	16
No f/u	1
Residual disease	
Yes	14
No	75
No f/u	1
Recurrence	
Yes	8
No	78
Expired	1
Lost f/u	3

The Table 3 illustrates the other characteristics like the disease free duration, residual disease and its recurrence. Most of the patients (n=73) were having a disease-free duration and the majority (n=75) doesn't have residual diseases, whereas one patient expired during the study period and disease recurrence was observed in 8 patients.

It is observed that there is a statistically significant relation between the gender (p=0.023) and the different types of diseases diagnosed (Table 4). The diagnosed malignant growth was high among males (n=11) when compared to females (n=7). Statistical significance was observed between the disease and the reported age, but with high statistical significance of 0.005 (Table 5). 18 malignant cases observed at the mean age of 59, whereas benign growth was high (n=26) at the mean age of 44.3.

However, inflammatory conditions were the highest among the diseases which accounted for 33 cases at a mean age of 42.5

Table 4: Type of disease and gender.

Type of the disease	Gender		P value
	Male	Female	
inflammatory	19	14	0.023
Non- inflammatory	9	3	
Mixed	0	1	
Benign	16	10	
Malignant	11	7	

Table 5: Disease and its relation with age.

Type of the disease	N	Mean age	SD	P value
inflammatory	33	42.5	16.6	0.005
Non-inflammatory	12	39.8	19.6	
Mixed	1	56.0	-	
Benign	26	44.3	13.5	
Malignant	18	59.0	14.8	

The most common type of diseases was inflammatory (n=33), non inflammatory (n=12), benign (n=26) and malignant (n=18), which are further correlated with the histological findings (Table 6). Among the inflammatory type, histological findings demonstrate that 6 (18.2%) as allergic fungal sinusitis and 4 (12.1%) as antrochoanal polyp. The non-inflammatroy types were histologically classified into two namely, meningocele-meningoencephalocele 6 (50.0%), and frontal mucocele 3 (25.0%). In the tumor group, the benign and malignant tumors of which, inverted papilloma 10 (38.5%) and fibrous dysplasia 3 (11.5%) were the commonest benign type and adenoid cystic carcinoma 2 (11.1%), non keratinizing poorly differentiated squamous cell carcinoma 2 (11.1%) were related with malignancy.

Table 6: Most common type of diseases.

Type of disease	Histology findings	N (%)
Inflammatory (n=33)	Allergic fungal sinusitis	6 (18.2)
	Antrochoanal polyp	4 (12.1)
Non-inflammatory (n=12)	Meningocele-meningoencephalocele	6 (50.0)
	Frontal mucocele	3 (25.0)
Benign (n=26)	Inverted papilloma	10 (38.5)
	Fibrous dysplasia	3 (11.5)
Malignant (n=18)	Adenoid cystic carcinoma	2 (11.1)
	Non keratinizing poorly differentiated squamous cell carcinoma	2 (11.1)

Table 7: Correlation of clinical, radiological and histopathological diagnosis.

Clinical diagnosis	N	Radiological findings	N	Histopathology findings	N
Angiofibroma	2	Suggestive	2	Juvenile angiofibroma	2
Antrochoanal polyp	5	Suggestive	5	Antrochoanal polyp	4
				Inflammatory polyposis	1
Frontal mucocele	3	Suggestive	3	mucocele	3
Fungal sinusitis	11	Suggestive	11	Fungal sinusitis	11
Granuloma	1	Suggestive	1	Granuloma	1
Hemangioma	1	Suggestive	1	Capiliary hemangioma	1
Inverted papilloma	7	Suggestive	7	Inverted papilloma	7
Nasal mass	25	Meningocele Meningoencephalocele Suggestive of other pathology	4 2 19	Meningocele	4
				Meningoencephalocele	1
				Meningocele	1
				Infra temporal papilloma	1
				Meningocele	1
				Mucocele	1
				Multiple myeloma	1
				Carcinoma	5
				Craniopharyngioma	2
				Fibrous dysplasia	3
				Fungal sinusitis	1
				Gland cell tumor	1
				Rhinoscleroma	1
				Schwannoma	2

Continued.

Clinical diagnosis	N	Radiological findings	N	Histopathology findings	N
Nasal polyposis	18	Suggestive of other pathology	18	Fungal sinusitis	3
				Granulomatous sinusitis	1
				Inflammatory polyposis	10
				Inverted papilloma	3
				Meningocele	1
Neoplastic nasal mass	11	Suggestive	11	Carcinoma	7
				Sarcoma	4
Septal mass	1	Suggestive	1	Carcinoma	1

