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Clinical Profile and Histopathological Patterns of Unilateral Nasal Masses

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ABSTRACT: Background: Unilateral nasal masses are common finding in an ENT outpatient department. Most patients present with complaints of nasal obstruction. Other symptoms include nasal discharge, epistaxis and disturbances of smell. A sinonasal mass can have various differential diagnoses. They may be congenital, inflammatory, neoplastic (benign or malignant) or traumatic in nature.

Aims of Study: To evaluate the specific age and gender of presentation, associated symptoms, histopathological results and frequency of lesions in patients with established unilateral nasal mass.

Patients and Methods: A prospective study of 50 selected adult patients presented with a unilateral nasal mass were seen in ENT department in Baghdad teaching medical city over a period of 12 months (Oct.2015- Sep.2016).A full history, ENT examination including nasoendoscopy, and head and neck examination were done for all patients. CT scan of nose and paranasal sinuses was done for all patients to identify the site of lesion, it's extension, and a probable diagnosis. MRI was done in selected patients for better soft tissue differentiation and for those with a possible intracranial or intraorbital extension. Biopsy from the lesion was taken under either local or general anesthesia. Those who were fit for GA underwent endoscopic sinus surgery as a definitive management for possible inflammatory lesions, or for biopsy and tumor debulking of neoplastic lesions. Some patients required no further management; others required additional management in the form of surgery, radiotherapy, chemotherapy or combination of any.

Results: Most of our patients were males (56%). The most common age of presentation was between 20-30 years and the mean ± standard deviation was (42.3 ± 18) years. Clinical presentations were nasal obstruction in 78%, rhinorrhea in 44% and smell change in 34% of patients. Histopathological results showed that 62% of patients presented with non-neoplastic lesion and 38% presented with neoplastic lesions (26% benign and 12% malignant). Inflammatory polyp (38%), inverted papllioma (16%) and squamous cell carcinoma (6%) were the highest findings representing non-neoplastic, benign and malignant lesions respectively. There was no significant association between the gender and type of lesion as the P value was 0.16. There was significant association between the age of the patients and the type of lesion as non-neoplastic lesions were found more common in the 3rd decade (the P value was 0.02) and neoplastic lesions were more common in the 6th decade (the P value was 0.006).

Conclusions: Unilateral sinonasal masses have male predilection. The mean age is

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oldest for neoplastic lesions and youngest for non-neoplastic lesions. Unilateral Nasal obstruction is the most common presentation in all types of unilateral sinonasal masses. Non-neoplastic lesions are commoner than neoplastic ones. Inflammatory polyp, inverted papllioma and squamous cell carcinoma are the most common findings representing non-neoplastic, benign and malignant lesions respectively.

INTRODUCTION

The nasal cavity extends from the external nares or nostrils to the posterior choanae, where it becomes continuous with the nasopharynx and is narrower anteriorly than posteriorly. Vertically, it extends from the palate to the cribiform plate, being broader at its base than superiorly where it narrows to the olfactory cleft. The nasal cavity is divided into two by a septum. The configuration and dimensions show considerable individual and ethnic variation. Each half has a floor, a roof, a lateral wall and a medial (septal) wall.The highest part of the nasal cavity relates to the cribiform plate of the ethmoid which is horizontal. This area is covered by olfactory epithelium which spreads down a little distance onto the upper lateral and medial walls of the nasal cavity. The rest of the nasal cavity (with the exception of the nasal vestibule) is lined by respiratory mucous membrane which is intimately adherent to the underlying periosteum and perichondrium and is continuous with that of the paranasal sinuses, nasolacrimal duct and nasopharynx. [1]

The nasal septum is composed of a small anterior membranous portion, cartilage and several bones: the perpendicular plate of the ethmoid, the vomer and two bony crests of the maxilla and palatine. The cartilaginous portion is composed of a quadrilateral cartilage with a contribution from the lower and upper lateral alar cartilages forming the anterior nasal septum. [1]The perpendicular plate forms the superior and anterior bony septum, is continuous above with the cribriform plate and crista galli and abuts a variable amount of the nasal bones. The vomer forms the posterior and inferior nasal septum and articulates by its two alae with the rostrum of the sphenoid.The inferior border of the vomer articulates with the nasal crest formed by the maxillae and palatine bones. The anterior border articulates with the perpendicular plate above and the quadrilateral cartilage inferiorly. The posterior edge of the vomer forms the posterior free edge of the septum. [1]

