

CYSTADENOCARCINOMA OF BARTHOLIN'S GLAND - HISTOPATHOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY

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ABSTRACT

Bartholin's glands are bilateral, mucus-secreting, tubuloacinar glands located within the submucosa of the vulva of ruminants. Seven years old graded Murrah buffalo was reported to have vaginal prolapse. Clinical examination of the vagina revealed a cyst like structure measuring about 7x6 cm and seen on the Bartholin's gland and on incision it was pink, soft, and fluctuating. The mass was removed as per the standard routine surgical procedure. The mass had a thick wall and contained about 100 ml of clear fluid. The inner side revealed a rough surface and multiple soft raised areas. Microscopical examination revealed invasive, pleomorphic neoplastic epithelial cells that formed irregular tubules and glands with abundant fibrous stroma and inflammation. The tubules were lined by single to double layered eosinophilic anaplastic cuboidal to columnar cells. The proliferated lining cells had large round to oval vesicular nuclei and prominent nucleoli and a few mitotic figures. Some glandular structures were dilated and cystic or irregularly shaped.

Local invasion into the surrounding muscles was noticed. Based on gross and histopathological features the case was diagnosed as Bartholin's gland cystadenocarcinoma. Immunohistochemical staining revealed strong positive reaction with cytokeratin. After treatment, animal recovered uneventfully and there was no recurrence.

Keywords: *Bubalus bubalis*, buffaloes, Bartholin's gland, Murrah buffalo, cytokeratin, cystadenocarcinoma

INTRODUCTION

Bartholin's gland (BG) also known as the major vestibular glands or Bartholin gland is a compound tubuloacinar mucus gland seen in ruminants, cats and women. It is about 1.5x3 cm in diameter located in constrictor muscles of the vestibule and are two in number one on each side. The ducts open into the lateral wall of the vestibule about 2.5 cm caudal to the vagina (Roberts, 1971). These glands are visible only when enlarged and

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if vestibular mucosa is slightly everted. They are highly sensitive to the estrogen and responding with the secretion of thin mucus and hyperplasia of the ductal epithelium (Jubb and Kennedy, 2007). Glandular fluid was enriched with sialic acid, glycidic radicals and both mutual and sulfated mucins. These peculiarities were considered critical for spermatozoa. The occlusion of the ducts can lead to formation of retention cyst and usually mistaken for prolapse of vagina. Pathological alterations in the BG are not frequently reported but there are reports on development of cyst, adenoma, and adenocarcinoma in ruminants. The present paper reports the occurrence, histopathological and immunohistochemical study of cystadenocarcinoma of Bartholin's gland in a graded Murrah buffalo.

MATERIALS AND METHODS

Seven years old graded Murrah buffalo was reported to have vaginal prolapse. Clinical examination of the vagina revealed a cyst like structure measuring about 7x6 cm and seen on the Bartholin's gland and on incision it was pink, soft and fluctuating. The mass was removed as per the standard routine surgical procedure and sent to the Department of Veterinary Pathology, Madras Veterinary College for the histopathology and confirmatory diagnosis. The tissue sample was fixed in 10% formalin and embedded in paraffin wax. Sections of 5 µm thickness were prepared and stained with Hematoxylin and Eosin for histopathological examination. For immunohistochemical analysis sections were processed as per the manufacturer's protocol. Briefly, tissue sections of 3 to 4 µm thick were collected on Poly L-Lysine coated slides and

subjected to antigen retrieval. After antigen retrieval they were subjected to incubation with anti- cytokeratin antibody (Pathnsitu, USA) followed by addition of substrate for the color development and counterstained with H&E.

