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Case Report

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18 Chronic Rhinosinusitis With Nasal Polyps In An Adolescent Girl With A History Of Allergies And Asthma

Lina Marlina¹, Meiranda Rose Pardede², Wendy Hendrika³¹Department of Ear Nose and Throat, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.20 ²Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.³Department of Surgery, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.

ABSTRACT

Background

1 Chronic rhinosinusitis with nasal polyps (CRS-NP) is an inflammatory condition of the nasal mucosa and paranasal sinuses that persists for more than 12 weeks. It is relatively uncommon in children and adolescents but is frequently associated with allergic diseases and asthma. Diagnosis is based on persistent symptoms and objective findings on nasal endoscopy and imaging. This case report describes CRS-NP in an adolescent patient with allergic and asthmatic risk factors who required functional endoscopic sinus surgery (FESS) and polypectomy.

Case Report

12 14-year-old girl presented with left-sided nasal congestion for 3 months, worsening over the preceding 2 weeks. Symptoms were associated with hyposmia, rhinorrhoea, pain, intermittent headache, snoring and itchy watery eyes. She had a history of asthma as well as allergy to dust and cold air. Anterior rhinoscopy revealed a narrow left nasal cavity and a solitary greyish-white mass in the left middle meatus. Nasoendoscopy confirmed a polypoid mass in the left middle meatus. Computed tomography demonstrated left maxillary sinusitis with hypertrophy of the left nasal conchae and obliteration of the left Osteomeatal complex. Based on the clinical, endoscopic, and radiological findings, a diagnosis of CRS-NP was established. The patient received antihistamines, systemic corticosteroids and intranasal corticosteroids followed by FESS and polypectomy. Postoperative evaluations showed marked improvement in nasal patency, complete relief of obstruction and no evidence of early recurrence.

Conclusion

CRS-NP needs to be considered in adolescents presenting with persistent nasal obstruction, hyposmia and a history of allergic disease or asthma. Endoscopy and CT imaging facilitate accurate and timely diagnosis. Management consists of combined medical therapy and FESS with polypectomy. Regular follow-up remains essential to detect recurrence.

8 **Keywords:** Adolescent, Asthma, Chronic Rhinosinusitis, Nasal Polyps, Endoscopic Sinus Surgery.

INTRODUCTION

1 Chronic rhinosinusitis (CRS) is an inflammatory condition of the nasal mucosa and paranasal sinuses that persists for more than 12 weeks. It is usually characterized by symptoms such as nasal obstruction, rhinorrhea, facial pain and olfactory disturbance such as hyposmia or anosmia.¹ CRS is classified into chronic rhinosinusitis without nasal polyps (CRSwNP) and with nasal polyps (CRS-NP). Both of these entities differ in clinical presentations and therapeutic options available for management. Globally CRS affects approximately 5–12% of the adult population and is known to significantly impact quality of life and healthcare costs. CRS is more common in adults however it can also be seen in children and adolescents. This is more common in individuals with risk factors such as allergies, asthma and anatomical abnormalities of the nasal cavity.²

9 Nasal polyps are soft, grayish-white inflammatory masses originating from the mucosa of the nasal cavity or paranasal sinuses. These polyps histologically are characterized by stromal edema and inflammatory cell infiltration particularly eosinophils. Their prevalence in the general population is estimated to be approximately 1–4%. However, its prevalence is comparatively higher in patients with asthma and allergic rhinitis.³

17 The association between CRS-NP and asthma reflects the concept of unified airway disease involving type-2 inflammatory mediators such as interleukin (IL)-4, IL-5, and IL-13. Allergic rhinitis, IgE-mediated responses to allergens and anatomical factors such as septal deviation or turbinate

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Dr Lina Marlina

Department of Ear Nose and Throat, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia.

