

Case Report

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Endoscopic Management of Large Antrochoanal Polyp in a Pediatric Patient: A Case Report

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ABSTRACT

Background

Benign solitary sinonasal lesions called antrochoanal polyps (ACPs) start in the mucosa of the maxillary sinus then propagate into the choana. Although they are fairly uncommon in children, they collectively make up a substantial proportion of nasal polyps in the pediatric age group. Considering its efficacy and low recurrence rate, endoscopic sinus surgery is now regarded as the preferred course of treatment.

Case Presentation

For eight months, a 8-year-old boy had intermittent nasal discharge, mouth breathing, snoring, and developing unilateral nasal blockage. A massive polypoidal tumor emerging from the left nasal cavity and expanding into the choana was discovered by nasal endoscopy. An antrochoanal polyp was identified by computed tomography (CT) of the paranasal sinuses as a soft tissue mass that originated in the left maxillary sinus and extended down the ostium into the nasal cavity and nasopharynx. The polyp, including its antral component, was completely removed from the patient during endoscopic sinus surgery. An inflammatory antrochoanal polyp was verified by histopathological analysis. During the six-month follow-up period, no recurrence was noted, and the postoperative period was uncomplicated.

Conclusion

Endoscopic excision of antrochoanal polyps is a safe, minimally invasive, and successful therapeutic option for pediatric patients, offering great visualization, full elimination, and low recurrence.

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Introduction

Antrochoanal polyp (ACP), sometimes referred to as Killian's polyp, is a benign single lesion that originates from the maxillary sinus mucosa and extends into the nasal cavity and choana through the natural or accessory ostium. It is a significant source of unilateral nasal obstruction in children, accounting for roughly 4-6% of all nasal polyps in the general population but over one-third of nasal polyps in the pediatric population [1,2]. Although the precise etiopathogenesis is still unknown, it has been linked to allergies, chronic rhinosinusitis, chronic inflammation, and blockage of the maxillary sinus drainage channel [1,3]. Clinically, rhinorrhea, mouth breathing, snoring, hyposmia, progressive unilateral nasal blockage, and, in more severe cases, signs of obstructive sleep are frequently observed in juvenile patients [1,4]. Because they enable preoperative surgical planning and precisely characterize the origin and extent of the lesion, nasal endoscopy and computed tomography (CT) of the paranasal sinuses are regarded as the preferred diagnostic techniques [4,5]. Since partial removal of the antral component is the main cause of recurrence, full surgical excision is the only effective treatment [2,5]. Compared to external procedures like the Caldwell-Luc operation, which is typically avoided in children due to the risk of injury to developing teeth

and impairment of facial growth, functional endoscopic sinus surgery (FESS) has become the preferred treatment modality due to its superior visualizing information, relatively low invasiveness, preservation of normal sinonasal anatomy, relatively short recovery time, and lower recurrence rates [2,5,6]. We describe a pediatric patient's successful endoscopic treatment of an antrochoanal polyp, emphasizing the surgical approach, radiological findings, clinical presentation, and positive postoperative result. This case demonstrates the effectiveness and safety of endoscopic sinus surgery in removing the nasal and antral components completely while lowering morbidity and the chance of recurrence in children.

Case Report

An 8-year-old kid was taken to the Apollo E.N.T. Hospital, Jodhpur, Rajasthan, with a history of progressive right-sided nasal blockage for six months. The obstruction was subtle in beginning and gradually deteriorated over time, eventually becoming complete on the affected side. The youngster also complained of intermittent mucoid nasal discharge, mouth breathing, snoring during sleep, and periodic hyponasal speech. Epistaxis, face pain, headache, anosmia, vision abnormalities, fever, weight loss, or recurring upper respiratory tract infections were not seen. The parents denied any prior sinonasal surgery, foreign body insertion, nasal trauma, or allergy-related symptoms such as watery rhinorrhea, sneezing, or itching. The youngster did not have a history of immunodeficiency,

