Indian J. Vet. Pathol., 50(2) : 173-176, 2026: DOI: https://doi.org/10.56093/bhsk5n12

CASE REPORT

Vulvovaginal squamous cell carcinoma: Mimicking chronic prolapse in bitch

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Received: 1.1.26; Accepted: 28.1.26

ABSTRACT

Squamous cell carcinoma (SCC) is a malignant epithelial neoplasm arising from squamous cells and is infrequently reported in the vulvovaginal region of bitches. Owing to its anatomical location and gross appearance, vulvovaginal SCC may clinically resemble vaginal prolapse leading to diagnostic ambiguity. The present study documents a rare case of vulvovaginal squamous cell carcinoma in a 3-year-6-month-old intact bitch presented to the Teaching Veterinary Clinical Complex, Bihar Veterinary College, Patna with a history of protruding vaginal mass for the past 20 days. Clinically, the mass was reddish-pink, firm, irregular, non-reducible and ulcerated, closely mimicking vaginal prolapse. Based on the chronicity, progressive enlargement and ulcerative surface changes of the mass, a neoplastic condition was clinically suspected and surgical excision was undertaken as a definitive diagnostic and therapeutic approach under general anaesthesia. Haematological evaluation revealed moderate normocytic normochromic anaemia, leucocytosis with neutrophilia and borderline thrombocytopenia, reflecting a non-specific systemic response to neoplasia. Biochemical analysis demonstrated elevated total protein and globulin levels with mild increases in alanine aminotransferase (ALT) suggestive of systemic inflammatory response and hepatic stress. Gross examination of the excised mass revealed an irregular, friable growth with focal pale yellow to grey, soft areas suggestive of necrosis, along with dark red to black, blood-filled regions consistent with haemorrhage. Histopathological examination confirmed the diagnosis of squamous cell carcinoma characterized by invasive cords and nests of neoplastic squamous epithelial cells, marked cellular pleomorphism, hyperchromatic nuclei, prominent nucleoli, frequent mitotic figures and keratin pearl formation within a desmoplastic stroma, consistent with a well to moderately differentiated SCC. Vulvovaginal squamous cell carcinoma though uncommon in young bitches should be considered as an important differential diagnosis in cases of chronic vaginal prolapse-like conditions unresponsive to manual reduction. The present study emphasizes the importance of thorough clinical evaluation, histopathological confirmation and prompt surgical intervention for successful management and prevention of local invasion and recurrence.

Keywords: Histopathology, vaginal prolapse, vulvovaginal squamous cell carcinoma

INTRODUCTION

Squamous cell carcinoma (SCC) is a malignant neoplasm arising from stratified squamous epithelial cells and represents one of the most frequently encountered epithelial tumours in dogs, commonly affecting the skin and mucocutaneous junctions[1,2]. The incidence of SCC in dogs is 6% of all skin tumours[3]. In dogs, the most frequent location occurs on the head, abdomen, limbs, perineum and digits (nailbed). Although cutaneous SCC is well documented, its occurrence in the vulvovaginal region of bitches is comparatively rare and often underreported, largely due to diagnostic challenges and clinical resemblance to non-neoplastic reproductive conditions[4,5]. Vulvovaginal SCC is characterized by locally invasive growth, progressive tissue destruction and a low but potential risk of metastasis, thereby posing significant clinical concern in canine oncology[6]. Malignant tumours like vaginal SCC occur more often in spayed animals[7].

The vulva and vagina are hormonally responsive tissues and endocrine influences particularly prolonged estrogenic stimulation are believed to play a contributory role in the pathogenesis of neoplastic transformation in this region[8,9]. Chronic exposure to endogenous estrogens in intact bitches, pseudopregnancy, repeated estrous cycles, ovarian cysts or estrogen-secreting tumours may induce epithelial hyperplasia and dysplasia, predisposing the mucosal epithelium to malignant transformation[10,11]. Additionally, local irritation, trauma, chronic inflammation and secondary infections also act as promoting factors in the development of vulvovaginal SCC[12].

How to cite this article : Sinha, V.K., Kumar, K., Kumar, D., Ali, I., Tiwary, R. and Kumar, R. 2026. Vulvovaginal squamous cell carcinoma: Mimicking chronic prolapse in bitch. Indian J. Vet. Pathol., 50(2) : 173-176.