Email: lina.marlina@uki.ac.id

hypertrophy can obstruct the Osteomeatal complex. The obstruction of Osteomeatal complex impairs sinus drainage and contributes to chronic inflammation and polyp formation.⁴

Diagnosis of CRS-NP is based on persistent symptoms for ≥ 12 weeks and objective findings from nasal endoscopy or imaging particularly CT scans of the paranasal sinuses. Management aims to control inflammation and restore sinus ventilation through medical therapy such as intranasal corticosteroids and saline irrigation. In intractable cases not responding to medical management surgical intervention, particularly Functional Endoscopic Sinus Surgery (FESS) is recommended. Despite effective outcomes, recurrence remains common particularly in patients with allergic and asthmatic comorbidities. Therefore, comprehensive management and regular follow-up are essential.

This case report describes CRS with nasal polyps in a 14-year-old patient with allergic and asthmatic risk factors, who required FESS and polypectomy.

CASE REPORT

A 14-year-old girl presented with a chief complaint of frequent left nasal congestion for 3 months prior to hospitalization, this left sided nasal congestion got worsened since last 2 weeks. The patient complained of an uneasy feeling of blockage in the nose and difficulty breathing through the nose leading to frequent mouth breathing. Symptoms were partially relieved when she slept in the lateral position. Symptoms were accompanied by a decreased sense of smell (hyposmia), a nasal voice, clear, watery rhinorrhea, cheek pain, intermittent throbbing headaches, and snoring during sleep. The patient also experienced recurrent sneezing, an itchy, watery nose and eyes, especially when exposed to dust and cold air, with attacks occurring more than 4 days per week. Past medical history showed the patient had experienced sinusitis and a history of asthma. The patient had a history of dust and cold-air allergy and used cetirizine 10 mg intermittently for symptom control.

A general physical examination was done which showed normal vital signs. Anterior rhinoscopy was done which revealed a narrow left nasal cavity, a livid inferior turbinate and presence of clear discharge in the middle meatus. A soft, round, solitary grayish-white mass was observed in the left middle meatus, consistent with a nasal polyp. The nasal septum was deviated to the right. An ear and throat examination was normal.

A naso-endoscopy confirmed a polypoid mass in the left middle meatus with clear discharge, a livid inferior turbinate, and a rightward septal deviation (Figure 1):

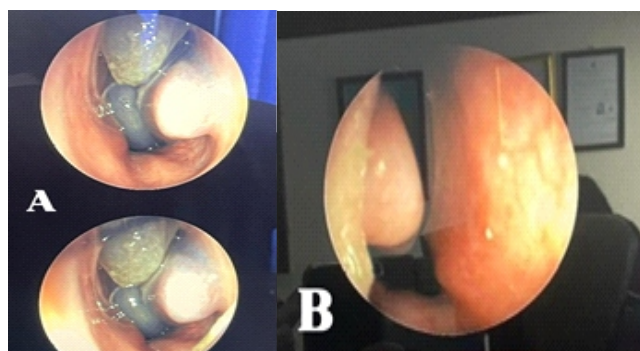


Figure 1: Nasoendoscopic view of the left nasal cavity showing a solitary greyish-white polypoid mass arising from the left middle meatus, with clear nasal secretions, livid inferior turbinate, and rightward nasal septal deviation.

The naso-endoscopic examination revealed a narrowed left nasal cavity with a livid inferior turbinate and a nasal septum deviated toward the right side. A solitary, soft, round, greyish-white mass was identified in the left middle meatus, accompanied by clear nasal secretions. The right nasal cavity appeared within normal limits. Computed tomography (CT) of the paranasal sinuses demonstrated left maxillary sinusitis with additional involvement of the left ethmoid, frontal, and sphenoid sinuses. Associated findings included hypertrophy of the left nasal conchae and obliteration of the left osteomeatal complex. No bone destruction was seen. (Figure 2)