cystic fibrosis, asthma, or any other persistent systemic ailment. There was no notable family history of sinonasal illness, and his developmental milestones were age-appropriate. The child was afebrile, active, and well-fed during general physical examination. Vital indicators were within normal ranges. No outward nasal deformity, cervical lymphadenopathy, orbital edema, or facial asymmetry were present. An examination of the oral cavity showed minimal tonsillar hypertrophy and minor mouth breathing. A smooth, pale lump protruded into the nasopharynx behind the soft palate upon phonation, according to a posterior pharyngeal examination. An anterior rhinoscopy revealed a polypoidal mass in the right nasal cavity that was smooth, whitish, and non-friable. The bulk made it difficult to see the middle meatus, was unresponsive to touch, and did not bleed when probed. The nasal cavity on the left was normal. A single pedunculated polyp that

originated in the right middle meatus and extended posteriorly into the choana and nasopharynx was discovered during a diagnostic nasal endoscopy utilizing a 2.7-mm rigid endoscope. (figure 1 and 2) There was no indication of purulent discharge or surrounding mucosal ulcers, and the lesion was smooth, shiny, and nonvascular. The nasopharynx and left nasal cavity were normal. Serum electrolytes, renal function tests, coagulation profiles, complete blood counts, and other routine laboratory testing were all within normal ranges. Serum immunoglobulin E levels and the absolute eosinophil count were not markedly increased. The right maxillary sinus was fully occupied by a homogenous soft tissue density that extended through an expanded natural maxillary ostium into the right nasal cavity, choana, and nasopharynx, according to computed tomography (CT) of the paranasal sinuses. (figure 3 A,B,C, and D) The paranasal sinuses that remained have.



Figure 1: Diagnostic nasal endoscopy revealed pale polypoidal nasal mass occupying the right nasal cavity



Figure 2: During Diagnostic nasal endoscopy, Antrum ball probe was used for probing to know the attachment of polyp

