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CASE REPORT

Concurrent occurrence of intestinal coccidiosis and oral papillomatosis in a buffalo calf

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ABSTRACT

This paper describes a unique case of concurrent oral papillomatosis and intestinal coccidiosis in a six-month-old buffalo calf with a history of anorexia, dysentry, and presence of multiple exophytic masses within the oral cavity. Microscopically, the tumors in the oral cavity were characterized by papillary projections with a fibrovascular core and characteristic koilocytes. Simultaneously, the intestines exhibited a thickened, corrugated, and hemorrhagic mucosa grossly, with coccidial oocysts in the intestinal scrapings. On histopathology, proliferative enteritis was recorded. The findings suggest that the physiological stress and immunosuppression induced by intestinal coccidiosis likely predisposed the calf to the mucosal manifestation of papillomatosis.

Keywords: Buffalo calf, coccidiosis, concurrent occurrence, immunosuppression, oral papillomatosis

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INTRODUCTION

The dairy industry is a cornerstone of India's economy, contributing approximately 5% to the national GDP and supporting the livelihoods of over eight crore farmers[1]. However, the sector faces significant challenges due to infectious diseases that impact animal health and productivity. Among these, coccidiosis stands out as a globally prevalent, stress-related intestinal protozoan disease caused by apicomplexan parasites of the genus *Eimeria*. The disease is a major driver of economic loss in the cattle sector, primarily due to high morbidity and mortality in young calves[2,3] . In addition to the parasitic threats, buffalo calves are susceptible to bovine papillomatosis, a contagious viral condition caused by the Bovine Papillomavirus (BPV). This disease is characterized by the development of benign tumors or "warts" on the skin and mucosal epithelium, particularly within the upper alimentary tract[4,5]. Although rarely fatal, papillomatosis can result in stunted growth and reduced milk production[4]. While both conditions are recognized as separate entities in the literature, this case report shows, for the first time, concurrent occurrence of coccidiosis and papillomatosis in a buffalo calf.

A six-month-old female buffalo calf was presented for necropsy to the Department of Veterinary Pathology, NTR College of Veterinary Science, Gannavaram with a history of dysentery and severe dehydration persisting for ten days prior to death. At necropsy, multiple exophytic, hard, sessile masses on the gums and the dorsum of the tongue (Fig.1) were observed. The masses were nodular and measured approximately 2–3 cm in diameter; their cut surfaces appeared grayish-white and fleshy. The abdominal cavity revealed generalized peritonitis, characterized by severe mesenteric and serosal congestion of the intestines, accompanied by localized adhesions between intestinal segments. The intestinal mucosa was severely congested to hemorrhagic, containing mucoid and blood-tinged contents. Notably, the mucosa of the large intestine was markedly thickened and exhibited prominent corrugations (Fig. 2). Direct smear examination of intestinal scrapings confirmed the presence of *Eimeria* spp. oocysts. Representative tissue samples were collected in 10% formalin and subjected to routine tissue processing, paraffin embedding and microtomy. Four to five micron thick paraffin sections were stained by Haemotoxylin and Eosin method. Histologically, the masses in the oral cavity were characterized by exophytic, unbranched to branched papillary projections composed of proliferating stratified squamous epithelium supported by a fibrovascular core. The stratum corneum exhibited hyperkeratosis with a "basket-weave" appearance, while the stratum spinosum showed marked acanthosis and presence of koilocytes, with characteristic perinuclear halos

