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Maxillary Sinus Mucormycosis Presenting as a Fungal Ball in an Uncontrolled Diabetic: A Diagnostic Dilemma

Dr. N Chandana[1], Dr. Sudhir M Naik[2], Dr. Aishwarya[3]

[1, 2, 3]Department of Otorhinolaryngology, The Oxford Medical College Hospital and Research Centre, Bangalore, Karnataka, India
Email: *nchandana1999[at]gmail.com*

Abstract: ***Background: Mucormycosis is a rare, invasive fungal infection typically associated with immunocompromised individuals, notably those with uncontrolled diabetes. It often presents aggressively with rapid progression involving the sinonasal, orbital, or cerebral regions. However, atypical presentations can complicate diagnosis and delay treatment. Case report: We report a case of a 44-year-old woman with poorly controlled diabetes mellitus (HbA1c: 8.4%) who presented with a 5–6 year history of left-sided headache and head heaviness, recently worsened and accompanied by unilateral facial pain, foul-smelling odor from the left nasal cavity, and postnasal drip. Notably, there were no signs of nasal obstruction, discharge, or systemic symptoms. Anterior rhinoscopy and diagnostic nasal endoscopy revealed minimal findings, while imaging studies suggested maxillary sinusitis with hyperdense material indicative of a fungal ball. The patient underwent functional endoscopic sinus surgery (FESS), revealing a calcified mass in the left maxillary sinus. Initial intraoperative findings and CT features suggested a non-invasive fungal ball, often associated with Aspergillus. However, histopathology confirmed mucormycosis, showing broad, aseptate, branching hyphae with PAS positivity. Conclusion: This case underscores an unusual presentation of maxillary sinus mucormycosis mimicking a fungal ball, emphasizing the importance of considering invasive fungal infections in diabetic patients, even in the absence of classical symptoms. Timely surgical intervention and histopathological confirmation are vital for accurate diagnosis and effective management. A high index of suspicion is essential to prevent potential complications associated with delayed treatment in immunocompromised individuals.***

Keywords: Mucormycosis, Fungal ball, Maxillary sinusitis, Diabetes mellitus, Invasive fungal sinusitis, Chronic headache, Posaconazole, Functional endoscopic sinus surgery (FESS), Histopathology, Atypical presentation, Calcified sinus mass, Immunocompromised host, Fungal rhinosinusitis, Diagnostic dilemma, Sinonasal infection.

1. Introduction

Mucormycosis is a rare but serious invasive fungal infection predominantly affecting immunocompromised individuals, especially those with poorly controlled diabetes mellitus. It typically presents with aggressive symptoms involving the sinonasal, orbital, or cerebral regions. However, in rare instances, it may mimic a non-invasive fungal ball, commonly caused by Aspergillus species, leading to diagnostic challenges. This report presents a unique case of maxillary sinus mucormycosis in a diabetic patient who exhibited atypical, chronic symptoms resembling a fungal ball. The case emphasizes the importance of maintaining high clinical suspicion, prompt surgical intervention, and histopathological confirmation to ensure accurate diagnosis and effective treatment in high-risk patients.

2. Case Presentation

A 44-year-old woman with a history of poorly controlled diabetes mellitus (HbA1c: 8.4%) presented with chronic left-sided headache and head heaviness for 5–6 years, worsened over the past month. She also reported left-sided facial pain, foul-smelling odor from the left nasal cavity, and postnasal drip. There was no history of nasal obstruction, discharge, fever, or systemic symptoms. She had a prior diagnosis of migraine and was recently restarted on treatment. Oral examination revealed dental caries and discoloration in the left upper premolars. These non-specific, chronic symptoms initially suggested a fungal ball, delaying the suspicion of invasive fungal sinusitis.

Figure 1: Initial presentation

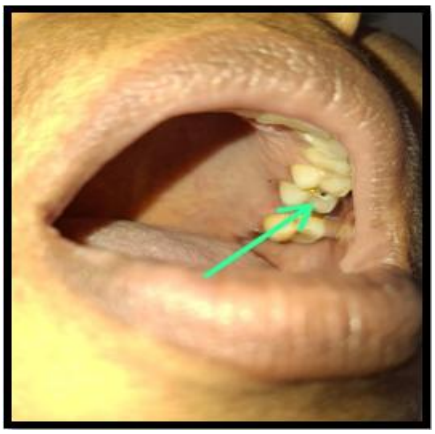

Figure 2: Oral examination revealed dental caries and discoloration in the left upper premolars

3. Investigation

Detailed ENT examination was done and then Anterior rhinoscopy revealed minimal nasal secretions and a deviated nasal septum. Diagnostic nasal endoscopy showed mucopurulent discharge in the left middle meatus. A CT scan of the paranasal sinuses indicated left maxillary sinusitis with hyperdense areas suggestive of a fungal ball, along with ethmoid and frontal sinusitis. No bacterial growth was observed in the nasal swab culture. These findings led to a provisional diagnosis of non-invasive fungal sinusitis.