The mucoperichondrium and mucoperiosteum of the septum are separate from that overlying the maxillary crest, reflecting their embryological development. The mucous membrane is predominantly respiratory with a small area of olfactory epithelium superiorly adjacent to the cribriform plate. Respiratory epithelium is composed of ciliated and nonciliated pseudostratified columnar cells, basal pluripotential stem cells and goblet cells.Seromucinous glands are found in the submucosa and are more important in mucus production in the nasal cavity than the goblet cells which are more numerous in the sinuses. On the septum, the number of goblet cells increases from anterior to posterior and from superior to inferior. By contrast, the glands decrease from anterior to posterior and from superior to inferior. The olfactory epithelium spreads down from the cribriform plate onto the upper septum. It is composed of receptor cells, supporting cells with microvilli and basal stem cells conferring on olfactory epithelium the capacity for regeneration. There is a sharp transition zone between the olfactory and respiratory epithelium though the relative area of each varies with age and reflects the decrease in olfactory acuity. [1]Nasal masses are common finding in an ENT (Ear, Nose and Throat) outpatient department. Most patients present with complaints of nasal obstruction. Other symptoms include nasal discharge, epistaxis and disturbances of smell. A sinonasal mass can have various differential diagnoses. They may be congenital, inflammatory, neoplastic (benign or malignant) or traumatic in nature. A congenital nasal mass may present intranasally, extranasally, or as external nasal mass with or without nasal obstruction. Congenital masses are predominantly midline swellings and include dermoids, glioma and encephaloceles as common diagnoses. Polyps are a common cause of nasal obstruction in adults with a prevalence of about 4% in the general population [2]. downwards from the normal surface and is macroscopically visible. It is also known as prolapsed pedunculated mucosa. This condition is well known with little improvement in its treatment modality, although it is a common condition; the exact aetiopathological correlation is still unknown. Hippocrates gave a graphic description of nasal polypoidal masses as early as 460-370 B.C., and can thus be considered the "Father of Rhinology". Forestus (1522-1597 A.D.) described a case of a woman whose nasal polyps, according to him, were due to forcing of mucous membrane into the nose, which he attributed to her carrying heavy weights on her head. [2] Nasal cavity contains different kinds of tissues such as the epithelial (squamous, neuroendocrine and olfactory) and the mesenchimal (bone, cartilage, muscle and vascular) ones and all of these may carry the risk for a variety of tumoral differentiation. Despite the wide range of diversity, the incidence of the

nasal tumors are as low as 1/100.000. Primary nasal malignancies consist of 0.2% - 0.8% of all the malignant tumors and 3.6% of the malignant upper airway tumors[3]

PATIENTS AND METHODS

A prospective study of 50 selected adult patients presented with a unilateral nasal mass were seen in ENT department in Baghdad teaching medical city over a period of 12 months (Oct.2015- Sep.2016).

- Inclusion criteria:
  - Patient age more than 18 years (adults). [4]
  - Unilateral sinonasal disease
  - Sinonasal mass detected by anterior rhinoscopy, nasoendoscope or radiology.
  - First time presentation (no previous similar attack).
- Direct questioning of patients about the biographic data, chief compliant and duration, detailed sinonasal specific symptoms and other important relevant symptoms, review of systems, other medical or surgical history, drug history and any relevant socio-economic history (attached questionnaire).
- Assessment of patient's general health and appearance.
- Nasal examination was started by inspecting and palpating the external nose looking for any obvious relevant lesion or deformity.
- Anterior rhinoscopy using head light and nasal speculum was done for assessment of the pathology and any related findings.
- Rigid nasoendoscope (using the 4.0 mm $0^0$and 30^0 rigid scope) was used to assess the lesion regarding the site of origin, extension, surface, tenderness, mobility, pulsation…etc, and performing the standard three passes (if possible) for full assessment of the nasal cavity.

