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Original Research Article

TO EVALUATE THE CLINICAL, RADIOLOGICAL, AND HISTOLOGICAL CHARACTERISTICS OF SINONASAL MASSES

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Abstract

Background: Otorhinolaryngologists often come with sinonasal masses in their clinical practice. These masses may be challenging to distinguish from one other owing to their similar clinical appearance, and their radiological characteristics further contribute to the misunderstanding. Histopathology is crucial in distinguishing these masses from one another. **Aim:** To evaluate the clinical, radiological, and histological characteristics of sinonasal masses. **Material and Methods:** This research included 50 instances of sinonasal pathology, with patient permission obtained in writing form. Every patient had a comprehensive assessment of their medical background and a thorough examination of their ears, nose, and throat. This was followed by a nasal endoscopic procedure and diagnostic imaging examinations using either CT or MRI scans. Encompasses individuals with a sinonasal mass identified by ENT examination, nasal endoscopy, and radiographic investigation. **Results:** The data shown in the tables indicates that the largest proportion of patients, 42%, falls within the age range of 40 to 60 years. 70% of the cases were found in males. It indicates that sinonasal masses are more prevalent in men. The majority of sinonasal masses manifest as nasal obstruction in 47 instances (94%). Other frequently reported symptoms include headache in 35 cases (70%), face discomfort in 34 cases (68%), facial edoema in 30 cases (60%), impaired vision in 19 cases (38%), and epistaxis in 11 cases (22%). The majority of sinonasal masses are often seen bilaterally in the sinonasal area, rather than unilaterally. The majority of individuals with sinonasal masses have diabetes, with nasal polyps being the most prevalent diagnosis and bleeding polyps being the second most common. **Conclusion:** The present research suggests that a thorough histological evaluation should be conducted in all patients with sino nasal masses to ensure an accurate diagnosis and determine the appropriate treatment plan. Radiology is very beneficial in situations requiring sino nasal volumes as it provides the endoscopic surgeon with a clear plan and alerts them to any potential challenges or obstacles. Due to their uncertain origin and tendency to recur, they provide a challenging diagnosis for the clinician to manage.

INTRODUCTION

Nasal and nasopharyngeal masses have a substantial influence on both the functional and structural elements of the patient. The prevalence of nasal and paranasal sinus diseases is increasing globally due to a surge in air pollution.[1] They have an impact on individuals of all age groups and both genders. Both non-cancerous and cancerous diseases are often seen in clinical practice. Due to its close proximity to essential tissues such as the brain, orbit, and important neurovascular systems, disorders affecting the nose and paranasal sinuses may often result in severe prognoses. Centuries ago, literature extensively discussed sinonasal tumours such as simple nasal polyps and their excision by Hippocrates.[2] The sinonasal cavities are a compact anatomical region, yet they may serve as the source of a wide range of tumours with different histology.[3] Sinonasal masses may arise from many conditions affecting the paranasal sinuses, as well as diseases of the nose and nasopharynx. A nasal cavity mass is a prevalent symptom in the field of otorhinolaryngology. Various diseases may lead to the development of a mass. The clinical examination, radiographic results, and histological reports are used to accurately separate the many disorders that manifest as sinonasal masses, in order to ascertain their precise nature. Benign neoplasms often enlarge and reshape bone, but malignant malignancies

