

# Correlation of Clinical, Radiological and Histopathological Diagnosis among Patients with Sinonasal Masses

Vikas Dhillon<sup>1</sup>, Rachna Dhingra<sup>2</sup>, Jai Lal Davessar<sup>3</sup>, Aarushi Chaudhary<sup>4</sup>, Shamim Monga<sup>5</sup>, Manpreet Kaur<sup>6</sup>, Hobinder Arora<sup>7</sup>

## ABSTRACT

**Introduction:** Neoplasms of the sinuses and nasal cavity account for 0.2–0.8 % of all carcinomas. The present study was carried out to find out correlation of clinical, radiological and histopathological diagnosis of sinonasal masses.

**Material and Methods:** The present study was carried out on 60 patients of any age and sex randomly selected who presented with sinonasal masses in the department of Otorhinolaryngology and Pathology in Guru Gobind Singh Medical College and Hospital, Faridkot. These cases were subjected to routine hematological and biochemical evaluation, nasal endoscopy, x-ray paranasal sinuses/CT scan and biopsy. Tissues were routinely processed for histopathological sections of 5 micron thickness and were stained by hematoxylin and eosin stain. Special staining by reticulin, von Gieson, PAS and Masson's trichrome were undertaken whenever applicable. The data so obtained was compiled, analyzed and valid conclusion drawn.

**Results:** In present study, histopathology showed the maximum cases (42 cases) of inflammatory polyps. On the basis of radiology, out of 60 patients, 43 patients (71.66%) were non-neoplastic, 10 patients (16.66%) were benign and 7 patients (11.66%) were malignant. In all the 60 patients, clinical diagnosis correlated with the radiologic Histopathological examination (HPE) report made the clinical diagnosis in 6 (10%) patients in which clinically inconclusive diagnosis of unilateral sinonasal mass was made and in 54 patients (90%) clinical and HPE diagnosis was same. All 6 patients had clinically inconclusive diagnosis of unilateral sinonasal mass, all of which were reported after HPE, 1 case ameloblastoma of maxilla, 1 case inverted papilloma, 1 case rhinoscleroma, 2 cases round cell tumour, in 2 cases immunohistochemistry confirmed as extramedullary plasmacytoma and esthesioneuroblastoma.

**Conclusion:** Comparison of histopathological findings with clinical findings showed that, a careful histopathological examination (HPE) is necessary to analyze the specific type of a lesion. Thus, HPE of the removed tissue is mandatory to provide the actual diagnosis of the various conditions identified as a sinonasal mass.

**Keywords:** Sinonasal masses; Deviated nasal septum; Otorhinolaryngologists

incidence of 1 to 4 % of the population. Neoplasms of the sinuses and nasal cavity account for 0.2–0.8 % of all carcinomas.<sup>3</sup> The present study was carried out to find out correlation of clinical, radiological and histopathological diagnosis of sinonasal masses.

## MATERIAL AND METHODS

The present study was conducted to study clinicopathological features, radiological findings of sinonasal masses. The prospective study was carried out on 60 patients of any age and sex randomly selected who presented with sinonasal masses in the department of Otorhinolaryngology and Pathology in Guru Gobind Singh Medical College and Hospital, Faridkot.

Prior approval from the institute ethics and research committee was taken. Informed consent was taken from all cases. Detailed clinical history was taken with reference to age, sex, residence, occupation, family history, past history, any allergic disorder, any addictive habits. Detailed clinical local and general examinations were done according to proforma attached with special reference to nose, paranasal sinuses and oral cavity. These cases were subjected to routine hematological and biochemical evaluation, nasal endoscopy, x-ray paranasal sinuses/CT scan, FNAC whenever required, biopsy. Tissues were routinely processed for histopathological sections of 5 micron thickness and were stained by hematoxylin and eosin stain. Special staining by reticulin, von Gieson, PAS and Masson's trichrome were undertaken whenever applicable. The data so obtained was compiled, analyzed and valid conclusion drawn.

