

## ASPERGILLUS SYDOWI INFECTION OF HUMAN FINGER NAIL

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### Summary

A case of *Aspergillus sydowi* infection of left middle finger nail is described. The presence of fungal hyphae with phialids and spores on direct microscopy as well as in culture, the colour of the subungual mass of the nail resembling the colour of the fungus in culture, repeated isolations of *A. sydowi* from the diseased tissue along with the absence of any established 'pathogenic' species in the specimen are taken as evidences that this fungus was invading the nail tissue.

### Introduction

In recent times opportunistic fungal infections in compromised hosts have been frequently seen in hosts suffering from debilitating diseases or in chiropody patients. Several species of *Aspergillus* are known to cause such infections of nail (onychomycosis) in man<sup>1-5</sup>.

In India, we have been able to find only one case in the literature available to us, of *A. nidulans* var. *dentatus* infection of finger nail<sup>6</sup>.

Recently, we had an opportunity to study a case of *A. sydowi* infection of the finger nail. A brief account of the case, along with the evidence that the fungus in question, was actively invading the nail tissue, is presented.

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### Material and Methods

Samples of the diseased nails were examined in 40% KOH squash preparations and cultured on slants containing (a) Sabouraud's dextrose agar incorporating cycloheximide (.5 mg/ml) and (b) Sabouraud's dextrose agar incorporating chloramphenicol (.05 mg/ml) only. The isolations were periodically repeated over a period of nine months. Rayner<sup>7</sup> colour chart was followed in the description of the organism.

### Results

#### Case History

A 31-year-old male tailor, resident of Balaghat (M.P.), India presented with onychomycosis of left middle finger. Infection was contracted some 10 years earlier and was associated with trauma (nail plate was injured by the needle of the sewing machine). There was no pain at the affected site. Patient's general health was excellent. Clinically, the infection was of distal subungual type. The affected nail was dystrophic showing onycholysis, slight



**Fig. 1** The infected left hand middle finger

subungual hyperkeratosis and separation of the nail plate from the nail bed. The subungual mass was buff coloured (Fig. 1).

Direct microscopic examination of the diseased nail samples revealed the presence of pale yellow, septate, branched, fungul mycelium, 2.5-4  $\mu\text{m}$  in width, sometimes with phialids (reduced conidial heads) borne directly on the mycelium along with many single celled, echinulate conidia, 4-5  $\mu\text{m}$  in diameters (Fig. 2).

Table I shows that in all instances there have been repeated isolations of *Aspergillus sydowi* in the cycloheximide free medium over a period of nine months. However, in the medium containing cycloheximide no dermatophyte was isolated.

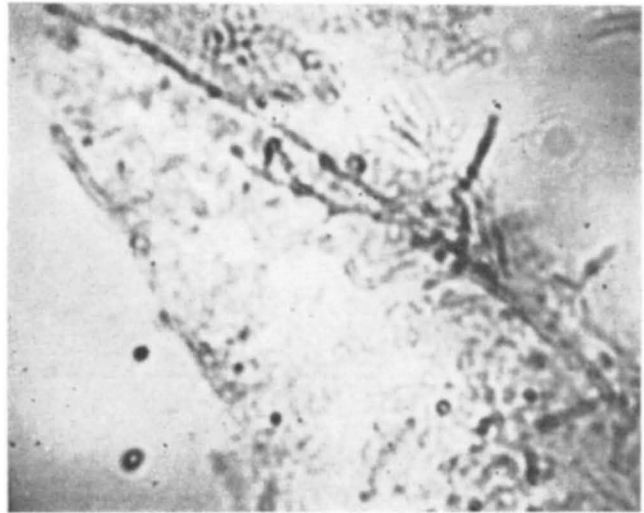
Colonies of *A. sydowi* on Sabouraud's dextrose agar were 5.6 mm in 16 days at 30°C. Initially these were whitish, mucoid showing concentric zonations, gradually becoming buff, then glaucous sky blue and finally glaucous grey in colour. Reverse was buff; conidiophores were hyaline, smooth, thick walled, 100-370 x 3-8  $\mu\text{m}$ ; vesicles were subglobose to elliptical, 6-16  $\mu\text{m}$ ;

phialids (reduced conidial heads) measured 3-35 x 6-6.5  $\mu\text{m}$  and were borne directly on the mycelium; conidia were single celled, globose, glaucous grey, echinulate, 4-5  $\mu\text{m}$  in diameter.

The culture has been deposited in the Herb. I.M.I. Kew No. 244082.