Technique of nasal endoscopic examination:

- Explanation of the procedure to the patient.
- Positioning of the patient and equipment preparation.
- Local anesthesia was used by applying lignocaine – oxymetazoline nasal spray and the endoscopy was started.
- An organized nasal endoscopy was accomplished in the standard three passes that facilitate a thorough and detailed examination.
- The first pass is along the floor of the nose. An initial impression should be obtained regarding the health of the sinonasal mucosa, changes with decongestion and the overall anatomy of the sinonasal cavity. The inferior meatus is the first area to inspect. After examination of the inferior meatus, the inferior part of the inferior turbinate and the nasal septum was examined, the scope is advanced through the nasal cavity toward the nasopharynx. The Eustachian tube orifices, torus tubarius, adenoid pad (if present) and entire nasopharynx was visualized.
- In the second pass the endoscope is reinserted between the inferior and middle turbinates. While advancing in a posterior direction, the inferior portion of the middle turbinate and middle meatus, the fontanelles and any accessory maxillary ostia were examined.

STATISTICAL ANALYSIS

- The chi-square (X^2) test social sciences program(SPSS) version 20was used to evaluate the association between categorical variables; to determine whether association was significant; the P value was calculated for the results as follows:
  - Significant (S) when the P value is < 0.05.
  - Not significant (NS) when the P value is > 0.05.

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RESULTS

- Twenty eight (56%) patients were males and 22 (44%) were females, as shown in **figure 3.1.**

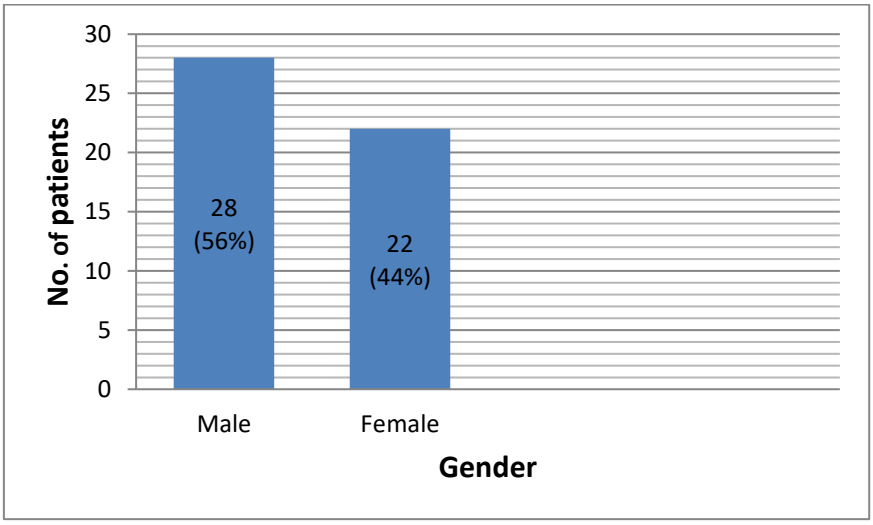


Figure 3.1: The gender of the studied group.

- The most common age of presentation of the studied group was between 20-30 years and the mean ± standard deviation was (42.3 ± 18) years, as shown in **figure 3.2.**

