

Risk Factors for Sinonasal Masses in Correlation with Their Clinical, Radiological, and Histopathological DiagnosesMd. Ale Imran Ansari¹, Md. Ozair², Md. Shakir³¹Assistant Professor, Department of ENT, Darbhanga Medical College & Hospital, Laheriasarai, Bihar²Assistant Professor and Head of Department, Department of ENT, Darbhanga Medical College & Hospital, Laheriasarai, Bihar³Assistant Professor, Department of Pathology, Darbhanga Medical College & Hospital, Laheriasarai, Bihar

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Abstract:

Background: Sinonasal masses are a spectrum of lesions that can be found in the sinonasal tract, spanning from non-neoplastic to neoplastic lesions. Despite sharing a similar clinical presentation, these lesions have very distinct histopathological diagnoses and require very different treatment plans and prognoses. Optimizing clinical treatment requires an understanding of the clinicopathological spectrum of these masses. The goal of the current research was to identify the risk factors for sinonasal masses in correlation with their clinical, radiological, and histopathological diagnoses.

Methods: From August 2022 to July 2023, 120 patients of any age and sex who presented with sinonasal masses at the ENT department and pathology department of DMCH, Laheriasarai, Bihar, were randomly chosen for the current research. Routine haematological and biochemical testing, nasal endoscopy, x-ray paranasal sinuses/CT scan, and biopsy were performed on these patients. Hematoxylin and eosin stain was used to regularly process tissues for histopathological sections that were 5 microns thick. When necessary, special labelling with reticulin, von gieson, PAS, and masson's strichrome was done. The information was collected, examined, and a reliable result was reached.

Results: In the current research, 84 cases of inflammatory polyps were found to be the majority by histopathology. According to radiology, out of 120 cases, 86 (71.66%) had non-neoplastic conditions, 20 (16.66%) had benign conditions, and 14 (11.66%) had malignant conditions. The clinical diagnosis in all 120 patients was consistent with the radiologic Histopathological Examination (HPE) report, with the exception of 12 (10%) patients in whom a unilateral sinonasal mass was given a clinically inconclusive diagnosis. In the remaining 108 patients (90%) the clinical and HPE diagnoses were identical. All 12 patients had a clinically inconclusive diagnosis of a unilateral sinonasal mass, which was reported after HPE in 2 cases as an extramedullary plasmacytoma and in 4 cases as an esthesioneuroblastoma. There were also 2 cases of maxillary ameloblastoma, 2 cases of inverted papillomas, 2 cases of rhinoscleroma, and 4 cases of round cell tumours.

Conclusion: A careful histopathological investigation (HPE) is required to determine the precise type of a lesion, according to a comparison of histopathological results with clinical findings. In order to provide the accurate diagnosis of the different conditions identified as a sinonasal mass, HPE of the removed tissue is required.

Keywords: Sinonasal masses; Deviated nasal septum; Otorhinolaryngologists.

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Introduction

Numerous neoplastic and non-neoplastic lesions can affect the sinonasal tract, which is made up of the paranasal sinuses and the nasal chamber [1]. The paranasal sinuses and the nasal cavity frequently work together as a single unit and are frequently impacted by comparable pathological processes [2]. In clinical practice, a variety of tumors, whether cancerous or not, will frequently be seen and will have different clinical presentations. Inflammatory polyps are the most

prevalent non-neoplastic tumours and make up 2% of sinonasal masses [2]. According to the WHO, 0.2-0.8% of all malignant neoplasms and 3% of head and neck cancers are carcinomas of the nasal canal and paranasal sinuses [3]. In most populations, the incidence of nasal and paranasal sinus cancers ranges from 1.5/100,000 in males to 1.0/100,000 in women [4]. The orbital cavity, brain, base of the cranium, and surrounding tissues in the infratemporal fossa are all close by to the

sinonasal tract. Although nose obstruction, rhinorrhea, and epistaxis are typically the primary presenting symptoms, invasion of nearby structures can also cause symptoms like proptosis, trismus, and lymph node enlargement [5].

