



ROLE OF NASAL ENDOSCOPY IN DIAGNOSIS OF NASAL PATHOLOGY.

Anaesthesiology

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ABSTRACT

Introduction: Accurate examination of nasal pathology is essential for timely diagnosis and management of sinonasal conditions. Conventional methods include anterior and posterior rhinoscopy, while rigid and flexible nasal endoscopy have become the gold standard due to better visualization and diagnostic accuracy. This study evaluates the diagnostic accuracy, patient comfort, compliance, and convenience of nasal endoscopy compared to conventional methods. **Methodology:** A hospital-based prospective cross-sectional study was conducted from August 2022 to July 2024 in a tertiary care hospital in Maharashtra. A total of 152 patients presenting with nasal masses were included. Patients underwent anterior/posterior rhinoscopy, diagnostic nasal endoscopy, and imaging (CT/X-ray) as indicated. Patient compliance and convenience were assessed using predefined criteria and a 5-point scale. **Results:** Of 152 patients, 57.32% were males and 42.68% females. Common symptoms were rhinorrhea (73.68%), nasal obstruction (61.18%), and headache (44.73%). Nasal endoscopy detected significantly more cases of ethmoidal polyps (30 vs. 21; $p < 0.01$) and rhinolith/foreign body (6 vs. 2; $p < 0.05$) than conventional methods, with fewer "no abnormality detected" labels (25 vs. 59; $p < 0.0001$). Patients reported higher comfort (53.28%), better compliance (44.74%), and greater convenience with endoscopy. Follow-up showed endoscopy enabled early detection of recurrence in nasal tumors, ethmoidal polyps, and mucormycosis, with FESS and combination therapy yielding better outcomes than medical treatment alone. **Conclusion:** Nasal endoscopy is superior to conventional rhinoscopy in diagnostic accuracy, patient comfort, compliance, and procedural convenience. It provides vision-controlled guidance for reliable diagnosis and effective follow-up of nasal and nasopharyngeal pathologies prone to recurrence.

KEYWORDS

Nasal endoscopy; Sinonasal masses; Diagnostic accuracy; Patient compliance

INTRODUCTION

Examination of nasal pathology is essential for timely diagnosis and management of sinonasal conditions. Various methods exist, including anterior rhinoscopy using a nasal speculum, posterior rhinoscopy with a mirror, rigid nasal endoscopy, and flexible fiberoptic nasal endoscopy. Among these, rigid and flexible nasal endoscopy has gained popularity and is now considered the gold standard for nasal evaluation due to their superior visualization and diagnostic accuracy [1]. Sinonasal masses are frequently encountered in routine otorhinolaryngology practice, but their diagnosis can be challenging due to late presentation and overlapping symptomatology with common rhinosinusitis [2,3]. Detailed history, thorough clinical examination, and imaging studies such as CT or MRI are often required to establish a probable diagnosis [3,4].

Endoscopic techniques offer several advantages over conventional approaches, including better illumination, minimal tissue manipulation, and reduced postoperative complications, which has led to a gradual replacement of traditional septal surgery with endoscopic procedures [4]. The rising prevalence of nasal and nasopharyngeal masses worldwide, attributed partly to environmental factors such as air pollution, has highlighted the importance of accurate diagnostic methods for both benign and malignant conditions [5]. Although CT scans provide reliable assessment of disease extent and complications, their limited availability in resource-poor settings emphasizes the role of endoscopy as a primary diagnostic tool [6].

Considering these factors, this study aims to evaluate the **accuracy of nasal endoscopy compared to conventional anterior and posterior rhinoscopy**, assess **patient comfort and compliance with endoscopic procedures**, and examine the **role of endoscopy in the diagnosis and follow-up of ethmoidal polyposis, mucormycosis, and nasal tumors known for recurrence**.

METHODOLOGY

A **hospital-based prospective cross-sectional study** was conducted in the Department of Otorhinolaryngology, Tertiary Care Hospital, Maharashtra from **August 2022 to July 2024**.

Study Population: Patients presenting with history of nasal mass.

Inclusion Criteria:

- Nasal obstruction/discharge >1 month not responding to medical

treatment.

- Recurrent epistaxis.
- Smell disturbance, post-nasal discharge, headache >1 month.
- Foreign body sensation, facial pain, deviation of eyeball.

Exclusion Criteria:

- Acute epistaxis.
- Patients not consenting/assenting.

Sample Size & Sampling:

Universal sampling was used. All eligible patients from OPD, emergency, and wards were screened. **152 patients** meeting inclusion criteria were included. Evaluation included anterior rhinoscopy, diagnostic nasal endoscopy, and CT/X-ray where indicated. Follow-up ranged from **1 month to 12 months**.