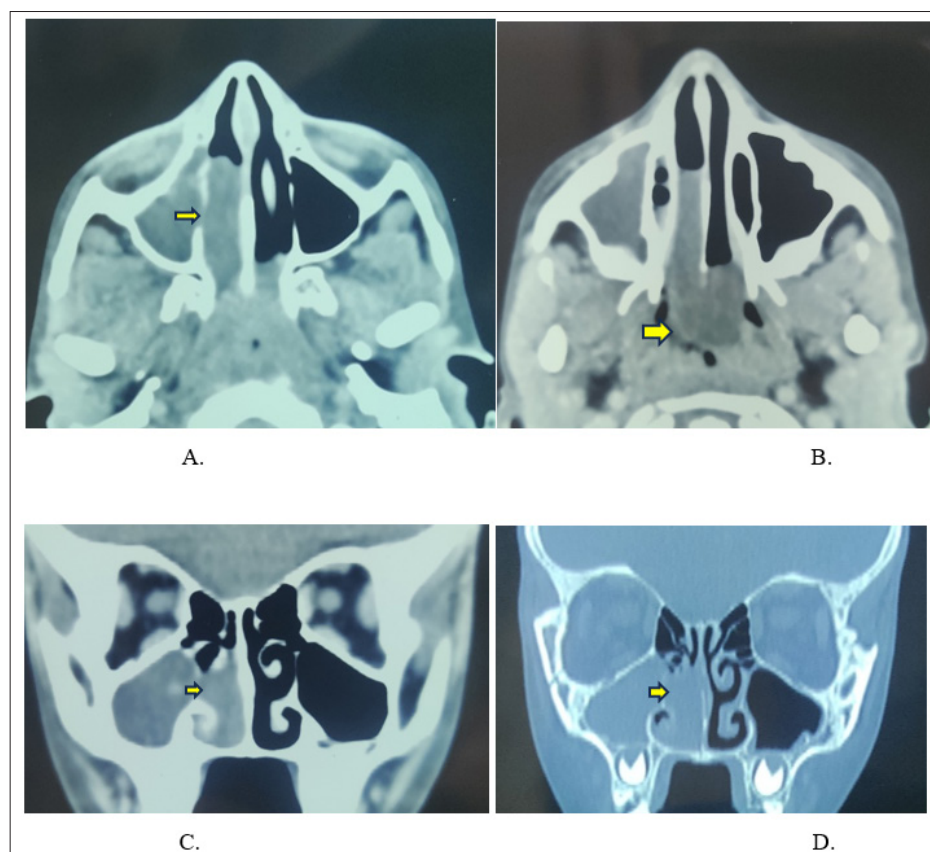


Figure 3: A, B, C and D: Axial (A and B) and coronal (C and D) computed tomography scan of paranasal sinus showing 6.8 x 3.0x 2.9cm polypoidal mildly enhancing soft tissue lesion in right maxillary sinus causing widening of maxillary ostium with extension to right nasal cavity and posterior extending to choana and bulging in nasopharynx

enough ventilation. No signs of cerebral involvement, orbital expansion, bone erosion, or destruction of nearby structures were found. An antrochoanal polyp was strongly suggested by these radiological results. A diagnosis of right-sided antrochoanal polyp was made based on the clinical examination, nasal endoscopy, and radiological findings. The patient was scheduled for endoscopic sinus surgery under general anesthesia following the acquisition of written informed consent from the parents. Cotton pledgets soaked in a 1:1000 adrenaline solution were used to prepare the nasal canal for mucosal decongestion after general anesthesia was induced. The right nasal cavity was filled with a 0-degree rigid nasal endoscope. It was determined that the polyp originated in the middle meatus and extended posteriorly into the choana. Using a backbiting Ostrum forcep, the right maxillary natural ostium was located and expanded (figure 4 and B). After that, an uncinectomy was done to reveal the maxillary sinus's natural ostium. In order to fully visualize the maxillary sinus opening, a middle meatal antrostomy was sufficiently expanded. Using an angled Blakesly forcep, polypoidal tissue from the maxilla was removed, and the entire polypoidal mass was removed through the oral cavity without fragmentation. (figure 5 and 6) A thorough examination of the maxillary sinus was performed to ensure that the lesion had completely cleared. Topical adrenaline-soaked patties and suction cautery were used to produce hemostasis. At the end of the procedure, no nasal packing was needed. No intraoperative problems, such as severe bleeding, ocular damage, cerebrospinal fluid leak, or damage to nearby tissues, occurred during the procedure. The recovery phase was unremarkable. During the immediate postoperative period, the patient was given intravenous antibiotics and analgesics; on the second postoperative day, oral drugs were administered upon discharge. After 48 hours, isotonic saline nasal irrigation was started, and the parents received instructions on maintaining good nasal hygiene. After surgery, the patient was evaluated after one week, one month, three months, six months, and one year. A widely patent middle meatal antrostomy with robust mucosal healing and no recurrent or residual polyps was seen during the follow-up nasal endoscopic examination. The child's mouth breathing, snoring, nasal discharge, and nasal blockage all completely disappeared. Nasal airflow, overall quality of life, and sleep quality were significantly improved, according to the patient and their parents. The successful outcome of total endoscopic excision was confirmed during the one-year follow-up, since there was no endoscopic or clinical signs of recurrence. This case demonstrates the distinctive radiological characteristics, clinical presentation, and successful surgical result of a pediatric antrochoanal polyp treated with endoscopic sinus surgery. In order to prevent recurrence while maintaining normal sinonasal anatomy and function, it was crucial to carefully identify and remove the maxillary sinus attachment. This supported endoscopic management as the preferred course of treatment for pediatric patients.

