Short Communication

SURGICAL REMOVAL OF VAGINAL TUMOUR IN A NON-DESCRIPT DOG UNDER DEXMEDETOMIDINE-BUTORPHANOL PREMEDICATION, KETAMINE-DIAZEPAM INDUCTION AND ISOFLURANE MAINTENANCE -A CASE REPORT

D. Vishnugurubaran[1]*, K. Shameera[2], S. Ganesh[3] and D.T. Kaarthick[4]

Department of Veterinary Surgery and Radiology
Veterinary College and Research Institute
Tamil Nadu Veterinary and Animal Sciences University
Orathanadu – 614 625

ABSTRACT

A ten-year-old non-descriptive male dog was presented to Small Animal Surgery Unit of Veterinary Clinical Complex,VCRI, Orathanadu with a history of perineal swelling for past two months.On general clinical examination the dog had normal temperature, congested conjunctival mucous membranes, tachycardia, tachypnoea and enlarged lymph nodes. Per-vaginal examination revealed hard mass in the roof of the vaginal passage and on ultrasonographic examination, a mass measuring around 32.8 x 37.6mm was noticed inside the vagina. The case was tentatively diagnosed as "vaginal tumor" and surgical removal of the tumour was decided. The animal was sedated with inj.dexmedetomidine at the dose rate of 2µg/kg b.wt i.v. and inj. butorphanol at the dose rate of 0.1mg/kg b.wt i.m. Anaesthetic induction was done with inj.ketamine at the dose rate of 5mg/kg b.wt i.v. and inj.diazepam at the dose rate of 0.5mg/kg b.wt i.v. and maintained with isoflurane with variable vaporizer setting and the fresh gas flow at the rate of 20 ml per kg body weight per minute. The cardiopulmonary parameters such as heart rate, respiratory rate, ECG, systolic blood pressure, diastolic blood pressure, mean arterial pressure, saturation of peripheral oxygenation and end-tidal carbon dioxide were monitored and recorded throughout the anaesthetic maintenance. Upon examination of the perineal region, a large mass was observed on the dorsal aspect of the vaginal roof. En-bloc resection of vaginal tumour was performed through dorsal episiotomy. The resected mass was weighing 375gms. Postoperatively the animal was treated with antibiotics, anti-inflammatory drugs along with fluid therapy. The animal made an uneventful recovery.

Key words: Vaginal tumor, dorsal episiotomy, anaesthetic monitoring

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[1]Assistant Professor and Head, *Corresponding Author
Email: drvishnu11@gmail.com
[2]UG Scholar, VC&RI, Orathanadu
[3]PG Scholar, VC&RI, Orathanadu
[4]Assistant Professor, Department of Veterinary Clinical Complex

INTRODUCTION

Tumors of the female reproductive tract are divided into two categories: those arising from the ovaries and those that are derived from the tubular

genitalia (Prashanth *et al.*, 2015). It is important to distinguish whether these neoplasms are benign or malignant and to differentiate them from other conditions such as hyperplasia, granulation tissue or abscessation (Dey *et al.,* 2017). Neoplasms of the female tubular genitalia account for 3% of all canine tumors; of these 85-90% occur in the vagina and vulva (Noakes *et al.,* 2019). Tumors of mesenchymal origin: leiomyomas, fibro-leiomyomas and fibromas occur most commonly (Tsili *et al.,* 2019). Leiomyosarcomas, lipomas, mastocytomas, adenocarcinomas, squamous cell carcinomas and transmissible venereal tumors occur much less frequently (Gurumyen *et al.,* 2021). Leiomyoma is a tumor of smooth muscle cells that may arise in any organ with a connective tissue or mesenchymal component and have been found in many organs including female reproductive tract (Sathya *et al.,* 2014). Leiomyomas of the reproductive tract in bitch are frequently associated with estrogen secreting tumors or ovarian follicular cysts and cystic endometrial hyperplasia, mammary hyperplasia and/or neoplasia may also be concurrently found (Bodinga *et al.,* 2019). Previous reports had shown 73-94% vaginal tumours as benign and pedunculated often with a narrow stalk (Salomon *et al.,* 2004). Vaginal leiomyomas may be single or multiple, intraluminal or extraluminal. The tumor is usually round or oval, well defined and encapsulated. The size and consistency may vary depending upon duration of growth, becoming firmer due to an increase in connective tissue. Large intraluminal tumors may protrude through the vulva, while extraluminal tumors tend to cause perineal swelling (Umamageswari *et al.,* 2016). This case report describes about a clinical case of dog with vaginal tumor, its anaesthetic monitoring and successful surgical management.

CASE HISTORY AND OBSERVATION

A ten-year-old non-descript female dog of 17.4 kg body weight was presented to Small Animal Surgery Unit of Veterinary Clinical Complex,VCRI, Orathanadu with a history of perineal swelling for past two months.

