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Dr. Paladugu Tejaswini
Junior Resident, Department of Otorhinolaryngology and Head and Neck Surgery KAHER, JN Medical College, Belagavi, Karnataka, India

Dr. Nitin R Ankle
Professor, Department of Otorhinolaryngology and Head and Neck Surgery KAHER, J N Medical College, Belagavi, Karnataka, India

Dr. Prashant H Patil
Professor, Department of Otorhinolaryngology and Head and Neck Surgery KAHER, J N Medical College, Belagavi, Karnataka, India

Dr. Aditya Achyut Redkar
Junior Resident, Department of Otorhinolaryngology and Head and Neck Surgery KAHER, J N Medical College, Belagavi, Karnataka, India

Corresponding Author:
Dr. Paladugu Tejaswini
Junior Resident, Department of Otorhinolaryngology and Head and Neck Surgery KAHER, JN Medical College, Belagavi, Karnataka, India

Rhinosporidiosis: A formidable beast lurking within the nostril: A case report

Paladugu Tejaswini, Nitin R Ankle, Prashant H Patil and Aditya Achyut Redkar

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Abstract
Rhinosporidiosis is a chronic granulomatous condition caused by *Rhinosporidium seeberi*, a waterborne pathogen that has been known for more than a century. It predominantly affects the mucous membranes of the nasal cavity, conjunctiva, and occasionally other anatomical sites, including the oropharynx, larynx, trachea, and genitalia. The disease manifests as slow-growing, polypoid, friable masses that are highly vascularized and prone to recurrent bleeding. These lesions can lead to symptoms such as nasal obstruction, epistaxis and discomfort, significantly impacting a patient's quality of life. Rhinosporidiosis generally presents as mass attached to anterior part of the nasal septum, sometimes extends into the nasopharynx but what makes our case interesting is the fact that an isolated mass was seen extending into the nasal vestibule, which is a rare presentation.
A 13-year-old male was brought to otorhinolaryngology OPD by his parents with complaints of left sided nasal obstruction since a month. The patient reported experiencing a sensation akin to a mass within the left nasal cavity. The patient had a history of frequent bathing and swimming activities in natural lakes in his village. Upon examination by anterior rhinoscopy, a non-tender, mobile, pink polypoid mass was identified in the left nasal cavity, characterized by its propensity to bleed upon palpation.
Due to its widespread occurrence in rural areas characterized by significant exposure to polluted water sources, enhancing public awareness and advocating for preventive strategies, such as the avoidance of stagnant water and the advancement of water sanitation, can significantly alleviate the burden of rhinosporidiosis in endemic territories. The complete endoscopic removal of the mass without traumatising adjacent structures followed by cauterisation of the base and administration of Dapsone therapy is recommended as a preventive measure against recurrences.

Keywords: Rhinosporidiosis, nasal endoscopy, cauterisation, dapsone

Introduction
Rhinosporidiosis is a chronic granulomatous condition caused by *Rhinosporidium seeberi*, a waterborne pathogen that has been known for more than a century. It predominantly affects the mucous membranes of the nasal cavity, conjunctiva, and occasionally other anatomical sites, including the oropharynx, larynx, trachea, and genitalia [1]. The disease manifests as slow-growing, polypoid, friable masses that are highly vascularized and prone to recurrent bleeding. These lesions can lead to symptoms such as nasal obstruction, epistaxis and discomfort, significantly impacting a patient's quality of life [2]. Rhinosporidiosis generally presents as mass attached to anterior part of the nasal septum, sometimes extends into the nasopharynx but what makes our case interesting is the fact that an isolated mass was seen extending into the nasal vestibule which is a rare presentation.
First described in 1900, rhinosporidiosis remains a largely misunderstood disease, particularly in terms of its classification. Initially believed to be a fungal infection, *Rhinosporidium seeberi* is now considered a member of the Mesomycetozoea group, a unique class of aquatic protists that includes other emerging pathogens. It is involved in the development of a chronic granulomatous disease of slow growth and usually exhibits benign behavior of polypoid characteristics mainly with a nasal, nasopharyngeal, and/or ocular involvement [3]. The organism thrives in stagnant or slow-moving freshwater environments such as ponds, lakes, and rivers, and infection is typically acquired through direct contact, often via bathing or swimming in contaminated water. The disease is endemic in India, Sri Lanka, South America, and parts of Africa, with sporadic cases reported worldwide. The exact incidence of rhinosporidiosis is not mentioned in any literature and google search.

Rhinosporidiosis is primarily diagnosed based on clinical presentation and confirmed through histopathological examination, where the characteristic thick-walled sporangia filled with endospores is observed. Unlike many fungal and bacterial infections, medical treatment with antifungal or antibiotic therapy is largely ineffective**,** and the disease is best managed through surgical excision of the lesions. However, recurrence is common, particularly if excision is incomplete, as the spores can persist in surrounding tissues [5].