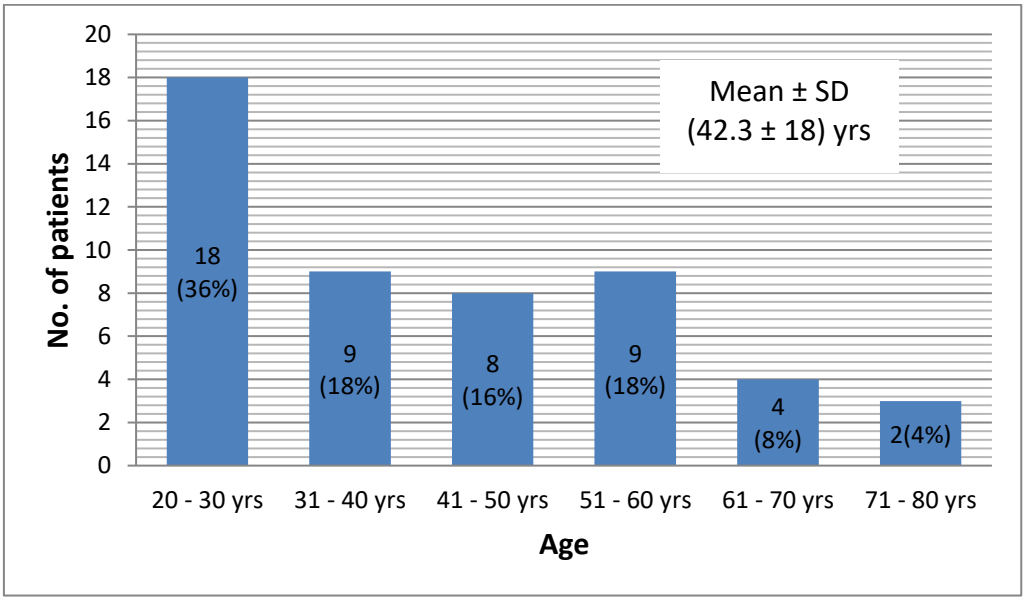


Figure 3.2: The age distribution of the studied group.

- The most common clinical presentations were nasal obstruction in 44 (88%) patients, rhinorrhea in 22 (44%) and smell change in 17 (34%) patients, as shown in **table 3.1**.

Table 3.1: Clinical presentations of the studied group.

	Clinical presentation	No. of patients	Percent
1	Nasal obstruction	44	88%
2	Rhinorrhea	22	44%
3	Smell change	17	34%
4	Epistaxis	11	22%

5	snoring	10	20%
6	Pain	10	20%
7	Facial swelling	7	14%
8	Diplopia	6	12%
9	Proptosis	6	12%
10	Hearing loss	5	10%
11	Tooth losing	1	2%

- Thirty one (62%) patients presented with non-neoplastic lesion and 19 (38%) patients presented with neoplastic lesions (13 benign and 6 malignant lesions) as shown in **figure 3.3.**

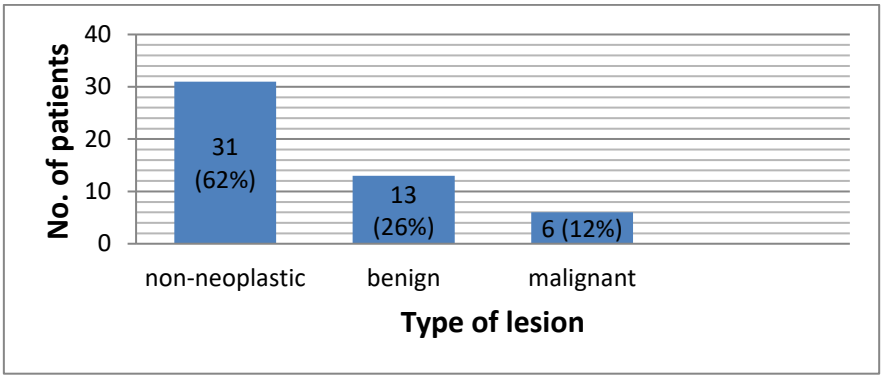


Figure 3.3: Types of lesion in the studied group.

- **Table 3.2**: Distribution of non neoplastic lesions

	Histopathological report	No. of patients	Percent
1	Inflammatory polyp	19	38%
2	Fungal infection	10	20%
3	TB	2	4%

- **Table 3.3**: Distribution of benign neoplastic lesions

	Histopathological report	No. of patients	Percent
1	Inverted papilloma	8	16%
2	Hemangioma	3	6%
3	Fibroma	1	2%
4	Angiofibroma	1	2%

- **Table 3.4**: Distribution of malignant neoplastic lesions

	Histopathological report	No. of patients	Percent
1	Squamous cell carcinoma	3	6%
2	Adenocarcinoma	1	2%
3	T/NK lymphoma	1	2%
4	Adenoid cystic carcinoma	1	2%

- Non-neoplastic lesions were found more in females (16 females vs. 15 males), while neoplastic lesions were more common in males (13 males vs. 6 females), as shown in **figure 3.4.** However, there is no significant association between the gender and type of lesion as the P value was 0.16 (> 0.05).