Figure 3A

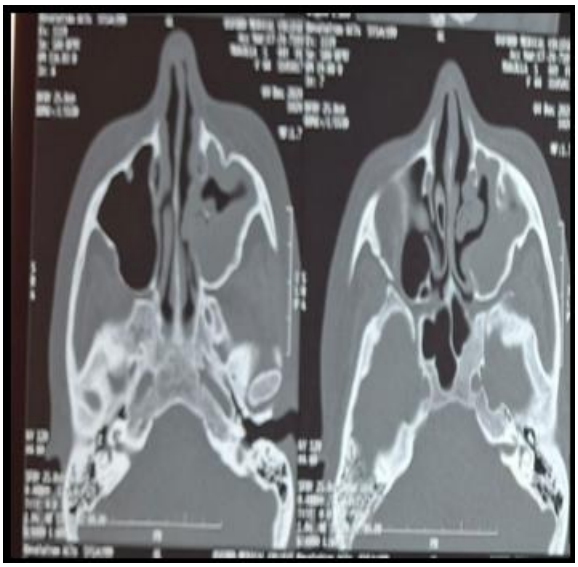

Figure 3B

Figure 3 (A-B): CT PNS showing Left maxillary sinusitis with hyperdense areas with Left frontal and bilateral anterior/middle ethmoid sinusitis. Right concha bullosa. Obstruction of the left frontoethmoidal recess due to mucosal thickening.

Management

The patient was initially started on antibiotics and nasal washes. However, due to persistent left-sided unilateral headache and CT findings suggestive of a fungal ball, she was planned for functional endoscopic sinus surgery (FESS).

Intraoperative Findings

The right nasal cavity was normal. The left maxillary sinus contained a foreign body-like structure/calcified fungal mass, which was removed and sent for: Histopathological examination (HPE), KOH mount and fungal culture.

Left medial maxillary antrostomy was performed, and the diseased tissue was completely cleared.

Postoperative Course & Antifungal Treatment

Itraconazole and nasal wash were started immediately postoperatively along with cephalosporins.

Histopathology confirmed mucormycosis with broad, aseptate, branching fungal hyphae and PAS positivity.

Following the confirmation of mucormycosis, the patient was started on Posaconazole 300 mg BD for 1 day, followed by 300 mg OD for 1 week, with a planned continuation for 6–12 weeks.

A repeat diagnostic nasal endoscopy showed residual fungal debris in the left nasal cavity, requiring ongoing antifungal therapy and debridement.

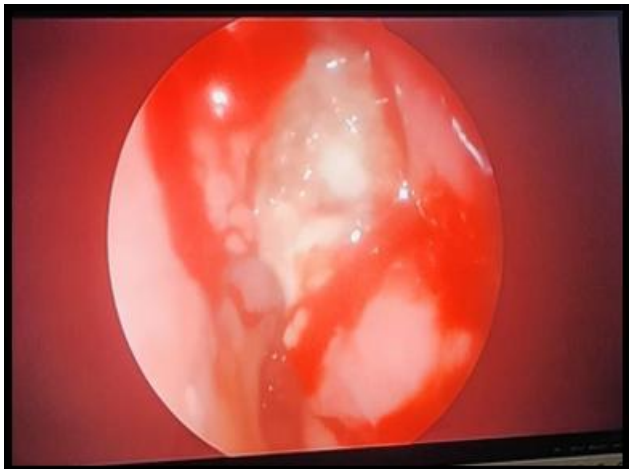

Figure 5: Intraoperative Findings - the right nasal cavity was normal. The left maxillary sinus contained a foreign body-like structure/calcified fungal mass, which was removed

Post-Treatment Endoscopic Findings & Follow-Up
The patient completed the full antifungal treatment course, including nasal washes and regular follow-ups.
Final diagnostic nasal endoscopy findings showed:
No residual mucopurulent discharge.
No fungal debris or necrotic tissue.
Patent left maxillary sinus opening with no evidence of recurrence.
Healthy pink mucosa without signs of inflammation.
The patient remains symptom-free and continues long-term monitoring for potential recurrence.

