A case of *Conidiobolus coronatus* in the vagina

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*Conidiobolus coronatus* is a zygomycete that commonly involves the rhinomaxillary area in humans and animals. Infections are reported mostly from West Africa and South East Asia. Vaginal involvement in humans has not been described before. We report a case of *C. coronatus* infection involving the vagina that was successfully treated.

**Keywords**  *Conidiobolus coronatus*, vaginal, boric acid

**Introduction**

*Conidiobolus coronatus* is a fungus belonging to the order *Entomophthorales* and subphylum *Entomophthoromycotina* [1]. *Conidiobolus* spp. commonly cause infections in the rhino-maxillary region occasionally spreading to adjacent areas. Rarely are they associated with invasive diseases involving the heart, lungs and the central nervous system [2] and infections of other organ systems are equally uncommon. We report a case with colonization of the vagina with *Conidiobolus coronatus*.

**Case report**

A 41-year-old, previously healthy woman presented to her gynecologist with a complaint of thick, white vaginal discharge of 6 weeks duration but without itching, irritation or soreness. Suspecting a possible yeast infection, a sample of the vaginal secretion was inoculated onto culture media. In addition, since her cervix was found to be ‘nodular’, a Papaniculou smear was performed, which did not show evidence of malignancy. However, the culture yielded a mold that was reported as *Conidiobolus coronatus*. Of interest, the patient worked as a dermatopathology technician and handled tissue samples on a regular basis.

When she was referred to our clinic about a month later, she complained of a moderate vaginal discharge with no accompanying symptoms. There was no past medical history of significance and her general examination was normal. The pelvic exam showed a cervix that had multiple Nabothian cysts but the rest of the vaginal examination was unremarkable with normal secretions. Microscopic examination of saline and 10% KOH preparations of vaginal samples did not show any abnormality. Swabs used to take scrapings from the lateral vaginal walls were used to inoculate Sabouraud’s dextrose agar cultures which yielded, after 48 h, a mold that was identified as *Conidiobolus coronatus*. To exclude the possibility of contamination, a second culture of vaginal samples were prepared and from which the same mold was recovered.

The identification of the isolate was based on its rapid growth, maturing in 5 days, as well as colony morphology. The colonies were flat, waxy, creamy gray in color becoming tan brown with age and were covered with short, sparse aerial hyphae (Fig. 1). On microscopic examination, the hyphae were found to have few septa with unbranched sporophores bearing single celled, round spores. A few of the latter contained a number of short extensions (secondary spores) and had a ‘corona’ appearance.

In view of the abnormal appearing cervix, in combination with the fact that *Conidiobolus* spp. can cause invasive disease in other areas of the body, colposcopy of the cervix and vagina, with a biopsy if needed, was planned. She was advised to use 600 mg boric acid vaginal capsules daily at bedtime for 1 week before the colposcopy and for another 2 weeks after the procedure for a total of 21 days. Colposcopy was normal and no biopsy was required.

She was reviewed 1 week after she stopped the boric acid treatment at which time repeat cultures of vaginal samples were prepared but were found to be negative. A further follow-up study at 1 month revealed negative mycology findings and absence of symptoms.

**Discussion**

There are 27 known species of *Conidiobolus*, of which three have been reported to cause disease in vertebrates, i.e.,
The mode of transmission is from the animal consuming vaginal colonization due to have not been documented in similar cases. The rates of cause for mycotic placentitis and abortion in cattle and in humans [3]. While members of the Subcutaneous disease is common in animals but is unusual disfigurement with nodule formation requiring surgery. The resultant disease can cause significant areas. The resultant disease can cause significant disfigurement with nodule formation requiring surgery. Subcutaneous disease is common in animals but is unusual in humans [3]. While members of the Mucorales are the cause for mycotic placentitis and abortion in cattle and horses [4]. Conidiobolus and other Entomophthorales have not been documented in similar cases. The rates of vaginal colonization due to Conidiobolus are not known. The mode of transmission is from the animal consuming mouldy hay or possibly by sitting on hay containing spores [4].

Conidiobolus is not a virulent fungus and disseminated and invasive infections are rare. Angioinvasion which is a feature of infections with Mucorales is unusual with Entomophthorales [5]. However, in the rare patient with invasive infections due to members of the latter order, mortality is high, ranging from 96–100% in various studies [2]. Unlike Mucorales, members of the Entomophthorales like Conidiobolus and Basidiobolus affect mostly immunocompetent adults. However immunocompromise, diabetes and administration of desferrioxamine independently or in the presence of renal failure can be predisposing causes of infection [2]. Disease is significantly more common in males and infections in children are rare [3].

Diagnosis is by the isolation of the etiologic agent in culture or examination of biopsy material from the affected areas. Standard mycology media such as Sabouraud Dextrose agar, cornmeal agar and potato dextrose agar can be used to recover the fungus. Conidiobolus grows rapidly at 37°C and forms white, waxy folded colonies which can completely overgrow the culture plate with time [5]. Microscopic examination of the cultures reveal broad septate hyphae with formation of radiating secondary conidia giving the species its species name of C. coronatus [2]. Sometimes radiating eosinophilic deposits, known as Splendore-Hoepli material, can be seen surrounding the hyphae and are believed to be an expression of host resistance [2].

Treatment for Conidiobolus infection has not been standardized. Potassium iodide and co-trimoxazole in high doses have been described as useful with unknown modes of action [3]. Amphotericin B for invasive disease has also been tried with varying success [3]. The azoles have not been well studied in cases of Conidiobolus infections. Itraconazole is used widely in animals with good success rates [2], but both ketoconazole and itraconazole in humans have had mixed results. Terbinafine and fluconazole have also been suggested as alternatives modes of therapy in a few case reports [2]. If single agents are ineffective, antifungal drug combination sometimes is useful for eradicating disease.

The recovery of Conidiobolus in cultures from vaginal samples of humans has never been previously reported. In our patient, the possibility of laboratory contamination was considered, but the isolation of the fungus from two separate cultures done about 1 month apart by two different laboratories would seem to eliminate this possibility. A detailed history with respect to travel, exposure to possible contaminated soil and infected animals was obtained but the mode of transmission could not be established other than her occupational hazard of exposure to excised dermatologic tissues.

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Consideration was given to all the current agents that are recommended for treatment of *Conidiobolus*, none of which are consistently successful. Instead a decision was made to use vaginal boric acid tablets which is commonly used for treatment of non-*Candida albicans* *Candida* infections and for which it has a cure rate of 60–70% [6]. It is a weak acid which is toxic when administered orally. In the vagina, it works as a fungistatic agent presumably by inhibiting hyphal transformation and by formation of oxygen free radicals [7]. The standard treatment regimen of 600 mg daily for 21 days was used which achieved a cure as demonstrated by negative culture one week after stopping treatment.

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**References**