

An unusual location for a fungus ball: the concha bullosa

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Abstract

Objective: We report an unusual case of a fungus ball in the concha bullosa, without involvement of the paranasal sinuses.

Case report: A 29-year-old woman presented complaining of nasal obstruction and postnasal discharge. Paranasal computed tomography demonstrated that the concha bullosa in the right middle turbinate was filled with a high-density material. The patient underwent endoscopic resection of the concha bullosa, during which a dark brown, cheese-like material was found. Histopathological examination of the excised specimen revealed a fungus ball.

Conclusion: Fungus balls are non-invasive accumulations of dense fungal concretions that generally affect healthy individuals. In the sinonasal region, they occur most frequently in the maxillary sinus. Although fungus ball formation in the concha bullosa is unusual, it should be considered in the differential diagnoses of middle turbinate and sinonasal pathology.

Key words: Turbinates; Fungus; Concha Bullosa; Aspergillosis

Introduction

Several types of sinonasal disease have been attributed to fungal pathogens. Fungal diseases of the paranasal sinuses are categorised as either invasive or non-invasive based on the presence or absence of tissue invasion. Fungus balls are extramucosal overgrowths of mycotic elements, which in the paranasal region are commonest in the maxillary sinus followed by the sphenoid sinus. *Aspergillus* species are the most commonly documented pathogens associated with the disease.^{1–3} Most patients are either asymptomatic or present with non-specific complaints similar to those of chronic sinusitis.^{1,2}

We report an unusual case of a fungus ball in the concha bullosa without paranasal sinus involvement.

Case report

A 29-year-old woman was admitted to our clinic complaining of nasal obstruction and postnasal discharge for 10 years. She had a history of seasonal allergy symptoms. Several courses of antibiotics and anti-allergic drugs had been prescribed, but her symptoms had never resolved completely. She was otherwise healthy, and there was no clinical suspicion of immunodeficiency.

An endoscopic examination revealed a prominent right middle turbinate. It was covered with smooth

mucosa and was hard on palpation. The nasal mucosa was normal and no pus was detected.

Computed tomography (CT) showed that the sinuses were clear, but identified a concha bullosa of the right middle turbinate filled with a high-density material (Figure 1).

The fungal material was removed via endoscopic resection. A vertical midline incision was made in the anterior part of the middle turbinate, and the lateral portion of the concha was then removed via an endoscopic transnasal approach. After removing the lateral portion, a dark brown, cheese-like material was aspirated from within the concha bullosa.

Histopathological examination of the excised specimen revealed aspergillosis (Figure 2).

The patient did not receive additional antifungal therapy, and there was no recurrence of disease post-operatively (Figure 3).

Discussion

Fungal infections are rare in otorhinolaryngology. However, an increasing number of fungal infections of the paranasal sinuses have been reported. This is attributed to improved diagnostic approaches to investigating the paranasal sinuses, and also to an increase in conditions that favour fungal infections, such as diabetes, long-term antibiotic and corticosteroid treatment,

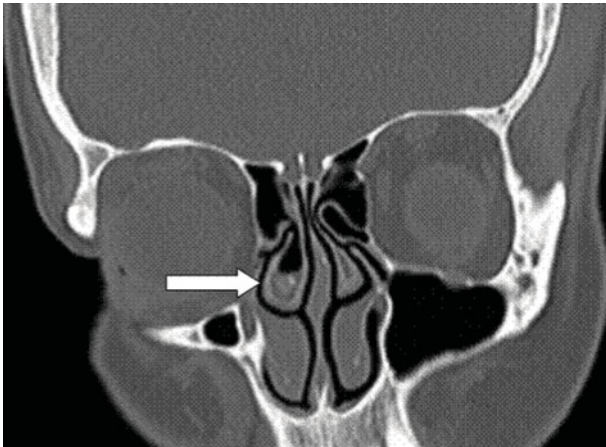


FIG. 1

Coronal computed tomography image showing the concha bullosa of the right middle turbinate filled with a high-density material (arrow).

radiochemotherapy, immunosuppressive treatment, and diseases causing immunodeficiency. Fungus balls typically affect healthy individuals and exhibit a female predominance.³

Fungus balls are usually found as an isolated collection in one sinus.⁴ Although paranasal sinus involvement with mycotic infection is well known, a fungus ball in the concha bullosa is unusual, with only a few reported cases. Cukurova *et al.* reported one such case in a series of 31 cases of concha bullosa pathology, and suggested that this case was only the second to be reported.⁵ Of course, there may have been unreported cases.

