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NASAL RHINOSPORIDIOSIS IN A BULL: GROSS AND HISTOPATHOLOGICAL FINDINGS

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ABSTRACT

A five-year-old non-descript bull was presented to Veterinary Clinical Complex, RAJUVAS, Bikaner with history of epistaxis and dyspnoea. A cauliflower like growth was visible from right external nare. Macroscopically, unilateral, lobulated, polypoid granulomatous mass with variable colouration (tan, reddish and black areas) and multinodular surface was observed. After excision, the cut surface of the growing mass appeared smooth and tan in colour. Microscopically, the growth revealed sporangium like round structures with dense infiltration of lymphocytes, plasma cells andepithelioidmacrophages in the surrounding stroma. In some areas, centre of the sporangium showed the dense eosinophilic debris suggestive of endospores and necrotic material. Thick pink collagen bundles were suggestive of fibrous stroma. Thus, the present study reports a case of nasal form of rhinosporidiosis based on gross and histopathological examination.

Key words: Bull, rhinosporidiosis, sporangia, endospores, histopathology

Introduction

Rhinosporidiosis is a sporadic and chronic granulomatous disease affectingcattle, goats, horses, mules, goose, duck and human (Chakrabarti, 2017 and Sharma *et al*., 2010). The disease has worldwide distribution and characterized by the development of large polypoid masses with a notable tendency for recurrence, dyspnoea accompanied by blood-stained mucopurulent nasal discharge. It is caused by an unisolated and unclassified fungus *Rhinosporidium seeberi* which is found in large sporangia in the nasal polyp (Sharma *et al*., 2010). These lesions most commonly involve the nasal mucosa followed by ocular mucosa, and are usually unilateral (Chakrabarti, 2017), highly vascularized, friable, and present as either sessile or pedunculated growths (Sharma *et al.,* 2010). The condition shows a higher prevalence in male of animals, likely due to their greater involvement in agricultural activities. Trauma is considered an important predisposing factor, as contamination of wounds with soil or inhalation of soil-borne dust particles can facilitate infection. Among cattle, bullocks are affected more frequently than cows, with the highest incidence reported in animals between four and nine years of age (Sharma *et al*., 2010).

Case presentation

A bull was presented to VCC, RAJUVAS, Bikaner with epistaxis, dyspnoeaand a cauliflower like growth, visible from right external nare. On Clinical examination, unilateral, irregular (with no clear encapsulation) and lobulated granulomatous mass with variable colouration (tan, reddish and necrotic black areas) was noticed (Fig. 1). The external surface showed multiple nodular and papillomatous projections, giving it a polypoid appearance. Assessment of physiological parameters revealed tachypnoea, slight increase in pulse rate and normal rectal temperature. The mass was surgically

Fig. 1: Photograph of right external nare of bull showing irregular and lobulated granulomatous mass with variable colouration

Fig. 2: Photograph of cut surface of granulomatous mass showing reddish tan to yellowish discolouration

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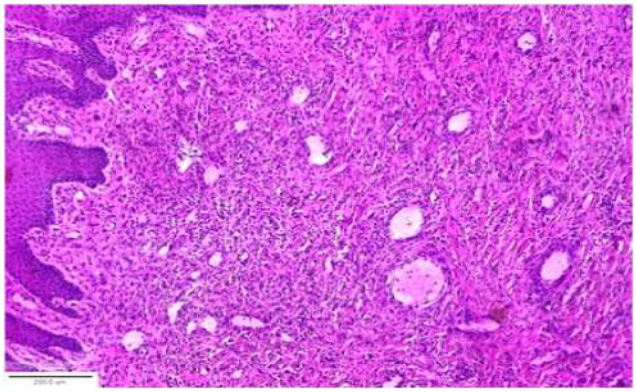

Fig. 3: Microphotograph of mass revealed multiple large, round, clear to lightly eosinophilic sporangium of *Rhinosporidium seeberi* along with thick pink collagen bundles in stroma. H & E. 100 X.

excised under infraorbital nerve block and then cauterization of underlying tissue was done. The excised mass was collected in 10% buffered formalin and processed mechanically for paraffin embedding by acetone benzene technique (Lillie, 1965). Sections of 4-6 microns thickness were cut and stained with haematoxylin and eosin staining method (Luna, 1968).

Macroscopic examination revealed polyps that were lobulated, soft in consistency and pink with a marked propensity for haemorrhage. The cut surface was reddish tan to yellowish, moist and friable (Fig. 2). The mass was moderately firm in consistency with some soft zones. Histopathology of the mass revealed multiple large, round, clear to lightly eosinophiliccystic spaces which resembled sporangium of *Rhinosporidium seeberi* along with thick pink collagen bundles present in the stroma (Fig. 3). The centre of some round to oval cystic spaces showed the presence of degenerated endospores, necrotic material and remnants of sporangial wall along with dense infiltration of lymphocytes,plasma cells and epithelioid macrophages around the cyst (Fig. 4).