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destroy and infiltrate surrounding tissue with poorly defined boundaries.[1] Multiple differential diagnoses exist for a sinonasal mass. Possible causes include congenital, inflammatory, allergy, neoplastic (benign or malignant), and fungal origins. Midline swelling often occurs in congenital malignancies such as dermoid cysts, gliomas, and encephaloceles. Allergic, inflammatory, or fungal polyps are benign growths that are not cancerous. Haemangioma, angiofibroma, mucocele, and inverted papilloma are all noncancerous growths. Angiofibroma is a non-cancerous tumour that exhibits aggressive growth patterns in teenage boys. Haemangiomas may be seen in many areas inside the nasal cavity, but they are often found on the front section of the nasal septum, where they are referred to as bleeding polyps of the septum. Malignant tumours may start or spread from the oropharynx or nasopharynx to the nose and paranasal sinuses. Sinonasal masses may indicate certain haematological malignancies. While benign tumours are very prevalent, malignant tumours are few, accounting for less than 1% of all malignancies (3% of all head and neck tumours). Neoplasms originating from the nervous system that specifically affect the nose and paranasal sinuses are quite uncommon. Neurofibroma and neurilemoma, which are tumours originating from schwann cells, seldom develop in the nasal fossa. The sinonasal malignancy originates from the tissues and structures of the nasal cavity and paranasal sinuses. Pathologies originating from the cranial cavity might manifest as masses in the nasal cavity or paranasal sinuses. The manifestation of sinonasal malignancy is contingent upon the location of the initial tumour, as well as the direction and scope of its dissemination. The predominant early symptoms include nasal blockage, nosebleeds, protrusion of the eyeball, excessive tearing, double vision, unstable teeth, face discomfort and inflammation, as well as swelling in the cheek or palate. Squamous cell carcinoma (SCCA) is the most common malignant cancer seen in the sinonasal cavity.[4] Men are more prone to experiencing them.[5] Squamous cell carcinoma of the sinonasal cavity is mostly seen in individuals who deal with nickel.[6] Their appearance is characterised by a nasal tumour, like other nasal malignancies, accompanied by symptoms such as blockage, secretion, haemorrhaging, and face swelling.[7] The prognostic indicators for a substantial group of carcinoma patients included histological differentiation, tumour location, tumour stage, nodal involvement, and therapeutic strategy.[8,9] Clinically, it is not feasible to determine the underlying disease. Consequently, it is advisable to have a nasal endoscopy. In order to determine a diagnosis, we use a combination of radiological evidence and histology. The conclusive determination of different illnesses manifesting as masses or abnormalities in the sinonasal region is made by histological examination of the surgically removed tissue.[10,11]

MATERIAL AND METHODS

This research was a prospective observational study undertaken at the department of Otorhinolaryngology (ENT). This research included 50 instances of sinonasal pathology, with patient permission obtained in writing form. Every patient had a comprehensive assessment of their medical background and a thorough examination of their ears, nose, and throat. This was followed by a nasal endoscopic procedure and diagnostic imaging examinations using either CT or MRI scans. Encompasses individuals with a sinonasal mass identified by ENT examination, nasal endoscopy, and radiographic investigation. Exclusion criteria for the trial included patients diagnosed with acute bacterial rhinosinusitis who did not provide permission, patients with craniofacial injuries, recalcitrant patients, and patients who were deemed unfit for surgery. The research participants completed a systematic sampling process, which included a comprehensive evaluation of their ear, nose, and throat (ENT) history, as well as a thorough nasal endoscopy and radiological imaging investigations. Subsequently, the patient received an endoscopic biopsy under general anaesthesia (GA), and further surgical and medicinal treatment was planned based on the histological findings. The combination of a comprehensive historical analysis and advanced imaging methods aids in establishing a tentative diagnosis. The data were inputted into Microsoft and evaluated using SPSS software. We computed the average and standard deviation for the linear variable, and the proportions for the categorical variable.

RESULTS

The data shown in the tables indicates that the largest proportion of patients, 42%, falls within the age range of 40 to 60 years. The second largest group, including 30% of patients, falls within the age range of 20 to 40 years. The prevalence of sinonasal masses is higher in individuals aged between their fourth and sixth decade of life. 70% of the cases were found in males. It indicates that sinonasal masses are more prevalent in men. The majority of sinonasal masses manifest as nasal obstruction in 47 instances (94%). Other frequently reported symptoms include headache in 35 cases (70%), face discomfort in 34 cases (68%), facial edoema in 30 cases (60%), impaired vision in 19 cases (38%), and epistaxis in 11 cases (22%). The majority of sinonasal masses are often seen bilaterally in the sinonasal area, rather than unilaterally. The majority of individuals with sinonasal masses have diabetes, with nasal polyps being the most prevalent diagnosis and bleeding polyps being the second most common. [Table 1] Out of the 50 cases in 56% Bony erosion, 80% Maxilary, 28% Ethmoid, 14% Frontal, 8% Sphenoid, 6% Infra temporal fossa, 2% Pterygopalatine fossa and 6% Intracranial extension were seen under radiology. [Table 4]