RESULTS AND DISCUSSION

Grossly, the mass had a thick wall and contained about 100 ml of clear fluid. The inner side revealed a rough surface and multiple soft raised areas. Microscopical examination revealed pleomorphic neoplastic epithelial cells that formed irregular tubules and glands with abundant fibrous stroma and inflammation (Figure 1). The tubules were lined by single to double layered eosinophilic anaplastic cuboidal to columnar cells (Figure 2). The proliferated lining cells had large round to oval vesicular nuclei and prominent nucleoli and a few mitotic figures (Figure 3). Some glandular structures were dilated and cystic or irregularly shaped (Figure 4). Local invasion into the surrounding muscles was also noticed. Based on gross and histopathological features the case was diagnosed as Bartholin's gland cystadenocarcinoma. On immunohistochemical analysis, all the glandular structures revealed strong diffuse immunoreactivity to cytokeratin (Figure 5). After treatment, animal recovered uneventfully and there was no recurrence. Cyst of Bartholin gland is rare in cattle. But Retention cyst is the most common Bartholin gland pathology in humans (Sosnik *et al.*, 2007). Hypoestrogenism is considered as one cause for development of retention cyst (Jubb and Kennedy, 2007). Also reports suggest that trauma or extensive lacerations at the time of calving can lead to necrotic vulvovaginitis and further obstruction of the duct

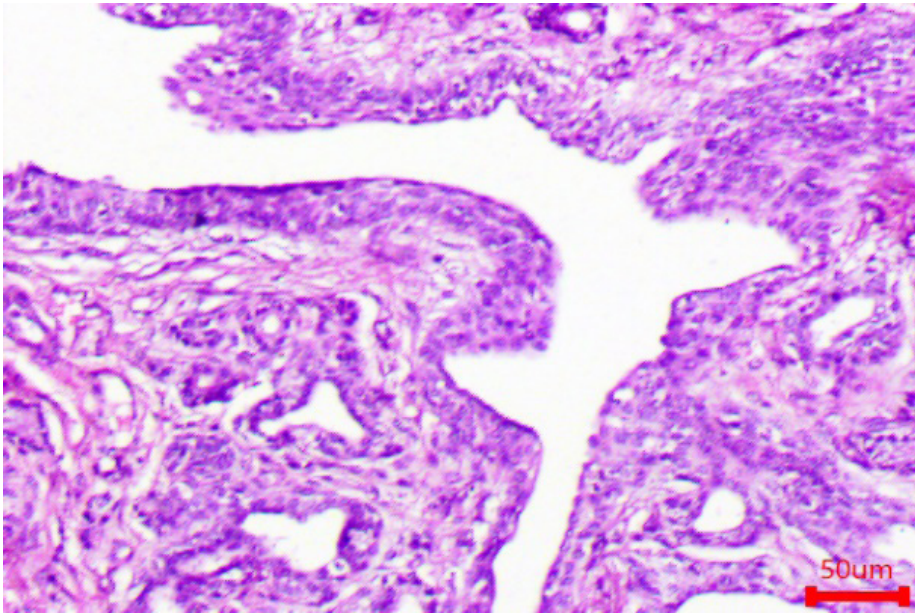


Figure 1. Irregular tubules and glands with abundant fibrous stroma. H&E. bar = 50 μ m.

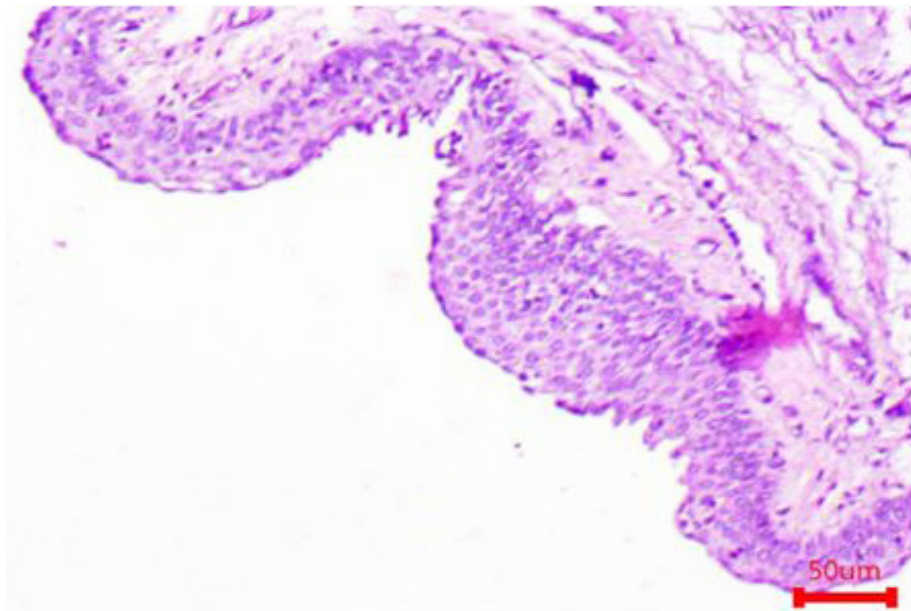


Figure 2. Glandular tubules lined by multilayered anaplastic cuboidal to columnar cells. H&E. bar = 50 μ m.

