

## Evaluation and Comparison of Radiological and Histopathological Diagnostic Consistency with Clinical Diagnosis in Patients of Nasal Polyps.

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**ABSTRACT:** AIMS: To evaluate the patients of nasal polyps and compare the radiological and histopathological diagnostic consistency with clinical diagnosis. **SUBJECTS AND METHODS:** Design & Setting: The prospective cohort study was conducted in the inpatient Department of E.N.T, M.G.M. Medical College & Hospital, Kamothe, Navi Mumbai over a period of 3 years from August 2009 to July 2011. Fifty patients with nasal polyps were studied. Samples were collected by complete enumeration method. Apart from diagnostic nasal endoscopy done preoperatively in all the cases radiological examination with C.T. Scan PNS, with or without contrast was done. All the samples were submitted for histopathological examination. **RESULTS:** Maximum number of patients were in the third decade with an age range of 10- 80 yrs. A male preponderance was seen. Nasal obstruction (100%) was the commonest symptom followed by nasal obstruction with rhinorrhoea 43(86%). Most of the patients 42(84%) had benign nasal polyps and allergic mucin was seen in 12(24%) on nasal endoscopy. The radiological diagnosis was consistent with clinical diagnosis in 39(78%). The histopathological diagnosis correlated with clinical diagnosis in the present study in 38(76%) patients. The diagnosis of allergic fungal polyps can only be made on histopathology. **CONCLUSION:** A comprehensive management plan incorporating nasal endoscopy, radiology and histopathology remains the most likely means of diagnosing and providing long term disease control for nasal polyps.

**Key Words:** Nasal polyps, Non-neoplastic, Neoplastic.

**INTRODUCTION :** A polyp is a pedunculated, soft elongated structure attached to the nasal mucosa by a slim stalk or a broad base. Polyps are usually mobile, have a smooth shiny surface and are of bluish grey or pink translucent appearance<sup>1</sup>. Nasal polyps diagnosed clinically are not always of inflammatory origin. There are a variety of conditions ranging from benign lesions to malignant nasal tumors which may mimic simple nasal polyps. Non neoplastic conditions such as Wegener's granulomatosis, Sarcoidosis, Rhinosporidiosis; Benign neoplastic conditions such as Inverted papilloma, Capillary hemangioma, Angiofibroma, Chondroma, Plasmacytoma, Meningioma, Leiomyoma, Schwannoma, Meningoencephalocele, Pituitary adenoma; Malignant conditions such as Squamous cell carcinoma, Adenocarcinoma, Malignant melanoma, Chondroma, Olfactory neuroblastoma, Rhabdomyosarcoma and Adenoid cystic carcinoma can present as nasal polyps. It is impossible to determine clinically what pathology lies underneath. Radiographic evidence of thickened mucosa, sinusopacification and bone erosion helps us to diagnose different diseases. The histopathological examination of the removed tissue helps to determine the actual pathology of the varied conditions labeled as nasal polyps. Therefore, nasal endoscopy, radiology and histopathology are employed to help to reach the diagnosis. With this aim we carried out a prospective randomized study to classify various types of neoplastic and non neoplastic lesions, presenting as nasal polyps and compared

radiological and histopathological diagnostic consistency with clinical diagnosis.

**SUBJECTS AND METHODS:** The prospective cohort study was conducted in the inpatient Department of E. N. T, M. G. M. Medical College & Hospital, Kamothe, Navi Mumbai over a period of 3 years from August 2009 to July 2011. Fifty patients with nasal polyps were taken. Samples were collected by complete enumeration method. All cases reporting to the ENT OPD with nasal polyps were included as per a pre-designed and pre-tested proforma and later confirmed radiologically and histopathologically. All the enumerated records were further analysed computationally. Patients included were; 1. Cases clinically diagnosed as having unilateral or bilateral nasal polyp(s). Patients excluded were; 1. Patients presenting with Congenital masses. 2. Patients with nasal mass of intracranial origin. All patients underwent a detailed history, clinical examination (External examination, Anterior and Posterior rhinoscopic, Probe test). Diagnostic nasal endoscopy was done preoperatively in all the cases. A careful and methodical diagnostic nasal endoscopy is the key to understanding anatomical variations and pathological processes in the nasal cavity. It was done using, a 0o rigid endoscope, consisting of all the three passes i. e 1st, 2nd and 3rd. Apart from routine work-up and investigations, radiological examination with C. T. Scan (N. C. C. T. ) P. N. S: Axial, Coronal and Sagittal sections was done. C. T. Scan (with contrast)