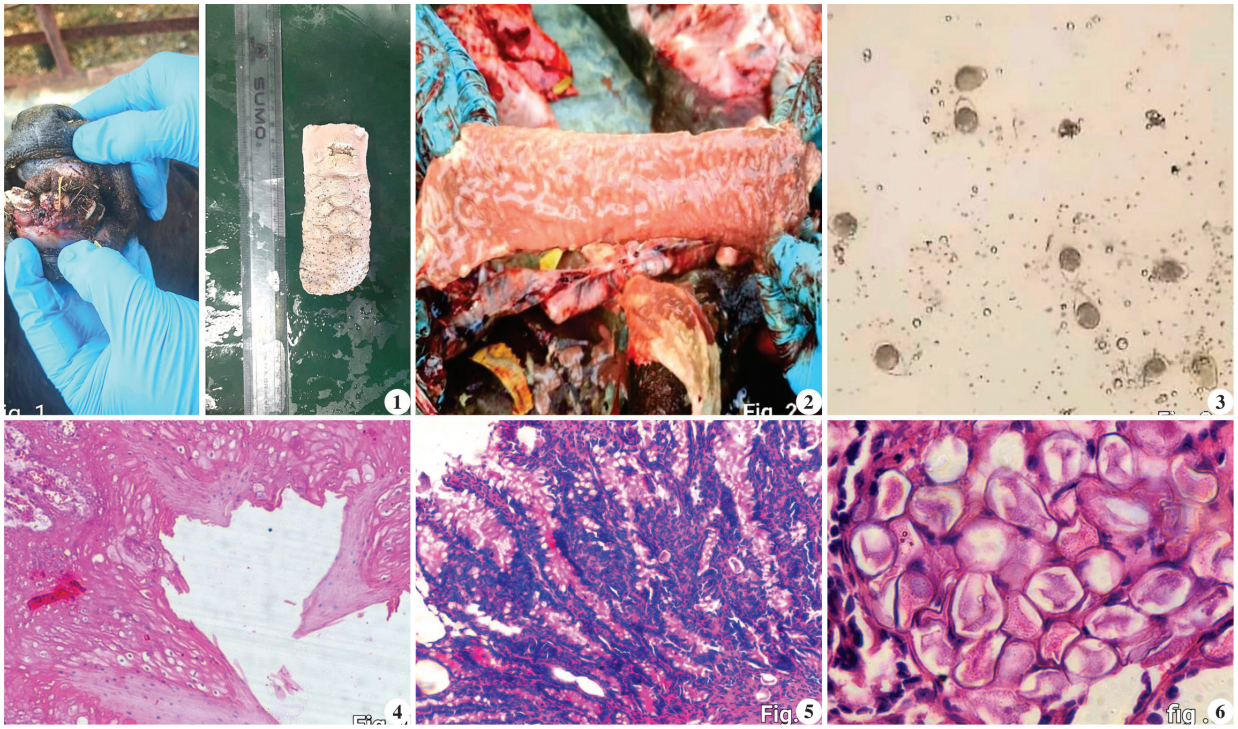

Fig. 1. Papillomas on the gum line and dorsum of the tongue; **Fig. 2.** Intestinal mucosa showing congestion and corrugations; **Fig. 3.** Intestinal scrapings showing a large number of unsporulated oocysts of *Eimeria sp.* x100; **Fig. 4.** Oral papillomatosis showing exophytic, papillary projections with hyperkeratosis, acanthosis and koilocytes, H&E x100; **Fig. 5.** Proliferative enteritis showing severe goblet cell hyperplasia and stages of coccidial organisms. H&E x100; **Fig. 6.** Intestinal mucosa inhabited by stages of coccidial organisms, H&E x400

(Fig. 3). The underlying fibrovascular core was composed of dense collagen, active fibroblasts, and significant neovascularization. Histopathological examination of the intestines revealed proliferative enteritis characterized by mucosa forming polypoid structures, goblet cell hyperplasia and the epithelium inhabited by various developmental stages of *Eimeria* spp. (Fig. 4 & 5). There was a severe infiltration of mononuclear cells within the lamina propria, while the intestinal lumen contained extensive necrotic debris, bacterial colonies, and various stages of *Eimeria* spp.

The present case report documents the concurrent occurrence of oral papillomatosis and intestinal coccidiosis in a buffalo calf. While previous literature has recorded concurrent viral infections in cattle, such as Papillomavirus combined with Parapox or Herpesvirus[6], the specific co-existence of oral papillomatosis and coccidiosis has not been previously documented. Bovine papillomatosis in young cattle is typically associated with several predisposing factors, including immunosuppression, age, poor nutritional status, parasitic infections, and environmental stress[7]. In this instance, it is highly probable that the intestinal coccidiosis induced a state of immunosuppression, thereby predisposing the animal to the papillomavirus infection.

While papillomas typically manifest on the head, neck, and shoulders[8], the growths in this case were localized specifically to the gums and tongue. Such mucosal forms are less frequent and are often categorized as exophytic papillomas, which can be precursors to alimentary or bladder cancers[9]. This unique presentation of concurrent oral papillomatosis and coccidiosis emphasizes the complex interplay between viral and parasitic pathogens in young ruminants and provides a novel reference for future clinico-pathological investigations.

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