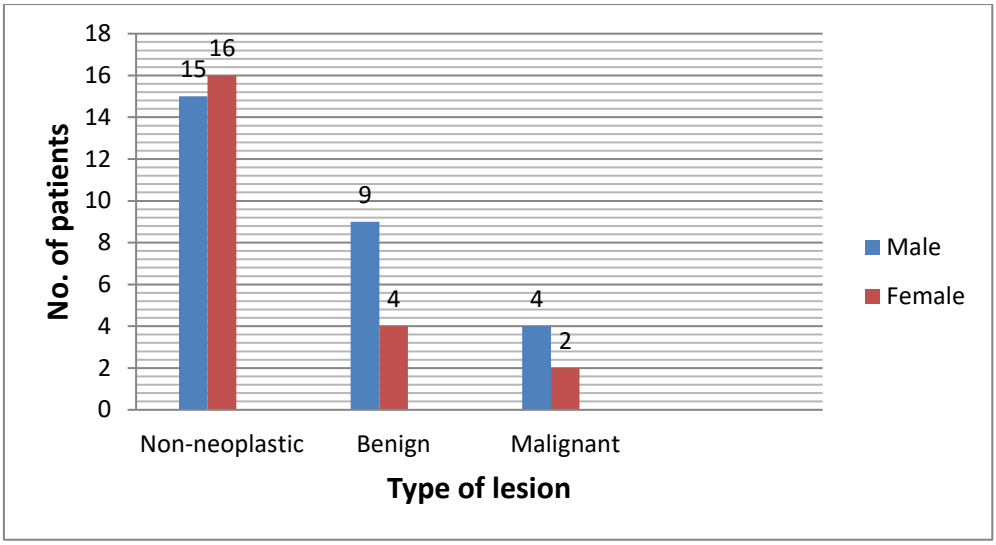


Figure 3.4: Types of lesion according to gender.

- Non-neoplastic lesions were found more in age group between 20 – 30 years (15 from 31 patients), while neoplastic lesions were more common in age group between 51 – 60 years (7 from 19 patients) as shown in **table 3.5.**

Table 3.5: Types of lesion according to age.

Type of lesion / Age(years)	Non-neoplastic	Benign	Malignant	P value
20 - 30	**15**	3	0	**0.02**
31 – 40	6	2	1	0.7
41 - 50	6	2	0	0.4
51 - 60	2	**4**	**3**	**0.006**
61 - 70	1	1	2	0.1
71 - 80	1	1	0	0.7
Total	31	13	6	

- From the previous result, we have found significant association between the type of lesion and the age of presentation as shown in **table 3.6.**

Table 3.6: Types of lesion according to specific age group.

Type of lesion / Age(years)	Non-neoplastic	Neoplastic	P value
20 - 30	**15**	3	**0.02**
51 - 60	2	**7**	**0.006**

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Table 3.7: Distribution of clinical presentations according to type of lesion.

	Inflammatory polyp	Fungal infection	Inverted papilloma	Malignant lesions	Others (TB & other benign lesions)
Nasal obstruction	15	11	7	5	6
Rhinorrhea	10	7	2	2	1
Smell change	6	5	2	3	1
Epistaxis	0	4	2	4	1
Snoring	4	2	1	1	2
Pain	0	4	1	4	1
Facial swelling	0	4	1	2	0
Diplopia	0	2	1	2	1
Proptosis	0	2	1	2	1
Hearing loss	2	0	0	1	1
Tooth losing	0	0	0	1	0

Table 3.8: type of management according to lesion

Type of lesion	Type of management
Inflammatory polyp	Endoscopic sinus surgery
Fungal infection	Endoscopic sinus surgery
TB	Anti TB
Inverted papilloma	Medial maxillectomy (endoscopic and external)
Hemangioma	Endoscopic sinus surgery
Angiofibroma	Endoscopic sinus surgery
Fibroma	Endoscopic sinus surgery
Squamous cell carcinoma	Medial and subtotal maxillectomy, chemoradiotherapy
Adenocarcinoma	Medial maxillectomy
Adenoid cystic carcinoma	Total maxillectomy
T/NK lymphoma	radiotherapy

DISCUSSION

- In our study, sinonasal masses had male predilection as 56% of patients were males and 44% patients were females. In other studies by Lathi A, et al. [2], Kucur C, et al. [5], Ngairangbam S, et al. [23] and Yildirim D, et al. [3], there were also male predominance as the percentage of (male/female) were (61% / 39%), (56% / 44%), (56.86% / 43.14%) and (53% / 47%) respectively.
- The mean age of presentation of the studied group was 42.3 years. The mean age of patients by other studies were 43 years by Yildirim D, et al. [3], 41.74 years by Kucur C, et al. [5] and 31.2 years by Lathi A, et al. [2].

