

An Amalgamation of Triple Entity: A Rare Co-existence of Antrochoanal Polyp, Ethmoidal Polyp and Fungal Sinusitis

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ABSTRACT

The co-existence of Antrochoanal Polyp (ACP), ethmoidal polyposis, and fungal sinusitis presents a unique diagnostic and therapeutic challenge due to overlapping symptoms and distinct treatment approaches. ACPs typically cause unilateral nasal obstruction, while ethmoidal polyps contribute to chronic rhinosinusitis, and fungal sinusitis may lead to facial pain and sinus opacification. Contrast-Enhanced Computed Tomography (CECT) aids in differentiation, while Functional Endoscopic Sinus Surgery (FESS) is essential for ACP and ethmoidal polyps, along with additional medical or surgical management for fungal sinusitis. A comprehensive approach ensures symptom resolution and minimises recurrence.

Keywords: Functional endoscopic sinus surgery, Nasal polyp, Rhinosinusitis, Sino-nasal diseases

CASE REPORT

A 24-year-old male presented to the otolaryngology clinic complaining of worsening nasal blockage and headache for six months. The headache was described as dull, aching, continuous, and non-radiating to any other region. He also experienced mucopurulent nasal discharge, a decreased sense of smell, and intermittent facial pain, particularly in the maxillary region, for the same duration. The patient denied any history of nasal trauma or significant medical conditions.

On examination, the patient appeared to be in good overall condition, although he breathed through his mouth and spoke in a hyponasal voice. Anterior rhinoscopy revealed a right-sided nasal mass that was glistening white and oedematous, with no clots or crusts. Probing of the nasal mass revealed that it was emerging from the middle meatus and did not bleed upon touch. The nasal septum was observed to be midline, with no significant deviation.

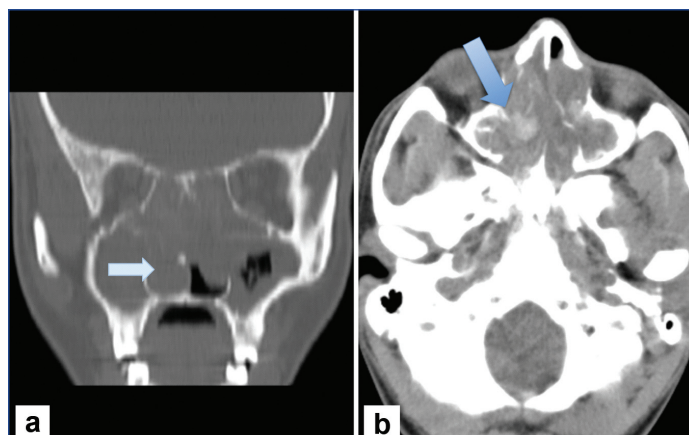
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A diagnostic nasal endoscopy was conducted, revealing significant polypoid alterations in both the middle meatus and the posterior nasal cavity. A large polyp originating from the right maxillary sinus ostium and extending into the nasopharynx was observed, indicating an ACP. Additionally, several smaller polyps were seen in the ethmoid sinus region, indicating ethmoidal polyposis.

A CECT scan of the paranasal sinuses revealed opacification of the bilateral maxillary sinuses, as well as a soft tissue density lesion in the right nostril that extended into the nasal cavity and posteriorly into the choana, confirming the presence of an ACP [Table/Fig-1]. The ethmoidal sinuses on both sides showed diffuse mucosal thickening and polypoid formation. There was also evidence of heterogeneity within the sinuses, suggesting the presence of fungal components.

The FESS was performed to precisely remove the two ACPs from their base in the right maxillary antrum. The first ACP removed was globular, yellowish-brown in colour, measuring approximately 4×2.5×2 cm, with a 1 cm stalk attached to the maxillary antrum [Table/Fig-2]. The second ACP extracted was also globular, greenish-yellow in colour, measuring 2.5×2×1 cm, with a 1 cm stalk [Table/Fig-3].

Using a microdebrider, the anterior and posterior ethmoid sinuses on both sides were wide opened, and the ethmoidal polyps were removed. Intraoperatively, a cheesy greyish-white mass in the right maxillary antrum [Table/Fig-4] revealed the presence of a fungal element, which was carefully removed and sent for histological and microbiological examination.