The physical examination of these individuals must be combined with nasoendoscopy for an accurate assessment. Since the constellation of symptoms is frequently the same and malignant disease typically displays local extension and distant spread in the late stages, it can be challenging to distinguish between neoplastic and non-neoplastic lesions. Sinonasal masses that are not regularly biopsied, like juvenile angiofibroma because of the risk of bleeding, and congenital masses, like encephaloceles, can be evaluated using computed tomography (CT) and magnetic resonance imaging (MRI) [6]. Due to the broad variety of cells in the mucosa of the sinonasal cavity and the structures close by to this tract, histopathological evaluation is essential in making a firm diagnosis of these masses. Particularly useful for differentiating lesions with identical morphology and weak differentiation is immunohistochemistry [7]. Before being referred to Otorhinolaryngologists, these lesions may be examined during presentation by other experts, such as an ophthalmologist and a maxillofacial surgeon. This study's goal is to identify the risk factors associated with sinonasal tumours based on their clinical, radiological, and histopathological diagnoses.

Material and Methods

The goal of the current research was to examine the radiological findings and clinicopathological characteristics of sinonasal masses. In the department of ENT with the department of pathology at Darbhanga Medical College and Hospital, Laheriasarai, Bihar, 120 patients of any

age and sex who presented with sinonasal masses were randomly chosen for the prospective study.

In every instance, informed consent was obtained. A thorough clinical history was obtained, including information on the patient's age, sex, place of residence, job, family history, previous experiences, and any allergies or addictive behaviours.

In-depth clinical local and general exams were carried out in accordance with the attached proforma, paying particular attention to the mouth, paranasal sinuses, and nose. Routine haematological and biochemical testing, nasal endoscopy, CT imaging of the paranasal sinuses, FNAC when necessary, and biopsy were all performed on these patients. Hematoxylin and eosin stain was used to regularly process tissues for histopathological sections that were 5 microns thick. When necessary, special labelling with reticulin, von gieson, PAS, and masson's strichrome was done. The information was compiled, examined, and a reliable result was reached..

Results

62 non-neoplastic lesions had bilateral nasal masses, and 24 had isolated nasal masses, according to diagnostic nasal endoscopy (Table 1). Unilateral nasal masses were the primary presenting feature of both normal and malignant lesions.

Twelve cancerous lesions and eight benign neoplastic lesions both bled when touched. 40 non-neoplastic lesions, 2 mild neoplastic lesions, and 6 malignant lesions all showed a deviated nasal septum (DNS). In 24 non-neoplastic lesions and 6 mild neoplastic lesions, turbinate hypertrophy was observed.

Table 1: Findings from Nasal Endoscopic

Symptoms and signs	Non- euplastic Lesions	Neoplastic	
		Benign Tumors	Malignant Tumors
Unilateral nasal mass	24	20	14
Bilateral nasal mass	62	0	0
Bleeding on touch	0	8	12
Deviated nasal septum	40	2	6
Turbinate hypertrophy	24	6	0

All 120 participants in our study received CT scanning. (Table-2). In instances of non-neoplastic lesions, 62 (72.09%) cases had bilateral nasal masses and 24 (27.90%) cases had unilateral nasal masses. Unilateral nasal masses were the primary presenting feature of both normal and malignant lesions. In 62 (72.09%) cases of non-neoplastic lesions, bilateral paranasal sinus mass CT scan findings were discovered; in contrast, unilateral paranasal sinus mass CT scan findings were

discovered in 18 (20.93%) cases of non-neoplastic lesions, 12 (60%) cases of mild neoplastic lesions, and 14 (100%) cases of malignant lesions. In 40 (46.41%) instances of non-neoplastic lesions, 2 (10%) cases of benign neoplastic lesions, and 6 (42.86%) cases of malignant lesions, a deviated nasal septum (DNS) was observed. In 24 (27.90%) instances of non-neoplastic lesions and 6 (30%) cases of benign neoplastic lesions, turbinate hypertrophy was observed. In 18 (20.93%)

instances of non-neoplastic lesions and 2 cases of benign neoplastic lesions, nasopharyngeal masses were discovered. Two (2.37%) instances of non-neoplastic bone erosion and fourteen (100%) cases

of malignant bone erosion were observed. Two (2.37%) instances of non-neoplastic lesions and six (42.86%) cases of malignant lesions were observed in the neck nodes.