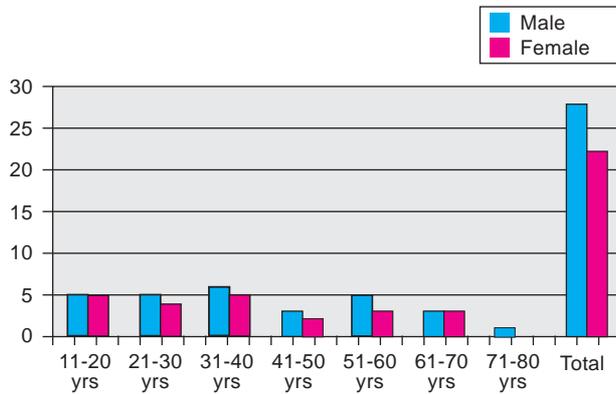


Figure 1: Age sex wise distribution of cases.

Lesion	Total no. of cases (%)
Non neoplastic	
a)Allergic polyps/Ethmoidal	15(30)
b)Allergic fungal polyps	12(24)
c)Non allergicpolyps/Antrochonalpolyps	7(14)
d)Diffuse nasal polyposis with chronic rhinosinusitis	8(16)
e)Mucormycosis	2(4)
Neoplastic(Benign)	
a)Inverted papilloma	1(2)
b)Angiofibroma	2(4)
c)Cemento-ossifying fibroma of nose and PNS	1(2)
Neoplastic(Malignant)	
a)SCC	1(2)
b)Neuroendocrine Carcinoma of Nose &PNS	1(2)
Total	50(100)

Table 1: Overall distribution of different lesions presenting as nasal polyps on Clinical examination (n=50).

Symptoms	Total no. of cases (%)
Nasal obstruction(Unilateral- right)	20(40)
Nasal obstruction(Unilateral- left)	11(22)
Nasal obstruction(Bilateral)	19(38)
Nasal obstruction with Rhinorrhoea	43(86)*
Nasal obstruction with Rhinorrhoea(Bilateral)	20(40)
Nasal obstruction with Rhinorrhoea(Unilateral)	23(46)
Nasal obstruction with headache	36(72)*
Nasal obstruction with headache(Bilateral)	15(30)
Nasal obstruction with headache(Unilateral)	21(42)
Nasal obstruction with epistaxis(Unilateral)	8(16)
Nasal Mass	22(44)
Smell	27(54)
Facial pain	12(24)
Mouth Breathing	10(20)
Change in voice	7(14)
Eye symptoms	6(12)

Table 2: Various symptoms reported by patients (n=50).

Endoscopic Findings	Total No. (%)
Ethmoidal Polyps	12(24)
Antrochonal Polyps	7(14)
Maxillary polyps	3(6)
Polyps with allergic mucin	12(24)
Polyps with mucopurulent discharge	8(16)
Black necrotic turbinate	2(4)
Polypoidal nasal masses	6(12)
Total	50(100)

Table 3(i): Endoscopic findings among the cases (n=50).