Clinically, vulvovaginal SCC often presents as a protruding, ulcerated or proliferative mass that may closely mimic vaginal prolapse, vaginal hyperplasia or transmissible venereal tumour particularly in younger intact bitches[13]. Such resemblance frequently leads to delayed diagnosis and inappropriate management. Affected animals may show vulvar swelling,

bleeding, discharge, dysuria and discomfort significantly impairing quality of life[14].

Haematological and biochemical alterations in dogs with SCC generally reflect chronic inflammation, tumour-associated stress and secondary infection commonly manifesting as anaemia, leucocytosis with neutrophilia and hyperglobulinaemia[6,15]. Histopathological examination remains the definitive diagnostic modality, revealing invasive nests and cords of malignant squamous cells with keratin pearl formation, nuclear pleomorphism and increased mitotic activity[1,5].

Despite its clinical relevance, literature documenting vulvovaginal SCC in bitches particularly from India remains scarce. The present study highlights a rare case of vulvovaginal squamous cell carcinoma in a young bitch mimicking vaginal prolapse, emphasizing the role of hormonal influences and the importance of clinicopathological correlation for accurate diagnosis and effective surgical management.

MATERIALS AND METHODS

The present study was conducted on a clinical case of a vulvovaginal neoplastic growth in a bitch presented to the Department of Veterinary Surgery and Radiology, Teaching Veterinary Clinical Complex, Bihar Veterinary College, Bihar Animal Sciences University (BASU), Patna. The case involved a 3-year-6-month-old intact female dog brought with a history of a protruding vulvovaginal mass for the past 20 days. According to the owner, the mass progressively increased in size and was initially suspected to be vaginal prolapse. The animal also exhibited intermittent serosanguinous discharge, licking of the perineal region and mild discomfort during urination. No prior medical or hormonal treatment was reported.

On clinical examination, the bitch was alert and responsive with normal rectal temperature, normal pulse and respiratory rate. A firm, irregular, reddish-pink, non-reducible mass was observed protruding from the vulva (Fig. 1). Mass was ulcerated at places with focal areas of necrosis. A large, protruding, reddish and lobulated mass from the vulvovaginal region during surgical manipulation appearing firm to friable with marked surface haemorrhage and congestion, necessitating urinary catheterization for procedural management (Fig. 2). Palpation elicited mild pain and regional lymph nodes were not markedly enlarged.

Haematological findings revealed mild to moderate anaemia with marginal leucocytosis while biochemical analysis showed elevated total protein and globulin levels with mild increases in Alanine Aminotransferase (ALT) and Aspartate Aminotransferase (AST) and normal renal parameters (Table 1 & 2).

Table 1. Haematological profile of dog suffering from Vulvovaginal Squamous cell carcinoma.

Parameter	Observed value	Reference range (Canine)
Haemoglobin (Hb) (g/dL)	**9.4**	12–18
Packed Cell Volume (PCV)	**28 %**	37–55 %
Total Erythrocyte Count (TEC) ($\times 10^6/\mu L$)	**4.2**	5.5–8.5
Total Leukocyte Count (TLC) ($\times 10^3/\mu L$)	**17.6**	6–17
Neutrophils	**78 %**	60–77 %
Lymphocytes	**16 %**	12–30 %
Monocytes	**4 %**	3–10 %
Eosinophils	**2 %**	2–10 %
Platelet count ($\times 10^5/\mu L$)	**2.1**	2–5

Table 2. Biochemical profiles of dog suffering from Vulvovaginal Squamous cell carcinoma.

Parameter	Observed value	Reference range (Canine)
Alanine aminotransferase (ALT) (IU/L)	92	10–80
Aspartate aminotransferase (AST) (IU/L)	58	10–50
Alkaline phosphatase (ALP) (IU/L)	138	20–150
Total Protein (g/dL)	8.2	5.5–7.5
Albumin (g/dL)	2.8	2.6–4.0
Globulin (g/dL)	5.4	2.5–4.5
Albumin:Globulin ratio	0.52	>0.8
Blood Urea Nitrogen (BUN) (mg/dL)	18	7–27
Creatinine (mg/dL)	1.0	0.5–1.5