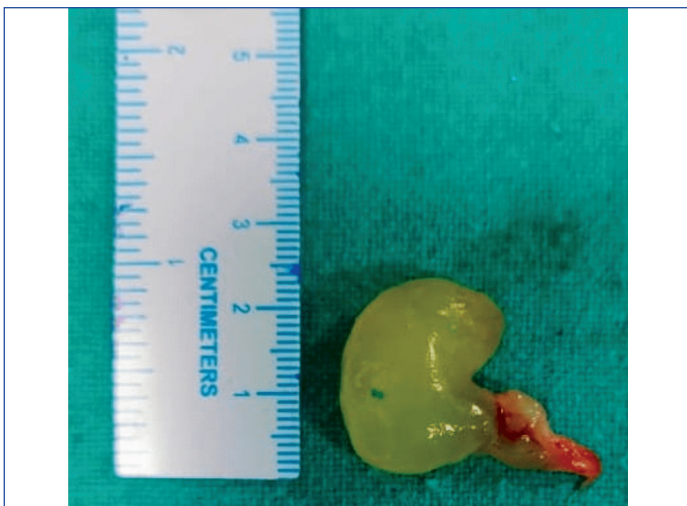


[Table/Fig-1]: Contrast-Enhanced Computed Tomography (CECT) of the paranasal sinus showing opacification of the bilateral maxillary sinus and ethmoid sinus (blue arrows); a) Coronal view; b) Axial view.

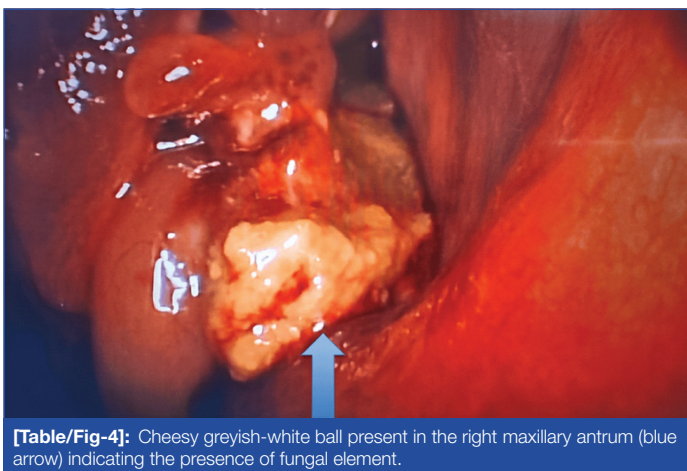


[Table/Fig-2]: Single, globular, yellowish-brown Antrochoanal Polyp (ACP) measuring 4×2.5×2 cm with a stalk of 1 cm.

During the procedure, two tissue samples were taken from the right maxillary sinus polyps (ACPs), as well as greyish-white cheesy material from the right maxillary antrum. These specimens were prepared and stained with Haematoxylin and Eosin (H&E) for routine



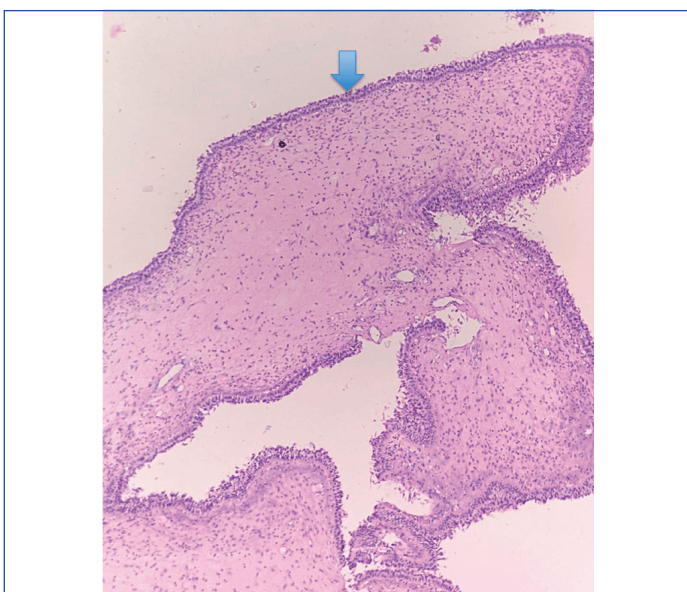
[Table/Fig-3]: Single, globular, greenish-yellow Antrochoanal Polyp (ACP) measuring 2.5×2×1 cm with a stalk of 1 cm.