### Discussion

The results presented above suggest that *A. sydowi* was surviving and actively invading the nail tissue of the patient for many years. This is indicated by the following facts: 1. The fungal hyphae with phialids were regularly seen in the diseased tissue similar to that seen in the culture. 2. The organism was repeatedly isolated for a period of nine months from a considerable proportion of the tissue fragments. 3. The colour of the subungual mass of the nail resembled the colour of the fungus in culture. 4. Single celled, echinulate, 4-5  $\mu\text{m}$  conidia, similar to the conidia of *A. sydowi* in culture were regularly observed in the diseased samples. Such a sexual sporulation in vivo is considered as typical of possible saprophytic invasion of the nail and a feature often found in non-dermatophytic nail



**Fig. 2** KOH squash preparation of the diseased nail showing hyphae with phialids and conidia x 300

infection but not invariably so. 5. No isolation of well established "pathogenic" species occurred in these repeated samples to suggest that *A. sydowi* was not the organism seen by direct microscopy. Thus it seems reasonable to postulate that *A. sydowi* was responsible for nail infection.

The site of the infection, in the present case was the left middle finger whereas, prior reports<sup>8,9</sup> were all from toe nails. The involvement of only one finger is not often seen in contrast to toe nail infection. This is probably due to the heat and humidity around toe nails<sup>10</sup>.

Usually, trauma is the predisposing factor in the non-dermatophytic nail infection with no involvement of skin. However, *Hendersonula toruloidea*,

a non-dermatophyte is capable of infecting skin and nails without trauma being the predisposing factor<sup>11,12</sup>.

Frequently, onychomycosis caused by molds is observed in old patients. Onsberg et al<sup>3</sup> attributed such occurrence to decreased cell-mediated immunity, poor circulation in the peripheral vessels, increased incidence of diabetes mellitus and senile nail changes. However, the present patient was young, and in excellent health. The predisposing factor in the present case was trauma. Perhaps the poor socio-economic background of the patients may have also contributed to the infection.

To our knowledge, the present case of onychomycosis is the first, caused by *A. sydowi* in India.

**TABLE 1**  
Results of the Mycological investigation

Date of collection	Site	Direct Examination in KOH	Culture results Sabouraud's dextrose agar	
			with cycloheximide	without cycloheximide
25- 3-1979	Left hand middle finger	+	-	<i>A-sydowi</i>
2- 5-1979	same	+	-	same
17- 9-1979	same	+	-	same
3-12-1979	same	+	-	same

**Acknowledgements**

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**References**

1. Botter AA: Durch *Aspergillus terreus* Thom. Hervor gerufte dermatomykose, Mykosen, 1968; 11: 358-390.
2. Fragner P, Kubiokovo V: Onychomykoza vyvolana *Aspergillus candidus* Cs. dermatologia, 1974; 4: 322-324.
3. Onsberg P, Stahl D, Veien NK: Onychomycosis caused by *Aspergillus terreus*, Sabouraudia, 1978; 16: 39-46.
4. Paldrok H, Hollstrom E: Onychomycosis due to *Aspergillus terreus* Acta Dermatovener, 1962; 28: 225-260.
5. Rosenthal SA, Stritzier RW: Onychomycosis caused by *Aspergillus tumigatus*, Arch Derm, 1968; 97: 685-687.
6. Sandhu DK, Sandhu RS: A new variety of *Aspergillus nidulance*, Mycologia, 1963; 55: 297-299.
7. Rayner RW: A Mycological colour chart, Kew, Surrey, England, Commonwealth Mycological Institute, 1970.
8. Walshe MM, English MP: Fungi and Nails, Brit J Derm, 1966; 78: 198-208.
9. Zaias N, Oertel I, Elliot DF: Fungi in toe nails, J Invest Derm, 1969; 53:140-142.
10. English MP: Nails and Fungi, Brit J Derm, 1976; 94: 697-701.
11. Gentles JC and Evans EGV: Infection of feet and nails with *Hendersonula toruloidea*, Sabouraudia, 1970; 8: 72-75.
12. Singh SM and Barde AK: *Hendersonula toruloidea* infection of skin and nails, Indian J Derm Vener, 1980; (in press.)

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**ERRATUM**

Volume 47 Number 4, 1981, page 245 para 1 line 5, please read "commingled" instead of comingled., para 2, line 7, read "sum" instead of some, and in line 12 please read "sexuality" instead of sexuality. On page 248, para 1, line 6 please read 'IM' instead of IH, para 2, line 8, read 'Oophoritis' instead of Oophritis, para 3, line 13 read 'appreciates' instead of appreciated and in para 4, line 2, please read 'An Acronyms Dictionary' instead of 'On Acronyms' Dictionary'.

Also note the changes in the following punctuation marks- Page 246, para 5, line 13, add, after T strain on page 247, para 5, line 8 add, after gene-plasmid.