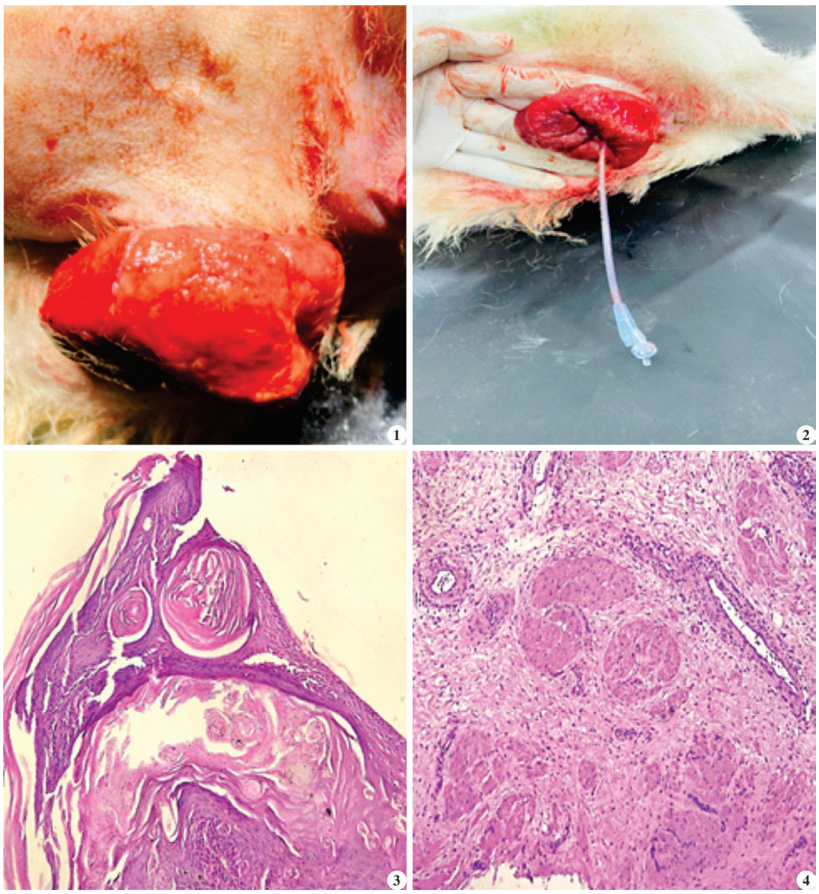

Fig. 1. Image showing a large, exophytic, irregular mass protruding from the vulvovaginal region with a reddish, ulcerated and friable surface; **Fig. 2.** Image showing a large, protruding, reddish and lobulated mass from the vulvovaginal region during surgical manipulation appearing firm to friable with marked surface haemorrhage and congestion, necessitating urinary catheterization for procedural management; **Fig. 3.** Histological section of canine vulvovaginal tumour (H&E 10X) showing infiltrative nests of neoplastic squamous epithelial cells with prominent concentric keratin pearl formation within the tumour mass, consistent with well-differentiated squamous cell carcinoma"; **Fig. 4.** Histological section of vulvovaginal tumour of dog (H&E 10X) showing invasive nests and cords of neoplastic squamous cells embedded in a fibrous stroma, with focal keratinization and associated inflammatory infiltrate.

Surgical excision of the vulvovaginal mass was performed under general anaesthesia with careful blunt and sharp dissection. The animal was pre-medicated with inj. atropine sulphate (0.04 mg/kg body weight, i.m.) and inj. xylazine (1 mg/kg body weight, i.m.) followed by induction with inj. ketamine (5 mg/kg body weight, i.v.). After achieving adequate anaesthesia, the animal was positioned in dorsal recumbency and the perineal region was prepared aseptically. A circumferential incision was made around the base of the mass and the tumour was carefully excised using blunt and sharp dissection. Haemostasis was achieved by ligation of bleeding vessels using absorbable suture material (polyglycolic acid 2/0). The vaginal mucosa was closed in a simple continuous pattern using absorbable sutures, and the skin was closed with nylon 2/0.

The excised tumour mass was immediately fixed in 10% neutral buffered formalin and submitted to the Department of Veterinary Pathology, Bihar Veterinary College, BASU, Patna for histopathological examination. Representative tissue samples were routinely processed by paraffin embedding, sectioned at 4–5 μm thickness and stained with Haematoxylin and Eosin (H&E) for microscopic evaluation.