[Table/Fig-4]: Cheesy greyish-white ball present in the right maxillary antrum (blue arrow) indicating the presence of fungal element.

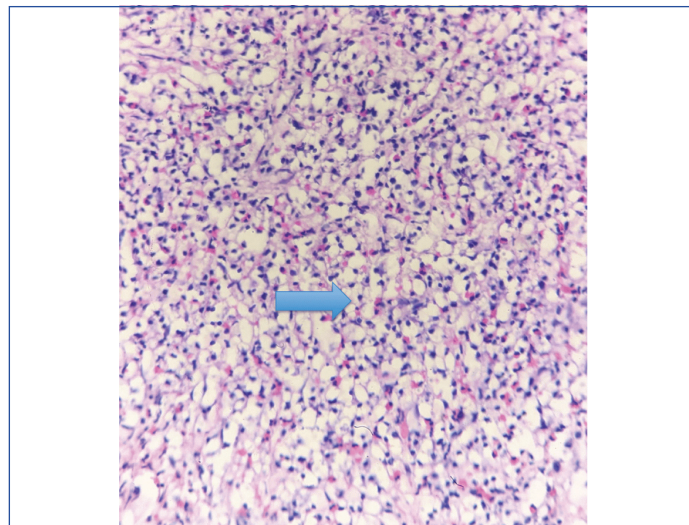
histological investigation. Special stains, such as Periodic Acid-Schiff (PAS), were used to highlight the fungal components.

Histopathological examination of the ACPs revealed typical characteristics of a benign nasal polyp covered by respiratory epithelium [Table/Fig-5] and edematous stroma infiltrated with inflammatory cells [Table/Fig-6]. Sections from the greyish-white mass extracted from the maxillary antrum were stained with PAS, which showed pseudohyphae of fungus suggestive of Candida [Table/Fig-7]. It was further sent for microbiological evaluation, where Potassium Hydroxide (KOH) mounting was performed,

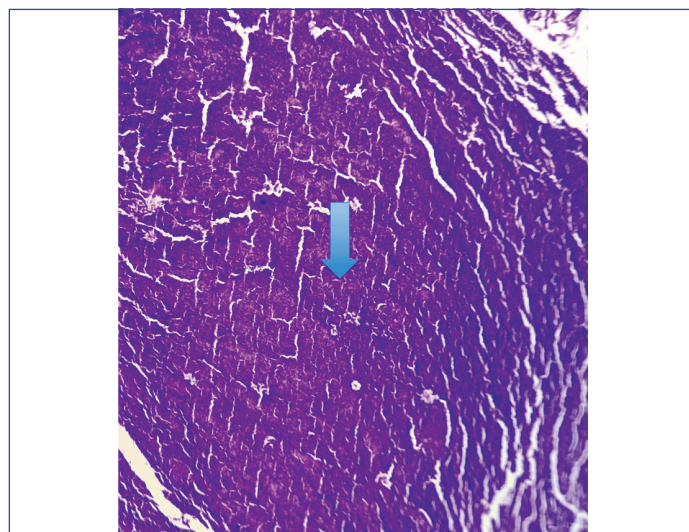


[Table/Fig-5]: Section shows inflammatory polyp characterised by edematous stroma, fibrotic and loosely myxoid stroma covered by respiratory epithelium (blue arrow).

yielding similar findings of Candida. These tissue samples also exhibited colonies of gram-negative bacilli and gram-positive cocci. There were no signs of dysplasia or malignancy in any of the tissue samples examined.



[Table/Fig-6]: Section show mixed inflammatory cells including lymphocytes, eosinophils, plasma cells, neutrophils and mast cells (blue arrow).



[Table/Fig-7]: Section show PAS stained slide of the greyish-white ball extracted from the right maxillary antrum, indicating pseudohyphae of fungus suggestive of candida (blue arrow).

Following FESS, the patient experienced significant symptomatic relief, including increased nasal airflow, decreased congestion, and restoration of smell function. The comprehensive surgical strategy, combined with postoperative medical management, reduced the likelihood of recurrence by providing antibiotic coverage for one week, oral antifungal therapy for two weeks, and alkaline nasal irrigation for two weeks following postoperative day 5. The patient was instructed to have regular endoscopic follow-ups, which were critical for monitoring healing and early detection of any recurrence, allowing for appropriate action if needed.

