

The Dark Side of the Ear: *Aspergillus Niger* Otomycosis in a Chronic Diabetic Patient: A Case Report**Pranshree Kalita¹, Tonushyam Sonowal², Ranjita Khandait³, Nayanjyoti Sarmah⁴, Subhrendu S. Sen⁵**¹Post Graduate Student, Dept. of Microbiology, Assam Medical College and Hospital, Dibrugarh, Assam²Demonstrator, Dept. of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam³Assistant professor, Dept. of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam⁴Assistant professor, Dept. of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam⁵Prof & Head, Dept. of Microbiology, Lakhimpur Medical College and Hospital, North Lakhimpur, Assam

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Abstract**Background:** Otomycosis is a superficial fungal infection of the external auditory canal, most commonly caused by *Aspergillus* and *Candida* species. It is particularly prevalent in tropical regions, with host factors such as diabetes, antibiotic use, and poor aural hygiene increasing susceptibility.**Case Presentation:** A 63-year-old female with uncontrolled type 2 diabetes mellitus presented with itching, pain, aural fullness, and discharge from the left ear. She reported recurrent symptoms over the past year and a history of applying mustard oil and using sharp objects for ear-picking. On examination, black, fluffy debris was noted in the external auditory canal, with an intact tympanic membrane. Microscopy of the aural debris showed septate hyphae with acute-angle branching on KOH mount. Culture on Sabouraud Dextrose Agar yielded black, powdery colonies, and Lactophenol Cotton Blue (LPCB) mount demonstrated characteristic morphology of *Aspergillus Niger*. The patient was treated with topical clotrimazole ear drops for 15 days and oral itraconazole for 10 days, resulting in complete resolution of symptoms.**Conclusion:** This case emphasizes the importance of considering *Aspergillus Niger* otomycosis in diabetic patients with recurrent ear complaints. Early diagnosis using microscopy and culture, along with appropriate antifungal therapy, is essential for favorable outcomes. Counseling on proper ear hygiene and strict glycemic control plays a pivotal role in preventing recurrence.**Keywords:** *Aspergillus Niger*, Diabetes Mellitus, Fungal Ear Infection, Otomycosis.

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Introduction

The human ear is continuously exposed to a wide variety of bacteria and fungi present in the external environment. Otomycosis is a superficial fungal infection that affects the external auditory canal [1]. The prevalence rate of otomycosis worldwide varies between 9% and 30%, the highest being in humid, hot, and dusty areas of tropical countries. In India, otomycosis accounts for about 9–27% of all clinical cases of otitis externa and up to 30% in patients with ear discharge. [2]

The incidence of otomycosis have increased due to host factors such as prolonged use of antibiotics and steroids, immunosuppressive conditions like diabetes and malignancies and various aural

preparations and unhealthy aural hygienic factors, like ear picking and use of oil [3,4]

Although a wide spectrum of fungi are known to be the causative agents, the most common cause of otomycosis are the *Aspergillus* species and the *Candida* species [5]; more precisely, species of *Aspergillus niger* complex, along with *Candida parapsilosis* and *Candida albicans*. [6]

Here, we report the case of otomycosis due to *Aspergillus niger* in a patient with uncontrolled diabetes mellitus with an emphasis on the diagnostic and treatment procedures.

Case Report

A 63-year-old female presented to the out-patient department with a two-week history of itching, pain, aural fullness, and discharge from the left ear. She was a homemaker with frequent exposure to dust, soil, and moisture. The patient also reported intermittent itching and pain in the same ear for the past one year, during which she had applied mustard oil to the external auditory canal and used a safety pin and matchstick for ear-picking. She was a known case of type 2 diabetes mellitus for the past 10 years with poor adherence to medication and dietary restrictions.

Local examination of the ear revealed black, fluffy debris in the left external auditory canal and mild erythema and edema of the canal walls. However, the tympanic membrane was intact.

Laboratory investigations revealed elevated fasting and post-prandial blood sugar levels (138 mg/dl and 213 mg/dl respectively). Liver function test showed the parameters within normal limits except for slightly raised levels of serum SGOT (63.7 U/l) and globulin (3.81 gm%).

For microbiological examination and culture of the aural debris, sterile swab sticks were used to gently collect adequate debris from the auditory canal and then transferred to the laboratory in a sterile container. Direct microscopy of the specimen

revealed septate hyphae with acute-angle branching on 10% potassium hydroxide (KOH) mount, suggestive of *Aspergillus* species (Figure 1). No bacterial morphology was observed on Gram stain. The specimen was cultured on Blood agar, MacConkey agar, and Sabouraud Dextrose Agar (SDA), and incubated at 37°C. After 24 hours, white, fluffy growth appeared on Blood agar, and a white, powdery growth without reverse pigmentation developed on SDA.