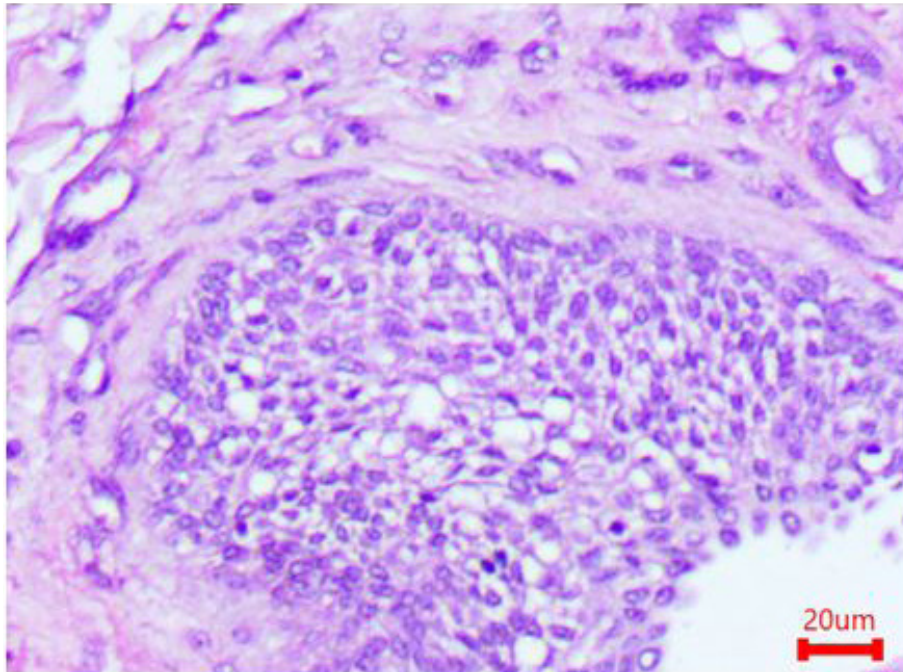


Figure 3. Pleomorphic cuboidal cells with mitotic figures. H&E. bar = 20 μ m.

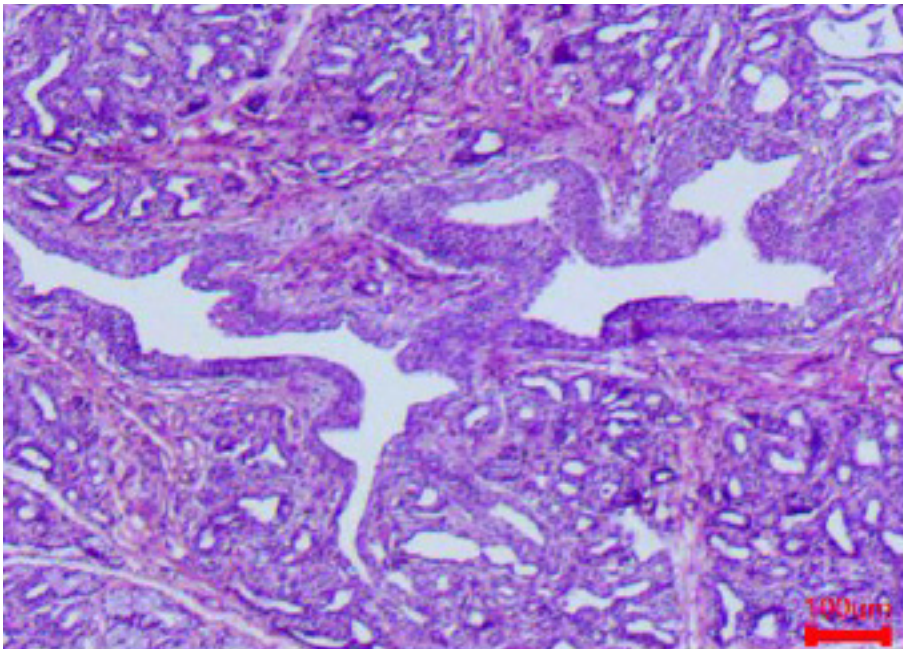


Figure 4. Cystic dilatation of glandular structure. H&E. bar = 100 μ m.

