Invasive Papillary Bladder Carcinoma in a Golden Retriever Dog and its Surgical Management

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ABSTRACT

A 12-year-old male Golden Retriever dog was presented to the Pet Connect speciality hospital with the complaint of blood in urine, stronguria and pollakiuria. Ultrasonography revealed moderately distended, irregular bladder wall thickening and cauliflower like mass with mixed echogenicity and an enlarged prostate gland. Cystotomy was performed to excise the mass attached to the bladder wall and to remove bladder stones. Bilateral orchiectomy was also performed. The histopathological examination of the mass revealed a high-grade invasive papillary urothelial carcinoma with a micropapillary pattern. This report describes the surgical management of invasive papillary bladder carcinoma in a Golden Retriever dog.

Keywords: Golden Retriever, Invasive papillary bladder carcinoma, Cystoliths

INTRODUCTION

Neoplasms of the lower urinary tract are uncommon in dogs. Urinary bladder cancer accounts for approximately 2 per cent of all reported malignancies in dogs (Knapp *et al.,* 2014). It is mostly seen in dogs 11 years and older (Akcakavak *et al*., 2023). The risk factors of urinary bladder cancer depend on multiple factors like sex, history of spay or neuter, obesity, exposure to topical insecticides and herbicides, cyclophosphamide administration and specific breeds. Female dogs are more likely to develop bladder transitional cell carcinoma (TCC) than male dogs (Knapp *et al*., 2014; Fulkerson and Knapp, 2015). Urothelial carcinomas (TCC) are the most malignant tumours originating from the epithelial layer of the urinary bladder (Meuten, 2017). Papillary tumors are thin, finger-like growths that usually start in the bladder lining and extend into the centre of the bladder. The present case describes the successful surgical management of invasive papillary bladder carcinoma in a Golden Retriever dog.

MATERIALS AND METHODS

A 12-year-old male Golden Retriever dog was presented to the Pet Connect speciality hospital with the complaint of blood in urine, stronguria, pollakiuria for a week, dullness and reduced appetite. On clinical examination, it was observed that the dog was dull, evincing pain on abdominal palpation, and the urinary bladder was distended. A urine sample was collected for urine analysis. Ultrasonography revealed moderately distended, irregular bladder wall thickening and a cauliflower-like mass with mixed echogenicity in the cranial bladder wall (Fig. 1). The prostate gland was enlarged in size, and increased echogenicity with homogenous echo texture was observed. Based on anamnesis, clinical and ultrasonographic examination, it was diagnosed as a bladder wall tumour and benign prostatic hyperplasia, and it was decided for surgical correction.

Preoperative blood examination was done for anaesthetic consideration. The animal was made to fast for about 12 hours before surgery. The surgical site was prepared for aseptic surgery. The dog was premedicated with Atropine sulphate @ 0.04 mg/kg body weight subcutaneously and Xylazine hydrochloride @1mg/kg body weight intramuscularly. After 10 minutes, anaesthesia was induced with 1:1 ratio of

Ketamine and propofol inj. combination and maintained with an isoflurane and oxygen mixture. The pet was positioned in dorsal recumbency. A para-pectoral skin incision was made through the skin and linea alba on the ventral midline. The urinary bladder was exteriorized and a stab incision was made on the dorsal surface of the bladder, away from the urethra. The papillary growth was excised from the bladder wall, and cystoliths, which were not observed on ultrasonography, were also removed (Fig. 2). The urinary bladder and urethra were flushed with normal saline. The bladder incision was closed by Cushing, followed by a Lembert suture pattern with Chromic catgut No 2-0. Linea alba was closed in a simple interrupted pattern using Vicryl No. 1. The subcutaneous tissue and skin were closed routinely. Bilateral orchiectomy was also done routinely. Postoperatively, the pet was given Cephalexin @ 20mg/kg for 7 days and Carprofen @ 3mg/kg P.O. for 2 days. The surgical wound was cleaned with povidone iodine, and a dressing was applied. Pet recovered uneventfully from anaesthesia, and skin sutures were removed on the 10th postoperative day.

Fig. 1: Ultrasound image of the urinary bladder showing irregular bladder wall thickening, mixed echogenicity and an enlarged Prostate gland with increased echogenicity with homogenous echo texture

