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Giant Unilateral Sinonasal Fungal Ball in an Immunocompetent Adolescent: CT and MRI Findings

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Abstract **Case Report**

Sinonasal fungal ball is a non-invasive form of fungal rhinosinusitis that usually occurs in immunocompetent adults and most commonly affects a single paranasal sinus, especially the maxillary sinus. Extensive unilateral involvement of the nasal cavity in an adolescent is unusual and may mimic a tumoral lesion on initial assessment. We report the case of a 16-year-old boy presenting with progressive left nasal obstruction for 3 years. Rhinoscopy showed a polypoid lesion filling the left nasal cavity. Computed tomography revealed a large heterogeneous expansile lesion centered in the left nasal fossa, with spontaneous internal hyperdense foci and no significant post-contrast enhancement, associated with ipsilateral maxillary and ethmoidal extension. Magnetic resonance imaging demonstrated predominantly high T1 signal, marked T2 hypointensity/signal void, and absence of appreciable internal gadolinium enhancement. These combined imaging findings were in favor of a sinonasal fungal ball. This case highlights the diagnostic value of combining CT and MRI when evaluating a unilateral sinonasal mass with a pseudo-tumoral appearance.

Keywords: Sinonasal fungal ball; sinus mycetoma; CT; MRI; adolescent; unilateral nasal obstruction Introduction.

INTRODUCTION

Fungal rhinosinusitis includes invasive and non-invasive entities, and fungal ball belongs to the non-invasive group. In this setting, fungal material accumulates within the sinonasal cavity without tissue invasion, while bone changes are usually related to expansion and remodeling rather than destructive infiltration [1].

Fungal ball typically affects immunocompetent patients, most often involves the maxillary sinus, and displays characteristic features on imaging. Computed tomography is particularly useful for recognizing its typical appearance [2]. The imaging pattern classically includes unilateral disease, internal calcified or hyperdense foci on CT, high signal intensity on T1-weighted MRI, and marked loss of signal on T2-weighted images [3].

We report an unusual case of a giant unilateral sinonasal fungal ball in an immunocompetent adolescent, with predominant nasal cavity involvement and associated maxillary and ethmoidal extension, producing a pseudo-tumoral radiologic appearance.

CASE PRESENTATION

A 16-year-old boy presented with progressive left-sided nasal obstruction evolving over 3 years. He was immunocompetent and had an atopic background. Rhinoscopic examination revealed a polypoid formation filling the left nasal cavity.

Facial CT was performed first. It demonstrated a large expansile heterogeneous lesion centered in the left nasal cavity. The lesion measured approximately 70 mm in anteroposterior diameter, 30 mm in transverse diameter, and 60 mm in craniocaudal extension. It contained multiple spontaneous hyperdense foci and showed no meaningful enhancement after intravenous contrast administration. The lesion involved the ipsilateral middle and superior turbinates, obstructed the ostiomeatal complex, and was associated with near-complete filling of the left maxillary sinus and ipsilateral ethmoidal extension. The nasal septum was displaced to the right. Posteriorly, the lesion extended toward the choanal region with partial filling of the nasopharyngeal lumen. Adjacent bony structures appeared remodeled rather than aggressively destroyed (Figure 1A-B).

MRI was subsequently obtained for better tissue characterization. It confirmed a well-defined lesion centered in the left nasal cavity, measuring approximately 75 × 45 × 69 mm. The lesion showed predominantly high signal intensity on T1-weighted images, marked low signal intensity with areas of signal void on T2-weighted images, and no appreciable central enhancement after gadolinium injection. Only peripheral mucosal enhancement was seen. The lesion extended toward a posterior ethmoidal cell and was associated with ipsilateral fronto-ethmoido-maxillary retention sinusitis (Figure 2A-D).

The combination of unilateral disease, internal spontaneous hyperdensities on CT, marked T2 signal loss on MRI, and absent significant core enhancement was in favor of a sinonasal fungal ball.

Imaging Findings

The CT appearance was dominated by a unilateral left-sided expansile sinonasal lesion with internal hyperdense foci. This pattern is highly suggestive of fungal concretions and mineralized debris rather than a simple inflammatory polyp. Similar reports describe CT as the key first-line modality for suggesting the diagnosis of sinus mycetoma [2,4].

MRI provided further diagnostic confidence. Prior case-based imaging descriptions have shown sinus mycetoma to display high signal on T1-weighted imaging and marked signal loss on T2-weighted imaging [3]. Our case closely reproduces this pattern, with marked T2 hypointensity/signal void and no appreciable internal enhancement, a combination that strongly favors fungal content over a solid enhancing neoplasm.