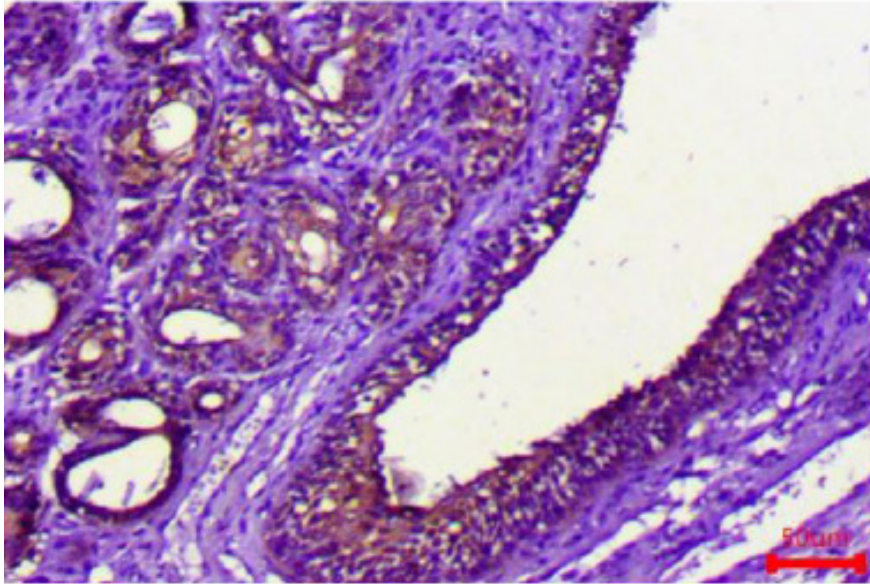


Figure 5. Strong positive immunoreactivity to Cytokeratin antibody. IHC-DAB Brown. bar = 50 μ m.

opening (Fathella *et al.*, 2000). Mostly it is seen in older animals and in those previously calved, but it is reported in pregnant heifer also (Bademkiran *et al.*, 2009). *Brucella abortus* was isolated on microbial culture of the cystic fluid from a cow (Fathella *et al.*, 1978). Biochemical analysis of the fluid revealed high albumin content. In all the cases cyst was found to be unilateral and larger cyst occasionally protrude through the vulvar lips and mistaken as prolapse of vagina. Presence of these cyst in birth canal found to be affecting conception even after several artificial inseminations in case of a cross bred cattle (Manokaran *et al.*, 2014).

Bartholin gland tumors are classified as adenoma and carcinoma by WHO with most of them originate from the mucin secreting columnar epithelial cells and from the squamous epithelium of the vestibular orifice of the ducts of Bartholin's Gland (Wilkinson and Teixeira, 2003). Malignant neoplastic growth is rare in humans and comprised about 2 to 7 of all the vulvar neoplasms.

In humans' carcinomas have been described as adenocarcinoma and squamous, adenoid cystic, transitional, adenosquamous and undifferentiated carcinomas and they metastasize to regional lymph node. Carcinoma predominantly occurs on the left side. It is an extremely rare tumor in case of animals (Meuton, 2017). But Carcinoma of the major vestibular gland was reported in a cow (Tanimoto *et al.*, 1994). Moreira *et al.* (2018) reported the incidence of adenoma of Bartholin gland in a Sannen goat. It was found to showing strong immunoreactivity to the epithelial marker cytokeratin and moderate immunoreactivity to Ki-67.

CONCLUSION

A case of cystadenocarcinoma of Bartholin's gland was diagnosed and recorded in a Murrah Buffalo. Histopathological and

Immunohistochemical characteristics were studied and reported.

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