Ethical Considerations:

Approval was obtained from IEC. Informed consent was taken from all patients (>18 yrs) and assent with parental consent for those <18 yrs.

Study Variables:

- Socio-demographic:** age, sex, occupation, symptoms, history.
- Nasal pathology:** allergic rhinitis, CRS, fungal rhinosinusitis, mucormycosis, polyps, DNS, epistaxis, neoplasm, rhinosporidiosis, etc.
- Procedures:** nasal endoscopy, anterior/posterior rhinoscopy, CT, X-ray PNS.
- Compliance with pre- and post-procedure instructions** was assessed using the following criteria:
 - Good:** Patient fully complied with all instructions without issues.
 - Fair:** Patient complied with most instructions but had minor issues or needed reminders.
 - Poor:** Patient had significant issues with compliance, affecting the procedure's outcome.
- Convenience of procedure duration** from the patient's perspective was rated on a 5-point scale:
 - Procedure took much longer than expected and was very time-consuming.
 - Procedure took longer than expected.
 - Procedure took an average amount of time.
 - Procedure was relatively quick.
 - Procedure was very quick and efficient.

Data Collection And Management:

Data were collected using a pre-tested proforma after obtaining informed consent. Each participant underwent detailed history-taking and ENT examination including anterior/posterior rhinoscopy and nasal endoscopy under local anesthesia, with CT scan of nose and paranasal sinuses done where required. Endoscopic procedures and surgeries were performed as indicated, and patients were followed up at 1, 3, 6, and 12 months. Compliance with pre- and post-procedure instructions was recorded as good, fair, or poor based on patient adherence, and convenience was assessed from the patient's perspective using a 5-point scale of procedure duration. All collected data were checked daily for completeness, entered into Microsoft Excel, cleaned, and analyzed. Quantitative variables were expressed as mean, standard deviation, and percentages, while categorical variables were expressed as proportions.

RESULT:

A total of **152 patients** were studied, of which **87 (57.32%) were males** and **65 (42.68%) were females**. The majority of patients belonged to the **21–30 years (23.02%)** and **31–40 years (22.36%)** age groups, followed by **11–20 years (20.39%)**. Fewer patients were observed in the **41–50 years (13.81%)**, **51–60 years (10.52%)**, and **>60 years (6.62%)** age groups, while the least were in the **1–10 years group (3.28%)**. (Figure 1)

The most common symptom among study subjects was **rhinorrhea (73.68%)**, followed by **nasal obstruction (61.18%)**, **headache (44.73%)**, **sneezing (38.81%)**, **hyposmia (17.10%)**, **post-nasal drip (15.78%)**, and **epistaxis (11.85%)**. Most patients presented with multiple symptoms. (Figure 2)

In the present study of 152 cases, **nasal endoscopy diagnosed more cases than conventional methods in most pathology**. Endoscopy detected **ethmoidal polyps in 30 vs. 21 cases by conventional methods ($p < 0.01$)** and **rhinolith/foreign body in 6 vs. 2 cases ($p < 0.05$)**, showing significantly higher accuracy. For conditions like chronic rhinosinusitis, allergic rhinitis, antrochoanal polyp, neoplasm, epistaxis, rhinosporidiosis, and mucormycosis, endoscopy identified slightly more cases than conventional methods, though the differences were not statistically significant. Interestingly, a larger number of patients were labeled as “no abnormality detected” (NAD) by conventional methods (59 cases) compared to endoscopy (25 cases), which was highly significant ($p < 0.0001$) (Table 1)

In this study, a higher proportion of subjects reported comfort with **endoscopy (53.28%)** compared to **anterior/posterior rhinoscopy (38.81%)**, while fewer found endoscopy uncomfortable (36.84% vs. 47.36%). Indifference was reported by 9.88% during endoscopy and 13.83% with conventional methods. The difference was statistically significant ($\chi^2 = 6.4571$, $p = 0.039$). (Table 2)

In the present study, compliance with pre- and post-procedure instructions was significantly better with **endoscopy**, where **44.74% showed good compliance** compared to **23.68% with conventional methods**. Poor compliance was much lower with endoscopy (9.21%) than with rhinoscopy (26.97%), while fair compliance was comparable (46.05% vs. 49.34%). This difference was highly significant ($\chi^2 = 23.27$, $p < 0.0001$). (Table 3)

In this study, patients perceived endoscopy as significantly more convenient in terms of procedure duration compared to conventional methods ($\chi^2 = 140.20$, $p < 0.00001$). While most subjects undergoing conventional rhinoscopy felt the procedure was longer or very time-consuming (67.8%), the majority of endoscopy patients rated it as average (44.7%), relatively quick (34.2%), or very quick (15.8%). (Table 4)