## RESULTS

On diagnostic nasal endoscopy (Table-1), 31 non-neoplastic lesions had bilateral nasal mass, 12 had unilateral nasal mass. All benign neoplastic and malignant lesions presented with unilateral nasal mass. Bleeding on touch was found in 4 benign neoplastic and 6 malignant lesions. Deviated nasal septum (DNS) was seen in 20 non-neoplastic lesions, 1 benign neoplastic lesions and 3

<sup>1</sup>Senior Resident, Department of ENT, BPS Government Medical College for Women, Khanpur Kalan Sonapat, <sup>2</sup>Assistant Professor, <sup>3</sup>Professor and Head, <sup>4</sup>PG Resident, Department of ENT, <sup>5</sup>Assistant Professor, <sup>6</sup>PG Resident, Department of Community Medicine, GGS Medical College, Faridkot, Punjab, <sup>7</sup>Resident, Department of Obs and Gynae, Dr. Baba sahib Ambedkar Hospital, New Delhi, India

**Corresponding author:** Vikas Dhillon, Senior Resident, Department of ENT, BPS Government Medical College for Women, Khanpur Kalan Sonapat, India

**How to cite this article:** Vikas Dhillon, Rachna Dhingra, Jai Lal Davessar, Aarushi Chaudhary, Shamim Monga, Manpreet Kaur, Hobinder Arora. Correlation of clinical, radiological and histopathological diagnosis among patients with sinonasal masses. International Journal of Contemporary Medical Research 2016;3(6):1612-1615.

## INTRODUCTION

The nose is the most prominent part of the face with functional and considerable aesthetic importance. Anatomical position of the nose and its passage have been considered as the direct route to the brain, individual's source of intelligence and spirituality.<sup>1</sup> Presence of any mass in the nose and paranasal sinuses seems to be a simple problem; however it raises many questions about the differential diagnosis.<sup>2</sup> A variety of sino-nasal conditions (neoplastic, non neoplastic and inflammatory) are very common lesions encountered in clinical practice with the reported

malignant lesions. Turbinate hypertrophy was seen in 12 non neoplastic lesions and 3 benign neoplastic lesions. In our study all 60 patients underwent CT scan (Table-2). In non-neoplastic lesions 12(27.90%) cases presented with unilateral nasal mass, 31(72.09%) cases presented with bilateral nasal mass. All benign neoplastic and malignant lesions presented with unilateral nasal mass. Bilateral paranasal sinus mass CT scan finding was found in 31(72.09%) cases of non-neoplastic lesions and Unilateral paranasal sinus mass CT scan finding was found in 9(20.93%) cases of non-neoplastic lesions, 6(60%) cases of benign neoplastic lesions, 7(100%) cases of malignant lesions. Deviated nasal septum (DNS) was seen in 20(46.41%) cases of non-neoplastic lesions, 1(10%) case of benign neoplastic lesion and 3(42.86%) cases of malignant lesions. Turbinate hypertrophy was seen in 12(27.90%) cases of non-neoplastic lesions and 3(30%) cases of benign neoplastic lesions. Nasopharyngeal mass was found in 9(20.93%) cases of

non-neoplastic lesions and 1 case of benign neoplastic lesion. Bone erosion was seen 1(2.37%) case of non-neoplastic lesion and 7(100%) cases of malignant lesions. Neck nodes was seen 1(2.37%) case of non-neoplastic lesion and 3(42.86%) cases of malignant lesions.

In present study, histopathology showed the maximum cases (42 cases) of inflammatory polyps (table-3).