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Table 1: Basic parameter of the participants

	Number =50	Percentage
Gender		
Male	70	35
Female	30	15
Age in years		
Below 20	4	8
20-40	15	30
40-60	21	42
Above 60	10	20
Mean Age	35.85±3.89	
Sino-nasal mass		
Bilateral	22	44
Left nasal mass	14	28
Right nasal mass	14	28

Table 2: Clinical Parameter

Clinical Parameter	Number =50	Percentage
Nasal obstruction	47	94
Cheek/facial swelling	30	60
Epistaxis	11	22
Facial pain	34	68
Reduced Vision	19	38
Proptosis	15	30
Headache	35	70
Palate involvement	10	20
Restrictedeye movement	15	30

Table 3: Radiological extent

Radiology	Number =50	Percentage
Bony erosion	28	56
Sinus extension		
Maxilary	40	80
Ethmoid	14	28
Frontal	7	14
Sphenoid	4	8
Infra temporal fossa	3	6
Pterygopalatine fossa	1	2
Intracranial extension	3	6

Table 4: Post op diagnosis

Post op	Number =50	Percentage
Adenoidcystic CA	1	2
Angiofibroma	3	6
Nasal polyp	19	38
Bleeding polyp	6	12
Centralgiantcell granuloma	1	2
Schwannoma	1	2
Dermoidcyst	1	2
Fibrousdysplasia	1	2
Inverted papilloma	5	10
Non-Hodgkins lymphoma	2	4
Moderately differentiated SCC	4	8
Undifferentiated nasopharyngeal carcinoma	5	10
Well differentiated SCC	1	2

DISCUSSION

The nasal cavity and paranasal sinuses are implicated in a diverse range of clinical disorders. Nasal polyps are pale, non-specific, eosinophilic, edematous, hyperplastic lumps seen in the sinonasal region. They often appear bilaterally, and any unilateral polyp should be regarded a potential neoplasia, either benign or malignant. Among the 50 patients, the highest occurrence of sinonasal masses was seen in individuals aged between 40 and 60 years, accounting for 21 instances (42% of the total). Deepti et al and Scott Brown have shown that the largest occurrence of cancer occurs between the ages of 60 and 69.[12,13] According to another research, the average age at which non-neoplastic lesions were seen was 22.5 years, while benign lesions were observed at an average age of 26.8 years, and malignant lesions were observed at an average age of 35.3 years.[14] The research found that the most common age for the appearance of benign, intermediate, and malignant lesions was the second, fifth, and sixth decade of life, respectively.[15] The majority of research found that the average age was

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lowest for non-neoplastic lesions, rose for benign lesions, and was greatest for malignant lesions.

Sino-nasal disorders have a higher prevalence in men, accounting for 70% of cases. Among these cases, 20% were identified as malignant, while the other 80% were non-malignant. There is a statistically significant correlation between age and the malignant nature of Sinonasal masses. Therefore, the aetiology of sinonasal masses exhibits a gender preference. An inverted papilloma is often identified by biopsy or excision because to its typically benign early clinical history and gross appearance.[16] Scott Browns reported that the greatest occurrence of sinonasal malignancy and JNA is seen in males.[13]

The research found that the largest occupational group among the patients consisted of farmers, accounting for 30% (15 out of 50), followed by labourers, comprising 22% (11 out of 50). The majority of sinonasal masses in this research were found at the bilateral site of the sinonasal area, rather than the unilateral site. In contrast to our findings, another study found that the majority of patients (44.7%) had sinonasal masses on both sides, whereas 31.6% had the mass on the right side and 23.6% had it on the left side.[17] According to Scott Brown, 40% of sinonasal masses linked with wood dust exhibited involvement of both sinonasal regions, whereas the involvement of the right and left sinonasal areas was found to be identical in 28% of cases. Lathi et colleagues found that 47.7% of patients had unilateral nasal masses, whereas the rest had bilateral nasal masses.[18] Out of the 50 patients included in our research, 47 (94%) of those with sino nasal masses reported experiencing nasal obstruction. Among these patients, 11 were diagnosed with malignancy, while the remaining 36 were found to be non-malignant.