Gram staining of the growth demonstrated septate, branching hyphae. Subculture on SDA slants yielded black, powdery colonies with no pigment on the reverse after overnight incubation. (Figure 2)

Lactophenol cotton blue (LPCB) mount revealed long smooth conidiophores ending in a globose vesicle, biserial phialides covering the entire vesicle, and chains of rough, brown to black, globose conidia giving a characteristic radiating black conidial head, confirming the diagnosis of *Aspergillus niger*. (Figure 3)

Antifungal susceptibility testing was, however, not carried out and the patient was treated as per existing antifungal guidelines [7] with clotrimazole ear drops for 15 days and oral Itraconazole 100 mg for 10 days. Following initiation of the prescribed regimen, the patient's symptoms subsided and was subsequently educated regarding preventive measures to minimize recurrence.

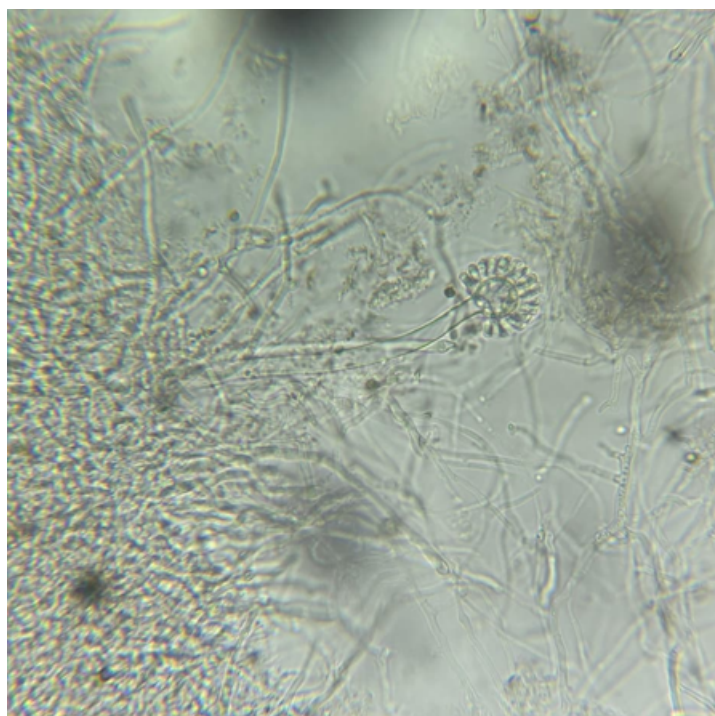


Figure 1: KOH mount showing septate fungal hyphae

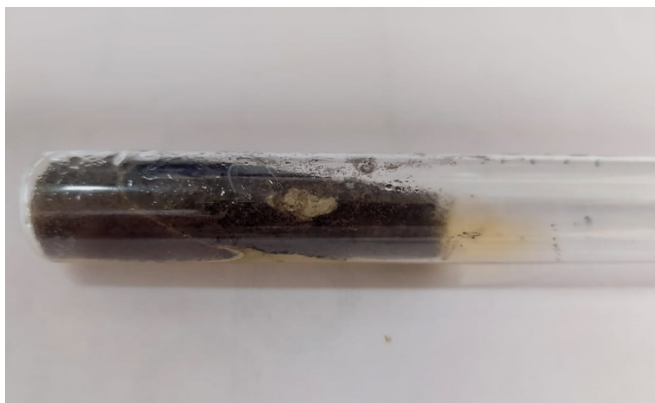


Figure 2: Growth of *Aspergillus Niger* on Sabouraud dextrose agar tube

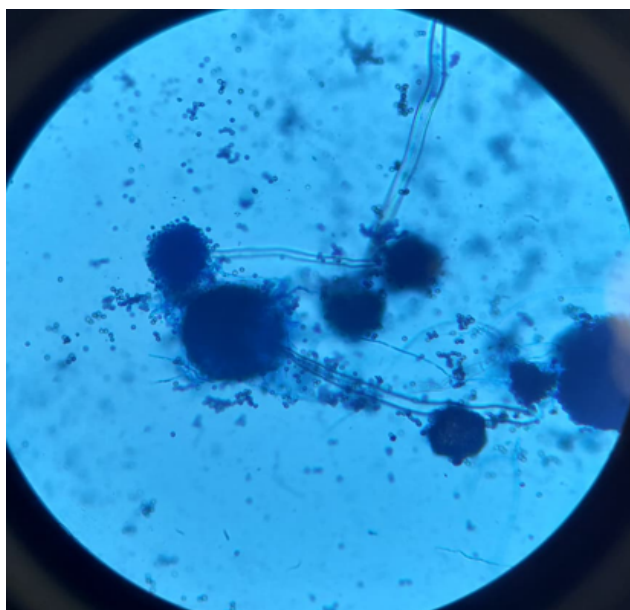


Figure 3: LPCB mount of *Aspergillus Niger* under 40X.

Discussion

Aspergillus niger accounts for about 32% of the otomycosis cases in this north-eastern part of the country. [8] However, literature regarding the same is sparse and to our knowledge there is no published recent literature on *Aspergillus niger* associated ear infection from this part of the country.

In the present case, *Aspergillus niger* was isolated from the aural debris of a diabetic female presenting with ear itching, pain, discharge, and blocked sensation. Several predisposing factors could be identified. The patient's long-standing, poorly controlled diabetes mellitus created a state of relative immunosuppression and hyperglycemia, which are well-established contributors to increased fungal susceptibility. [4] In addition, her repeated use of mustard oil in the ear canal and self-instrumentation with sharp objects such as safety pins and matchsticks provided both the moist environment and local trauma that promote fungal colonization. Environmental exposure to dust and soil, due to her household activities, likely acted as an additional source of fungal spores. [9]

The clinical manifestations of otomycosis are often non-specific and overlap with bacterial otitis externa, including pruritus, otalgia, otorrhea, and aural fullness. [10] In such scenarios, laboratory confirmation becomes crucial. Direct microscopy using a potassium hydroxide (KOH) mount remains a rapid, inexpensive and informative diagnostic tool, capable of detecting fungal hyphae.