Radiological Findings	Total No. (%)
B/L involvement of sinuses	36(72)
U/L involemnt of sinus	14(28)
Widening , ballooning of OMC	21(42)
Fungus with double density sign	7(14)
Intraorbital extension with expansion of sinus	3(6)
Sinus wall expansion with thinning	2(4)
Destruction of medical wall of maxillary sinus	2(4)
Extension into the middle cranial fossa through the nasopharynx with destruction of medial pterygoid plate	1(2)
Pressure erosion of the septum with encroachment on the lateral nasopharyngeal wall	1(2)
Inverted papilloma	1(2)
Pneumocephalus in the right frontal recess with fungal sinus	89*

Table 3(ii): Radiological findings among the cases (n=50).

Histopathological finding	Total No. (%)
Allergic polyps (Eosinophil rich infiltrate)	18(36)
Infective (non specific )polyps	18(36)
Polyps with fungal hyphae	7(14)
Suppurative lesion	1(2)
Angiofibroma	2(4)
Inverted papilloma	1(2)
Neuroendocrine carcinoma of the nose &paranasal sinuses	1(2)
Cementoossifying fibroma of nose & maxillary sinus	1(2)
Well differentiated SCC of the left maxillary sinus	1(2)
Total	50(100)

Table 3(iii): Histopathological findings among the cases (n=50).

Clinical Diagnosis	Radiological Diagnosis	Total no(%)
Non specific polyps(N=15)		
Consistent		13(86.6)
Inconsistent		2 (13.4)
Allergic Fungal Polyp(N=12)		
Consistent		8(66.6)
Inconsistent		4 (33.4)
Antrochoanal Polyp(N=7)		
Consistent		7(100)
Inconsistent		0
Diffuse polyposis with chronic rhinosinusitis (N=8)		
Consistent		5(62.5)
Inconsistent		3(43.5)
Mucormycosis (N=2)		
Consistent		2(100)
Inconsistent		0

Table 4: Comparison of Clinically diagnosed cases with Radiological diagnosis in Non-neoplastic cases (n=44).

was done in cases of recurrences. Afterexcision, specimen were sent for histopathology and fungal staining. Besides Hematoxylin and Eosin stain, for specimen staining, L. P. C. B. (Lacto Phenol Cotton Blue), PAS(Paraaminosalicylic acid) stain and Gomori's Methamine Silver(GMS) stain were used. Statistical analysis was performed by using Mean, Chi square tests etc.

RESULTS: A total 50 cases of nasal polyps were studied. Age and sex wise distribution is shown in the Bar Diagram. Age of the patients ranged from 10 yrs to 80 yrs. Mean age was 40. 16 years. Total male

Clinical Diagnosis	Histopathological Diagnosis Total no(%)	P value
Non specific polyps(N=15)		
Consistent	12(80)	NS
Inconsistent	3 (20)	
Allergic Fungal Polyp(N=12)		
Consistent	7(58.3)	NS
Inconsistent	3 (41.7)	
Antrochonal Polyp(N=7)		
Consistent	7(100)	NS
Inconsistent	0	
Diffuse polyposis with chronic rhinosinusitis (N=8)		
Consistent	5(62.5)	NS
Inconsistent	3(43.5)	
Mucormycosis (N=2)		
Consistent	2(100)	NS
Inconsistent	0	

Table-5(i): Comparison of Clinically diagnosed cases with Histopathological diagnosis in Non-neoplastic cases (n=44).

Clinical Diagnosis	Histopathological Diagnosis Total no(%)	P value
Inverted Papilloma (N=1)		
Consistent	1(100)	NS
Inconsistent	0	
Angiofibroma (N=2)		
Consistent	2(100)	NS
Inconsistent	0	
Malignancy of Nose & PNS(N=1)		
Consistent	1(100)	NS
Inconsistent	0	
Juvenila Malignancy of Nose & PNS (N=1)		
Consistent	0	NS
Inconsistent	1(100)	
Malignancy of left Maxilla(N=1)		
Consistent	1(100)	NS
Inconsistent	0	

Table-5(i): Comparison of Clinically diagnosed cases with Histopathological diagnosis in Neoplastic cases (n=6).