Discussion

The clinical signs observed *viz.* unilateral and friable mass, irregular and reddish surface and polypoid appearance of granuloma were in correlation with earlier studies (Bhargava, *et al*., 2012 and Sinha *et al*., 2012). Many of the observed cystic structures in our specimen exhibited central degeneration, containing necrotic debris, degenerated endospores and fragmented remnants of the sporangial wall. This feature suggests rupture or late-stage maturation of sporangia. Comparable findings have been reported by Das *et al*., 2018 and Putthia *et al*., 2018, indicating progression of the lesion into a chronic inflammatory phase. The connective tissue surrounding the sporangia revealed dense infiltration of lymphocytes, plasma cells and epithelioid macrophages, forming a granulomatous inflammatory response. Such chronic inflammatory infiltrates are well established in rhinosporidiosis and represent the host's reaction to persistent antigenic stimulation produced by the organism (Sinha *et al*., 2012; Sengupta *et al*., 2015; Tiwari *et al*., 2015 and Nayakand Pandey, 2021).

The stroma exhibited thick, pink collagen bundles, indicating fibrosis. Fibro-collagenous or fibromyxoid stromal reactions are common in long-standing lesions of

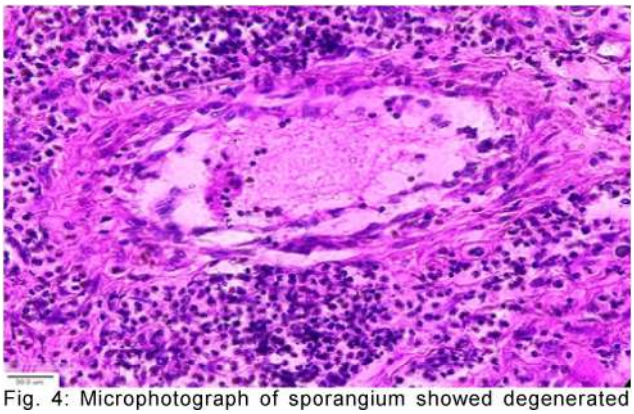

Fig. 4: Microphotograph of sporangium showed degenerated endospores, necrotic material and remnants of sporangial wall along with dense infiltration of lymphocytes, plasma cells and epithelioid macrophages. H & E. 400 X.

rhinosporidiosis and have been reported by Bhargava *et al*. (2012); Prasad *et al*. (2015); Tiwari *et al*. (2015) and Joshi *et al*. (2016). This stromal organization reflects chronicity and ongoing tissue repair secondary to repeated cycles of sporangial rupture and inflammation.

Rhinosporidiosis requires careful differentiation from nasal papilloma, fibro-papilloma, and carcinoma due to overlapping clinical features such as polypoid growth and potential recurrence (Bhargava *et al*., 2012 and Sinha *et al*., 2012). Nasal papillomas and fibro-papillomas, frequently associated with Bovine Papilloma Virus (BPV), demonstrate papillary or exophytic epithelial proliferation with fibro-vascular stroma and possible viral cytopathic effects, without the hallmark sporangia or endospores (Duarte *et al*., 2015). Carcinomas exhibit marked cellular atypia, mitotic figures, and stromal invasion, in contrast to the granulomatous response with fibrosis seen in rhinosporidiosis (Thompson *et al*., 2022). Histopathology is definitive, showing mature thick-walled sporangia, ruptured forms with degenerated endospores, necrotic debris, and dense lymphoplasmacytic infiltration, which distinguish it from neoplastic entities (Das *et al*., 2018; Tiwari *et al*., 2015 and Abraham *et al*., 2024). Similar findings have been reported in both human and veterinary cases.

Overall, the histopathological observations in this caseincluding intact and ruptured sporangia, degenerated endospores, chronic inflammatory infiltrates and stromal fibrosis, strongly support the diagnosis of rhinosporidiosis. The constellation of features is consistent with classical descriptions in both human and animal infections and underscores the utility of histopathology as the gold standard for confirmation of this organism.

In the present case, diagnosis is primarily supported by the characteristic clinical presentation, the animal's geographic origin, and a history of local recurrence. Confirmation achieved by demonstrating the presence of spores or sporangia in tissue specimens. Neither systemic nor localized pharmacological therapies significantly influence the progression of the disease. Effective management primarily relies on surgical excision of the polyps, followed by thorough cauterization of the underlying tissue.