Despite being a recognized disease for over a century, many aspects of *Rhinosporidium seeberi*'s life cycle, transmission dynamics, and potential for human-to-human spread remain poorly understood. Further research is necessary to develop more effective treatment options, improve early detection, and reduce recurrence rates. Due to its prevalence in rural areas with high exposure to contaminated water sources, raising awareness and promoting preventive measures such as avoiding stagnant water and improving water sanitation can help mitigate the burden of rhinosporidiosis in endemic regions.

Case report

A 13-year-old male was brought to otorhinolaryngology OPD by his parents with complaints of left sided nasal obstruction since a month. The patient reported experiencing a sensation akin to a mass within the left nasal cavity. The patient had a history of frequent bathing and swimming activities in natural lakes in his village. Upon examination by anterior rhinoscopy, a non-tender, mobile, pink polypoid mass was identified in the left nasal cavity, as seen in Figure 1, characterized by its propensity to bleed upon palpation.

Fig 1: Mass in the left nasal cavity

A diagnostic nasal endoscopy was performed with a zero-degree rigid endoscope, which confirmed the presence of a pink polypoid mass in the left nasal cavity, as seen in Figure 2 with characteristic bleeding upon contact that stopped spontaneously. The mass was adhered to the anterior and superior region of the nasal septum in proximity to the mucocutaneous junction. The rest of the nasal cavity appeared healthy. The general physical examination was within normal limits, and blood tests were unremarkable.

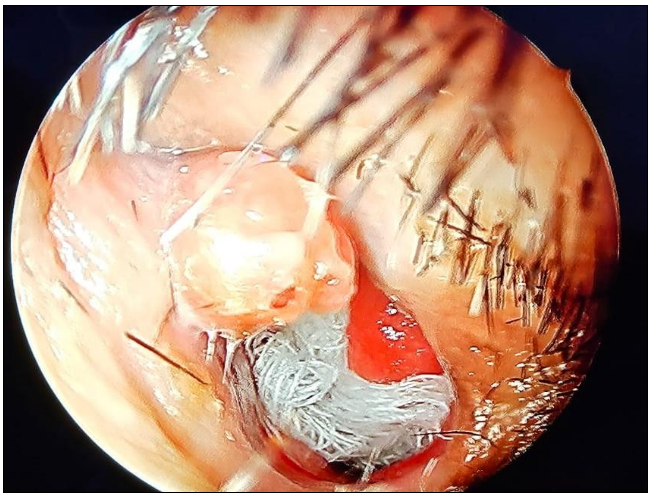

Fig 2: Endoscopic image showing polypoid mass in the left nasal cavity

A contrast-enhanced computed tomography scan of the nose and paranasal sinuses revealed a heterogeneously enhancing soft tissue density lesion, approximately measuring 4.0 x 3.0 mm, located along the nasal septum on the left side, not extending into other areas as shown in Figure 3.

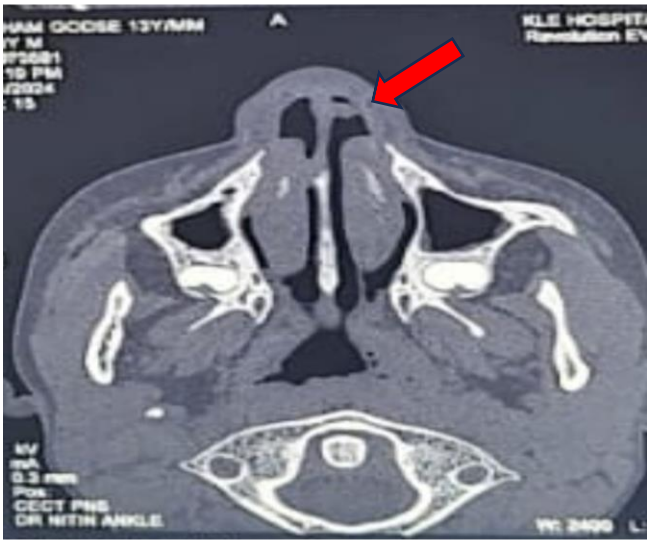

Fig 3: CECT Paranasal sinuses - axial view showing heterogeneously enhancing tiny soft tissue density lesion (red arrow)

Tissue sent for histopathological examination showed a polypoidal tissue lined by stratified squamous epithelium, sub epithelium shows multiple sporangia containing sporangiospores; features suggestive of rhinosporidiosis.

A surgical excision was meticulously planned within the operating theatre after obtaining informed consent from the parents, elucidating the necessity for medical management following the excision and the likelihood of recurrence of the lesion in the near future. The surgical intervention was conducted under sedation. The mass was excised with precision at its base, and both the base and adjacent tissue were subjected to cauterization. The specimen was subsequently dispatched for histopathological analysis, and the patient was discharged uneventfully.