Table 2: Various types of sinonasal masses Exhibit Computer Tomography (CT Scan) findings

CT scan finding	Non-neoplastic Lesions	Neoplastic	
		Benign Lesions	Malignant Lesions
Unilateral nasal mass	24(27.90%)	20(100%)	14(100%)
Bilateral nasal mass	62(72.09%)	-	-
Unilateral paranasal sinus mass	18(20.93%)	12(60%)	14(100%)
Bilateral paranasal sinus mass	62(72.09%)		
Nasopharyngeal mass	8(20.93%)	2(10%)	
Deviated nasal septum	40(46.41%)	2(10%)	6(42.86%)
Turbinate Hypertrophy	24(27.90%)	6(30%)	
Bone erosion	2(2.37%)		14(100%)
Neck nodes	2(2.37%)		6(42.86%)

In present study, histopathology showed the maximum cases (84 cases) of inflammatory polyps (table-3).

Table 3: Sinonasal tumours are diagnosed histopathologically

Histopathological diagnosis	No. of cases	Percentage
Inflammatory Polyp	84	70%
Angiofibroma	6	5%
Squamous Cell Carcinoma	6	5%
Invasive Fungal Sinusitis	2	1.67%
Inverted Papilloma	2	1.67%
Lobular Capillary Haemangioma	6	5%
Adenocarcinoma	4	3.33%
Esthesioneuroblastoma	2	1.67%
Extramedullary Plasmacytoma	2	1.67%
Rhinoscleroma	2	1.67%
Ameloblastoma	2	1.67%
Hemangiopericytoma	2	1.67%

All 120 patients in our study received a CT scan. According to radiology, out of 120 cases, 86 (71.66%) had non-neoplastic conditions, 20 (16.66%) had benign conditions, and 14 (11.66%) had malignant conditions.

The clinical and radiologic diagnoses were all correlated in the 120 cases. In the current research, a comparison of clinical and radiological findings revealed that the latter were consistent with clinical suspicion. In our research, 12 (10%) patients had histopathological examination (HPE) reports that provided a clinically inconclusive diagnosis of a unilateral sinonasal mass, while 108 patients (90%) had the same clinical and HPE diagnoses.

All 12 patients had a clinically inconclusive diagnosis of a unilateral sinonasal mass, which was reported after HPE in 2 cases as an extramedullary plasmacytoma and in 4 cases as an esthesioneuroblastoma. There were also 2 cases of maxillary ameloblastoma, 2 cases of inverted papillomas, 2 cases of rhinoscleroma, and 4 cases of round cell tumours. A careful histopathological investigation (HPE) is required to determine the nature of a particular lesion, according to a comparison of histopathological results with

clinical findings. The real diagnosis of the various conditions referred to as sinonasal masses is provided by the HPE of the tissue that was removed.

Discussion

Nasal cavity (NC) and paranasal sinuses (PNS) involvement is prevalent in both benign and malignant conditions, and these lesions are seen frequently in clinical practise. Advanced imaging techniques, presenting symptoms, and features all contribute to a provisional diagnosis, but a histopathological investigation is still the gold standard for a conclusive diagnosis. [8] There were 20 benign neoplastic sinonasal masses in the current research. 16.66% of all sinonasal tumours were made up of them. Ninety percent of patients report of nasal obstruction. 60% of the patients reported past nose bleeding. This high rate of nasal bleeding cases was caused by the greater number of angiofibroma cases (30%), which usually present with episodes of minor to significant nasal bleeding. Khan N. et al. [9], Shashin K. et al. [10], and Swamy KVN. et al. [11] made similar observations. In 20% of instances, facial swelling and ear abnormalities were observed. The signs of

secretory or adhesive otitis media included ear pain, discharge, and reduced hearing.

In the current study, 28.57% of patients with cancer reported experiencing pain, making it crucial to fully examine every case presenting with headache or facial pain symptoms to rule out any underlying malignancy.