- In this study, the most common clinical presentations were nasal obstruction in 88%, rhinorrhea in 44% and smell change in 34% of patients. The most common clinical presentations of unilateral sinonasal mass in other studies were nasal obstruction 97%, rhinorrhea 49% and smell change 31% by Lathi A, et al. [2], nasal obstruction 84.5 %, rhinorrhoea 47.5%, hyposmia 39 % and intermittent epistaxis / blood tinged discharge 36.5% by Chatterjee P et al. [6], nasal obstruction, nosebleed and headache by Kucur C, et al. [5], and nasal obstruction by Yildirim D, et al. [3]. Nair S et al. [7] also found that nasal obstruction was the commonest symptom. Epistaxis, facial pain, dental and orbital complaints were found to be significantly higher in neoplastic conditions whereas nasal discharge was higher in inflammatory conditions.
- The most common type of lesion in this study was non-neoplastic (inflammatory, fungal, granulomatous…etc) in 62% of patients, while neoplastic (both benign and malignant) lesions accounted for 38%. In other studies, the percentages of (non-neoplastic/neoplastic) were (88.4% / 11.6%) by Shah R, et al. [8], (83.1% / 16.9%) by Nair S et al. [6], (78% / 22%) by Kucur C, et al. [5], (72.7% / 27.3%) by Yildirim D, et al. [10], (71.4% / 28.6%) by Lathi A, et al. [2] and (58% / 42%) by Chatterjee P et al. [6].
- In our study, the distribution of non-neoplastic lesions was as follow: **inflammatory polyp** was the most common lesion (13 cases presented with ethmoidal polyp and 6 presented with antrochoanal polyp), this distinction was made depending on the clinical and radiological features of antrochoanal polyp which include: complete opacity of maxillary sinus, widening of maxillary ostium, extension of lesion to postnasal space and absence of ethmoidal involvement, while histopathology could not differentiate between the two types. The second most common non-neoplastic lesions was **fungal rhinosinusitis** which was allergic fungal (found in 10 cases), and finally **tuberculosis** was found in 2 cases. In other studies, the distributions of non-neoplastic lesions were:
  - Ethmoidal polyp (n=50), antrochoanal polyp (n=20), rhinoscleroma (n=8) and rhinosporodiosis (n=2); total number was 80 by Lathi A, et al. [2]
  - Inflammatory polyp (n=16), chronic sinusitis (n=11), antrochoanal polyp (n=6), retention cyst (n=6), rhinolith (n=4), concha bullosa (n=4), mucocele (n=4), chronic fungal sinusitis (n=2), pyocele of concha bullosa (n=1), allergic fungal sinusitis (n=1), acute fulminant invasive fungal sinusitis (n=1) and angiomatous polyp (n=1); total number was 57 by Kucur C, et al. [5].
  - Complicated concha bullosa (n=6), mucocele (n=6), antrochoanal polyp (n=4), rhinolith (n=4), atypical retention cyst (n=4), fungal destructive sinusitis (n=3), sphenochoanal polyp (n=1) and columellar dermoid cyst (n=1); total number was 29 by Yildirim D, et al. [3].
  - Inflammatory polyp (n=46), allergic polyp (n=12) and tuberculosis (n=1); total number was 59 by Ngairangbam S, et al. [9]
  - Chronic rhinosinusitis (n=19), antrochoanal polyp (n=9), fungal sinusitis (n=7), mucocele (n=4), rhinosporidosis (n=3), mucormycosis (n=1) and Keratocyst maxilla (n=1); total number was 44 by Nair S et al. [7].
- In this study, the distribution of benign neoplastic lesions was as follow: **inverted papilloma** was the most common lesion, followed by **hemangioma** which was originated from either the lateral nasal wall or nasal septum, and finally **fibroma** and **angiofibroma**, each was found in one case. In other studies, the distributions of benign neoplastic lesions were:
  - Hemangioma (n=9), inverted papilloma (n=7), mucocele (n=2) and angiofibroma (n=1); total number was 19 by Lathi A, et al. [2]
  - Inverted papillomas (n=8), pyogenic granuloma (n=2), capillary hemangioma (n=1), fibrous dysplasia (n=1), hemangioendothelioma (n=1) and osteoma (n=1); total number was 14 by Kucur C, et al. [5]
  - Inverted papilloma (n=6), fibrous dysplasia of the maxillary sinus (n=5), hemangioma (n=1), nasal angiofibroma (n=1), pleomorphic adenoma (n=1) and nasal paraganglioma (n=1); total number was 15 by Yildirim D, et al. [2]
  - Sinonasal papillomas (n=10), angiofibroma (n=2), hemangioma (n=2) and hemangiopericytoma (n=1); total number was 15 by Ngairangbam S, et al. [9]
  - Capillary hemangioma (n=12), inverted papillomas (n=9), osteoma (n=3), cavernous hemangioma (n=2), ossifying fibroma (n=1), liomyoma (n=1), myxoma (n=1), glioma (n=1) and schwannoma (n=1); total number was 31 by Ali M, et al. [10]