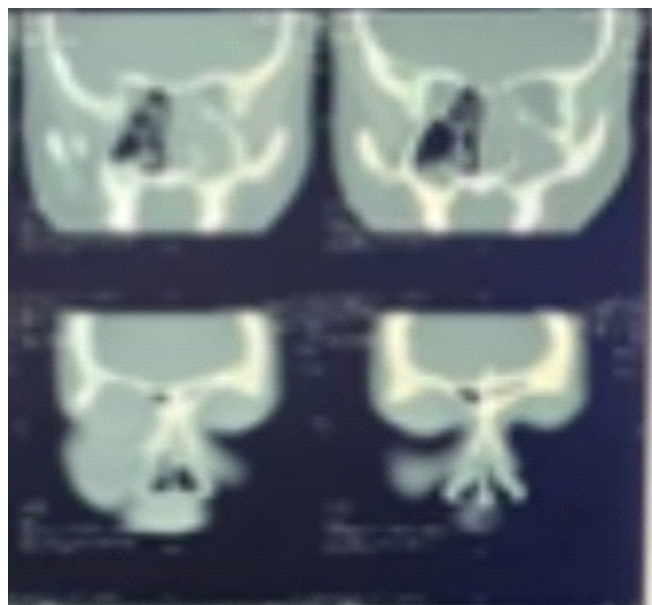


Figure 2. CT-scan showing opacity involving left maxillary, ethmoidal, frontal and sphenoidal sinuses along with mucosal thickening of left maxillary sinus. Obliterated left osteomeatal complex is also seen.

Based on the history, physical examination, and supporting tests, a diagnosis of chronic rhinosinusitis with nasal polyps was established. Differential diagnoses included allergic rhinitis, choanal polyps, and nasal tumors.

The patient was treated by antihistamines, systemic corticosteroids and intranasal corticosteroids in preparation for surgery. Functional Endoscopic Sinus Surgery (FESS) and polypectomy were then performed. Postoperative evaluation on day 1 showed no active bleeding and a reduction in symptoms. On days 7 and 14 postoperatively, significant clinical improvement was observed. Postoperatively the left nasal cavity became more open and the obstruction was completely relieved (Figure 3). Patient was discharged and advised regular follow up.

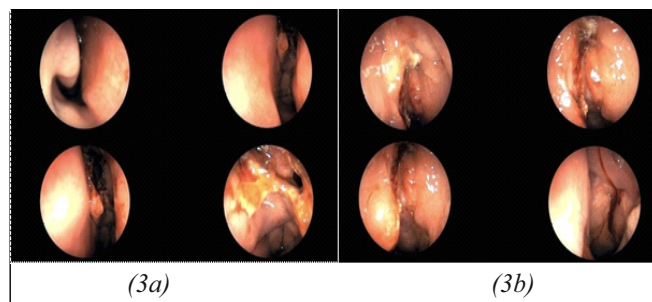


Figure 3: Postoperative nasoendoscopic findings on day 7 (A) and day 14 (B), demonstrating improved nasal patency and resolution of obstruction.

DISCUSSION

Chronic rhinosinusitis with nasal polyps (CRS-NP) is relatively uncommon in children and adolescents as compared to adults. However, when present in adolescents, it is frequently associated with underlying allergic diseases, asthma or other systemic inflammatory conditions. The present case involved a 14-year-old female patient who had persistent unilateral nasal obstruction, hyposmia, rhinorrhoea and a documented history of asthma and dust allergy. These findings are consistent with the current understanding that CRS-NP as a manifestation of type 2 airway inflammation. Bachert C et al described CRS-NP as a predominantly type 2 inflammatory disease which is characterized by increased expression of interleukin (IL)-4, IL-5 and IL-13.⁵ This increased expression is hypothesised to cause eosinophilic inflammation and polyp formation.

Similarly, Wojas O et al reported that CRS-NP commonly coexists with allergic disorders including bronchial asthma.⁶ These findings support the concept of a unified airway disease in which inflammatory processes simultaneously affect the upper as well as lower respiratory tracts. The coexistence of asthma and allergic rhinitis-like symptoms in our patient therefore represents a typical clinical phenotype of type 2 CRS-NP. Furthermore, the recurrent sneezing, itchy nose, and symptom exacerbation following exposure to dust and cold air reinforce the contribution of allergic sensitization to disease development. These observations make it important that a comprehensive evaluation for presence of comorbid allergic and respiratory conditions is done in cases of adolescents presenting with chronic sinonasal symptoms.

