A Case of Primary Cutaneous Aspergillosis of the Foot Triggered by an Orthopedic Shoe

Evangeline B. Handog, Katsutaro Nishimoto*, Kizou Honma and Kyoko Kikitsu
Department of Dermatology, Nagasaki University School of Medicine
(Director: Prof. Hikotaro Yoshida)

[Received for Publication: October 17, 1984]

A case of primary cutaneous aspergillosis caused by Aspergillus flavus and A. niger in a five and a half month old baby is presented. The lesions appeared following constant contact wear of orthopedic shoes and consisted of vesicles and pustules which are indistinguishable from those of tinea or candidiasis of the sole. The patient was successfully treated with topical application of isoconazole nitrate (Adestan cream®) twice daily for three weeks.

Key words: vesiculopustular lesion, Aspergillus flavus, Aspergillus niger, orthopedic shoes, isoconazole nitrate

Aspergillosis, most of which are regarded as opportunistic infections, have been usually reported to involve the lungs, but rarely the skin1). Cutaneous aspergillosis manifests diverse clinical pictures depending on the relationship between host and parasite. This report deals with a case of vesiculopustular form of primary cutaneous aspergillosis affecting the right sole of a five and a half month old baby girl. Except for pes valgoplanus for which she had to constantly wear orthopedic shoes, the patient’s condition is unremarkable.

Case Report

A five and a half month old baby girl, weighing 7 kg, was first seen at the outpatient clinic of the Department of Dermatology, Nagasaki University Hospital in Japan on May 10, 1984. Physical examination revealed right plantar arch lesions which consisted of fine scales, vesicles and pustules on a slightly erythematous base (Fig. 1). Review of organ-systems was done. No abnormalities were found except that the baby had to wear orthopedic shoes almost all day long to correct pes valgoplanus.

Mycological Examination

Potassium hydroxide examination of the materials taken from the roof of the vesicles and scales revealed broad hyphae with variability of width. Ramifications of Y-configuration were also noted (Fig. 2). Cultures of the specimens on Sabouraud dextrose agar slants at room temperature yielded two kinds of rapidly growing molds. Macroscopically and microscopically, the first one with yellow-green powdery colony developed radiate conidial

*To whom inquires should be addressed.
heads with subglobose vesicles (25-30 μm in diam). Echi-
nulate conidia (6.5-7 μm in diam) were borne on the
phialides, ca 6.5 μm long, attached to the vesicles by
metulae of ca 9 μm long. The second one was a black,
coarse and powdery colony. Conidial heads radiated. The
results of the measurements were as follows: vesicles 50-
60 μm in diam., metulae and phialides: 10-15 μm and 7-
10 μm long respectively, and conidia: 3.3-4.8 μm in diam.
From the above findings they were identified as *Asper-
gillus flavus* and *A. niger* respectively (Figs. 3-5).

During the follow-up consultation of the patient on May
18, 1984, the orthopedic shoes were seen to be macro-
scopically contaminated by fungi. The swabs taken from
the shoes revealed the presence of *Aspergillus* conidia-
phores (Figs. 6-8). The culture for the fungi from the
right shoe (affected side) yielded *A. flavus* and *A. niger*
while the left shoe's culture grew only *A. fumigatus*.
Course and Treatment

Skin biopsy was not performed. The patient was treated with isoconazole nitrate cream (Adestan cream®) applied twice daily. She improved well with the treatment after three weeks without scar formation.

Discussion

Generally, Aspergillus species have been considered of very low pathogenicity for man. The infections occur only in patients who have altered host resistance secondary to immuno-suppressive therapy, and who are receiving aggressive therapy for malignancies or long term antibiotic and steroid therapy1-3).

Skin lesions associated with Aspergillus spp. range from those based on hypersensitivity such as urticaria and eczematous dermatitis to those based on minimal host resistance4).

Nishimoto et al.5) proposed a classification of cutaneous lesions related to Aspergilli as shown in Table 1. The majority of the cases are included into primary cutaneous aspergillosis in the table, as we could collect 52 cases belonging to this category from the literature (Handog, E.B. and Nishimoto, K. in preparation).

The clinical pictures of the primary cutaneous aspergillosis make a spectrum ranging from a superficial pustular lesion to a deep ulcerative form depending on the conditions they are provoked.

In Japan, Chujo6) followed by Fukushiro7) reported several cases belonging to this entity, and characteristically presenting pustules and/or small necrotic foci in common under the names of “aspergillosis cutis aceneformis” and “primary pyoderma-like aspergillosis” respectively. Usually they affect the skin covered with casts or non-permeable materials. It has also been reported that Aspergilli were isolated from the lesions on the back of patients who had to stay in bed for a long time. The immunological state of the patient is not impaired and the lesions tend to heal promptly after the improvement of the topical condition favorable for the growth of Aspergilli. There are many cases reported thereafter belonging to this clinical form in Japan.

Generally, A. fumigatus is a major causative agent of visceral and cutaneous aspergillosis, but in cases belonging to this clinical form, A. flavus and A. niger are isolated relatively more frequently. Sometimes, more than two or more Aspergillus species were isolated simultaneously from a single lesion. The present case shows typical characteristics of this clinical form. Moreover, this case is interesting because of the following: 1) The lesions were contracted from a saprophytic Aspergillus colonization on the inner surface of an orthopedic shoe. 2) The causative fungi were A. flavus and A. niger which correspond to the fungi isolated from the shoe of the affected foot. A. fumigatus, though the colonization was also proven to be inside the left shoe, yielded no lesion on the left foot skin in spite of the existence of the same condition that affected the right shoe. 3) The lesions consisted of vesicles and pustules resembling those of tinea pedis or candidiasis.

Conclusion

As shown in the present case, Aspergilli, utilizing their ability to grow rapidly on various materials, can affect healthy individuals when the opportunity arises. They can make lesions indistinguishable from those of tinea or candidiasis. The careful examination of scales with KOH preparation along with the culture might result in the further discovery of such superficial aspergillosis cases.

The authors deeply thank Prof. Hikotaro Yoshida for his helpful comments, and Dr. Fumi Sakabe and Dr. Masakatsu Ichinoe of the National Institute for Hygienic Sciences, Tokyo, for their confirmation in identifying the fungus cultures.

References


Table 1. Skin lesions related to Aspergillus species

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Allergic type including urticaria or eczematous dermatitis</td>
</tr>
<tr>
<td>2.</td>
<td>Saprophytic growth on pre-existing necrotic tissue</td>
</tr>
<tr>
<td>3.</td>
<td>Primary cutaneous aspergillosis including: Aspergillosis cutis aceneformis (Chujo) Primary pyoderma-like aspergillosis (Fukushiro) Deep seated granuloma</td>
</tr>
<tr>
<td>4.</td>
<td>Mycetoma</td>
</tr>
<tr>
<td>5.</td>
<td>Secondary cutaneous aspergillosis</td>
</tr>
<tr>
<td>6.</td>
<td>Onychomycosis</td>
</tr>
<tr>
<td>7.</td>
<td>Otomycosis</td>
</tr>
</tbody>
</table>

Modified from Nishimoto, K. et al., 19809).