Figure 1: CT findings of the left sinonasal lesion. A) Axial non-contrast bone-window image shows an expansile lesion centered in the left nasal cavity with internal spontaneous hyperdense foci. B) Axial contrast-enhanced image shows no significant internal enhancement and associated ipsilateral maxillary extension

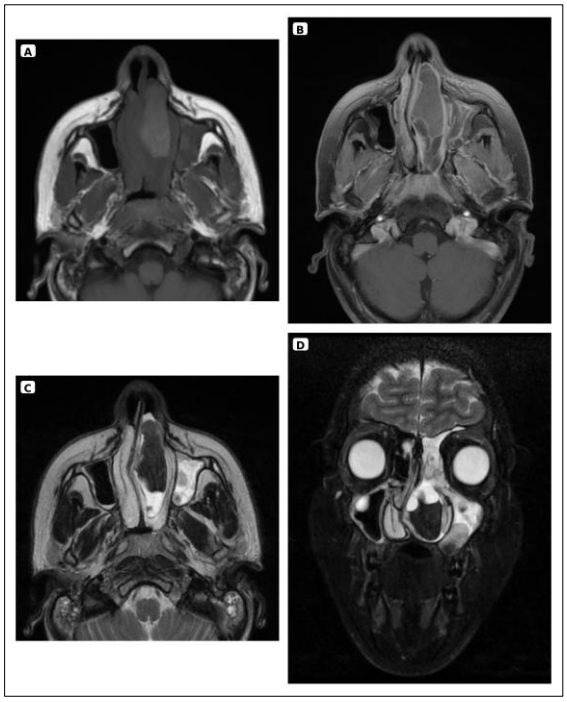

Figure 2: MRI findings of the left sinonasal lesion. A) Axial T1-weighted image shows predominantly intermediate-to-high signal intensity. B) Axial fat-suppressed contrast-enhanced T1-weighted image shows no appreciable enhancement of the lesion core, with peripheral mucosal enhancement. C) Axial T2-weighted image shows marked low signal intensity/signal void. D) Coronal fat-suppressed T2-weighted image confirms unilateral sinonasal extension and associated inflammatory sinus changes

DISCUSSION

Fungal ball is a chronic non-invasive fungal infection of the paranasal sinuses. It is most often reported in adults and commonly involves the maxillary sinus, although other sites may be affected. The condition can be clinically silent or mimic chronic rhinosinusitis, with symptoms lasting months or even years. Chronic unilateral sinonasal symptoms should therefore raise suspicion, especially when imaging reveals calcified or hyperdense content [2,5].

The radiologic pattern in this patient is the main strength of the case. CT demonstrated unilateral heterogeneous soft-tissue density with internal spontaneous hyperdense foci and expansile remodeling. Previous case reports and reviews emphasize that these CT findings are among the most helpful clues to the diagnosis [2,4]. MRI added an important layer of specificity by showing high T1 signal and marked T2 signal loss, findings that have been attributed to dense fungal concretions and the presence of metallic ions such as iron and manganese within the mycelium [3].

Another important point is the pseudo-tumoral appearance. In the Aspergillus niger case report, CT initially raised the possibility of a neoplasm before pathology confirmed a non-invasive mycetoma [4]. The same interpretive challenge exists here because of the lesion's large size, unilateral expansion, and mass effect within the nasal cavity. However, the lack of solid internal enhancement and the characteristic T2 signal void favor fungal material rather than a true sinonasal tumor.

The main differential diagnoses in our case include antrochoanal polyp, allergic fungal rhinosinusitis, inverted papilloma, and sinonasal neoplasm. Antrochoanal polyps usually do not show dense internal calcified foci or marked T2 signal void. Allergic fungal rhinosinusitis can share some imaging features, particularly in atopic patients, but often presents with broader sinus involvement. Inverted papilloma and malignant lesions are more likely to show a recognizable enhancing soft-tissue component. Since our patient is atopic, allergic fungal rhinosinusitis remains a consideration; however, the compact intralesional hyperdensities on CT and the pronounced T2 signal loss argue more strongly for fungal ball.

The case is also notable because of the patient's age. The literature is dominated by adult cases, whereas our patient is an adolescent [3,4]. That relative rarity, together with the extensive endonasal component, gives this report educational value for both radiologists and otorhinolaryngologists.

Published cases indicate that management usually relies on endoscopic surgical removal and restoration of sinus drainage, with good outcomes in non-invasive disease [2,4].

CONCLUSION

The combination of a unilateral expansile sinonasal lesion containing spontaneous hyperdense foci on CT with high T1 signal, marked T2 hypointensity/signal void, and no significant internal enhancement on MRI is strongly in favor of a fungal ball, even in a young immunocompetent patient. The association of CT and MRI is particularly valuable when the lesion presents with a pseudo-tumoral appearance.

DECLARATIONS

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REFERENCES

- Nimhuircheartaigh E, O'Brien WT, *et al.,* Fungal rhinosinusitis: a radiological review with intraoperative correlation. Can Assoc Radiol J. 2017;68(2):178-186.
- Bosi GR, Braga GL, de Almeida TS, de Carli A. Fungus ball of the paranasal sinuses: report of two cases and literature review. Int Arch Otorhinolaryngol. 2012;16(2):286-290.
- Morino T, Kuroyanagi H, Yanagihara T, Ohto H. Sinus mycetoma. Intern Med. 2021; 60:3183-3184.
- Zaman SU, Sarma DP. Maxillary sinus mycetoma due to Aspergillus niger. Internet J Otorhinolaryngol. 2007;6(1).
- Grosjean P, Weber R. Fungus balls of the paranasal sinuses: a review. Eur Arch Otorhinolaryngol. 2007;264(5):461-470.