In our study all 60 patients underwent CT scan. On the basis of radiology, out of 60 patients, 43 patients (71.66%) were non-neoplastic, 10 patients (16.66%) were benign and 7 patients (11.66%) were malignant. In all the 60 patients, clinical diagnosis correlated with the radiologic diagnosis (table-4). Comparison of clinical and radiological findings in present study showed that the radiological findings were consistent with that of clinical suspicion. In our study, Histopathological examination (HPE) report made the clinical diagnosis in 6 (10%) patients in which clinically inconclusive diagnosis of unilateral sinonasal mass was made and in 54 patients (90%) clinical and HPE diagnosis was same. All 6 patients had clinically inconclusive diagnosis of unilateral sinonasal mass, all of which were reported after HPE, 1 case ameloblastoma of maxilla, 1 case inverted papilloma, 1 case rhinoscleroma, 2 cases round cell tumour, in 2 cases immuno-histochemistry confirmed as extramedullary plasmacytoma and esthesioneuroblastoma. Comparison of histopathological findings with clinical findings showed that, a careful histopathological examination (HPE) is necessary to decide the nature of a specific lesion. The HPE of the removed tissue provides the actual diagnosis of the varied conditions labeled as a sinonasal mass.

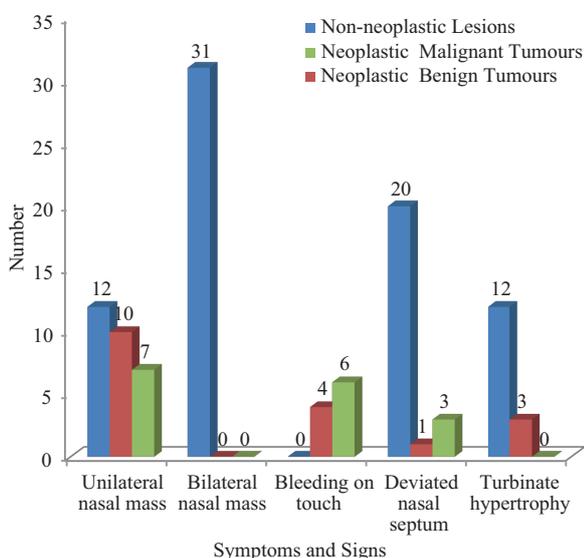


Figure-1: Nasal endoscopy findings

Symptoms and signs	Non-neoplastic Lesions	Neoplastic	
		Benign Tumours	Malignant Tumours
Unilateral nasal mass	12	10	7
Bilateral nasal mass	31	0	0
Bleeding on touch	0	4	6
Deviated nasal septum	20	1	3
Turbinate hypertrophy	12	3	0

Table-1: Nasal endoscopy findings

DISCUSSION

A variety of non-neoplastic and neoplastic conditions involve the nasal cavity (NC), paranasal sinuses (PNS) and these are very common lesions encountered in clinical practice. The presenting features and *symptomatology* and advanced imaging technique helps to draw a provisional diagnosis but histopathological examination remains the gold standard to illustrate definitive diagnosis.<sup>4</sup>

In the present study, there were 10 cases of benign neoplastic sinonasal masses. They constituted 16.66% of all sinonasal masses. 90% of those presented with complain of nasal obstruction. 60% patient gave history of nasal bleed. This high number of cases with nasal bleed was due to higher number (30%) of cases of angiofibromas invariably presenting with episodes of minor to significant nasal bleed. Similar finding was noted by Khan N et al,<sup>5</sup> Shashin K et al<sup>6</sup> and Swamy KVN et al.<sup>7</sup> Facial swelling was seen in 20%, and ear findings in 10%

CT scan finding	Non-neoplastic Lesions	Neoplastic	
		Benign Lesions	Malignant Lesions
Unilateral nasal mass	12(27.90%)	10(100%)	7(100%)
Bilateral nasal mass	31(72.09%)	-	-
Unilateral paranasal sinus mass	9(20.93%)	6(60%)	7(100%)
Bilateral paranasal sinus mass	31(72.09%)	-	-
Nasopharyngeal mass	9(20.93%)	1(10%)	-
Deviated nasal septum	20(46.41%)	1(10%)	3(42.86%)
Turbinate Hypertrophy	12(27.90%)	3(30%)	-
Bone erosion	1(2.37%)	-	7(100%)
Neck nodes	1(2.37%)	-	3(42.86%)

Table-2: Computer tomography (CT Scan) findings seen in different types of sinonasal masses

of cases. Ear symptoms included pain, discharge and decreased hearing due to secretory otitis media or adhesive otitis media. Pain is an important feature in the present study, complained by 28.57% patients diagnosed with malignancies, so it is imperative that every case who presents with symptoms of headache or facial pain should be examined thoroughly to find out any hidden malignant condition.