DISCUSSION

Fungal sinusitis, ACP and ethmoidal polyps are separate pathogenic entities within the spectrum of sinonasal disease, each having its own aetiology, clinical presentation, and therapeutic challenges.

Fungal sinusitis is a group of conditions that can range from benign fungal colonisation to invasive and potentially fatal infections, with chronic symptoms including nasal obstruction, facial pain, and purulent discharge [1]. According to available studies, the incidence of fungal sinusitis is estimated to be around 10% of chronic rhinosinusitis cases, meaning that roughly one in ten people diagnosed with chronic sinusitis will also have a fungal sinus infection [2].

ACPs are benign tumours that originate in the maxillary sinus and extend through the sinus ostium into the choana, sometimes reaching further into the nasopharynx [3]. ACPs are often characterised by unilateral nasal blockage and rhinorrhoea, and their diagnosis is frequently confirmed via nasal endoscopy and imaging studies [3]. An ACP typically accounts for 4-6% of all nasal polyps in the general population, but it is significantly more common in children and young adults, where it can represent up to 33% of nasal polyps [4].

Ethmoidal polyps are benign growths that develop in the ethmoid sinuses and are frequently associated with chronic rhinosinusitis. They often co-exist with other sinus conditions and are distinguished by symptoms such as nasal congestion, anosmia, and postnasal drip [5]. The inflammatory nature of ethmoidal polyps often indicates underlying allergic or immunological causes, necessitating a combination of medical and surgical interventions for optimal treatment [6]. According to available research, the incidence of ethmoidal polyps (which are the most common type of nasal polyp) in the general population is estimated to be around 4% [7].

In 2021, Issa I et al., reported a case of unilateral concomitant ACP and a fungal ball in the maxillary sinus, which was removed via FESS. Histopathological evaluation revealed the presence of inflammatory infiltrates in the polyp, and septate hyphae indicated the presence of a fungal element [8].

Gorski Z and Zawadzka-Glos L described a study that analysed 26 paediatric cystic fibrosis patients with chronic rhinosinusitis and nasal polyposis. Chronic Rhinosinusitis (CRS) was present in all patients, while nasal polyposis was found in 88.5%, predominantly in the paranasal sinuses. FESS was commonly performed, with a revision rate of 51.4% due to recurrent nasal polyps and impaired healing. While FESS improved symptoms, its long-term impact on pulmonary function and microbial colonisation was limited [9].

This case highlights the intricate interplay between ACP, ethmoidal polyposis, and fungal sinusitis, making diagnosis and treatment challenging. The 24-year-old patient presented with bilateral nasal blockage and headache, symptoms consistent with Chronic Rhinosinusitis with Nasal Polyps (CRSwNP). While ACPs are unilateral, originating in the maxillary sinus and extending into the choana, ethmoidal polyps are bilateral and linked to diffuse mucosal inflammation [10]. The additional presence of fungal sinusitis, confirmed by histopathology showing fungal pseudohyphae (Candida), further complicated the case.

High-resolution CT revealed an ACP extending from the right maxillary sinus, bilateral ethmoidal polyps, and heterogeneous sinus opacification, suggestive of fungal involvement [11]. Endoscopic examination confirmed the polypoid tissue, while histopathology demonstrated inflammatory infiltration and fibrovascular stroma—typical of CRSwNP.

The management of this case posed several challenges, including distinguishing between overlapping sinonasal pathologies and determining the extent of fungal involvement. The co-existence of ACP, ethmoidal polyposis, and fungal sinusitis complicated both diagnosis and treatment planning. Surgical intervention required precision to ensure complete removal while preserving mucosal integrity. Additionally, the risk of recurrence necessitated ongoing medical therapy and vigilant long-term follow-up.

CONCLUSION(S)

The amalgamation of ACP, ethmoidal polyps, and fungal sinusitis in a single patient is an uncommon and challenging clinical situation. To address the specific elements of each condition, a complete and integrated diagnostic and therapeutic strategy is required. FESS, when combined with appropriate medical therapy, provides an effective treatment pathway that results in significant symptomatic improvement and a higher quality of life. This case emphasises the value of a multidisciplinary approach to the diagnosis and management of complex sinonasal disorders, involving otolaryngologists, infectious disease specialists, radiologists, and pathologists. The successful resolution of postoperative symptoms and the avoidance of recurrence depend on a thorough diagnostic evaluation, a specific and comprehensive treatment plan, and regular endoscopic follow-ups.

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