Follow-up of 8 nasal tumor cases using endoscopy showed recurrence in one case of capillary haemangioma at six months, one case of nasopharyngeal carcinoma at one year, rhabdomyosarcoma at three months, and non-Hodgkin's lymphoma at six months, while inverted papilloma showed no recurrence. Among 32 cases of ethmoidal polyps, recurrence was highest with topical steroids alone (7 cases at one year), lower with FESS (2 cases at one year), and least with combined treatment (3 cases at one year). Of 5 mucormycosis cases, recurrence occurred in one case treated with antifungal drugs alone at six months and one case treated with antifungal plus surgical debridement at one year. These findings highlight the role of

endoscopy in effective monitoring and detecting recurrence, with FESS and combination therapy showing better outcomes than medical treatment alone. (Table 5)

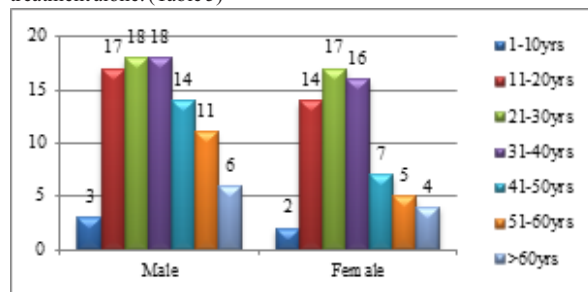


Figure 1: Distribution Of Study Subjects According To Their Age And Gender.

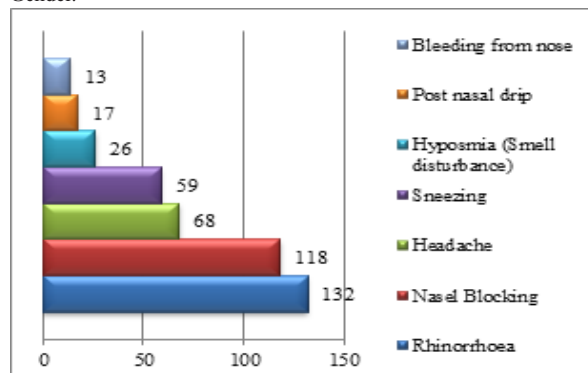


Figure 2: Distribution Of Study Subjects According To Symptoms Experienced.

Table 1: Distribution Of Study Subjects According To Diagnosis Made By Conventional Methods And By Nasal Endoscopy.

Diagnosis	Final Diagnosis using CT scan.	Diagnosed by Conventional method 152(100%)	Diagnosed by Endoscopy 152(100%)	P value McNemar's test
Ethmoidal polyps	32(21.05%)	21	30	<0.01
Chronic rhinosinusitis	29(19.08%)	26	28	0.317
Allergic rhinitis	21(13.81%)	12	19	0.069
Deviated nasal septum	15(9.86%)	10	12	0.157
Antrochoanal polyp	11(7.24%)	8	11	0.083
Neoplasm	08(5.26%)	3	7	0.10
Epistaxis	07(4.60%)	6	7	0.267
Rhinolith/FB in nose	07(4.60%)	2	6	<0.05
Rhinosporidiosis	06(3.94%)	3	5	0.317
Mucormycosis	05(3.28%)	2	2	1.00
NAD	11(7.24%)	59	25	<0.0001

Table 2: Distribution Of Study Subjects According To Comfort Perceived By Study Subjects In Different Procedures.

Comfort perceived	Anterior rhinoscopy/ Posterior rhinoscopy	Endoscopy	Chi square (P value)
Comfortable	59(38.81%)	81(53.28%)	$\chi^2 = 6.4571$ 0.039
Uncomfortable	72(47.36%)	56(36.84%)	
Indifferent	21(13.83%)	15(9.88%)	
Total	152(100%)	152(100%)	

Table 3: Distribution Of Study Subjects According To Compliance With Pre- And Post-Procedure Instructions.

Compliance with Pre- and Post-Procedure Instructions	Conventional Method (rhinoscopy)	Endoscopy	Chi square, P value
Good	36(23.68%)	68(44.74%)	$\chi^2 = 23.27$ <0.0001
Fair	75(49.34%)	70(46.05%)	

Poor	41(26.97%)	14(09.21%)	
Total	152(100%)	152(100%)	

Table 4: Distribution Of Study Subjects According To Convenience Using Procedure Duration From Patient's Perspective.

