

# Clinical and Radiological Study of Antrochoanal Polyps

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## ABSTRACT

**Introduction:** A polypoidal mass in the nasal cavity is a commonly encountered but its treatment often presents a clinical dilemma, as a diverse group of lesions may present themselves as polypoidal masses. Computerized Tomography (CT) provides essential preoperative information for the assessment of patients undergoing functional endoscopic sinus surgery (FESS). Aim of the research was to study the Clinical (endoscopic) and radiological correlation of antrochoanal polyps and to aid for management of these cases depending on their radiological features.

**Material and methods:** Study group 50 patients with nasal polypoid masses, who were treated for a period of 2 years. Patients were subjected to a comprehensive history and clinical evaluation, radiological evaluation and histological examinations as per the proforma designed for study.

**Results:** In study of 50 cases of antrochoanal polyps, the maximum incidence is in 11 to 20 years age range (40%) followed by 21-30 years age (36%) and predominantly in females (60%). Unilateral presentation of antrochoanal polyps (100%) was most commonly with predominance of right side (76%) and 60% of antrochoanal polyps had posterior. Nasal obstruction was the prominent symptom (100%). More number of patients were seen with complaints of headache (36%) which is one of the main symptom of sino nasal pathologies. Sinus tenderness is to be the most predominant sign seen in most of the patients, (86%). In 33 (66%) of 50 patients we found mucosal thickness as associated findings, evidenced by CT; only 30 (60%) of 50 patients had the same problem in nasal endoscopy.

**Conclusion:** CT scans form an important and reliable objective assessment tool for patients undergoing surgery for sino nasal pathologies.

**Keywords:** Antrochoanal polyps, Functional endoscopic sinus surgery, Computerized Tomography.

## INTRODUCTION

A polypoidal mass in the nasal cavity is a commonly encountered by most of the Otorhinolaryngologists all over the world. Despite the high prevalence, its treatment often presents a clinical dilemma, as a diverse group of lesions may present themselves as polypoidal masses. They may be simple mucosal polyp or a variety of other pathological entities like infective granulomatous diseases, papillomas, vascular masses or neoplasms. A number of deceptively benign looking polyps often turn out to be intracranial lesions, such as meningocele or encephalocele and these exemplify the difficulty faced by the clinicians. However, only by histopathological examination of excised polypoidal tissues one can arrive at the final diagnosis. This study is intended to assess, differentiate and manage the various conditions presenting as antrochoanal polyps. Also to understand their exact nature by histopathological examination and to understand their site of involvement by radiological investigations

(CT scan), for placing them under established classification and thereby learn the relative incidence of Antrochoanal polyps, in our geographical area.

CT has become the standard diagnostic tool in evaluation of paranasal air. CT scan evaluation of the patients, who have to undergo eventually FESS, is extremely useful in confirming the clinical diagnosis, for knowing the extension of the disease and any abnormalities in the anatomy of paranasal air sinuses. Computerized Tomography (CT) scan play a vital role in the present day to day assessment of all the sinonasal pathologies and their management.<sup>1</sup> Though the investigation is expensive and having merits and demerits of its own, this study will help in having an insight into the necessity of this investigation.<sup>2</sup> Variations in intranasal and sinus anatomy have been implicated in the aetiology of sinonasal disease, and CT imaging has become an important diagnostic tool. Despite this, some patients present with symptoms and signs suggests sinonasal disease, yet demonstrate little abnormality on CT scan.<sup>3</sup> The pre-operative diagnosis for these patients is based upon the combination

of endoscopy of the lateral nasal wall along with CT scan of the paranasal sinuses, but however, the prevalence of the mucosal changes in an asymptomatic population is quite significant.<sup>4</sup> The present study was done to correlate and evaluate between the clinical and radiological findings (CT Scan) of antrochoanal polyps.

Computerized Tomography (CT) provides essential preoperative information for the assessment of patients undergoing functional endoscopic sinus surgery (FESS). One of the aim of CT of the sinuses is to delineate the extent of the disease, define any anatomical variants and relationship of the sinuses with the surrounding important structures. At present, CT scanning is the most commonly used imaging technique for assessing Sino nasal pathologies and defining the anatomical abnormalities.

