Disseminated Rhinosporidiosis with Conjunctival Involvement in an Immunocompromised Patient

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Abstract:
Rhinosporidiosis is a granulomatous infection of mucocutaneous tissue caused by *Rhinosporidium seeberi* that most commonly occurs in the nasal cavity. Ocular rhinosporidiosis affects primarily the conjunctiva. Diagnosis of rhinosporidiosis is based on strong clinical suspicion and is confirmed by histopathological examination. We report a rare case of conjunctival rhinosporidiosis in an immunocompromised patient (human immunodeficiency virus) with disseminated cutaneous rhinosporidiosis. A 44-year-old male presented with a swelling in the right upper eyelid for 6 months. Excision biopsy of the ocular lesion showed multiple thick-walled, variable-sized sporangia containing endospores within the subepithelium suggestive of rhinosporidiosis. A multidrug regimen of systemic cycloserine, ketoconazole, and dapsone was administered to treat disseminated rhinosporidiosis, in addition to antiretroviral therapy. There was good response with reduction in the swellings.

Keywords: Conjunctival rhinosporidiosis, disseminated rhinosporidiosis, immunocompromised, *Rhinosporidium seeberi*

Introduction

Rhinosporidiosis is a chronic granulomatous infection caused by *Rhinosporidium seeberi*. Ocular rhinosporidiosis accounts for about 15% of disease. It presents as a vascular, friable, sessile, or pedunculated mass usually arising from the nasal mucosa. The entry of the organism into the host is postulated to be via traumatized epithelium though in rare cases of dissemination a hematogenous spread may occur. Ocular sites of infection are palpebral and bulbar conjunctiva, lacrimal sac, canaliculi, and the sclera. Conjunctival rhinosporidiosis has been reported in immunocompetent patients. Scleral melting associated with conjunctival lesions has resulted in staphylomatous protrusion of uveal tissue requiring tectonic graft. A few cases of rhinosporidiosis have been reported in immunocompromised patients. This is a report of conjunctival rhinosporidiosis in an immunocompromised patient who was on oral dapsone for disseminated rhinosporidiosis and highly active antiretroviral therapy (HAART) for human immunodeficiency virus (HIV) infection.

Case Report

A 44-year-old male presented in 2012 with swelling on the undersurface of the right upper lid for 6 months. He was diagnosed elsewhere in 1998 to have rhinosporidiosis and was started on oral dapsone 100 mg twice daily. In spite of good compliance with dapsone therapy, he developed multiple recurrent cutaneous lesions requiring repeated excisions. In 2001, while on treatment for disseminated rhinosporidiosis, he was tested seropositive...
for HIV. He had been on HAART since 2004 and was compliant with treatment. At the time of presentation to us, he had multiple nodular lesions over the face, trunk, and extremities with CD4+ T-cell levels of 260 cells/µl.

On ocular examination, the best-corrected visual acuity in both eyes was 6/6 J1. Eversion of the upper eyelid showed a pedunculated friable conjunctival lesion in the right upper tarsal conjunctiva with white spherules over the lesion [Figure 1]. Rest of the ocular examination in both eyes was normal.

Computerized tomography (CT) scan of the paranasal sinuses showed a polypoidal mass filling the left nasal cavity. Also seen were a polypoidal mass in the oropharynx, and few cutaneous and subcutaneous lesions [Figure 2]. Endoscopic excision biopsy of the mass confirmed the diagnosis of rhinosporidiosis [Figure 3]. Chest X-ray, ultrasound abdomen, and CT brain were normal and did not reveal more lesions.

Excision biopsy of the conjunctival mass showed multiple thick-walled, variable-sized sporangia containing endospores within the subepithelium with inflammatory response thus confirming the diagnosis of conjunctival rhinosporidiosis. As he had developed recurrence even with good compliance to dapsone treatment, he was advised multidrug therapy with systemic cycloserine (250 mg thrice daily) and ketoconazole (400 mg twice daily) along with HAART and dapsone. HAART medications were modified to prevent drug interaction with ketoconazole. The patient responded favorably to the multidrug regimen with reduction in the swellings.

Discussion

Rhinosporidiosis is an infection of the mucous membranes manifesting as a polypoidal vascular friable mass. The common presentations are in the form of a nasopharyngeal mass (70%) or an ocular lesion (15%). It is endemic in Asia and Africa, and 90% of the reported cases are from India. The mode of transmission is believed to be from the natural aquatic habitat through traumatized nasal mucosa. In rare cases of dissemination, a hematogenous spread has been postulated. The disease progresses with local replication of microcysts and is associated with hyperplastic growth of host tissue and localized immune response.

Rhinosporidiosis presents as a tumor-like friable, vascularized, polypoid, hyperplastic wart-like mass that may be pedunculated or sessile and bleeds easily. The surface shows tiny white spots which are due to the underlying mature sporangia beneath the layer of the epithelium. Subcutaneous granulomata without
breach of the skin could be due to hematogenous dissemination.[3] Strong clinical suspicion and histopathological examination of the biopsied specimen will clinch the diagnosis.

Diagnosis of rhinosporidiosis can be made by aspiration cytology and examination of the aspirated material with Gomori methenamine silver and periodic acid–Schiff stain. However, definitive diagnosis is by histopathology of biopsied tissues and identification of the pathogen in various stages of maturation. It has a mature stage of sporangia consisting of large, thick-walled spherical structures, and smaller daughter cells named endospores can be seen with fungal and routine hematoxylin and eosin staining.[1] Each mature sporangium contains a pore through which the endospores are extruded. Transepidermal elimination of the sporangia at the surface of the epithelium with extrusion of the endospores has been reported which explains the occurrence of satellite lesions.[3] R. seeberi cannot be grown in culture, and this prevents the determination of the sensitivity of this organism to drugs. This has been overcome recently by MTT reduction method which assesses the viability of the endospores of R. seeberi.[7,13]

There is no immunity developed against rhinosporidiosis.[2] Spontaneous regression has been noted, however, definitive treatment consists of surgical excision with cauterization of the base.[1,2] The potential for recurrence increases if there is spillage of endospores from the adjacent traumatized mucosa.[3] The rate of recurrence can be reduced by cauterization of base of the lesion or cryotherapy. Dapsone acts by arresting maturation of sporangia[1] and accelerating its degenerative changes.[2] In our patient, conjunctival involvement was noted while he was already on dapsone, suggesting nonresponsiveness to the drug. Hence, multidrug therapy of cycloserine and ketoconazole was tried. Dapsone and ketoconazole are endospore static and nonlytic to endospores. Cycloserine which is an antituberculous agent has been recommended in rhinosporidiosis. In vitro studies have shown that 50% inhibitory concentration (IC50) of cycloserine against rhinosporidiosis is 10 µg/ml. IC50 of <100 µg/ml is considered as therapeutic efficiency and of the eight antimicrobial agents tested in humans, cycloserine had the least IC50 values.[13]

Conclusion

Rhinosporidiosis is a sporadic infection endemic in India. There are many reports in the literature on disseminated as well as conjunctival rhinosporidiosis in patients from endemic areas. However, this is a rare report of conjunctival rhinosporidiosis, in an immunocompromised patient. In endemic regions, rhinosporidiosis should be considered in the differential diagnosis for conjunctival lesions in immunocompetent as well as immunocompromised patients.

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Conflicts of interest
There are no conflicts of interest.

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