Histopathology:

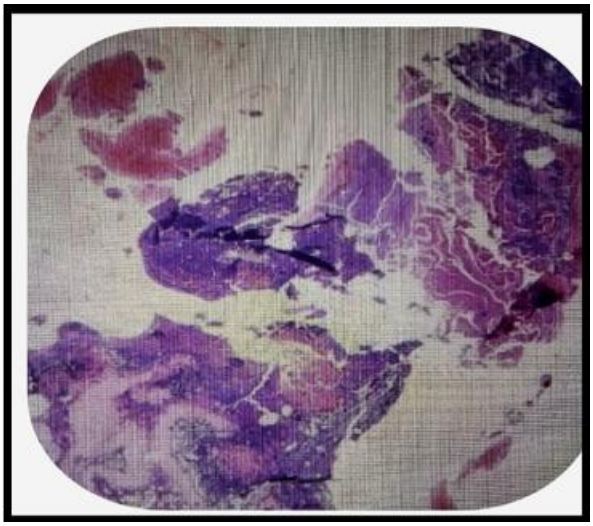

Figure 4A

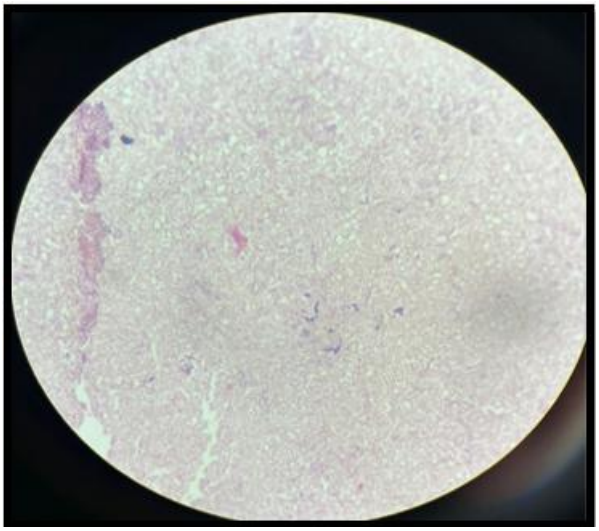

Figure 4B

Figure 4 (A-B): Histopathology slide showing broad, aseptate, ribbon-like fungal hyphae, which are characteristic of Mucormycosis

4. Discussion

This case highlights an uncommon presentation of maxillary sinus mucormycosis mimicking a fungal ball in an immunocompromised patient. Fungal balls are typically non-invasive and often associated with *Aspergillus* species; however, in this diabetic patient, mucormycosis presented as a chronic, indolent sinus disease with calcified mass and without classical signs of tissue necrosis. Differential diagnoses included allergic fungal rhinosinusitis, chronic bacterial sinusitis, and non-invasive fungal infection. The absence of aggressive clinical features delayed the suspicion of mucormycosis. Histopathological confirmation was crucial for diagnosis. This case underscores the importance of high clinical suspicion, especially in diabetic patients with atypical or prolonged sinonasal symptoms. Mucormycosis is a fulminant fungal infection and affects more commonly the immunocompromised host. These fungi are present in soil, air, food, animal excreta, and in the environment as saprophytes.[1] In a healthy individual, fungal spore enters through the inhalation route daily and colonize mucosa of the oral and nasal cavity, paranasal sinuses, and pharyngeal mucosa. The fungal spore also gets precipitated through trauma, dental extractions, intramuscular injections to infected wounds, insect bites, intravenous drug abuse, and prosthetic devices.[2]

Differential diagnoses: included allergic fungal rhinosinusitis, bacterial sinusitis, and chronic invasive fungal sinusitis. The absence of necrosis and the presence of a calcified mass suggested a fungal ball, but histopathology confirmed mucormycosis, emphasizing the need for tissue diagnosis in ambiguous cases[3]. Early identification and treatment are crucial to prevent complications associated with invasive fungal infections in high-risk patients.

5. Conclusion

Mucormycosis is typically an aggressive, rapidly progressive infection with sinonasal, orbital, or cerebral involvement, especially in immunocompromised individuals. However, this case presented atypically with chronic unilateral headache, facial pain, and foul-smelling nasal discharge, resembling a fungal ball rather than invasive fungal sinusitis. Mucormycosis rarely manifests as a fungal ball, which is more commonly linked to Aspergillus infections. The calcified sinus mass and absence of necrosis intraoperatively made diagnosis challenging. Histopathology was essential in confirming invasive mucormycosis. This case highlights the need for high clinical suspicion in diabetic patients with atypical presentations, as early diagnosis, surgical debridement, and antifungal therapy are crucial to preventing complications.

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