patients were 27 (54%) and female were 23(46%). Out of 50 cases studied, 44(88%) were Non –neoplastic while 06(12%) were neoplastic. Among the non neoplastic conditions allergic polyps accounted for 27(54%) of cases. Among the Neoplastic lesions, 4(8%) were benign and 2(4%) were malignant. Nasal obstruction was the commonest symptom. Other symptoms other than nasal obstruction were, Nasal obstruction with Rhinorrhoea in 43(86%) followed by Nasal obstruction with headache in 36 (72%). The commonest endoscopic finding was Nasal polyps in 42(84%), followed by polypoidal nasal masses of neoplastic and non-neoplastic etiology in 6(12%) and black necrotic turbinate suggestive of mucormycosis in 2(4%). In radiological diagnosis, bilateral involvement of sinuses was seen in 36(72%), followed by unilateral involvement in 14(28%). Evidence of fungal disease with double density sign was present in 7(14%). Intraorbital extension with destruction of lamina papyracea was found in 3(6%) and destruction of medial wall of maxillary sinus wall was noted in

2(4%). Extension to the middle cranial fossa and pressure erosion of the septum with encroachment on the nasopharyngeal wall was seen in 1(2%) case each. Radiology was suggestive of Inverted papilloma in 1(2%) case. Pneumocephalus in the Frontal sinus with fungal sinusitis was seen in 1(2%) case. Confirmed histopathological findings were allergic polyps (Eosinophil rich infiltrate ) in 18(36%) and infective (non specific) polyps again in 18(36%), followed by polyps with fungal hyphae in 7(14%). Clinically diagnosed cases were compared with Radiological diagnosis in Non-neoplastic cases (n=44) and were categorized into two;1)Consistent with clinical findings and 2) inconsistent with clinical findings. The radiological diagnosis in Nonspecific polyps was consistent with clinically diagnosed cases in 13(86. 6%) while inconsistent in 2(13. 4%). All the cases of antrochoanal polyp(n=7) and mucormycosis(n=2) were correctly diagnosed radiologically. However radiology helped to diagnose Allergic fungal polyps in only 8(66. 6%) with inconsistency in 4(33. 3%) cases. Radiological diagnosis was consistent with clinical diagnosis of Angiofibroma in 2(100%) and 1(100%) case each of malignancy of Nose and PNS and malignancy of left maxilla. Overall, in Non-neoplastic cases(n=44) radiological consistency was in 35(79. 5%) and inconsistency with radiological diagnosis was in 9(20. 4%). This difference was statistically not significant. Maximum neoplastic cases were consistent radiologically with clinical diagnosis. Histopathological diagnosis in Nonspecific polyps was consistent with clinical diagnosis in 12(80%) cases while inconsistent in 3(20%). This difference was not statistically significant. In Allergic fungal polyps histopathological diagnosis was consistent in 7(58. 3%) and inconsistent in 3(41. 7%). In diffuse polyposis with chronic rhinosinusitis 5(62. %) and 3(43. 5%) were found consistent and inconsistent respectively with the histopathological diagnosis. All the clinically diagnosed cases of antrochoanal and mucormycosis showed consistent reports with the histopathological diagnosis. Comparison of Clinically diagnosed cases with Histopathological diagnosis in Neoplastic cases (n=6) showed only a single case clinically diagnosed of having malignancy of nose and PNS, histopathologically proved as cementoossifying fibroma of the nose and PNS. Rest all the diagnostic consistency were the same as the clinical diagnosis. Further, it was analysed that in Non-neoplastic cases(n=44) the Histopathological consistency was in 33(75%) and inconsistency in 11(25%) This difference was statistically not significant.

DISCUSSION: Nasal polyposis is a relatively common condition found in 1-4% of the general population<sup>2</sup>. Our 50 patients of non-neoplastic and neoplastic lesions of the nose presenting as nasal polyps were studied in relation to distribution of different lesions, age-sex distribution, presenting symptoms, nasal endoscopy, radiological and histopathological findings. We compared the histopathological and radiological diagnostic consistency with clinical diagnosis.