In a comparable examination on sinonasal masses, the predominant symptom reported was nasal obstruction, affecting 94% of the participants. Among those affected, 84% had unilateral obstruction, while 14% experienced bilateral obstruction. Loss of smell was the second most prevalent symptom, reported by 68% of the participants, followed by epistaxis, which was reported by 50% of the participants.[19] Another research found that the predominant symptoms reported were nasal congestion (71%), nasal discharge (54%), and nasal edoema or mass (39%).[15] In previous comparable research, nasal obstruction was the predominant symptom found, although the occurrence of other symptoms varied.

In Sudheer et al's investigation on SCC, it was shown that 68% of the patients had nasal obstruction.[20] Malignant tumours in the nasal cavity are rare, however the similar clinical features of benign and malignant tumours cause a delay in diagnosis.[21] According to our research, 30 individuals (60%) reported experiencing cheek edoema. Among these instances, 9 were diagnosed as malignant, whereas 21 patients were found to be non-malignant. Swelling was seen in 11.6% of the patients, as reported by Lathi et al.[18] Half of the entire bulk is seen within one month after the onset of symptoms. 10% of the patients saw a gradual start of symptoms, whereas 30% of the patients experienced a fast onset. The current research found that among the 50 instances examined, bony erosion was seen in 56% of the cases. Specifically, 80% of the patients showed maxillary erosion, 28% showed ethmoid erosion, 14% showed frontal erosion, 8% showed sphenoid erosion, 6% showed infra temporal fossa erosion, 2% showed pterygopalatine fossa erosion, and 6% showed intracranial extension on radiography. The imaging technique used for sino nasal evaluation is computed tomography, which is complemented by magnetic resonance imaging (MRI), known for its greater ability to assess extensions inside the eye socket and the skull.[22]

CONCLUSION

The present research suggests that a thorough histological evaluation should be conducted in all patients with sino nasal masses to ensure an accurate diagnosis and determine the appropriate treatment plan. Significant abnormalities may go undetected during clinical or radiographic evaluation. Radiology is very beneficial in situations requiring sino nasal volumes as it provides the endoscopic surgeon with a clear plan and alerts them to any potential challenges or obstacles. Due to their uncertain origin and tendency to recur, they provide a challenging diagnosis for the clinician to manage. Although each of these approaches has some benefits, histopathology analysis remains the most dependable approach for establishing a diagnosis.

REFERENCES

1. Leland EM, Vohra V, Seal SM, Zhang Z, Ramanathan M Jr. Environmental air pollution and chronic rhinosinusitis: a systematic review. Laryngoscope Investig Otolaryngol. 2022;7(2):349-60. doi: 10.1002/lio2.774, PMID 35434330.
2. Bist SS, Varshney S, Baunthiyal V, Bhagat S, Kusum A. Clinico-pathological profile of sinonasal masses: an experience in tertiary care hospital of Uttarakhand. Natl J Maxillofac Surg. 2012 July;3(2):180-6. doi: 10.4103/0975-5950.111375, PMID 23833494, PMCID PMC3700153.
3. Patni D, Yadav S, Prajapati KK, Munjal VR. Evaluation of clinical, radiological and pathological correlation of sino-nasal masses: our experience. Int J Otorhinolaryngol Head Neck Surg. 2022;8(9):735-9. doi: 10.18203/issn.2454-5929.ijohns20222165.
4. Bhalodiya N, Prajapati KJ, Hingol P, Bhadania S. Clinical, pathological and radiological profile of sinonasal masses in patients presenting to a tertiary care center: a retrospective observational study. Int J Otorhinolaryngol Head Neck Surg. 2020;6(10):1859-66. doi: 10.18203/issn.2454-5929.ijohns20204190.
5. Garavello W, Gaini RM. Histopathology of routine nasal polypectomy specimens: a review of 2,147 cases. Laryngoscope. 2005;115(10):1866-8. doi: 10.1097/01.mlg.0000177075.09594.90, PMID 16222211.
6. Zafar U, Khan N, Afroz N, Hasan SA. Clinicopathological study of non-neoplastic lesions of nasal cavity and paranasal sinuses. Indian J Pathol Microbiol. 2008;51(1):26-9. doi: 10.4103/0377-4929.40386. PMID 18417845.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