Convenience using Procedure duration	Conventional Method	Endoscopy	Chi square, P value
1: The procedure took much longer than expected and was very time-consuming.	25(%)	05(%)	$\chi^2 = 140.1952$ <0.00001
2: The procedure took longer than expected	78(%)	03(%)	
3: The procedure took an average amount of time.	38(%)	68(%)	
4: The procedure was relatively quick.	09(%)	52(%)	
5: The procedure was very quick and efficient.	02(%)	24(%)	
Total	152(100%)	152(100%)	

Table 5: Follow Up Of Cases According To Recurrence.

Diagnosis	No. of cases	Follow up at					
		3 Months		6 Months		1 Year	
		RE	NR	RE	NR	RE	NR
Follow up of all the cases of Nasal tumors by Endoscopy for recurrence.							
Capillary Haemangioma	3	0	3	1	2	1	2
Ca. Nasopharynx	2	0	2	0	2	1	1
Inverted Papilloma	1	0	1	0	1	0	1
Rhabdomyosarcoma	1	1	0	-	-	-	-
NHL	1	0	1	1	0	-	-
Follow up of all the cases of Ethmoidal polyps by Endoscopy for recurrence.							
Topical Steroid	12	2	10	3	9	7	5
FESS	6	1	5	1	5	2	4
Topical Steroid first then FESS	14	0	14	1	13	3	11
Follow up of all the cases of Mucormycosis by Endoscopy for recurrence.							
Antifungal	2	0	2	1	1	1	1
Antifungal and Surgical debridement	3	0	3	0	3	1	2

DISCUSSION

In the present study, males (57.32%) predominated over females (42.68%), with most cases in the second to fourth decades, consistent with Lathi A et al.[7] and Deosthale NV et al.[2] Nasal symptoms were multiple, with rhinorrhea (73.68%) being the most frequent, followed by nasal obstruction (61.18%) and headache (44.73%). While our findings highlight rhinorrhea as the leading symptom, other studies such as Lathi A et al.[7] and Bakari A et al. [8] reported nasal obstruction as most common, showing some population- and pathology-related variability.

Regarding diagnostic accuracy, nasal endoscopy demonstrated clear superiority over conventional methods, particularly for ethmoidal polyps (30 vs. 21 cases, $p < 0.01$), allergic rhinitis, and rhinolith/foreign bodies ($p < 0.05$). For certain conditions such as chronic rhinosinusitis and deviated nasal septum, both methods showed comparable results. These findings align with Gupta Y et al.[9], and Abou-Elhamd K et al.[10], all of whom emphasized the added diagnostic yield of endoscopy over anterior rhinoscopy, especially for posterior nasal lesions.

Endoscopy also proved valuable in **follow-up of recurrent diseases**. In ethmoidal polyposis, recurrence was highest with topical steroids alone (58.3% at one year), while FESS alone (33.3%) and combined therapy (21.4%) showed better outcomes. This pattern parallels studies by DeConde AS et al.[11] and Singh SP et al.[12], supporting surgery-based approaches as more effective. Among nasal tumors, recurrences were identified in capillary haemangioma, Ca. nasopharynx, rhabdomyosarcoma, and NHL, whereas inverted papilloma remained recurrence-free, highlighting the role of endoscopy in early detection. Comparisons with Khademi BI et al.[13] and Winter S et al.[14] confirm its utility in long-term monitoring. For mucormycosis, recurrence was lower with combined antifungal and surgical treatment compared to antifungal therapy alone, similar to

Jain AK et al.[15] and Sachdeva K et al.[16], reaffirming the need for multimodal therapy with vigilant endoscopic follow-up.

Patient-centered outcomes were also favorable: 53.28% reported good comfort and 90.79% demonstrated good to fair compliance, suggesting that the technical advantages of endoscopy translate into better patient acceptance. Studies by Pandya KB et al.[4] and Dhaka R et al.[17] similarly support its high accuracy, minimal complications, and better patient tolerance compared to conventional methods.

CONCLUSION

The present study demonstrated that nasal endoscopy is superior to conventional anterior and posterior rhinoscopy in terms of diagnostic accuracy, patient comfort, convenience, and compliance. Endoscopy provided vision-controlled guidance, enabling more reliable diagnosis and effective follow-up of conditions such as ethmoidal polyposis, mucormycosis, and nasal tumors prone to recurrence. Patients reported greater comfort, quicker procedures, and better adherence to instructions with endoscopy compared to conventional methods, highlighting its pivotal role in both diagnosis and long-term management of nasal and nasopharyngeal pathologies.

LIMITATIONS

The study was subject to certain limitations, including operator dependency, as variability in skill and experience among otorhinolaryngologists could influence diagnostic accuracy. Differences in the quality and design of endoscopes, as well as factors like nasal congestion, bleeding, or anatomical variations, may have affected visualization and results. Additionally, the cost and availability of nasal endoscopy equipment can limit its feasibility and generalizability across different healthcare settings.

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