The primary role of the coronal CT scan is to determine the extent and if possible the underlying cause. As a rule, surgeons individualize their surgical approach according to the extent and location of disease, they see on CT scan. Endoscopic techniques for paranasal sinus surgery have allowed detailed and complete visualization of sinus disease while promising minimum distress to the patient. The endoscopic view of the operative field shows details of the sinus anatomy and its disease. It is possible to see areas of the cribriform

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and orbital wall that are at risk to produce cerebrospinal fluid rhinorrhoea and orbital complications during the surgery respectively. At the same time, landmarks for avoiding these complications can be defined to guide the surgeon during the surgery as seen through the endoscope.

Anterior rhinoscopy reveals little information with regard to the middle meatal cleft and provides no information regarding the infundibulum and maxillary sinus orifice. Nasal endoscopy provides the ability to accurately access these areas for evidence of localized disease, or for the anatomical defects that compromise ventilation and mucociliary clearance.

Hence computerized tomography(CT) and endoscopy have revolutionised the understanding and management of sino nasal pathology in recent times. Recently combination of systematic understanding of the lateral nasal wall with CT in the coronal plane and endoscopy has become the corner stone in the evaluation of the PNS disease. This is the basis for the concept of FESS.

**MATERIAL AND METHODS**

Study group 50 patients with nasal polypoid masses, who

	Antrochoanal polyps ( n=50)	Percentage
Age Group		
0 – 10	4	8%
11 – 20	20	40%
21 – 30	18	36%
31 – 40	2	4%
41 – 50	3	6%
51 – 60	3	6%
Gender		
Male	20	40%
Female	30	60%
Symptoms of antrochoanal polyps		
Nasal Obstruction	50	46%
Nasal Mass	23	70%
Rhinorrhoea	35	26%
Post nasal Discharge	13	28%
Smell Disturbance	14	10%
Epistaxis	5	36%
Headache	18	10%
Sneezing	5	100%
Duration of symptoms of Antrochoanal polyps		
0– 6	17	34%
7 – 12	17	34%
13– 24	10	20%
> 24	6	12%
Incidence		
Recurrence absent	45	90%
Recurrence present	5	10%

**Table-1:** Details of Antrochoanal polyps

were treated at Guntur Govt. general Hospital, Guntur attached to Guntur Medical College, Guntur between nov 2012 and october 2014. Sample size was based on inclusion and exclusion criteria.

**Inclusion criteria:** The patients of all age groups of both sexes presenting with nasal symptoms and who on anterior rhinoscopy revealed polypoidal mass in either or both nasal cavities.

**Exclusion criteria:** Patients presenting with congenital nasal mass or nasal mass, of intra cranial origin such as basal meningocoele, basal meningo-encephalocele and nasal glioma Patients were subjected to a comprehensive history and clinical evaluation, radiological evaluation and histological examinations as per the proforma designed for this study.

The histopathological slides and blocks were taken from the department of pathology and were reviewed by the pathologist. The radiological data and reports were taken from the department of radiology and were reviewed by the radiologist.

Heamatological investigations like Hb%, total leukocyte count, Differential count, Absolute eosinophil count, bleeding time, clotting time, blood grouping and typing and urine examination were done. Radiological investigations included plain paranasal sinus x-rays (Water’s view/ Caldwell’s view/Lateral view), Computerised tomographic scan of nose and paranasal sinuses (coronal and axial with or without contrast enhancement) was done in all cases.

**RESULTS**

A total number of 50 cases were studied during two years period. The following observations were made and analyzed. Antrochoanal polyps had an incidence of 8% in the age group of 0 to 10 years and incidence of 40% in the 11 to 20 years, followed by 36% in the age group of 21 to 30 years, 41 to 50 years and 51 to 60 years has got 6%. Overall, females dominated with the ratio of 0.66:1. In our present series females dominating in antrochoanal polyps.

Nasal obstruction was found in all cases with majority (100%). Other symptoms included rhinorrhoea 70% and post nasal discharge 26%. Anterior rhinoscopy showed mass in nasal cavity in most of cases and showed posterior extension in post nasal examination in 30 cases. Antrochoanal polyps had a maximum duration of symptoms with 0 -6 and 7-12 months (34%). Incidence of recurrence of Antrochoanal polyps is 10%.