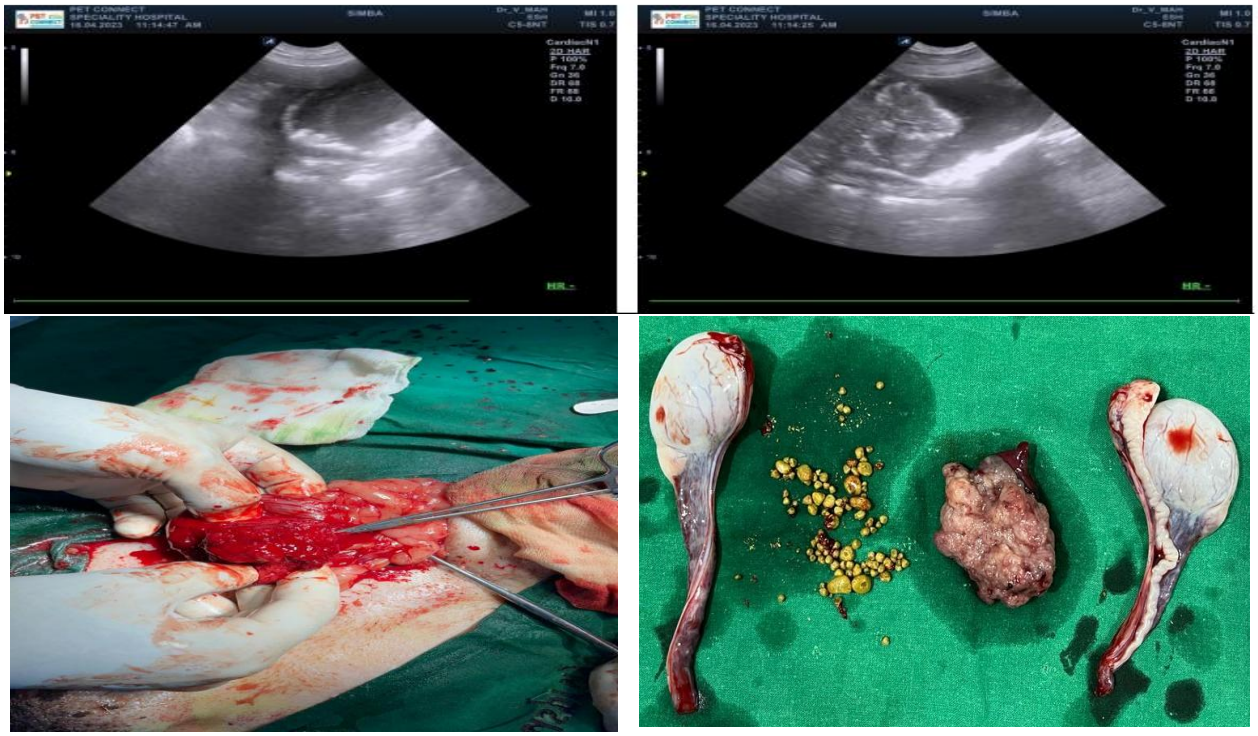

Fig. 2: Photo showing exteriorised urinary bladder and tumour mass testicles, and cystoliths removed

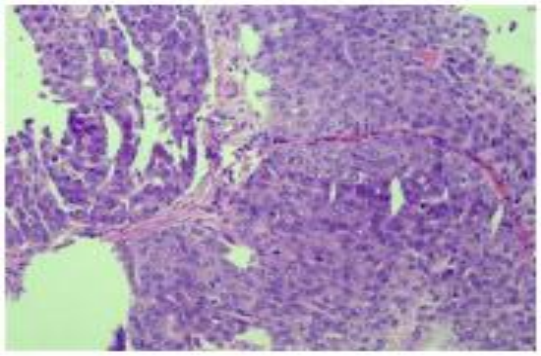

Fig. 3: Histopathological examination of the tumoral mass in the urinary bladder of dogs visualised using H&E staining

RESULTS AND DISCUSSION

Urinary bladder neoplasms are the most common neoplasms of the urinary system in dogs. The majority of the canine urinary tract tumours are malignant (Rangel *et al*., 2023). Female dogs are about twice as likely to develop bladder carcinoma as male dogs (De Brot *et al*., 2018), but it was a male dog that was affected in the present case. Earlier studies had reported that the incidence of tumours in dogs increased with age (Kent *et al*., 2018; Kok *et al*., 2019), which was in agreement with the present case.

Excision of the tumour is the most beneficial therapy in case of bladder carcinoma. In the present case, after surgical excision of the mass in the bladder and removal of cystoliths, the animal recovered well without any complications and survived for one year. Urothelial carcinomas are single or multiple, mostly with a papillary structure. In the present case, invasive papillary urothelial carcinoma with micropapillary patterned structures was observed, where Akcakavak *et al*. (2023) reported a similar case of papillary structures filling the urinary bladder in a terrier dog. The histopathological examination of the mass section showed the tumour tissue arranged in fused papillae with fibrovascular cores, micropapillary pattern and diffuse solid sheets. Cells were highly pleomorphic, having large, irregular vesicular nuclei, coarse chromatin, some with prominent nucleoli and moderate eosinophilic to clear cytoplasm. Numerous atypical mitotic figures and apoptotic debris, areas of necrosis and haemorrhage were noted. Tumour was seen infiltrating into the lamina propria, while muscularis infiltration was not identified. Also, lympho vascular invasion was observed (Fig. 3). The final impression was high-grade invasive papillary urothelial carcinoma with micropapillary pattern. Prognosis is generally poor for these animals, even with surgery, as the chances of recurrence and metastasis are high (Brown, 2022).

CONCLUSION

Urinary bladder carcinoma was diagnosed based on clinical, urinalysis and ultrasound examination. Ultrasound examination is important in making an early and tentative diagnosis. It is a treatable condition by surgical excision with an expected good outcome in the majority of dogs. However, in some cases, because of metastasis, the prognosis is poor.

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