Nasal endoscopy permits a thorough examination of intranasal anatomy and identification of pathology involving anterior rhinoscopy. The technique is recognized as more sensitive than CT scan for the investigation of accessible disease and gives

more important information regarding recurrence / residual disease postoperatively.

The diagnostic algorithm for sinus diseases continues to evolve along with the advances in imaging modality. Earlier, plain radiographs were one of the basis of diagnosis of the diseases involving sinuses but now high resolution computerized tomography have replaced plain radiographs for the investigation of the sinus diseases. CT scan is an useful and informative aid in diagnosis and tumour staging and for proper management. All the patient of sinonasal masses had undergone CT scan.<sup>3</sup>

Several studies have provided evidence that CT and symptoms do not necessarily correlate. In a study by Bolger WE et al,<sup>8</sup> 42% of asymptomatic patients had mucosal changes on CT scan. In a study Stankiewicz JA et al,<sup>9</sup> examined 78 patients meeting chronic rhinosinusitis symptom criteria of which only 47% had evidence of chronic rhinosinusitis on CT. A prospective study of patients without chronic rhinosinusitis by Flinn J et al,<sup>10</sup> found that 27% had mucosal changes suggestive of chronic rhinosinusitis.

Clinical, radiological and CT findings for each adjacent sub site were tabulated and compared by Tandon DA et al<sup>11</sup> in consecutive cases undergoing surgery for malignant lesions of the maxillo-ethmoid complex and found that tumour extensions into nose, palate, cheek and orbit were identified correctly in a high proportion of cases clinically and radiologically.

There is lack of general harmony about the need for routine

Histopathological diagnosis	No. of cases	%
Inflammatory Polyp	42	70%
Angiofibroma	3	5%
Squamous Cell Carcinoma	3	5%
Invasive Fungal Sinusitis	1	1.67%
Inverted Papilloma	1	1.67%
Lobular Capillary Haemangioma	3	5%
Adenocarcinoma	2	3.33%
Esthesioneuroblastoma	1	1.67%
Extramedullary Plasmacytoma	1	1.67%
Rhinoscleroma	1	1.67%
Ameloblastoma	1	1.67%
Hemangiopericytoma	1	1.67%

**Table-3:** Histopathological diagnosis of sinonasal masses

Clinical Diagnosis	No. of Patients	Radiological Diagnosis	No. of Patients	Histopathological Diagnosis	No. of Patients
B/L Nasal Polyposis	30	B/L Sinonasal Polyposis	30	Inflammatory Polyp	30
Invasive Fungal Sinusitis	1	(B/L blackish nasal mass) Invasive Fungal Sinusitis	1	Invasive Fungal Sinusitis	1
Unilateral Nasal Polyp (Antrochoanal Polyp)	9	Antrochoanal Polyp	9	Inflammatory Polyp	9
Unilateral Sinonasal Mass	6	Expansile Lytic Lesion Maxilla + Nasal Mass ?Ameloblastoma	1	Ameloblastoma	1
		Nasal Mass	1	Inverted Papilloma	1
		Nasal Mass	1	Rhinoscleroma	1
		Sinonasal Mass	1	Hemangiopericytoma	1
Nasal Tumour ? Malignant	2			Extramedullary Plasmacytoma	1
				Esthesioneuroblastoma	1
Malignancy? Maxilla	3	Malignancy Maxilla	3	S.C.C. Maxilla	3
Malignant? Mass Nasal Cavity	2	Malignant Tumour Ethmoid	2	Sinonasal Adeno Carcinoma	2
Rhinolith	2	Rhinolith	2	Rhinolith	2
Angiofibroma	3	Angiofibroma	3	Angiofibroma	3
Haemangioma	3	Haemangioma	3	Haemangioma	3
Nasolabial cyst	1	Nasolabial cyst	1	Nasolabial cyst	1
	60		60		60

