

# Paranasal Sinuses Fungal Balls in Children

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## Abstract

**Objective:** Rare cases of fungal balls of paranasal sinuses in children. No case has been reported in young children so far. However, allergic aspergillosis has been reported in young children.

**Method:** A case report of 2 cases of fungal balls of paranasal sinuses in children and review of the current literature concerning fungal balls of paranasal sinuses in children are presented.

**Result:** 2 cases of fungal balls in paranasal sinuses were diagnosed in children of 9 and 10 years respectively. Both of them presented with nasal obstruction and eye signs provisional diagnosis was based on CT scan findings. FESS was done and fungal balls were subjected to histopathological examination to rule out invasive fungal sinusitis, fungal staining and culture were done which confirmed the diagnosis of Aspergillosis.

**Conclusion:** To our knowledge this is the first case report of fungal balls in PNS in children in otolaryngology literature. Both the patients were males with age of 9 and 10 years respectively.

**Keywords:** Paranasal sinuses, Mycetoma, Aspergillosis, Fungal sinusitis, FESS, CT.

## INTRODUCTION

Fungal rhinosinusitis is encountered in about 10% of patients requiring surgeries for the nose and PNS. In last two decades the clinical form of fungal rhinosinusitis has been better defined and classified. Most accepted classification is invasive and noninvasive. The noninvasive form is by far most prevalent and classically further divided into Allergic fungal sinusitis and fungal balls.

In children only allergic aspergillosis has been reported.<sup>1</sup> No case of mycetoma has been reported in young children so far.<sup>1-4</sup> It is mostly encountered in older individuals with an average age at presentation being 64 years (range 14-90).<sup>4</sup> Patients suffering from fungal ball of paranasal sinus are immunocompetent.

Most patients present with nonspecific complaints. The slow and asymptomatic development of fungus balls and the nonspecific symptoms often lead to late diagnosis. Most common symptoms are repeated sinus infection, headache, facial pain, postnasal drip, cacosmia and nocturnal cough. Rarer clinical presentations include epistaxis, proptosis, visual changes and neurological signs.<sup>6</sup>

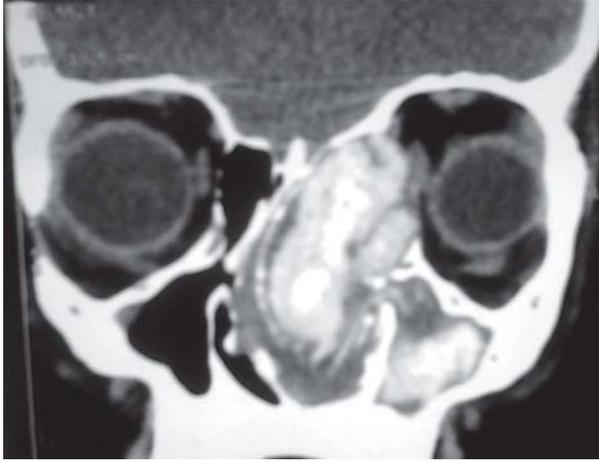
Fungal ball is usually found in one sinus most frequently in maxillary sinus. Predisposing local factors such as septal deviation, paradoxical curvature of middle turbinate have been advocated but not clearly demonstrated. A history of previous dental filling is encountered in as many as 84% of

patients diagnosed with fungal ball and seems to be the only predisposing factor.<sup>3</sup> On the other hand, an ostial closure permits the development of an anaerobic environment that is a favorable condition for *Aspergillus* growth. The combination of these factors probably contributes to the transformation of saprophytic fungal aggregates from the simple contaminant to the pathological form.<sup>2</sup>

When based on the history, endoscopic findings if a patient is suspected of having a fungal ball a computed tomography (CT) of the sinus should be performed.

## CASE NO. 1

A 9 years old boy presented to us with nasal obstruction on left side with mucopurulent nasal discharge and lateral deviation of left eye. On examination, there was DNS on right side, mucopurulent discharge in left nasal cavity with dirty gray debris. CT scan showed fungal ball in all the sinus, lamina papyracea was destroyed leading to fungal ball involving orbit (Fig. 1). FESS was done to remove the fungal ball and to widen the natural ostia. Middle meatus antrostomy was done and the ostia was widened. Sphenoid localization was managed by sphenoidotomy. Fungal balls were removed by suction and irrigation of sinuses with saline with special precaution to avoid injury to the orbit as the lamina papyracea was dehiscent. Follow-up was done for 1 year which was uneventful. Patient was lost for follow-up after 1 year.