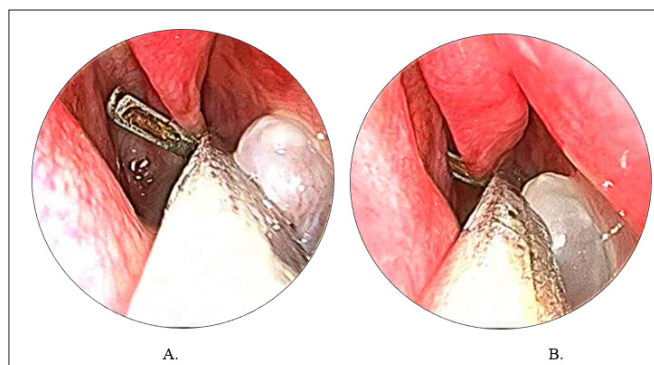


Figure 4 (A and B): Intraoperative picture of Ostrum backbiting antrum punch forcep using for adequate widening of maxillary ostium



Figure 5: Intraoperative picture showing delivering of antrochoanal polyp through oral cavity

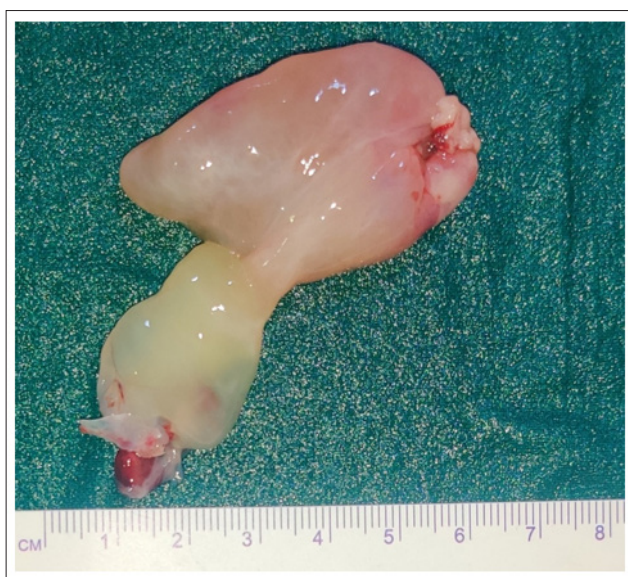


Figure 6: Main Surgical Specimen

Discussion

Antrochoanal polyp (ACP) is a benign single sinonasal lesion that spreads through the maxillary ostium into the nasal cavity, choana, and sometimes the nasopharynx. It typically begins in the posterior, lateral, or inferior wall of the maxillary sinus. ACP is a rather significant source of unilateral nasal obstruction in the pediatric age group, although making up just 4-6% of all nasal polyps in the general population. In children, it can account for up to one-third of nasal polyps. In contrast to bilateral inflammatory nasal polyposis, ACP is typically unilateral and is not frequently linked to systemic conditions like aspirin-exacerbated respiratory illness or cystic fibrosis. Chronic inflammation, allergies, recurrent sinus infections, and the growth of an antral cyst through an accessory maxillary ostium have all been suggested as contributing causes, however the pathophysiology is still unclear [1,2,4]. The current case illustrates the typical clinical presentation of pediatric ACP, which is marked by snoring, nasal discharge, increasing unilateral nasal obstruction, and a noticeable nasal mass. Mouth breathing, hyposmia, epistaxis, dysphagia, obstructive sleep symptoms, and even eustachian tube dysfunction as a result of nasopharyngeal extension are additional symptoms that patients may suffer in severe cases. Diagnosis may be delayed, especially in younger children, because these symptoms are similar to those of allergic rhinitis and chronic rhinosinusitis. Therefore, when unilateral nasal blockage continues despite medical treatment, a strong index of suspicion is required. Early detection allows for prompt care and avoids problems from repeated infections and protracted airway blockage [1,7]. Because nasal endoscopy makes it possible to directly see a smooth, whitish, pedunculated mass that emerges from the middle meatus and extends posteriorly toward the choana, it is essential in the diagnosis of ACP. However, imaging is still crucial for figuring out the disease's origin, severity, and surgical strategy. Because it accurately shows complete or partial opacification of the affected maxillary sinus along with a soft tissue mass extending into the nasal cavity and choana without showing signs of bone destruction, computed tomography (CT) of the paranasal sinuses is regarded as the preferred imaging modality. Magnetic resonance imaging (MRI) is typically saved for unusual presentations or when it's necessary to distinguish between meningoencephalocele, neoplastic lesions, or other abnormalities of the skull and base. In this instance, proper surgical planning was made possible by a strong correlation between the CT results and the endoscopic appearance [3,5,8]. Juvenile nasopharyngeal angiofibroma, inverted papilloma, congenital choanal atresia, meningoencephalocele, dermoid cyst, hypertrophied adenoids, benign sinonasal tumors, and malignant lesions like rhabdomyosarcoma or lymphoma are among the differential diagnoses for unilateral nasal masses in children. ACP is typically distinguished from these illnesses by clinical examination in conjunction with nasal endoscopy and imaging. After excision, histopathological analysis is still required to confirm the diagnosis and rule out malignant disease. Histologically, ACP is made up of respiratory epithelium overlaying an edematous stroma with dilated blood vessels, inflammatory cells, and fewer eosinophils than are usually seen in allergic nasal polyps [4,9]. Because conservative medicinal therapy only temporarily relieves symptoms and does not eliminate the antral component of the disease, complete surgical excision continues to be the preferred course of treatment. In the past, the Caldwell-Luc procedure was frequently used to access the maxillary sinus; however, due to potential complications such as facial growth disturbances, damage to developing permanent teeth, infraorbital nerve damage, facial swelling, and chronic maxillary dysfunction, this approach is now mostly avoided in pediatric patients. By enabling the whole removal of both the nasal and antral components while