On general clinical examination, normal temperature, congested conjunctival mucous membranes, tachycardia, tachypnoea and enlarged lymph nodes were noticed. Per-vaginal examination revealed hard mass on the roof of the vaginal passage and on ultrasonographic examination, a mass measuring around 32.8x37.6mm was noticed on the roof of the vaginal passage. On haematological examination, anaemia and leukocytopenia were noticed. The biochemical values were normal. On physical examination of perineal region revealed the hard mass. The animal was subjected to surgical removal of the mass through dorsal episiotomy.

RESULTS AND DISCUSSION

The food and water were withheld for 24 and 12 hours, respectively before the surgery. The animal was premedicated using inj.dexmedetomidine at the dose rate of 2µg/kg b.wt i.v. and inj.butorphanol at the dose rate of 0.1mg/kg b.wt i.m. After

10 minutes, the anaesthesia was induced using inj. ketamine at the dose rate of 5mg/kg i.v. and inj. diazepam at the dose rate of 0.5mg/kg i.v. and the anaesthesia was maintained using 2% isoflurane with fresh gas flow of oxygen at the dose rate of 20 ml/kg/minute. The animal was placed in sternal recumbency with elevated hindquarters and the tail flexed cranially over the spine. The surgical site was aseptically prepared using 2.5 percent povidone iodine, 70 percent ethyl alcohol and 2 percent chlorhexidine. The cardiopulmonary parameters such as heart rate, respiratory rate, ECG, systolic blood pressure, diastolic blood pressure, mean arterial pressure, saturation of peripheral oxygenation and end-tidal carbon dioxide were monitored and recorded throughout the anaesthetic maintenance (Table 1). Dorsal episiotomy was performed by making 5 cm incision on the dorsal wall of the vulva.The smaller blood vesselswere sealed by artery forceps, electrocauterization was done in case of bleeding vesselsand ligation was done in case of larger vessel using PGA 1-0. The mass was noticed on the roof of the vagina and it was firm to touch (Figure 1). The mas was excised and sample wassent for histopathological study. Closure was achieved by approximating the mucosa of the vaginal floor as well as occluding the submucosal dead space by Ford interlocking pattern using PGA 2-0. Episiotomy incision was closed using PGA 2-0. The resected mass was weighing 375gms (Figure 2). For post-operative care, the wound was dressed with Staphban ointment, and the animal received antibiotics, analgesics, and anti-inflammatory medications for seven days. Spaying was recommended after full recovery to prevent recurrence of the condition.

The dog recovered uneventfully from anesthesia and did not develop postoperative complications such as delirium, urine retention or incontinence. The combination of diazepam and ketamine was a commonly described protocol for induction of general anaesthesia in healthy dogs of various age (Ferreira *et al.,* 2015). This combination has generally been associated with excitement-free induction of anaesthesia in dogs. However, maintenance of pharyngeal and laryngeal reflexes as well as hypersalivation have resulted in difficult intubation (Henao-Guerrero and Ricco, 2015).The following parameters were monitored during different stages of anaesthesia and the results were presented:

The heart rate decreased significantly after premedication and thereafter it increased gradually and reached to near normal after recovery from anaesthesia.The decrease in heart rate after premedication was caused by cardiovascular depression effect of dexmedetomidine and this was due to activation of postsynaptic α2 adrenoceptors in the central nervous system (CNS) thereby potentially reducing both blood pressure and heart rate (Smith *et al.,* 2017). Administration of ketamine resulted in an increase in heart rate, cardiac output and blood pressure, hence ketamine alone or in combination with other medications was often considered a reasonable choice for veterinary patients with hypovolemia and certain forms of cardiopulmonary instability. Similar findings were noticed by

Fayyaz *et al.* (2009), Mair *et al.* (2009) and Vishnugurubaran *et al.* (2023). According to Fayyaz *et al.* (2009) administration of ketamine resulted in an increase in heart rate, cardiac output and blood pressure, hence ketamine alone or in combination with other medications was often considered a reasonable choice for veterinary patients with hypovolemia and certain forms of cardiopulmonary instability.

The reduction in respiratory rate after premedication was due to the respiratory depression effect of dexmedetomidine and butorphanol (Paul *et al.,* 2019).

The oesophageal temperature recorded in °C by multiparameter monitor was found to decrease gradually after premedication, after induction and throughout the surgical period, which may be due to the depression of the thermoregulatory center by anaesthetic drugs. Similar observations were documented in studies conducted by Liu *et al.* (2018) and Vigneswaran (2021).

The saturation of peripheral oxygen (%) and end tidal carbon dioxide concentration (%) were maintained within the normal range throughout the anaesthetic maintenance and there was no significant difference in SpO2 and ETCO2 values during different periods of anaesthesia. This might be due to supplementary oxygen provided during anaesthetic maintenance and respiratory stabilization provided by isoflurane used in this anaesthetic protocol. This concurs with the findings of Kronen (2007).