The black discolouration on the polyp might be due to surface necrosis or haemorrhage. The colour and physical

nature of cut surface was consistent with an inflammatory granulomatous tissue. The consistency of the mass suggested the presence of mixed fibrous and granulomatous tissue. The histopathological findings in the present case were characteristic of rhinosporidiosis and closely correlated with previously published descriptions. The presence of large, round, cystic structures with clear to lightly eosinophilic walls corresponds to the mature sporangia of *Rhinosporidium seeberi*, which are considered the diagnostic hallmark of this infection. Similar morphology of thick-walled sporangia has been documented in several earlier studies of nasal and cutaneous rhinosporidiosis in humans and animals (Bhargava, *et al*., 2012; Sinha *et al*., 2012; Tiwari *et al*., 2015 and Das *et al*., 2018).

In conclusion, the study is significant because it documents a rare case of nasal rhinosporidiosis in a bull, adding to the limited reports of the disease in cattle from Rajasthan and contributing to its epidemiological record. The detailed clinical, surgical and histopathological characterization (including sporangia and endospores) enhances diagnostic understanding for veterinary practitioners. Moreover, by reporting from a specific region, it contributes epidemiological insight and highlights the potential of cattle as reservoirs in endemic areas.

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Conflict of interest

The authors have no conflicts of interest to declare.

References

Abraham, ZS, Zerd, F, Mnguruta, BJ, Mgute, CD and Kahinga, AA (2024) Synchronous nasal rhinosporidiosis and inverted papilloma in a paediatric patient in Dodoma, Tanzania: Case report. *International J. Surg. Case Rep*. **117**:109578.

Bhargava S, Grover M and Maheshwari V (2012) Rhinosporidiosis: Intraoperative cytological diagnosis in an unsuspected lesion. *Case Rep. Pathol.***2012**:101832:1-3.

Chakrabarti A (2017) Fungal diseases of the ear, nose and throat. In: *Oxford Textbook of Medical Mycology*, p. 154.

Das C, Das SK, Chatterjee P and Bandyopadhyay SN (2018) Series of atypical rhinosporidiosis: Our experience in the western part of West Bengal. *Indian J. Otolaryngol. Head Neck Surg.***71**(Suppl. 3):1863-1870.

Duarte, RP, Rocha, PRD, Schweigert, A, Morelli, FC and Machado, GF (2015) Nasal polyposis in a cow. *Brazilian J. Vet.Pathol*. **8**(3):102-106.

Joshi A, Ray CS and Khatua RK (2016) Disseminated cutaneous rhinosporidiosis: A rare case report. *Int. J. Otorhinolaryngol. Clin.***8**(2):72-74.

Lillie RD (1965) *Histopathological Techniques and Practical Histochemistry*. 3rd edn., McGraw-Hill Book Company, New York.

Luna LG (1968) *Manual of Histologic Staining Methods of the Armed Forces Institute of Pathology*. 3rd edn., McGraw-Hill Book Company, New York.

Nayak S and Pandey S (2021) Unusual presentations of disseminated cutaneous rhinosporidiosis masquerading as tumour-like lesions of skin: A clinicopathological study. *Natl. J. Lab. Med*.**10**(2):25-28.

Prasad HK, Rao C, Girisha BS, Shetty V, Permi HS, Jayakumar M and Kiran HS (2015) Subcutaneous rhinosporidiosis masquerading as soft tissue tumor: Diagnosed by fine-needle aspiration cytology. *Indian J. Dermatol.***60**(2):215.

Putthia H, Manjunatha BS, Astekar M and Taufiq S (2018) Palatal rhinosporidiosis: An unusual case report and review of the literature. *J. Korean Assoc. Oral Maxillofac. Surg.***44**(6):293-297.

Sengupta S, Pal S, Biswas BK, Jana S, Biswas S and Minz RS (2015) Clinico-pathological study of 273 cases of rhinosporidiosis over a period of ten years in a tertiary care institute catering predominantly to a rural population of tribal origin. *Bangladesh J. Med. Sci.***14**(2):159-164.

Sharma RD, Kumar M and Sharma MC (2010) *Textbook of Preventive Veterinary Medicine and Epidemiology*.Directorate of Information and Publications of Agriculture, Indian Council of Agricultural Research, New Delhi.

Sinha A, Phukan JP, Bandyopadhyay G, Sengupta S, Bose K, Mondal RK and Choudhuri MK (2012) Clinicopathological study of rhinosporidiosis with special reference to cytodiagnosis. *J. Cytol.***29**(4):246-249.

Thompson, LDR, Müller, S and Nelson, BL (2022) *Diagnostic pathology: Head and neck* (3rd ed.). Elsevier.

Tiwari R, Karthik K, Dhama K and Shabbir MZ (2015) Rhinosporidiosis: A riddled disease of man and animals. *Adv. Anim. Vet. Sci.***3**(2 Suppl.):54-63.