According to the clinical findings, antrochoanal polyps had 100% unilateral presentation with predominance of right side (76%). while antrochoanal polyps presented as solitary polypoidal mass in all cases (100%). 60% of antrochoanal polyps had posterior extension.

Type	Laterality		No of cases visualized in posterior rhinoscopic Examination	
	Right	Left	Visualized	Not Visualized
Antro Choanal polyps	38	12	30	20
Percentage	76%	24%	60%	40%

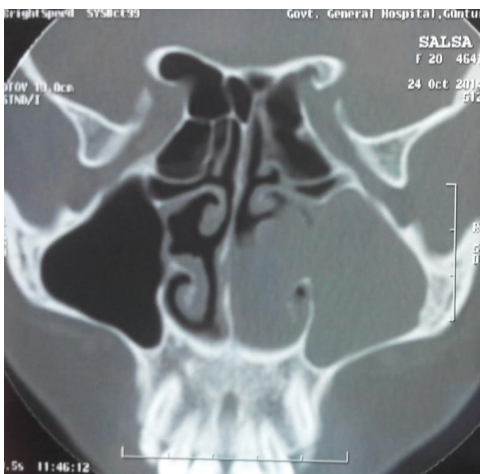
**Table-2:** Clinical findings in cases of Antrochoanal polyps

Findings	Total CT scan	Endoscopy Positive CT scan
Mucosal thickness	28	2
Left OMC patency	32	2
Right OMC patency	31	3
Hypertrophy of Inferioturbinate	32	1
Hypertrophy of middle turbinate	7	1
Septal deviation	31	0
Polyp	50	0
Cyst	6	0
Concha bullosa	4	0

**Table-3:** Correlation between CT- Scan and endoscopic features in patients with sino nasal pathologies

Types	Antrochoanal polyps	Percentage
Inflammatory (Neutrophils + Plasma cell predominance )	38	76%
Allergic (Eosinophilic predominance)	12	24%

**Table-4:** Histopathological pattern of Antro Choanal polyps



**Figure-1:** CT-PNS right antrochoanal polyp; Endoscopic view of Antrochoanal polyp

Hypertrophied middle turbinate is found in 34 %whereas non purulent middle meatal discharge is seen in 30% of the patients. Other signs like inferior turbinate hypertrophy are seen in 42%, oedematous nasal mucosa in18%, congested

mucosa in 34% and pale mucosa in 26%. Normal mucosa is seen in 22% of the patients. In antrochoanal polyps recurrence incidence was less (10%).

**DISCUSSION**

The present study was conducted on 50 patients enumerated the clinico-radiological features of antrochoanal polyps in the nasal cavity. The patients are in the age group of 6 to 78 years with the mean age being 20 years. Of the patients, 20 were males and 30 were females.

In our study the age incidence of 37 out of 50 patients with antro choanal polyps, ranged between 16 to 45 years. Out of them the majority belonged to 11 to 20 years of age (40%). This has a difference of 26.5% higher incidence in adolescent group. Antrochoanal polyps are said to be more common in children and adolescents. Study done by Ramesh C.Deka et al<sup>5</sup> out of 120 patients majority of patients belong to adolescent age which well correlates with our study.

In our study of 50 cases, males dominated with 20 cases (40%). The male to female ratio was 1:1.5. Study also correlates with previous studies. Our study is nearly on par with the study conducted by Anuj kaushal et al<sup>7</sup> with respect to male: female ratio it is.<sup>6</sup>

Antrochoanal polyp had symptoms of unilateral nasal obstruction (100%) and unilateral presentation (100%), post nasal discharge (26%), which closely resembles Anuj kaushal et al<sup>7</sup>

In the study conducted by Fikret Kasapoglu et al<sup>8</sup> the most common findings are deviated nasal septum noted in 18 (41.9%) cases on CT scan. In the study conducted by Jareoncharsri P et al<sup>9</sup> septal deviation is obvious in 60(72.3%) of the patients out of 83 cases on nasal endoscopy. No conclusive literature is present to compare CT scan and endoscopy of deviated nasal septum on the same patients.

