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CASE REPORT

# A Rhinofacial *Conidiobolus coronatus* Fungal Infection Presenting as an Intranasal Tumour

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# حالة عدوي بفطر كونيديوبولوس كورواناتوس في الأنف والوجه ظهرت كورم في داخل الأنف

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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-Hoeppli 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. To the best of the authors' knowledge, this is the first report of a case of rhinofacial conidiobolomycosis from the UAE.

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

**الملخص:** داء فُطَار الأنف والجيوب المجاورة للأنف داء نادر الحدوث، ويصيب البالغين في المناطق المدارية. ونقدم هنا تقريرا بحالة رجل في 42 من العمر تم تحويله إلى مستشفى سليمان حبيب في دبي بالأمارات العربية المتحدة في عام 2013م لإصابته بنزف أنفي مفرط، وللشك في إصابته بورم في الأنف. ذكر المريض أنه زار وسط الهند لمدة قصيرة قبل تسعة أشهر. وأظهر التَصْويرُ المقْطعيُّ المحَوسَب والرنين المغنطيسي كتلة غنية بالأوعية الدموية في التجويف الأنفي. وتمت إزالة تلك الكتلة جراحيا وأعطى المريض دواء امفوتيرسين ب ديوكسي كوليت؛ غير أن ذلك العلاج لم ينجح، وازداد تطور المرض وسبب تشوها خارجيا وداخليا في الأنف، مما استدعى إجراء عملية جراحية لإزالة الورم وعمل اسْتِبْناء للوجه. وأثبت الفحص الهيستوباثلوجي لخزعة ثانية وجود أجسام نَجْمَانيّة (تغيرات اسبيلندور-هويلي) دالة على وجود عدوى فَطرية. وأثبتت الاختبارات المكروبيولوجية لاحقا وجود فطر كونيديوبولوس كوروناتوس. وعقب ذلك عولج المريض بدوائي اتراكونازول وفلوكونازول. ونحسب-مبلغ علمنا-أن هذا التقرير هو أول تقرير لحالة مريض مصاب ب داء فُطار الأنف والوجه في الإمارات العربية المتحدة.

**الكلمات المفتاحية:** انسداد أنفي؛ كونيديوبولوس؛ فطار عفني؛ دواء مضاد للفطريات؛ تقرير حالة؛ الإمارات العربية المتحدة.

First identified in mammals such as horses, dolphins and chimpanzees, *Conidiobolus coronatus* is an opportunistic pathogen which causes rhinofacial conidiobolomycosis in humans.[1,2] Initially, cases were restricted to areas with tropical and subtropical climates; however, due to climate change and modern advances in global travel, the disease can now be found on almost every continent.[1] The main symptoms of *C. coronatus* infections are facial deformation with extensive nasal blockage and bleeding due to the presence of subcutaneous granulomatous lesions.[1,3,4] The fungus usually infects healthy male farm workers between 20–60 years old.[1,2]

In humans, *C. coronatus* infections likely occur due to inhalation of the fungal spores which imbed into the nasal *mucosa*; subsequently, as a result of enzymatic activity, they can penetrate into the subcutaneous area of the face as well as the nasal cavity and sinuses.[1] Swelling inside the nasal cavity is usually localised to the lower turbinate and nasal *mucosa*.[1,2] More fulminant progression has been reported in immunocompromised hosts, with invasion into the blood vessels; however, in otherwise healthy patients, the infection is non-fatal and localised to the subcutaneous and mucocutaneous tissues.[2,5]

## 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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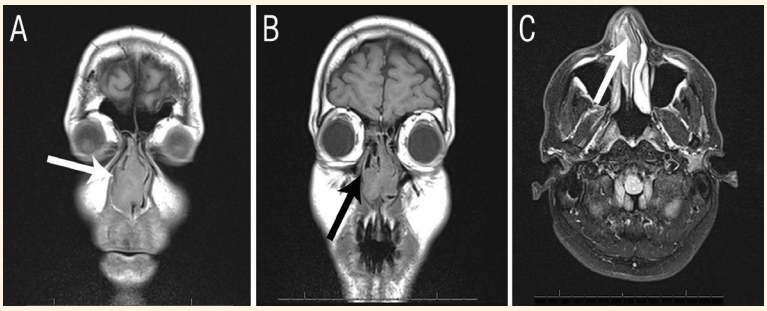


**Figure 1:** Imaging of a 42-year-old male patient with excessive nasal bleeding and a suspected nasal tumour. **A & B:** Computed tomography scans confirming the intact nasal bony wall (arrows). **C:** Magnetic resonance imaging showing increased T2 signals in the nasal cavity alone (arrow), without intracranial spread or extension to the sinuses.

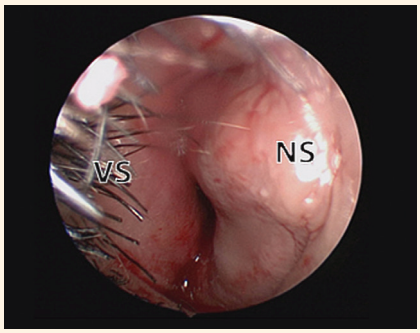


**Figure 2:** Endoscopic photograph of the nasal cavity of a 42-year-old male patient showing the spread of a highly vascularised mass to both the nasal *mucosa* and vestibular skin, indicating subcutaneous fat involvement.
*NS = nasal mucosa; VS = vestibular skin.*

visited 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]. 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 contagion (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

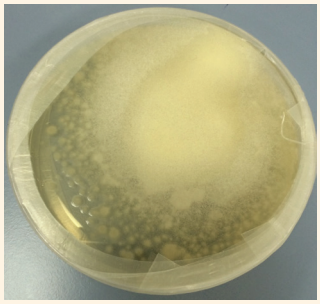

**Figure 3:** Photograph of a nasal mass culture showing multiple, flat, white, glabrous, slightly powdery-to-granular and radially furrowed colonies of fungus with several peripheral satellite colonies.

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

| Antifungal agent | MIC in µg/mL |
|---|---|
| Amphotericin B deoxycholate | 2 |
| Voriconazole | >16 |
| Itraconazole | >16 |
| Posaconazole | >16* |
| Caspofungin | >64 |
| Anidulafungin | 8 |
| Micafungin | >8 |

*MIC = minimal inhibitory concentration. *80% inhibition at 4 µg/mL.*

laboratory affiliated with the Postgraduate Institute of Medical Education & Research, Chandigarh, India. Molecular typing and an antifungal susceptibility profile was performed as per standard methods and the recommendations of the Clinical & Laboratory Standards Institute (CLSI).[6–8] Briefly, the macrobroth was diluted according to M61 CLSI standards and a final concentration of $3.5 \times 10^2$ colony forming units/mL was used as the *inoculum*, before being incubated at 35 °C for 48 hours.[8] Based on these findings, the fungus was identified to be *C. coronatus*.

As per the antifungal susceptibility profile, oral antifungal treatment was initiated with 200 mg/day of itraconazole combined with 100 mg/day of fluconazole [Table 1]. After six months of treatment, only a small granulomatous lesion remained which was subsequently removed under local anaesthesia. The nasal deformation resulting from the nostril retraction was corrected with a skin flap rotation procedure. The previously noted enlargement of the nasal *dorsum* reduced without the need for surgical intervention. Antifungal therapy was continued for a total of 18 months. There was no sign of disease recurrence at a three-year follow-up.

## Discussion

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.[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.[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).[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.[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.[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.

Other researchers have reported similar success using potassium iodide, trimethoprim/sulfamethoxazole, amphotericin B, ketoconazole and itraconazole, either individually or in combination.[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.[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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