

## A CASE STUDY OF ONYCHOMYCOSIS CAUSED BY ASPERGILLUS FUMIGATUS IN DHIRAJ HOSPITAL, VADODARA.

### Clinical Microbiology

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### ABSTRACT

Onychomycosis is a fungal infection of the nails. It is the most common nail disease in adults. Toenails are more likely to be infected than fingernails. Because fungi like warm, moist environments, the inside of a shoe is a perfect place for fungi to grow. Onychomycosis is known as nail fungal infection brought on by dermatophytes, yeast, non-dermatophyte Mold. According to epidemiological investigations, the *Aspergillus fumigatus* has been identified as an egregious fungal cause of toenail onychomycosis. Here, we present a case of *Aspergillus fumigatus*-related multiple toenail infections in 57-year-old men with type 2 diabetes. The causing agent was determined to be *A. fumigatus* based on the culture's macroscopic and microscopic features.

### KEYWORDS

Sabouraud dextrose agar (SDA), Lactophenol cotton blue (LPCB), potassium hydroxide (KOH)

### INTRODUCTION-

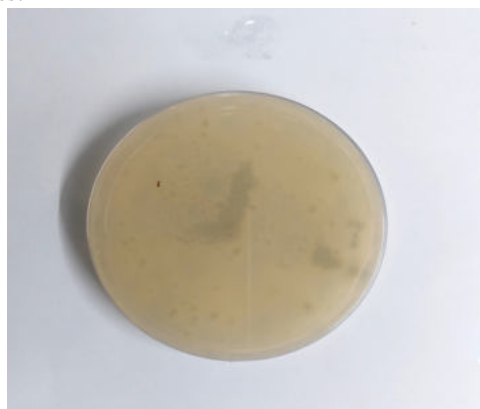
Onychomycosis is a fungal infection of the nails. It is the most common nail disease in adults. Toenails are more likely to be infected than fingernails. Because fungi like warm, moist environments, the inside of a shoe is a perfect place for fungi to grow. Onychomycosis is a frequent nail infection caused by dermatophytes, yeasts and non-dermatophyte molds. Among them, non dermatophytic onychomycoses represent 1.45–17.6% of all fungal nail infections. Out of all these infections, *Aspergillus* has been reported to be the most common agent causing onychomycosis after *Scopulariopsis* spp. The clinical selection of *Aspergillus* isolates however has to be carefully ascertained in nails because of the ubiquitous distribution of this agent and its frequent isolation as a lab contaminant. In this study, we describe a case of onychomycosis due to *Aspergillus fumigatus* occurring in 57-year-old men with type 2 diabetes.

### Case Report-

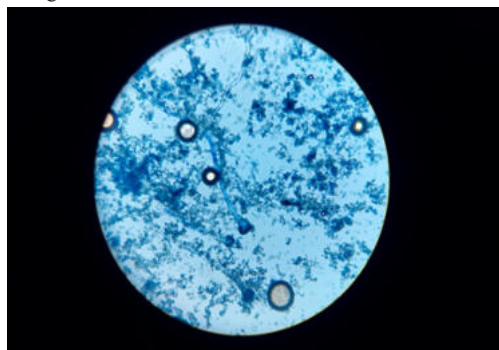
57-year-old men with type 2 diabetes from an urban background, presented to the Dermatology OPD with discoloration and disfigurement of all the toenails of the right foot for 8 months. There were no lesions elsewhere in the body. The patient had no history of trauma. He denied any suggestive history of contact in the family or with animals. Examination of the affected toenails revealed yellowish green discoloration with thickening debris with visible infection. On microscopic examination, fungal hyphae were observed in 20% potassium hydroxide preparations which were abundant, hyaline and septate with dichotomous seen. The nail sample was cultured on Sabouraud's dextrose agar at 25°C. The growth on SDA was rapid and had a granular texture with bluish green pigmentation. Lactophenol cotton blue mount of the fungal growth revealed the presence of a uniseriate columnar vesicle that had been emerging from the upper two-thirds of the vesicle. The conidia were arranged in long chains and were globose to sub globose, green and finely roughened (shown in figures). Similar growth was observed from a repeat sample collected from the patient after an interval of 1.5 weeks. The fungal isolation was identified as *Aspergillus fumigatus* and the patient was administered 8-week course of oral Itraconazole once daily along with Itraconazole cream. Follow up visit 2 months later revealed improvement and discoloration of the nails and no fungal elements in KOH mount.