Osteomeatal complex block is seen in 17(34%) cases on diseased side on nasal endoscopy. The block is assessed with an angled endoscope and in many of the cases with the help of a curved suction tube which can be passed into the ostium, thereby confirming block. On CT scan the present study shows 19(38%) cases on diseased side has block.

In the study conducted by Zojaji et al<sup>10</sup> OMC block is seen in 18(36%) on right and 17(34%) on left when seen by CT scan and 15(30%) on both right and left when seen by nasal endoscopy. On comparison the present study shows similar results.

Pneumatized uncinata process is seen in 2 cases (4%) on the right and one case on the left on CT scan, while on FESS only 1case (2%) is seen on the left. In the study conducted by G.L Fadda et al<sup>11</sup> pneumatized uncinata process is noted in 1(0.7%) case on the right and 4(2.8%) on left. On comparison both the studies shows almost equal percentage of patients with pneumatized uncinata.

Agger nasi: 8(16%) cases on the right and 14((28%) cases were demonstrated with FESS whereas on CT scan shows 15 (30%) on right and 18(36%) cases on the left. In the study conducted by Sheetal D et al<sup>1</sup> on CT scan the Agger nasi cells are present in 37% and 33% of the cases on the right and left sides respectively. cells. On comparing both studies showed similar number of cases with Agger nasi



Onodi cells is only seen on CT scan in 2(4%) cases on the right side. Importance of Onodi cells is its close relation to the optic nerve and it can be only appreciated completely in axial cuts of the CT scan hence making axial cuts to be a must in CT study of paranasal sinus.

Middle turbinate concha bullosa is the most common variation present, seen both in nasal endoscopy and CT scan. 4(8%) cases show concha bullosa on nasal endoscopy whereas CT scan shows 6(12%). The advantage of CT scan is that it detects both lamellar as well as concha pneumatization with more accuracy. The presence of concha is more important, because pneumatization of middle turbinate causes compression of the middle meatus and hence causes narrowing of the hiatus semilunaris.

Paradoxical middle turbinate is seen only on left side in 3 (6%) on endoscopy whereas on CT scan 1 (2%) case is seen on the right and 5 (10%) is seen on the left side.

In the study by Sheetal D et al<sup>1</sup> on CT scan Concha bullosa is seen in 35% and 42% of the patients on the right and left sides respectively. On endoscopy concha bullosa is seen in 33% and 40% of the patients on the right and left sides respectively. On CT scan Paradoxical middle turbinate is seen in 17% and 8% of the patients on the right and left sides respectively. On comparison, present study has less number of paradoxical middle turbinate as well as concha bullosa.

Hypertrophy of Middle turbinate is seen in 8(16%) cases on Nasal Endoscopy and CT scan. The hypertrophy of the middle turbinate is mostly seen in cases with allergy. In the similar study conducted by Zojaji et al<sup>10</sup> out of 51 patients, middle turbinate hypertrophy is seen in 8(15.6%) cases endoscopically and 7 (13.7%) cases in CT scan. On comparison both the studies have almost similar number of cases seen with middle turbinate hypertrophy.

Inferior turbinate hypertrophy: It is seen in 33 (66%) patients on both right and left on Nasal Endoscopy, whereas on CT scan shows 35 (70%) on both the left and right side. The striking finding seen both in CT and Endoscopy is the inferior turbinate hypertrophy is always bilateral and in no case can a unilateral hypertrophy be seen and in most of the cases it is associated with pale mucosa indicating allergic condition. Pale inferior turbinate is evident in 31 cases on the right (62%) and 31 cases on the left (62%). Whereas this finding is not appreciated on CT scan, hence indicating that the condition of the mucosa whether pale, congested and edematous can only be clearly appreciated on endoscopy, whereas CT scan holds no diagnostic value about the condition of the mucosa.

In the study conducted by S. Naghibi et al<sup>12</sup> Hypertrophy of the inferior turbinate is the most obvious finding in the CT scan (70.6%) as well as in endoscopic evaluation (68.6%).