**Fig. 1:** Coronal CT scan of the paranasal sinus showing deviation of the nasal septum towards right side and hyperdensity in the maxillary and ethmoid sinus left side with erosion of the lamina papyracea and extension of the disease into the orbital cavity

## CASE NO. 2

A 10-year-old boy presented with nasal obstruction, purulent rhinorrhea, lateral deviation of right eye and mild proptosis in 2006. Nasal endoscopy was done which showed fungal debris in right nasal cavity. CT scan was done which showed extensive fungal balls filling all the sinuses on right side (Fig. 2). FESS was done to remove all the fungal debris and to widen the sinus opening. Infundibulotomy with middle meatus antrostomy was done to gain access to maxillary sinus, sphenoidotomy was done followed by widening of frontal recess. All the fungal balls were removed by repeated irrigation with saline and suction with special care during removal of fungal ball from posterior ethmoids where the lamina papyracea was breached invading the orbit.



**Fig. 2:** Coronal CT scan of the paranasal sinus showing hyperdensity in the maxillary and posterior ethmoid sinus of the right side

Systematic antifungal drugs were not given and follow-up lasted for 1 year, after which patient was lost for follow-up. He again presented after 3 years at the age of 13 years with nasal obstruction of right side since 3 months. CT scan was again done and we found fungal balls involving all the sinuses on right side. Revision FESS was done and the report was again Aspergillosis.

## DISCUSSION

Previously frequently referred to incorrectly as mycetoma. The fungus ball is now well-defined as the presence of tangled mats of hyphae in one or more sinus cavities. It occurs in immunocompetent patients.<sup>2</sup> Persistent symptoms such as postnasal discharge, crocosmia are the most common presentation.<sup>2</sup> Rarer clinical presentation includes epistaxis, proptosis and neurological complaints.<sup>4</sup>

Fungal balls of PNS are mostly encountered in older individuals with an average age at presently being 64 years (range 14-90)<sup>4</sup> no case has been reported in young children.<sup>1-4</sup>

We are reporting 2 cases of preadolescent age group (9 and 10 years).

In most series a female predominance is noted (2:1)<sup>2,4</sup> but our both patients were male. It is usually found in just one sinus, most frequently maxillary sinus, followed by the sphenoid sinus,<sup>4</sup> in our cases all the sinuses on one side were involved.

CT is the most reliable radiological examination to identify a fungus ball.<sup>2,5</sup> Heterogeneous opacification is the most common appearance associated with bony thickening or sclerosis of sinus walls involved.

Calcification corresponding to dense hyphae is frequently observed but is not specific for fungus ball furthermore bone erosion may be observed specially when there is significant inflammatory reaction to mucous membrane.<sup>1</sup>

Diagnosis is confirmed by HPE. No mucosal invasion is found as it is an extramucosal disease.

FESS is nowadays the treatment of choice allowing excellent results with limited morbidity. Surgery is most often curative and no local or systematic antifungal therapy is required. No medical treatment is required even when radiologically bone destruction is noted.<sup>2,3</sup>

Recurrent or persistent disease is most often detected during investigation for persistent or recurrent symptoms such as postnasal discharge and is most often diagnosed in the first 2 or 4 years after surgery. We observed recurrence in one patient after 3 years of surgery due to sinostomy closure.

In 50% of cases closure of sinostomy is observed.<sup>3</sup> Resolution can usually be achieved with a minimal invasive surgical procedure but we had to revise FESS. Other authors propose a Caldwell luc approach for recurrence of maxillary fungal ball.<sup>3</sup>

- Fungal ball in PNS has not been reported in children.
- This is the first report of two cases of fungal ball in PNS in children.
- All the sinuses on one side were involved.
- Orbital symptoms were present.
- Recurrence was seen after 3 years in one case.

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