The clinical presentation observed in this case closely mirrors the characteristic symptoms reported in the literature in cases of chronic sinusitis with polyposis. This patient reported symptoms such as persistent nasal obstruction, hyposmia, rhinorrhoea and sleep-related symptoms. All these symptoms significantly affected daily functioning of the girl. Fokkens WJ et al identified nasal blockage, nasal discharge and olfactory dysfunction as the cardinal manifestations of CRS.⁷ Similarly Gudis DA et al reported that patients with CRS-NP frequently report smell disturbances and nasal obstruction as the most troublesome symptoms.⁸ This anosmia is particularly seen in cases when disease coexists with asthma. In the present case, hyposmia and severe nasal blockage were prominent complaints and improved substantially after treatment. This supports previous observations that symptom burden correlates with the extent of mucosal inflammation and polyp growth.

Radiological and endoscopic evaluations played a crucial role in establishing the diagnosis and defining disease extent in this patient. Nasoendoscopy showed a greyish-white polypoid mass which was seen to be originating from the left middle meatus. Computed tomography (CT) was done which revealed extensive sinonasal involvement including left maxillary sinusitis, left ethmoid, frontal, and sphenoid sinus disease as well as obstruction of the left Osteomeatal complex. Hopkins C et al emphasized that nasal endoscopy remains the gold standard for objective confirmation of nasal polyps because it allows direct visualization of inflammatory lesions and assessment of disease severity.⁹ Similarly, Leo G et al reported that CT imaging is important in paediatric CRS because it not only accurately identifies the extent of sinus involvement but also gives an idea about anatomical variations and surgical landmarks.¹⁰ The CT findings in this case showed involvement of multiple nasal sinuses as well as Osteomeatal complex obstruction.

Management of CRS-NP generally starts with medical therapy which is aimed at reducing inflammation and

restoring sinonasal function. In the present case initially, the patient received antihistamines as well as systemic and intranasal corticosteroids before undergoing surgery. This approach is consistent with contemporary management strategies that advocate maximal medical therapy prior to surgical intervention. Han JK et al demonstrated that monoclonal antibodies-based treatment effectively reduces polyp size as well as inflammatory burden.¹¹ This is caused by targeting type 2 cytokine pathways. Similarly, Mullol J et al reported significant improvement in nasal obstruction and olfactory dysfunction following anti-inflammatory treatment in CRS-NP cases.¹² Our patient exhibited involvement of multiple sinuses and significant mechanical obstruction caused by the nasal polyp. These factors were taken into consideration while making a decision to proceed with surgical intervention.

In this case functional Endoscopic Sinus Surgery (FESS) combined with polypectomy resulted in excellent short-term outcomes in this patient. Postoperatively there was marked improvement in nasal patency and there was no evidence of recurrence during the early postoperative period. These findings are consistent with previous studies evaluating surgical management of CRS-NP. Ramadan HH reported that FESS is an effective treatment option in paediatric and adolescent patients with chronic rhinosinusitis.¹³ Likewise, Smith TL et al demonstrated that endoscopic sinus surgery significantly improves sinonasal outcomes in these cases.¹⁴

The absence of early recurrence in our patient may reflect the benefits of combined medical and surgical management. However, long-term surveillance is important because recurrence rates are known to be higher among patients with asthma, allergies and persistent type 2 inflammation. Studies by Stevens WW et al¹⁵ and Laidlaw TM et al¹⁶ have shown that comorbid asthma is associated with more severe disease and increased chances of recurrence following successful management. Therefore, regular follow-up and monitoring of asthma status are necessary interventions.

CONCLUSION

Chronic rhinosinusitis with nasal polyps is uncommon in adolescents. However, its possibility should be considered in patients presenting with persistent nasal obstruction, hyposmia and a history of allergic disease or asthma. Comprehensive workup in these cases include endoscopy and CT imaging which facilitates accurate diagnosis. Combined medical therapy and surgical interventions (such as functional endoscopic sinus surgery with polypectomy) can provide significant symptomatic relief. Regular follow-up remains essential to detect recurrence.

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