The pathogenesis of fungal infections of the paranasal region is unclear. Hypoventilation could be important in trapping fungal spores and providing anaerobic conditions for fungus ball development.⁴ The concha bullosa has a mucociliary transport system which connects the aerated cell to the frontal recess, lateral sinus or hiatus semilunaris, via the ostium.^{6,7}

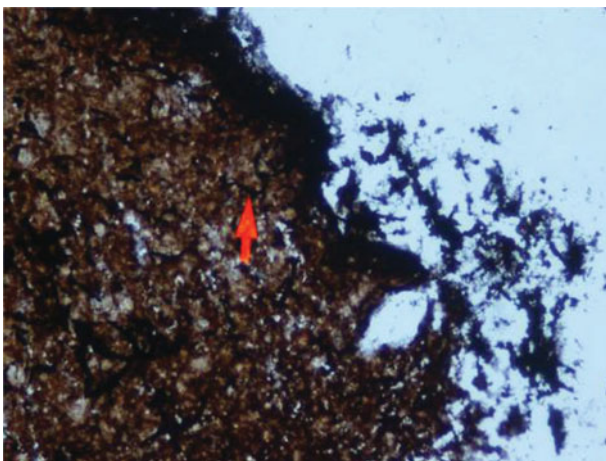


FIG. 2

Photomicrograph of the excised specimen showing septated aspergillus hyphae (arrow).

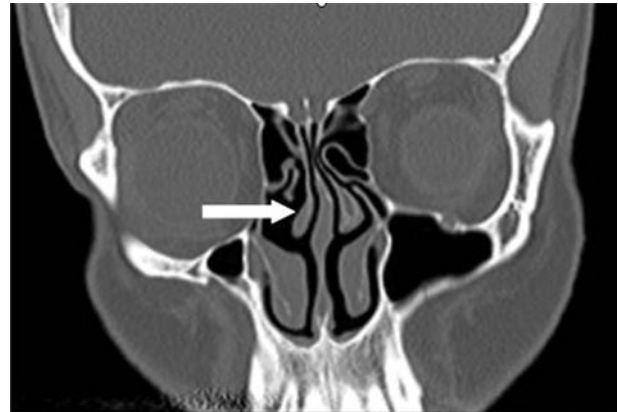


FIG. 3

Post-operative coronal computed tomography image showing absence of the fungus ball (arrow).

Initially, we thought that obstruction of the ostium and inflammatory changes within it might have led to our patient's mycotic infection; however, the ostium of the concha bullosa did not appear obstructed in the CT images. Our patient had previously been prescribed several courses of antibiotics and anti-allergic drugs, and these may have acted as predisposing factors contributing to the aetiology of her condition.

Computed tomography is the most common method of diagnosing fungal infections, as it is for other types of sinonasal pathology. The most common CT appearance of fungus balls is partial or complete, heterogeneous opacification of the involved sinus, often with calcified material.^{1,2,8,9} The next most common CT finding is thickening or erosion of the bony sinus wall.⁸ In our patient, a high-density, heterogeneous material filled the right middle turbinate.

- **Paranasal sinus fungus balls most commonly involve the maxillary and sphenoid sinuses**
- **A fungus ball in the concha bullosa is presented, without paranasal sinus involvement**
- **Surgery is the advised management for sinus fungus balls**

The diagnosis of fungus ball is based on identification of characteristic macroscopic and microscopic features. Macroscopically, fungus balls are characterised by grumous, friable, cheese-like material that can be green, yellow, brown or black and is easily peeled off the mucosa. Microscopically, there is an aggregate of tightly packed hyphae.^{1,2} In our patient's case, the excised specimen showed septated aspergillus hyphae on periodic acid Schiff staining. Positive fungal cultures are reported in only 20–50 per cent of patients, probably due to the poor viability of fungal elements in fungus balls.^{1,9} In our case, fungal culture of the

excised material was negative, probably for this same reason.

Surgery of paranasal fungus balls is generally curative, and no local or systemic antifungal therapy is required.¹ Transnasal endoscopic surgery is the preferred approach due to its rapid recovery time, minimal complications and short hospitalisation period.⁹

Conclusion

Although rare, fungus balls should be considered in the differential diagnosis of middle turbinate and sinonasal pathology. Surgery remains the primary treatment. Nasal endoscopic inspection should be performed during post-operative follow-up visits.

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Dr U Demiray take responsibility for the integrity of the content of the paper

Competing interests: None declared