Out of 50 cases studied, 44(88%) were non-neoplastic and 6(12%) were neoplastic. Among the non neoplastic conditions, allergic polyps accounted for 27(54%) of cases. Among the neoplastic lesions, 4(8%) were benign and 2(4%) were malignant. Diamantopoulos et. al<sup>3</sup> conducted a study in 2021 patients presenting as nasal polyps and found 2008 non neoplastic and 13 neoplastic lesions. In our study, age of the patients ranged from 10- 80 yrs. Maximum number of patients were in the age group of 31-40 yrs. Mean age was 40. 16 yrs. A male preponderance of 1. 6:1 was found. In the study of 110 cases conducted by Mysorekar V et. al<sup>4</sup>, 66 cases were males, and 44 cases were females. Nasal polyps are more common, in adults than in children under 10 years of age<sup>5</sup>. Marked male preponderance of nasal polyposis has been widely reported<sup>6</sup>. Nasal obstruction (100%) was the commonest symptom in our study followed by nasal obstruction with rhinorrhoea 43(86%). Tahimet. Al<sup>7</sup> also found nasal obstruction in their 100% of cases, while nasal discharge was present in 90% of their patients. A diagnostic nasal endoscopy was performed on all patients before embarking on endoscopic sinus surgery. Most of our patients 42(84%) had benign nasal polyps. Most of the patients (76%) also had ethmoidal polyps in the study by Chopra. H<sup>8</sup>. Nasal endoscopy showed the characteristic allergic mucin resembling peanut butter, cheesy white debris in 12(24%). This was followed by polyps with mucopurulent discharge suggestive of chronic rhinosinusitis in 8(16%) and 7(14%) had antrochoanal polyps. Eight percent had antrochoanal polyp and cheesy debris was found in 32% of patients in the study by Chopra. H.

CT of the nose and paranasal sinuses is still the ideal imaging method to investigate nasal and paranasal sinus diseases with a high sensitivity. Radiologically in 36(72%) patients bilateral disease was found while unilateral disease was present in 14(28%) patients. Approximately half the cases (51%) occurred unilaterally, and many others showed asymmetric involvement (78%) as studied by Mukherji et al<sup>9</sup>, by the disease on two sides. Evidence of fungal disease with double density sign was present in 7(14%) patients. Intraorbital extension with destruction of lamina papyracea was found in 3(6%) and destruction of the medial wall of maxillary sinus was noted in 2(4%). Extension to the middle cranial fossa and pressure erosion on the septum with encroachment on the nasopharyngeal wall was seen in 1(2%) case each. Several studies have quoted the incidence of bony erosion with spread of pathology into the adjacent anatomic areas as 20% (Mukherji et. al). Radiology was suggestive of Inverted papilloma in 1(2%) cases. Pneumocephalus in the Frontal sinus with fungal sinusitis as a rare complication of sinusitis was seen in 1(2%) case. On CT, polyps appear as rounded bodies of soft tissue arising from the mucosal surfaces of nose and paranasal sinuses. Rarely a pedicle attaching the polypoid mass to the nasal mucosal lining can be seen clearly in the CT scan (pedicle sign). They never cause