An anterior rhinoscopy-related pathology can be identified and the intranasal structure can be thoroughly examined using nasal endoscopy. The method provides more significant information about postoperative recurrence/residual disease and is acknowledged as being more sensitive than a CT scan for the study of accessible disease.

Along with improvements in imaging technology, the diagnostic algorithm for sinus illnesses is constantly changing. Plain radiographs used to be one of the main methods for diagnosing diseases of the sinuses, but high resolution computer tomography has since taken their place for the study of sinus diseases. A CT scan is a helpful and educational tool for diagnosis, tumour staging, and effective treatment. Every single patient with sinonasal tumours had a CT scan.

Numerous investigations have shown that there is no direct relationship between CT and symptoms. 42% of asymptomatic patients in a research by Bolger WE et al. [12] had mucosal changes on their CT scan. Only 47% of the 78 patients in a trial by Stankiewicz JA et al. [13] who met the criteria for chronic rhinosinusitis symptoms had CT evidence of chronic rhinosinusitis. According to a prospective research by Flinn J. et al. [14], 27% of patients without chronic rhinosinusitis had mucosal changes that were suggestive of the condition. Tandon DA et al [15] tabulated and compared the clinical, radiological, and CT findings for each adjacent sub site in consecutive cases undergoing surgery for malignant lesions of the maxillo-ethmoid complex and discovered that tumour extensions into the nose, palate, cheek, and orbit were correctly identified in a high percentage of cases clinically and radiographically.

There is a dearth of consensus among ENT surgeons regarding the necessity of routine histology for nasal polyps. Alun-Jones et al. state that the clinical selection of nasal polyps for histology has been suggested as a potential middle ground between increased hospital expenses and/or burden and proper medical procedure. [16] However, in this research, the selection of nasal polyps for histology using clinical criteria was insufficient because several cases of polyps with sinister pathology would have gone undetected.

Only 70% of the time in Chopra H [17] study of 50 nasal polyp patients did the radiological results match the clinical suspicion. In their investigation,

allergic fungal tumours had the highest rate of accurate radiological diagnosis. This was brought on by the elevated proportion of hyperdense signal (caused by calcium salts) in the paranasal sinus of the CT scan. In the majority of instances, the diagnosis of non-specific sinonasal polyps, antrochoanal polyps, and mucormycosis was established with accuracy. In about 20% of non-neoplastic lesions, the physician and the radiologist had different opinions. Only 22% of neoplastic lesions had the proper diagnosis confirmed (2 out of 9 patients). In most cases it was inadequate to predict the histological subtype and to differentiate non-neoplastic versus neoplastic and benign versus malignant lesions.

All 120 patients in our study received a CT scan. According to radiology, out of 120 cases, 86 (71.66%) had non-neoplastic conditions, 20 (16.66%) had benign conditions, and 14 (11.66%) had malignant conditions. The clinical and radiologic diagnoses were all correlated in the 120 cases. In the current research, a comparison of clinical and radiological findings revealed that the latter were consistent with clinical suspicion. Similar findings were found by Bist SS et al [18].

In our research, the clinical and HPE diagnoses were identical in 108 patients (90%) and 12 patients (10%) with a clinically inconclusive diagnosis of a unilateral sinonasal mass. All 12 patients had a clinically inconclusive diagnosis of a unilateral sinonasal mass, which was reported after HPE in 2 cases as an extramedullary plasmacytoma and in 4 cases as an esthesioneuroblastoma. There were also 2 cases of maxillary ameloblastoma, 2 cases of inverted papillomas, 2 cases of rhinoscleroma, and 4 cases of round cell tumours. A careful histopathological investigation (HPE) is required to determine the nature of a particular lesion, according to a comparison of histopathological results with clinical findings. The real diagnosis of the various conditions referred to as sinonasal masses is provided by the HPE of the tissue that was removed. The general conclusion from studies is that histopathological examination is still the gold standard for diagnosis in the majority of cases.

Conclusion

This research led us to the conclusion that although paranasal sinus tumours are uncommon, they are incredibly well-known when they do occur. The only way the patient has a chance of a favourable prognosis is if they are diagnosed early and treated aggressively. In the majority of instances, histopathological analysis is still the gold standard for diagnosis.

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