- In our study, the distribution of malignant neoplastic lesions was as follow: **squamous cell carcinoma** was the most common lesion, while **adenocarcinoma**, **T/NK lymphoma** and **adenoid cystic carcinoma** were found in same frequencies. In other studies, the distributions of malignant neoplastic lesions were:
  - Squamous cell carcinoma (n=12) and adenocarcinoma (n=1) by Lathi A, et al. [2]
  - Adenocarcinoma (n=1) and adenoid cystic carcinoma (n=1) by Kucur C, et al. [5]
  - Sinonasal lymphoma (n=5), squamous cell carcinoma (n=4), lethal midline granuloma (n=3), chondrosarcoma (n=2), melanoma (n=1), adenoid cystic carcinoma (n=1), esthesioneuroblastoma (n=1), and sinonasal Ewing sarcoma (n=1); total number was 18 by Yildirim D, et al. [3]
  - Undifferentiated carcinoma (n=22), squamous cell carcinoma (n=4), olfactory neuroblastoma (n=1) and Non-Hodgkin's lymphoma (n=1); total number was 28 by Ngairangbam S, et al. [9]
  - squamous cell carcinoma (n=3), adenocarcinoma (n=1) and Non-Hodgkin's lymphoma (n=1); total number was 5 by Nair S et al. [7]
- In this study, non-neoplastic lesions were more common in females, while neoplastic lesions were more common in males, however, there is **no** significant association between the gender and type of lesion as the **Pvalue** was **0.16** which is > 0.05. The results of other studies were as follow:
  - Lathi A, et al. [9] found that both types of lesions were more common in males, as the numbers of (male vs. female) were (46 vs. 34) in non-neoplastic lesions and (22 vs. 10) in neoplastic lesions.
  - Abbas AO [11] also found the same result and the numbers of patients were (24 vs. 11) in non-neoplastic lesions and (17 vs. 12) in neoplastic lesions.
  - Salami AM [12] found that the males were predominant in all types of lesion.
- In our study, there was significant association between the age of the patients and the type of lesion as non-neoplastic lesions were found more common in the 3rd decade (the P value was 0.02) and neoplastic lesions were more common in the 6th decade (the P value was 0.006). The results of other studies were as follow:
  - Non-neoplastic lesions were common in age group 11 to 40 years while neoplastic lesions were common in age group 41 to 50 years by Lathi A, et al. [2]
  - Non-neoplastic lesions were more common in the 2nd decade while neoplastic lesions were more common in the 6th decade by Abbas AO. [11]
  - The mean age was oldest for malignant tumors and youngest for antrochoanal polyp by Salami AM. [12]
  - Neoplastic lesions were common in age group 51 to 60 years by Ngairangbam S, et al. [9]
  - Nair S et al. [7] found that 86.3% of inflammatory masses were found in age group less than 50 years, while 55.5% of neoplastic lesions were found in age group more than 50 years and this finding was statistically significant as the P value was 0.0046.

CONCLUSION

Epidemiological and clinical evaluations of sinonasal masses reveal a distinct male predilection, with the mean age of patients peaking in neoplastic cases and being notably lower in non-neoplastic conditions. Across all histological subtypes of unilateral sinonasal masses, nasal obstruction emerges as the most prevalent clinical presentation. Overall, non-neoplastic lesions demonstrate a higher incidence than neoplastic entities, with inflammatory polyps, inverted papillomas, and squamous cell carcinomas representing the most frequent non-neoplastic, benign, and malignant findings, respectively.

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