Postoperatively, the bitch was treated with inj. ceftriaxone (25 mg/kg body weight, i.m.) once daily for five days and inj. meloxicam (0.2 mg/kg body weight, i.m.) for three days. The surgical site was cleaned with povidone-iodine solution twice daily for one week and sutures were removed after 10–12 days. The animal was monitored for postoperative complications and recurrence during follow-up.

RESULTS AND DISCUSSION

Gross examination of the excised vulvovaginal mass revealed an irregular, firm to hard, reddish-pink growth with focal ulceration and areas of necrosis. The cut surface appeared grayish-white with occasional haemorrhagic foci. Such gross features are characteristic of squamous cell carcinoma and have been previously described in vulvovaginal and cutaneous SCC in dogs[1,2,16]. The chronicity of the lesion and its firm, non-reducible nature distinguished it from simple vaginal prolapse or hyperplasia.

The affected bitch showed marked clinical improvement following surgical excision of the vulvovaginal mass. Normal feeding behaviour and activity were resumed within 3–5 days postoperatively. The surgical wound healed uneventfully and sutures were removed on day 10 without any complications. On follow-up examination conducted two months after surgery, no evidence of local recurrence, vaginal obstruction or metastatic spread was observed indicating a favourable postoperative outcome. Similar favourable outcomes following complete excision of vulvar and vaginal tumours in dogs have been reported earlier[8,13].

Histological section of canine vulvovaginal tumour (H&E 10X) showed infiltrative nests of neoplastic squamous epithelial cells with prominent concentric keratin pearl formation within the tumour mass, consistent with well-differentiated squamous cell carcinoma (Fig. 3).

Another Histological section of vulvovaginal tumour of dog showed invasive nests and cords of neoplastic squamous cells embedded in a fibrous stroma, with focal keratinization and associated inflammatory infiltrate (Fig. 4). Based on these findings, the lesion was diagnosed as well to moderately differentiated squamous cell carcinoma, in agreement with earlier reports on canine vulvovaginal SCC[4,5].

Haematological evaluation revealed anaemia characterized by decreased haemoglobin, packed cell volume and total erythrocyte count, consistent with normocytic normochromic anaemia, along with marginal leucocytosis. Biochemical analysis showed elevated total protein and globulin levels with mild increases in ALT and AST suggesting systemic inflammatory response and hepatic stress. Similar hematobiochemical alterations have been documented in dogs with epithelial tumours and chronic neoplastic condition[6,15].

Squamous cell carcinoma accounts for approximately 4–19% of all canine skin tumours; however, its occurrence in the vulvovaginal region is relatively rare[2,10]. Hormonal influence particularly prolonged estrogenic stimulation in intact bitches along with chronic irritation and inflammation has been implicated in the pathogenesis of vulvovaginal SCC[8,14]. The present case highlights the diagnostic challenge posed by such tumours due to their close clinical resemblance to vaginal prolapse.

The absence of recurrence in the present case reinforces that early diagnosis and complete surgical excision remain the treatment of choice for localized vulvovaginal SCC. The findings emphasize the importance of considering neoplasia as a differential diagnosis in cases of chronic or atypical vaginal prolapse to ensure timely and appropriate intervention.

CONCLUSION

Vulvovaginal squamous cell carcinoma in bitches is an uncommon but clinically significant malignant neoplasm that may closely mimic vaginal prolapse particularly in intact animals. Owing to its locally invasive nature and potential for progressive tissue destruction, accurate differentiation from non-neoplastic reproductive conditions is essential for appropriate clinical management. Early diagnosis based on thorough clinical examination supported by haematological, biochemical and definitive histopathological evaluation is crucial for timely intervention. The present study highlights the importance of considering vulvovaginal squamous cell carcinoma as a differential diagnosis in chronic or atypical cases of vaginal prolapse and underscores the need for vigilant postoperative monitoring to ensure long-term therapeutic success.

ACKNOWLEDGEMENTS

The authors express their gratitude to the Vice Chancellor and the Dean of Bihar Veterinary College, Bihar Animal Sciences University, Patna, for providing the necessary facilities to carry out this work.

Financial support & sponsorship: None.

Conflicts of interest: None.

Use of artificial intelligence (AI)-Assisted Technology for manuscript preparation: The authors confirm that there was no use of AI-assisted technology for assisting in the writing of the manuscript and no images were manipulated using AI.

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