Histopathological analysis revealed a polypoidal tissue characterized by a lining of stratified squamous epithelium, with the subepithelial layer exhibiting numerous sporangia

containing sporangiospores, as shown in Figure 4, indicative of 'Rhinosporidiosis.'
Postoperatively, Tab Dapsone 50 mg/day was administered for the child after the pediatrician's opinion.
The patient has been engaging in regular follow-up consultations since the date of discharge, and during the most recent visit (after a duration of 6 months), no signs of recurrence were detected.

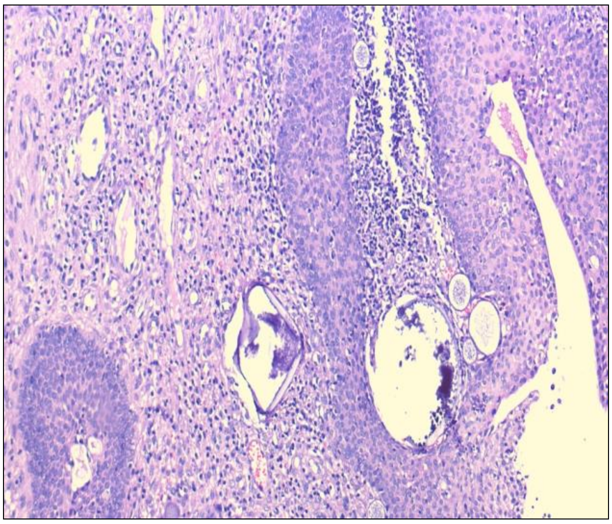

Fig 4: Histopathological slide showing multiple sporangia containing sporangiospores

Discussion

A high index of suspicion should be practiced when dealing with nasal masses. It has been advised to consider Rhinosporidiosis as differential diagnosis in any patients, particularly those coming from endemic regions with nasal masses [5].
Rhinosporidiosis generally presents as mass attached to anterior part of the nasal septum, sometimes extends into the nasopharynx, but here mass is seen extending into the vestibule, which is a rare presentation [1].
Radiological investigation particularly CT and MRI imaging are extremely helpful in outlining the extent of the disease as well as excluding other pathology in patients presenting with nasopharyngeal masses [6]. These imaging modalities are also essential to rule out diseases extending into the orbit, nasolacrimal duct and the tracheobronchial tree.
Rhinosporidium seebri presents as a round structure with yellow spots which microscopically vary in size, corresponding to different stages in the development of the organism. [7].
Characteristically, the surgical excision of the lesion accompanied by cauterization of the base demonstrates a nearly curative outcome in a minimum of 90% of the instances [8]; however, in endemic regions, the recurrence rate exhibits considerable variability, fluctuating between 5% and 67%, associated with the challenges inherent in achieving complete resection [9]. Studies have indicated that at least in the context of dapsone, there exists *in vitro* evidence denoting degenerative alterations and complete inactivation of free endospores, alongside *in vivo* responses that are variable, presumably attributable to pharmacokinetic and pharmacodynamic factors, yet lacking adequate substantiation to endorse its therapeutic application [10]. Extended therapeutic regimens utilizing Dapsone or antifungal agents have been attempted with inconsistent efficacy. In spite of these interventions, recurrence rates persist at elevated levels, likely due to the inadvertent dispersal and seeding of sporangia during the excision process, which subsequently infiltrate adjacent healthy tissues [4]. At present, there is an insufficient body of medical evidence to substantiate the efficacy of alternative medical therapies alone [3].

Conclusion

Due to its widespread occurrence in rural areas characterized by significant exposure to polluted water sources, enhancing public awareness and advocating for preventive strategies, such as the avoidance of stagnant water and the advancement of water sanitation, can significantly alleviate the burden of rhinosporidiosis in endemic territories. Generally, the prognosis associated with the disease is favorable; however, in light of the potential for recurrence, prompt diagnosis, rigorous treatment, and prolonged patient follow-up to identify relapses and prevent complications is necessary.
Rhinosporidiosis generally presents as mass attached to anterior part of the nasal septum, sometimes extends into the nasopharynx, but what makes our case interesting is the fact that an isolated mass was seen extending into the nasal vestibule, which is a rare presentation.
Otolaryngologists should remain vigilant about the clinical presentation of rhinosporidiosis when treating migrant populations exhibiting nasopharyngeal masses or abnormal growths associated with mucosal surfaces, even if these cases arise from non-endemic regions.
The evaluation using radiological imaging, coupled with the distinctive histological findings, constitutes vital components in the management of this condition.
The complete endoscopic removal of the mass without traumatising adjacent structures followed by cauterisation of the base and administration of Dapsone therapy is recommended as a preventive measure against recurrences.

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