maintaining normal sinonasal anatomy and mucociliary function, advances in endoscopic sinus surgery have significantly altered the treatment of ACP. As a result, endoscopic surgery is now the gold standard for treating pediatric ACP [2,10,11]. In this instance, the polyp's endoscopic removal and the excision of its maxillary connection completely resolved the patient's symptoms without causing any difficulties during the procedure. This result is in line with a number of published series showing that, because there are no exterior incisions, endoscopic sinus surgery is linked to shorter hospital stays, less blood loss, less postoperative pain, quick recovery, and outstanding esthetic results. Additionally, rigid endoscopes' enlarged visualization makes it possible to precisely identify the stalk attachment, which lowers the possibility of residual disease. Long-term functional results and better postoperative mucociliary clearance are further benefits of maintaining healthy sinonasal mucosa [10-13]. After surgical therapy for ACP, recurrence is still the main issue. This is mainly because the antral component is not completely removed or the attachment point is not identified. Recurrence rates after total endoscopic excision are typically between 0% and 15%, although reported rates after basic polypectomy have ranged from 25% to 50%. In order to reduce recurrence, some authors have stressed the importance of carefully examining the maxillary sinus with angled endoscopes and specialized tools. Adjunctive treatments such endoscopic canine fossa puncture or mini-Caldwell access may be taken into consideration in certain situations when visualization of the connection is still challenging, although these methods are only necessary for severe lesions and are rarely needed in children [2,11,14]. Since most recurrences happen within the first two years following surgery, postoperative follow-up is especially crucial for pediatric patients. Frequent endoscopic examinations allow for the early detection of recurring or residual illness before symptoms worsen. Treatment for persistent sinonasal inflammation, saline nasal irrigation, and proper management of underlying allergic rhinitis where it exists can all help to maximize healing and enhance long-term results. The efficacy of total endoscopic excision was supported by the patient's scheduled postoperative endoscopic surveillance, which showed excellent healing without any signs of recurrence [7,12].

Conclusion

All things considered, this case supports the increasing amount of data that indicates endoscopic sinus surgery is the best course of action for treating pediatric antrochoanal polyps. Excellent functional results are achieved while reducing recurrence and maintaining normal face growth with early detection using precise endoscopic excision of the entire polyp, including its maxillary connection, after rigorous clinical examination, nasal endoscopy, and CT imaging. In order to guarantee long-term disease-free results, this example further emphasizes the significance of long-term postoperative surveillance in children.

Compliance with Ethical Standards

The procedure performed in this case report was in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Conflict of Interest

The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this paper.

Ethical Approval

The study was published with written consent of the patient.

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