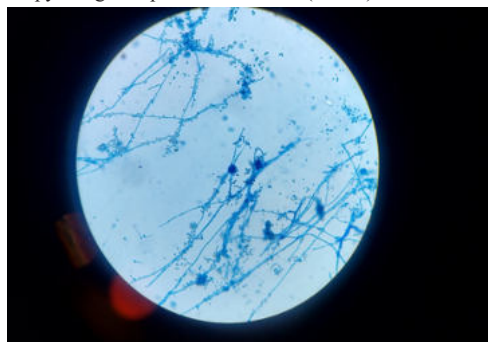
**Figure-1** - Front view of *Aspergillus Fumigatus* colon on sabouraud dextrose



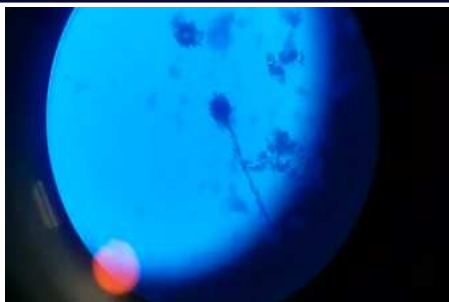
**Figure-2**- Reverse view of *Aspergillus Fumigatus* on sabouraud dextrose agar



**Figure-3**- Microscopic image of *Aspergillus Fumigatus* under light microscopy using lactophenol cotton blue (LPCB)



**Figure-4**- LPCB mount of *Aspergillus Fumigatus* 40X



**Figure-5-** LPCB mount of *Aspergillus Fumigatus*

All toes nail shows a total dystrophic variant of the onychomycosis. The 20% potassium hydroxide preparations which showed abundant, hyaline and septate with dichotomous branching. The Nail samples were cultured on SDA media and Culture showing a smoky green, velvety powder appearance suggestive of *Aspergillus fumigatus*. Lactophenol cotton blue (LPCB) Characteristics of conidia over a flask-shaped vesicle of *Aspergillus fumigatus*.

### DISCUSSION-

The isolation of *Aspergillus fumigatus* as the causative agent of onychomycosis in 57-year-old men with type 2 diabetes belonging from an affluent background and with no precipitating risk factors. Onychomycosis affects employees in a variety of occupations, but Kaur et al. is covered that housewives, farmers, labourers, industrial workers, clerical workers, and students were the most frequently affected. The majority of cases involved ill-fitting usages and barefoot walking among other risk variables. *Aspergillus* spp. is frequently isolated from soil, air, and plant matter. F Zaini et al. reported that toenail onychomycosis among non-dermatophyte Molds, *Aspergillus flavus* (11.78%) was the commonest species of all non dermatophytic Molds followed by *A. fumigatus* (6.08%), *A. Niger* (3.04%) and *Penicillium* spp. (2.66%). Similarly, *A. Niger* was the most prevalent organism (32.0 percent), followed by *A. fumigatus* (26.05), *A. flavus* (16.0 percent), *A. Tereus* (4.0 percent), and *A. Sydowii* (1/50, 2.0 percent). In a similar manner, Sung Min Hwang et al. discovered that *Aspergillus* spp. was the most frequently isolated etiologic agent of onychomycosis due to NDM (83.1 percent in a case of *Aspergillus fumigatus* toenail onychomycosis that was described by Stanley A. et al. in 1998, the patient was immunocompetent.

In our case, direct KOH mount preparation showed the presence of abundant hyaline and septate hyphae with dichotomous branching and it could be correlated with the results of the culture, the same results were seen when a lactophenol cotton blue stain was used. Did not perform antifungal susceptibility testing and morphological identification could not be confirmed by the molecular methods due to the lack of facility in our laboratory.

### CONCLUSION-

Awareness among Microbiologists about the Etiological association of *aspergillus fumigatus* with onychomycosis is required.

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