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Diagnosis and Management of Endometrial Adenocarcinoma Complex with Pyometra in a Bitch - A Case Report

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Abstract

An eight-year-old nulliparous Spitz dog was presented with a history of anorexia, blackish vaginal discharge, and vomiting for the past 3 days. General clinical examination revealed a weak and poor body condition. Vaginal examination showed blackish-brown vaginal discharge and a pale mucous membrane. Radiographic examination showed distended uterine horns. Ultrasound examination revealed mild anechoic sacculations of one uterine horn and the other with mixed echogenicity of uterine masses suggesting a uterine tumour. Haematobiochemical estimation revealed decreased Haemoglobin concentration PCV, and platelet counts with elevated leukocytes, BUN, and creatinine levels. Hence, emergency blood transfusion was carried out as per the standard protocol, and after the stabilization of the animal, surgery was performed under general anaesthesia. During surgery, the left uterine horn was found distended with purulent fluid and the right horn had two large-sized masses which were removed by ovariohysterectomy. Histopathology revealed endometrial adenocarcinoma. This is a rare case of concurrent pyometra and canine endometrial carcinomas.

Keywords: Endometrial Adenocarcinoma, Pyometra, Blood transfusion, ovariohysterectomy.

Canine pyometra is one of the most common disease conditions found in adult intact female dogs characterized by the accumulation of inflammatory exudates within the uterine lumen with diverse clinicopathological manifestations either locally or systemically (Johnston *et al.,* 2001). Further, enlargement of the uterus is also suspected for uterine neoplasia in bitches which is considered to be a rare occurrence, accounting for about 0.3 to 0.4% of all canine tumors (Cave *et al.,* 2002). Among uterine tumors, leiomyoma is most commonly reported in bitches than other types such as lipoleiomyoma, leiomyosarcoma, and adenocarcinomas. However, very few cases of endometrial adenocarcinomas were reported in dogs treated with steroid hormones (Payne-Johnson *et al.,*1986), concurrent with mucometra (Pena *et al.,* 2006), ovarian remnant syndrome (Branimira *et al.,* 2019), or accidental findings in animals (Cave *et al.,* 2002). The present case report describes the clinical manifestation, diagnosis, and management of uterine tumor and pyometra complex in a nulliparous bitch.

Case History and Observations

An eight-year-old intact Spitz female dog was presented at the Small Animal Obstetric and Gynecological unit of the Teaching Veterinary

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Clinical Complex, Madras Veterinary College, Chennai, with a complaint of anorexia, blackish vaginal discharge, and vomiting for the past 3 days. The dog appeared dull and depressed and on physical examination, a blackish vaginal discharge was noticed and the vaginal mucous membrane was pale. The nulliparous animal exhibited estrus 3 months back and was not subjected to mating. On clinical examination, the temperature was 104.3ºF, pulse rate was 86 bpm with shallow and deep respiration. The lateral radiograph revealed soft tissue opacity located in the mid-abdomen below the lumbar region suggestive of uterine involvement. Trans-abdominal ultrasonographic examination was done using a 7.5 MHz sector transducer revealing mild anechoic sacculations in the left uterine horn and hypoechoic to anechoic echogenicity in the right uterine horn. Hematology and serum biochemistry showed decreased hemoglobin value (3.2 g/dL), PCV (8.8%), red blood cell count (1.31 million cells/mm3), along with an elevation in white blood cell count (neutrophilia), creatinine (4.7 mg/dL), and blood urea nitrogen (106 mg/dL).

Treatment and Discussion

Based on the history, physical examination, haematology, and clinical observations, a tentative diagnosis of open-cervix pyometra was made. Abdominal radiography revealed uterine involvement (Fig.1), while thoracic radiography showed a normal cardiac silhouette and bronchial pattern (Fig. 2). Ultrasound examination revealed anechoic sacculations with mixed echogenicity of uterine contents (Fig. 3).

Pre-surgical haematological evaluation revealed severe anaemia (haemoglobin value -3.2 g/dL and PCV -8.8) Hence, the dog underwent blood transfusion with 76 ml of blood from donor after cross-matching. Due to the poor condition of the patient, a quick decision for Ovariohysterectomy was made. The surgery was performed under general endotracheal anesthesia. Diazepam (0.25mg/Kg IV) was used for premedication. Later the animal was induced into general anesthesia using propofol, and intubated. Anesthesia was maintained using a mixture of isoflurane 2.5% and oxygen. After preparation of the operation field, on dorsal recumbency, laparotomy was performed in linea alba starting from the umbilicus and ending a few centimeters in front of the pubis and ovario-hysterectomy was done. Grossly two enlarged uterine mass in right horn (8*9 cm and 10*8cm) and mild fluid filled distension of left horn was observed (Fig. 4).

The uterine tissue sample fixed in 10% formaline solution and histopathological examination revealing right uterine horn with neoplastic mass composed of round to polyonal shaped pleomorphic cells arranged in pappilary pattern. Neoplastic cells contained round to oval hyperchromatic vesiculated nuclei with single to multiple prominent nucleoli. Mitotic figures also seen. Some of the area also had cystic pattern (Fig. 5). Left uterine horn revealed degeneration and necrosis of luminal epithelium with mild cystic endometrial hyperplasia and presence of numerous degenerative neutrophils in the endometrial stroma as well as in the endometrium. Few areas revealed peri-glandular fibrosis (Fig. 6). Postoperatively, the patient was treated with antibiotics (Enrofloxacin-5m/Kg) for 10 days and supportive therapy (Haematinics) for two weeks. Over the next several days, the patient's overall activity returned to normal. Few weeks following the ovariohysterectomy, the patient was reevaluated for neoplastic metastasis. Abdominal ultrasound and thoracic radiography revealed no obvious abnormalities in any visceral organ, and the bitch recovered uneventfully.