Correlation of clinical, radiological and histopathological diagnosis was analyzed (Table 7) which illustrates that for the first seven clinical diagnoses the radiological finding were suggestive of clinical findings, which means it is pointing out towards the clinical diagnosis, but not completely affirming the diagnosis. However, the histopathological findings almost completely agree with the clinical diagnosis. This was followed by clinical diagnosis of 25 nasal masses, of which 6 cases were radiologically identified as meningocele, but 19 cases were suggestive of other pathology. The histological investigation too agrees with the six radiological findings as meningocele. From the remaining 19 radiological findings 'indicating suggestive for other findings', the histopathological findings provided with more specific findings than the clinical diagnosis as nasal mass. Out of which, the majority was identified as carcinoma (n=5) followed by a case of multiple myeloma, gland cell tumor (n=1), schwannoma (n=2). The clinical diagnosis as nasal polyposis (m=18) was provided with findings suggestive of other pathology by the radiological investigation. But the histological findings were more specific, provided with 5 categories, of which, inflammatory polyposis consists of 10 cases and 3 cases each for inverted papilloma and fungal sinusitis. Eleven cases were clinically diagnosed as characteristic of cancer or neoplastic nasal mass, which was provided with radiological findings as suggestive. Among them the histological findings was more specific which indicates 7 cases of cancer and 4 cases of sarcoma. Furthermore, the clinical diagnosis of septal mass was radiologically suggestive, but identified histologically as carcinoma.

DISCUSSION

Nasal polyps are common diagnosis for the cases reported to the Ear Nose Throat (ENT) clinics, which are treated without much complication, but the unilateral sinonasal symptoms may be often a signal to sinonasal neoplasms with understated indications, mimicking inflammatory pathology. The prevalence of nasal polyposis in Saudi Arabia is not known well, however, a cross-sectional case control study in France indicates the prevalence as 2.11%.[8] Further, studies are sparse on the diverse presentations of unilateral nasal mass, if not diagnosed properly it may go unnoticed with probability of becoming a benign or malignant nasal mass. Hence, this study intended to identify the suggestive features of neoplastic pathology verifying the different diagnosis with radiological and histopathological findings.

The presented symptoms of this study illustrate nasal obstruction as the predominant symptom, which is quiet common among cases with nasal mass and polyps. This may be because any sort of inflammation in the nasal mucosa, irrespective of its cause will lead to nasal obstruction. But, the feeling of nasal obstruction may vary from person to person, what one person feel may be of less importance to another patient with same level of obstruction.[9] It is reported that nasal mass and nasal polyps were the most common clinical diagnosis, which are the common diagnoses in the ENT clinics presented with nasal inflammations. Studies also indicate that chronic sinusitis with or without polyposis always prompt the clinicians to suspect potential presentation of cystic fibrosis.[10] However, radiological and histopathological investigations are necessary to rule out possible malignancies of the nasal mass and polyps.[11]

The histopathological investigations demonstrated carcinoma, inflammatory polyposis and allergic sinusitis as the leading findings. Histological investigations provide with specific findings, which help to rule out the unclear diagnosis and unveil the hidden carcinomas as illustrated by a case study.[12] Surprisingly, the percentage of malignancy (20%) and benign tumors (29%) were observed to be similar among both the genders. Literature is not sufficient to explore the difference in sinonasal malignancies between the two genders. But, a study on olfactory neuroblastoma indicated that the survival rate of male higher than that of female with treatment. Benign tumors were also the same between the genders with 29% cases in both the genders. As expected we also observed the number of malignancy at a higher median age. We also noticed the higher rate of inverted papilloma, a benign tumor, which can undergo aggressive malignant transformation into squamous cell carcinoma. This is clarified by a retrospective cohort study, which stated that it has the most severe degree of abnormal cells prior to neoplasmic transformation and with higher recurrence rate and multifocal involvement, but with low rate of conversion to invasive carcinoma.[13]

Even though most of the clinical diagnosis correlates with radiological findings and histopathological findings, the diagnosis of nasal mass and nasal polyposis was not

#exactly matching with the histological findings. This was in particular for the diagnosis of nasal mass and polyposis, when the radiological investigations provided are suggestive of the condition, but the histopathological findings clarified specific conditions. Currently, there is no relevant literature available for comparing the clinical with radiological and histopathological findings in patients with nasal mass or nasal polyposis. The only study which titles the comparison between the investigations stated a positive correlation of radiological findings and concluded that there is no histopathological difference between polypoind infiltrations of sinuses.[14] Hence, this study could not explore the literature to contrast with findings of this study with similar studies. However, the neoplastic pathology of the unilateral nasal masses was well clarified and confirmed by the histological investigations, which correlates with clinical diagnosis to a major extent.

CONCLUSION

Nasal obstruction is the major symptom of sinonasal mass with a high rate of malignancy. Carcinoma, inflammatory polyposis, inverted papilloma and allergic fungal sinusitis were among the highest histological diagnosis. The clinical diagnosis and the suggestive features of radiological findings mostly resemble the histological findings. However, in contrary to the resemblance, the histological finding reveals the general diagnosis of nasal mass to the precise diagnosis, especially the fatal conditions like carcinoma. The high rate of malignancy and suggestive radiological findings warrants histological analysis to rule out the probability of neoplasm.

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