**Table-4:** Correlation of Clinical, Radiological and Histopathological Diagnosis

Symptoms and signs	Khan N et al <sup>5</sup>	Shashin K et al <sup>6</sup>	Swamy KVN et al <sup>7</sup>	Present study
Nasal obstruction	86%	100%	56%	90%
Nasal discharge	76%	82%	50%	60%
Bleeding per nose	76%	75.8%	53%	60%
Facial swelling	20%	41%	29%	20%
Ear symptoms	6%	17%	9%	10%
Alteration of smell	-	-	-	20%
Headache	-	-	-	20%

**Table-5:** Comparison of clinical presentation of benign neoplastic sinonasal tumours in present study with earlier studies

Symptoms and signs	Khan et al	Swami et al	Present study
Nasal obstruction	70%	50%	100%
Nasal discharge	21%	60%	57.14%
Bleeding per nose	70%	50%	71.43%
Facial swelling	64%	74%	57.14%
Ear symptoms	23%	14%	28.57%
Ocular symptoms	41%	15%	28.57%
Headache and facial pain	-	-	28.57%

**Table-6:** Comparison of clinical presentation of malignant tumours in present study with earlier studies

histology for nasal polyps among ENT surgeons. According to Alun-Jones et al the clinical selection of nasal polyps for histology has been recommended as a possible compromise between additional hospital cost and/or workload and acceptable medical practice.<sup>12</sup> However, in this study, the use of clinical criteria as a method for selecting nasal polyps for histology proved inadequate, as several cases of polyps with sinister pathology would have escaped diagnosis.

In a study of 50 patients of nasal polyps by Chopra H,<sup>13</sup> the radiological findings matched with clinical suspicion in only 70% cases. The allergic fungal polyps were the most correctly diagnosed radiological condition in their study. This was due to the high percentage of hyperdense signal in the sinus cavities (caused by calcium salts) detected on CT scan paranasal sinus. The diagnosis of non-specific sinonasal polyps, antrochoanal polyp and mucormycosis was correctly established in most of the cases. There was a difference of opinion between the clinician and the radiologist in about 20% of non-neoplastic lesions. The correct diagnosis of neoplastic lesions was established in only 22% of cases (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.

In our study all 60 patients underwent CT scan. On the basis of radiology, out of 60 patients, 43 patients (71.66%) were non-neoplastic, 10 patients (16.66%) were benign, and 7 patients (11.66%) were malignant. In all the 60 patients, clinical diagnosis correlated with the radiologic diagnosis. Comparison of clinical and radiological findings in present study showed that the radiological findings were consistent with that of clinical suspicion. Bist SS et al<sup>14</sup> reported similar findings.

In our study, HPE report made the clinical diagnosis in 6 (10%) patients in which clinically inconclusive diagnosis of unilateral sinonasal mass was made and in 54 patients (90%) clinical and HPE diagnosis was same. All 6 patients had clinically inconclusive diagnosis of unilateral sinonasal mass, all of which were reported after HPE, 1 case ameloblastoma of maxilla, 1 case inverted papilloma, 1 case rhinoscleroma, 2 cases round cell tumour, in 2 cases immuno-histochemistry confirmed as extramedullary plasmacytoma and esthesioneuroblastoma. Comparison of histopathological findings with clinical findings showed that, a careful histopathological examination (HPE) is necessary to decide the nature of a specific lesion. The HPE of the removed tissue provides the actual diagnosis of the varied conditions labeled as a sinonasal mass. Thus, studies point out to the common finding that histopathological examination still remains the gold standard for diagnosis in most cases.

## CONCLUSION

From this study we have reached to the inference that tumours of the paranasal sinuses are rare but when they occur they are extremely notorious. It is only if they are diagnosed at an early stage and treated radically, the patient have a chance of good prognosis. Histopathological examination still remains the gold standard for diagnosis in most cases.

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**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 16-04-2016; **Published online:** 17-05-2016