In this case, KOH mount revealed septate hyphae with acute angle branching suggestive of *Aspergillus*. Subsequent culture on Sabouraud Dextrose Agar yielded typical black, powdery colonies, and lactophenol cotton blue (LPCB) mount confirmed the characteristic morphology of *A. niger*—smooth conidiophores terminating in globose vesicles with biserial phialides and radiating black conidial heads. Such combined use of direct microscopy and culture not only enables species-level identification but also helps exclude bacterial co-infections.

Management of otomycosis involves meticulous aural toileting to remove fungal debris, elimination of predisposing factors and antifungal therapy.

Topical azoles such as clotrimazole, miconazole are widely regarded as first-line agents due to their high efficacy, low ototoxicity, and favorable safety profile. Oral antifungals such as itraconazole or fluconazole are generally reserved for refractory, recurrent, or immunocompromised cases. [7,11] In this patient, a combination of local and systemic antifungal therapy was employed, resulting in complete resolution of symptoms. Importantly, patient counseling regarding avoidance of self-medication with oils, refraining from traumatic ear cleaning practices, and strict glycemic control was emphasized to reduce the risk of recurrence.

Several studies have highlighted the high relapse rate of otomycosis, particularly in individuals with persistent risk factors [12]. The present case is instructive in demonstrating how multiple risk factors and unhygienic local practices, namely, diabetes, self-instrumentation, moisture and environmental exposure—can synergistically predispose to chronic or recurrent otomycosis.

The case also reinforces the need for physicians and microbiologists to maintain a high index of suspicion for fungal otitis in patients with recurrent or non-resolving ear infections, especially in diabetics.

Limitations

The current case report is limited by the lack of molecular identification such as PCR, which could enhance the accuracy of identification and differentiate *Aspergillus niger* from other similar species. Absence of Antifungal Susceptibility Testing is another limitation as testing could provide more specific guidance and ensure the effectiveness of the chosen antifungal agents. In addition, the follow-up period was solely focused till resolution of symptoms and as such there is no data on recurrence or long-term complications.

Conclusion

Mycotic otitis externa being the most common fungal infection affecting the external ear, especially patients from low socio-economic strata and immunocompromised people, a simple step-wise protocol is needed for proper treatment. [13]

Prompt diagnosis with direct microscopy and culture, coupled with appropriate antifungal therapy and patient education, ensures favorable outcomes. Attention to predisposing factors like poor glycemic control and unhygienic ear practices is crucial in preventing recurrence.

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