bone erosion. If soft tissue mass arising from the nasal mucosa is associated with bone erosion then it is a definite pointer towards the diagnosis of malignancy. The unenhanced CT scan shows a characteristic heterogeneity of signal within the involved sinus, which has been given many names such as 'starry sky', 'ground glass' or 'serpiginous' patterns, but commonly referred to as the 'double density' sign is diagnostic of fungal polyps. This is best appreciated in the soft tissue windows<sup>10</sup>. Nose and PNS malignancies have irregular margins with evidence of thickened mucosa and a mass exhibiting viable enhancement following contrast infusions. Disruption of fascial planes beyond the sinus walls is the most characteristic CT sign for the identification of malignancy. Allergic polyps and Infective (non specific) polyps were proven histopathologically in 18(36%) each. Inflammatory polyps were classified as non-allergic polyps depending upon the predominance of eosinophils. In a study conducted by Mysorekar V et al, out of 110 cases, 72 cases were non allergic polyps and 18 cases were allergic polyps. Polyps with positive fungal hyphae were seen in 7(14%) subjects in our study. Ponikau et. al<sup>11</sup> demonstrated allergic mucin histologically in 96% of their 101 patients, emphasizing the importance of histopathological diagnosis for confirmation. Of the 6 patients with neoplastic lesions, 2(4%) were seen to have Angiofibroma, Inverted papilloma each. Cementossifying fibroma of the nose and paranasal sinuse, well differentiated SCC of the left maxillary sinus and Neuroendocrine tumour of the nose and paranasal sinus proven with immunohistochemistry was seen in 1(2%) cases each. In a 10 year study of 344 cases, Kate et. Al<sup>12</sup> studied 344 cases and observed 16 neoplastic lesions presenting as nasal polyps, out of which 9 were benign and 7 were malignant. Comparison of clinical and radiological findings in our study showed that there were 39(78%) patients in whom the radiological findings were consistent with that of the clinical suspicion. However in 11(22%), there was a difference in opinion. Out of 44 patients with clinically non- neoplastic benign polyps, consistent radiological findings were given in 35(79. 54%) patients. Of the 6 patients with clinically neoplastic lesions, similar radiological opinion was given in 4(66. 6%) patients. The radiological diagnosis in Non specific polyps was consistent with clinically diagnosed cases in 13(86. 6%) while inconsistent in 2(13. 4%). This indicates that radiological investigation is quite useful in diagnosis of nasal polyps. A similar study by H. Chopra, had 70% patients in which radiological findings were consistent with that of clinical suspicion and in 30% a difference in opinion. In the same study, of the 41 patients with clinically non-neoplastic benign polyps, consistent radiological findings were given in 33(80. 5%). Of the nine patients with clinically neoplastic lesions similar radiological opinion was given in only 2 patients (22. 2%). Comparison of clinical and histopathological findings showed that of the 44 patients with clinically non-neoplastic polyps, allergic polyps (Eosinophil rich

infiltrate) and infective (non specific) polyps were diagnosed in 18(36%) cases each. Out of 6 patients with clinically neoplastic lesions, similar histopathology opinion was given in 5(83.3%) and in 1(16.6%) the diagnostic results varied. One case of suspected malignancy in a 12 year old female turned out to be Cementoossifying fibroma of the maxilla on biopsy report. The histopathological diagnosis correlated with clinical diagnosis in the present study in 38(76%) patients. In the study by Kale et al and Diamantopoulos II et al the clinico - histopathological correlation was in 99.7% and 98.8% respectively. This relatively lower clinico-pathological correlation in the present study, when compared to the other studies can be attributable to the lesser number of cases included in the study. There was a discrepancy in diagnosing allergic fungal polypi in most cases. They were mainly reported as eosinophil rich polypi (Allergic fungal sinusitis like syndrome). But the management still remained the same as earlier i. e. complete removal of fungus and polypi. This difference could partially be attributed to lack of special stains for fungal hyphae in our centre, which markedly impaired the ability to recognize fungal elements on histopathology. However, histopathology still remains the gold standard for diagnosis in most cases. **CONCLUSION:** Since a lesion in the nasal cavity clinically presenting as nasal polyp can either be neoplastic or non neoplastic, all nasal polyps excised should be submitted for histopathological examination. A comprehensive management plan incorporating nasal endoscopy, radiology and histopathology remains the most likely means of diagnosing and providing long term disease control for nasal polyps. While

radiology proves to be indispensable, as it provides a road map to the endoscopic surgeon and warns one of any existing or impending complications, histopathology gives a confirmatory diagnosis. **REFERENCES:**

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