Pyometra is a major reproductive disorder that occurs during the diestrus phase in sexually intact, mature female dogs and involves prolonged exposure to progesterone and estrogenic phases with clinical signs of depression, lethargy, vomiting, septicemia, toxaemia, and shock (Johnston *et al*.,2001; Pires *et al*., 2010). Elevated progesterone levels bring about decreased myometrial contractions, hyperplasia of the endometrial glands, and suppressed leukocyte response which together facilitate bacterial growth in the uterine lumen and lead to pyometra development (Johnston *et al*., 2001; Sugiura *et al*., 2004). Further, the effects of repeated exposure to steroid hormones produced during oestrous cycles (particularly

Fig.1. Soft tissue opacity located in the mid-abdomen below the lumbar region

Fig. 2. Normal cardiac silhouette and bronchial pattern

Fig.3. Anechoic to hypoechoic echogenicity

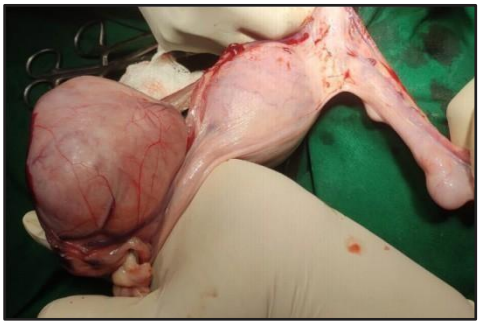

Fig. 4. Two uterine mass in right horn and mild fluid filled distension of left horn

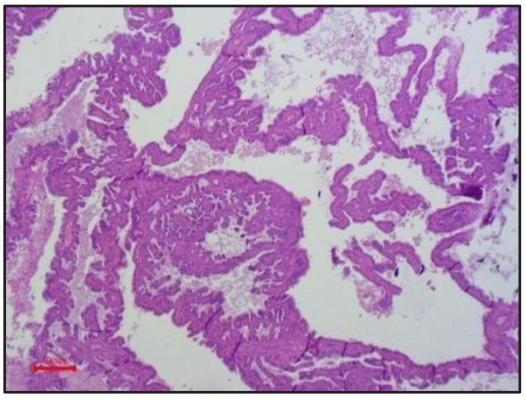

Fig.5. Right uterine horn-adenocarcinoma

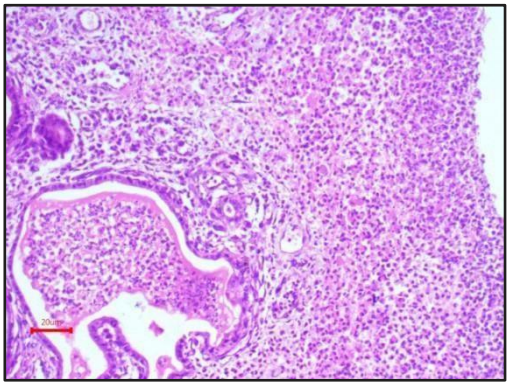

Fig.6. Left uterine horn-Pyometra

estrogen) play an important factor in the formation of uterine tumor.

Although uterine carcinoma is rare in domestic animals, a higher incidence of these tumors is reported in older cows, particularly in slaughtered specimens (Agnew *et al*., 2017). Whereas in dogs, its occurrence is very rare and few cases are documented in bitches aged between 5 and 12 years (Baldwin *et al*., 1992; Cave *et al.,* 2002). Among uterine tumors, leiomyomas are the most common and constitute about 85–90% of cases (Murphey *et al*., 1994). The clinical signs of uterine neoplasia vary and depend upon the tumor size, the presence of metastatic disease, or any concurrent illnesses (Cave *et al*., 2002). Common symptoms include chronic abdominal enlargement, decreased appetite, and vaginal discharge (Cave *et al*., 2002; Pena *et al*., 2006). These signs are also observed in other reproductive disorders like cystic endometrial hyperplasia/pyometra and mucometra, which can occur alongside endometrial carcinoma (Cave *et al.,*

2002; Pena *et al*., 2006).

Most endometrial cancer cells have estrogen and/or progesterone receptors on their surfaces, and the interaction between these receptors and hormones can stimulate excessive growth of the endometrium and eventually lead to cancer (Fieni *et al.,* 2003). Metastasis has been noted in several cases of canine endometrial carcinoma, often leading to the animal's death (K Pena *et al*., 2006) However, in the present case, older age increased myometrial invasion, and endometrial infection play an important role in the occurrence of uterine tumors with no metastatic disease was observed and the animal survived after surgery.

Conclusion

Thus, whenever reproductive tract tumors are suspected, they are often diagnosed using abdominal imaging techniques including abdominal ultrasound, radiographs, and advanced imaging methods like Computed Tomography (CT) scans (Saba and Lawrence, 2019). However, a confirmative diagnosis of a uterine neoplasm can only be done by laparotomy surgery and histopathological analysis of tumour tissue following ovariohysterectomy. Although the occurrence of uterine adenocarcinoma is rare in dogs, it should be considered as one of the differential diagnosis of uterine lesions with vaginal discharge. With this study, we intend to improve the knowledge on canine endometrial adenocarcinoma with pyometra in dogs.

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