A Rhinofacial Conidiobolus coronatus Fungal Infection Presenting as an Intranasal Tumour

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Abstract: Conidiobolomycosis is a rare fungal infection that affects adults in tropical regions. We report a 42-year-old male patient who was referred to the Sulaiman Al Habib Hospital, Dubai, United Arab Emirates (UAE), in 2013 with excessive nasal bleeding and a suspected nasal tumour. He reported having briefly visited central India nine months previously. Computed tomography and magnetic resonance imaging showed a highly vascularised mass in the nasal cavity. However, after surgical excision, initial treatment with amphotericin B deoxycholate was unsuccessful and the disease progressed, leading to external and internal nasal deformation and necessitating further excision and facial reconstruction. Histopathological analysis of the second biopsy revealed Splendore-Hoepli changes consistent with a fungal infection. Microbiological findings subsequently confirmed Conidiobolus coronatus. Subsequently, the patient was successfully treated with a combination of itraconazole and fluconazole.

Keywords: Nasal Obstruction; Conidiobolus; Zygomycosis; Antifungal Agents; Case Report; United Arab Emirates.

Case Report

A 42-year-old male patient was referred to the Sulaiman Al Habib Hospital, Dubai, United Arab Emirates (UAE), in 2013 with excessive nasal bleeding and a suspected nasal tumour. Nine months previously, the patient had...
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Under general anaesthesia, resectioning of the lower turbinate was performed and a biopsy of the mass and the involved mucosa was taken. Significant bleeding was encountered and controlled by laser vaporisation of the mucosa edges. A fresh frozen section examination of the biopsy suggested a fungal infection; however, a fungal culture did not yield any growth. The patient was therefore suspected of having aspergillosis.

Following extensive nasal debridement, the patient was treated with 2.5 mg/kg/day of intravenous amphotericin B deoxycholate and was monitored for all necessary blood parameters. However, after 10 days of treatment, the mass regrew rapidly. A further tissue biopsy and culture were performed, followed by a radical turbinectomy and excision of the mucosa from the floor of the nose together with the mid-portion of the cartilaginous nasal septum. The vestibular skin was also found to be affected and was removed (Figure 2).

The second biopsy was sent for histopathological and microbiological analysis.

A haematoxylin and eosin stain of the biopsy specimen showed eosinophilic deposits surrounded by hyphae (i.e. Splendore-Hoeppli phenomenon), while Gram staining showed broad sparsely septate hyphae. The biopsy specimen was cultured using both Sabouraud dextrose Agar (SDA) with chloramphenicol and cycloheximide and plain SDA and incubated at 30°C and 37°C. After five days of incubation at 30°C, the plates with the plain SDA medium showed multiple flat, white, glabrous, slightly powdery-to-granular and radially furrowed colonies of mould with several peripheral satellite colonies [Figure 3]. As these features were highly indicative of a Conidiobolus species, the lid of the plate was secured with a thermoplastic self-sealing film to prevent contamination (Parafilm®, Bemis Co. Inc., Neenah, Wisconsin, USA). In addition, a lactophenol cotton blue stain preparation showed broad hyaline sparsely septate hyphae with a few spherical conidia with hair-like appendages (i.e. villae), also characteristic of a Zygomycetes species.

The cultured fungus was sent for molecular identification and antifungal susceptibility testing at a reputable laboratory.

visit central India for a few days; subsequently, three months after returning to the UAE, he had noticed swelling and tenderness above his nasal dorsum, with progressive nasal blockage. Six months later, he developed recurrent epistaxis, resulting in admission to another healthcare facility. However, following failed conventional management, he was referred to the Sulaiman Al Habib Hospital.

Upon physical examination, there was thickening of the right nasal vestibule as well as occlusion of the nasal cavity due to highly vascularised granulomatous tissue growth involving the right inferior turbinate, the floor of the nasal cavity and the right side of the nasal septum. No airway could be established, despite the administration of xylometazoline as a decongestant. In addition, the left nasal cavity was narrowed due to a deviated septum. The nasal mucosa was intact and the nasal dorsum was slightly tender and widened. The patient was otherwise in good health with no evidence of underlying disease.

Computed tomography and magnetic resonance imaging scans of the nose and paranasal sinuses revealed a highly vascularised mass occupying the entire nasal cavity. The sinuses were intact without bony erosion or extension to the adjacent anatomical areas (Figure 1).
As in the current case, most published reports of rhinofacial C. coronatus infections have occurred in males with normal immune status who have recently travelled to a tropical region.\textsuperscript{5,9-11} Overall, very few cases of rhinofacial C. coronatus infections have been reported in the literature; as such, early identification of the organism remains challenging.\textsuperscript{1,3,4} To the best of the authors’ knowledge, the current case is the first report of a patient with rhinofacial conidiobolomycosis from the UAE. The diagnosis of a C. coronatus infection is based on a tissue biopsy in which eosinophilic deposits surrounding the hyphae can be seen (i.e. Splendore-Hoeppli phenomenon).\textsuperscript{1,2} However, physicians often face difficulties in obtaining a positive culture in order to demonstrate antimicrobial susceptibility; as such, the disease has a high morbidity and mortality rate.\textsuperscript{1,2,9,12}

Currently, there is no standard recommended therapy for conidiobolomycosis cases. Generally, treatment ranges from conservative options to the radical resectioning of infected tissues, with approaches varying according to individual cases and local drug resistance patterns.\textsuperscript{1,4,13,14} In the current case, the initial culture was negative and histopathologically misdiagnosed as aspergillosis. Following disease progression and unsuccessful treatment with amphotericin B deoxycholate, the patient required extensive surgical debridement. At this point, a repeated culture confirmed a diagnosis of a C. coronatus infection and a detailed antifungal susceptibility profile was established. The patient was then successfully treated with prolonged combination therapy involving itraconazole and fluconazole.

Table 1: Antifungal susceptibility profile of a cultured fungus identified as Conidiobolus coronatus

<table>
<thead>
<tr>
<th>Antifungal agent</th>
<th>MIC in µg/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphotericin B deoxycholate</td>
<td>2</td>
</tr>
<tr>
<td>Voriconazole</td>
<td>&gt;16</td>
</tr>
<tr>
<td>Itraconazole</td>
<td>&gt;16</td>
</tr>
<tr>
<td>Posaconazole</td>
<td>&gt;16*</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>&gt;64</td>
</tr>
<tr>
<td>Anidulafungin</td>
<td>8</td>
</tr>
<tr>
<td>Micafungin</td>
<td>&gt;8</td>
</tr>
</tbody>
</table>

\textit{MIC} = minimal inhibitory concentration. *80% inhibition at 4 µg/mL.

Other researchers have reported similar success using potassium iodide, trimethoprim/sulfamethoxazole, amphotericin B, ketoconazole and itraconazole, either individually or in combination.\textsuperscript{1,3,15,16} Blumentrath et al. proposed a treatment strategy according to stages of disease progression; based on these classifications, the current case would be considered intermediate due to the incubation period and vestibular skin involvement and a surgical approach would not be recommended.\textsuperscript{17} However, the current patient had non-responsive bleeding and a blocked airway; as such, his quality of life immediately improved following surgical debridement.

**Conclusion**

Due to climate change and increasing global travel, rhinofacial C. coronatus infections are no longer restricted to tropical regions. However, successful management of such cases remains challenging due to the low
incidence of the disease, difficulties in confirming the diagnosis and the lack of established treatment strategies. As highlighted by the current case, physicians should bear this fungal infection in mind when encountering nasal obstructions or a nasal tumour of uncertain aetiology. Early identification of the infection is crucial to reduce morbidity.

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References