7. Gupta R, Moupachi SS, Poorey VK. Sinonasal masses: a retrospective analysis. Indian J Otolaryngol Head Neck Surg. 2013;65(1):52-6. doi: 10.1007/s12070-012-0602-x, PMID 24381921.
8. Bakari A, Afolabi OA, Adoga AA, Kodiya AM, Ahmad BM. Clinico-pathological profile of sinonasal masses: an experience in national ear care center Kaduna, Nigeria. British Medi cent Resear notes. 2010;3:186.
9. Burdak H, Harshvardhan R, Sehra R, Meena R. A descriptive study of clinical, radiological, and histopathological correlation of sinonasal masses. Int J Sci Stud. 2021;8(12):26-31.
10. Dhillon V, Dhingra R, lal Davessar J, Chaudhary A, Monga S, Kaur M et al. Correlation of clinical, radiological and histopathological diagnosis among patients with sinonasal masses. International Journal of Contemporary Medical Research. 2016;3(6):1612-5.
11. Sahoo AK, Sidam S, Chavan A. Clinicopathological profile of sinonasal masses in a tertiary Care Center in central India: A retrospective study. Cureus. December 17, 2023;15(12):e50700. doi: 10.7759/cureus.50700.
12. Deepthi S, Pratibha CB, Balasubramanya AM. Unilateral maxillary swelling. Int J Otorhinolaryngol Head Neck Surg. 2019;5(1):120-6.
13. Stern SJ, Goepfert H, Clayman G, Byers R, Ang KK, el-Naggar AK, et al. Squamous cell carcinoma of the maxillary sinus. Arch Otolaryngol Head Neck Surg. 1993;119(9):964-9. doi: 10.1001/archotol.1993.01880210052008, PMID 8357597.
14. Khan N, Zafar U, Afroz N, Ahmad SS, Hasan SA. Masses of nasal cavity, paranasal sinuses and nasopharynx: A clinicopathological study. Indian J Otolaryngol Head Neck Surg. 2006;58(3):259-63. doi: 10.1007/BF03050834, PMID 23120307.
15. Patel SV, Katakwar BP. Clincopathological study of benign and malignant lesions of nasal cavity, paranasal sinuses and nasopharynx: A prospective study. Orissa J Otolaryngol Head Neck Surg. 2009;3:11-5.
16. Mainzer F, Stargardter FL, Connolly ES, Fletcher E. Inverting papilloma of the nose and paranasal sinuses. Radiology. 1969;92(5):964-8. doi: 10.1148/92.5.964, PMID 5771838.
17. Bakari A, Afolabi OA, Adoga AA, Kodiya AM, Ahmad BM. Clinico-pathological profile of sinonasal masses: an experience in National Ear Care Center Kaduna, Nigeria. BMC Res Notes. 2010;3:186. doi: 10.1186/1756-0500-3-186, PMID 20618972.
18. Lathi A, Syed MMA, Kalakoti P, Qutub D, Kishve SP. Clinico-pathological profile of sinonasal masses: a study from a tertiary care hospital of India. Acta Otorhinolaryngol Ital. 2011;31(6):372-7. PMID 22323848.
19. Humayun AHP, Huq AZ, Ahmed ST, Kamal MS, U KK, Bhattacharjee N. Clinicopathological study of sinonasal masses. Bangladesh J Otorhinolaryngol. 2010;16(1):15-22. doi: 10.3329/bjo.v16i1.5776.
20. Sudheer CP, Singh TD. Squamous cell carcinoma of maxillary sinus: a comparison of clinico-radiological staging with pre-operative staging. Int J Otorhinolaryngol Head Neck Surg. 2018;4(5):1229-32. doi: 10.18203/issn.2454-5929.ijohns20183692.
21. Fagin JA, Matsuo K, Karmakar A, Chen DL, Tang SH, Koeffler HP. High prevalence of mutations of the p53 gene in poorly differentiated human thyroid carcinomas. J Clin Invest. 1993;91(1):179-84. doi: 10.1172/JCI116168, PMID 8423216.
22. Higuera JG, Mullins CB, Duran LR, Sandoval H, Akle N, Figueroa R. Sinonasal fungal infections and complications. J Clin Imaging Sci. 2016;6:23.

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