On comparison with the present study both the studies shows nasal endoscopy as well as CT scan can detect hypertrophied inferior turbinate in almost equal percentage of cases.

Polyp is seen in 50 cases detected on nasal endoscopy whereas CT scan also showed 50(100%) findings, thereby showing that CT para nasal sinuses has more sensitivity in evaluating polyps. Mild polyposis could not be seen in Nasal Endoscopy.

Masses and Cysts in CT Scan and nasal endoscopy showed

almost similar results. Maxillary mucosal thickening noted in 23(46%) cases on CT scans and 20(40%) in nasal endoscopy. Anterior ethmoidal and sphenoid sinus haziness is seen in 12 cases (24%) in CT scans and 8(16%) in nasal endoscopy. Maxillary mucosal thickening is mostly seen associated with other sinus involvement.

In the study of Sheetal D et al<sup>1</sup> on CT scan maxillary sinus is found to be the most common sinus to get affected (57% on the right and, 46% on the left side), followed by the anterior ethmoid cells (40% on the right and, 37% on the left side), the posterior ethmoid cells (33% on the right and, 28% on the left side), the frontal sinus (28% on the right and, 26% on the left side) and, sphenoid (20% on the right and, 13% on the left side) respectively.

CT has become the standard diagnostic tool in the evaluation of paranasal sinuses. When coupled with nasal endoscopy, it provides most of the objective data needed for diagnosing sino nasal pathologies. The aim of this study was to determine the correlation between preoperative CT and clinical features, in patients with sino nasal pathologies. The results of our study indicated that although for most of the findings, there was a good to excellent level of agreement between the results of the two methods. According to the present results, the finding of hypertrophic inferior turbinate was more evidenced in CT scan compared to sinus endoscopy (88% vs 84%).

In 33 (66%) of 50 patients we found mucosal thickness as associated findings, evidenced by CT; only 30 (60%) of 50 patients had the same problem in nasal endoscopy. This discrepancy may be due to the fact that up to 40% of asymptomatic individuals have incidental opacification of the paranasal sinuses on CT. In children, the prevalence of mucosal change is even larger. CT scans form an important and reliable objective assessment tool for patients undergoing surgery for sino nasal pathologies.

No single intervention, questionnaire, or radiologic study is sufficient to make the diagnosis alone. When combined with a directed and thoughtful history, CT Scan can yield valuable information regarding anatomic location and severity of the disease which will act as "road map" for the surgeon who plans FESS.

The polyps are divided into two types depending on the eosinophils and inflammatory cells. The eosinophilic polyp, which have abundant eosinophils are said to be associated with allergy while inflammatory polyps with scanty eosinophils and moderate number of lymphocytes, plasma cells and neutrophils are said to be associated with chronic inflammation.

Dandapath A<sup>13</sup> found an incidence of only 48.7% of eosinophilic variety among nasal polyps. However in our study 76.19% of antrochoanal polyp showed inflammatory cell type, mainly lymphocytic.

## CONCLUSION

CT scan has got a better advantage compared to nasal endoscopy in detecting the anatomical variations, number of sinuses involved as well as to know the extent of disease in sinuses.

Pneumatized uncinat process is better seen in CT scan than

Nasal endoscopy as that condition is present in few cases only. It is an anatomical variation that causes narrowing of the infundibulum there by leading to sino nasal pathologies. Most of the important findings like OMC block, Hypertrophy of turbinates, septal deviation, polypoidal mass, were detected both in CT and nasal endoscopy and showed good correlation. Mucosal thickness, Concha bullosa are better seen in CT rather than Endoscopy. Nasal endoscopy can prove to be a better diagnostic modality compared to CT scan when conditions like middle meatal secretions, condition of mucosa, polyps are looked for. The study stresses that in all patients with sino nasal disease CT scan has to be done, to know the exact pathology, any anatomical abnormalities and to plan for FESS. From this study it is evident that CT can complement for diagnosis there by facilitating surgery (FESS) to a great extent. CT scan provides findings almost similar to the preoperative findings of Nasal endoscopy and helps in management and provides “road map” to the surgeons if FESS is indicated.

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