On histopathological examination, interlacing bundles of spindle shaped cells divided as lobules by fibrous tissue was observed (Figure 3) confirming vaginal leiomyoma. In this case, the primary approach of treatment involved surgical excision of the mass. If discrete metastatic foci encountered, they should also be removed. Since most tumors originate from the vestibule or the smooth muscle wall of the vagina, they are typically excised via the vulva. For larger tumors, an episiotomy might be required to facilitate removal. (Sontas *et al.,* 2010). Radiation therapy may be considered if surgical removal of the tumor and/or locating metastatic foci is not possible (Weissman *et al.,* 2013).

Iatrogenic damage to the urethra or accidental injury to other perineal structures are possible surgical complications. Urethral catheterization will greatly assist in avoiding damage to this structure. Postoperative infection and/or scar contracture can also result in urethral obstruction. While some authors believe that excision of the vaginal leiomyoma is curative (Lee *et al.,* 2014), the condition will usually recur due to hormonal (i.e. estrogenic) influence. Thus, prevention and control of the disease is best achieved by ovariohysterectomy.

CONCLUSION

There was no anaesthetic complication recorded during the entire anaesthetic period which indicates that the anaesthetic protocol employed in this case is safe for dogs with cardiovascular compromise. Earlier diagnosis and prompt radical excision of the tumor mass was found efficient in treating vaginal tumors in canine patients. The dog made an uneventful recovery.

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Table.Vital Parameters during different stages of anaesthesia

Parameters	**Before Preme dication**	**Pre-Operative**	**After Induction**	**10 minutes**	**15 minutes**	**30 minutes**	**35 minutes**	**45 minutes**	**After Recovery**
Heart rate (Beats per minute)	132	113	128	131	158	134	126	128	118
Respiratory rate									
(Breaths per minute)	16	10	11	12	11	14	15	16	16
Temperature (°C)	38.4	38.4	38.4	38.4	38.3	38.2	38.1	38	37.9
SPO2(%)	-	98	99	100	100	100	99	99	99
EtCO2(mm Hg)	-	45	57	54	54	57	53	51	51
Systolic BP (mm Hg)	124	103	136	158	117	121	114	76	79
Diastolic BP (mm Hg)	78	84	102	123	107	120	35	54	55
Mean arterial pressure (mm Hg)	93	87	113	103	130	110	115	60	60

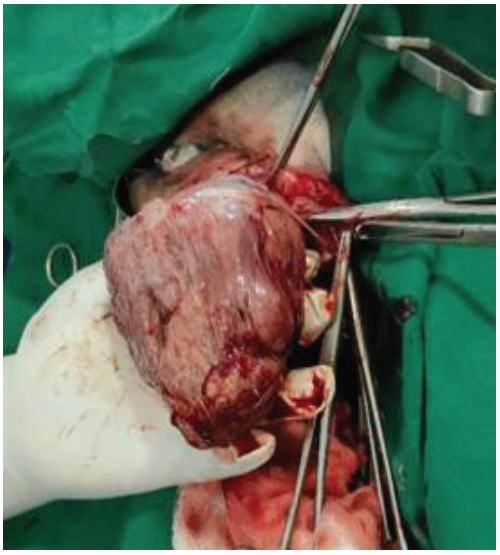

Fig.1. Mass noticed on the roof of the vagina

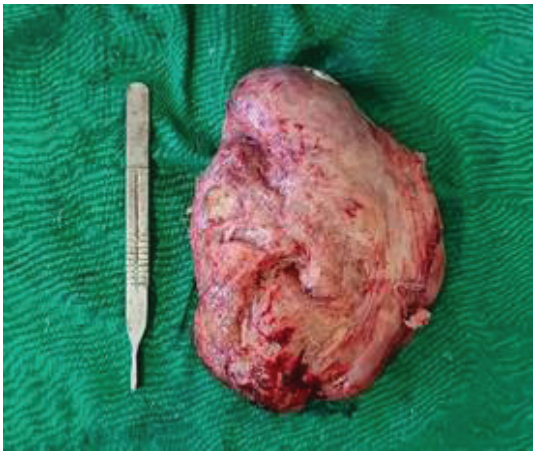

Fig.2. Excised mass weighing 375 grams

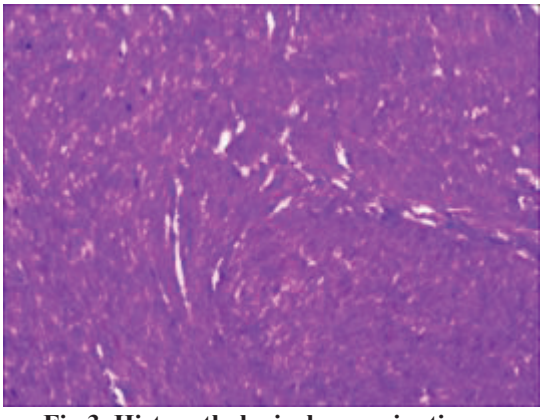

Fig.3. Histopathologicale examination - interlacing bundles of spindle shaped cells divided as lobules by fibrous tissue suggestive of Leiomyoma

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