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Surgical management of massive uterine leiomyosarcoma with open cervix pyometra in a spitz bitch

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Abstract
A seven-year-old entire female, mixed-breed dog, weighing 19 kg, was presented with a 2-day history of abdominal distension, reduced appetite and general dullness. Abdominal palpation revealed a large mass. Radiography showed a large mass occupying the left mid-abdominal area and convoluted loops of tubular fluid opacity occupying the right mid-abdominal area. Ultrasonography revealed a large heterogeneous mass with an anechoic area and some hyperechoic foci, indicative of calcification, in the mid-abdominal area. Furthermore, hypoechoic areas were found in the middle and caudal abdominal area and were presumed to be the fluid-filled uterine horns. At laparotomy, a 10·5×14·5-cm firm mass was found in the uterine body, while the uterine horns were filled with a thick red-brownish exudate; ovariohysterectomy was subsequently performed. A diagnosis of uterine leiomyosarcoma associated with pyometra was established by histopathology.

Keywords: Massive uterine leiomyosarcoma-open cervix pyometra-dog

Introduction
Leiomyosarcoma and lymphosarcoma are rare mesenchymal malignant neoplasms [1, 2]. Only a few cases of uterine malignant tumours have been described in the dog [1, 3, 4, 5]. Most are mesenchymal, whereas epithelial tumours are rare [5]. Other malignant uterine tumours reported, although limited to a few reports, are haemangiosarcoma [4] and carcinoma [3, 5, 6]. Leiomyosarcomas of the genital system are more common in entire females and occur mostly in the vagina or vulva [1]. There are two reported cases in which chronic exposure to progestogen was linked to uterine malignancy [5], although a clear cause-effect relationship was not demonstrated.

Case history and treatment
A 10-year-old Female Intact Spitz dog was presented to Small Animal Outpatient Surgery Unit of Madras Veterinary College, Chennai with an history of vomition and anorexia for 1 month. The owner also reported that the abdomen was progressively increasing in size with cessation of estrum during the last 6 months and presence of scanty brownish discharge from the vagina. On clinical examination the animal was afebrile, dehydrated and had sunken eyeballs. The mucous membrane was pale pink in color with normal heart rate and pulse. On abdominal palpation a soft contoured hard massive mass was felt at the caudal abdomen, the mass was painless and was freely movable. Lateral thoracic and abdominal radiographs were taken to diagnose the condition which revealed a large radiolucent smooth contoured mass in the caudal abdomen with absence of any bladder involvement. Thoracic radiograph was indicative of mild pulmonary infiltration with absence of any metastasis. Ultrasonography revealed a large (10×14 cm), heterogeneous mass with an anechoic area (2·9×5·6 cm) and some hyperechoic foci, indicative of calcification, in the mid-abdominal area.
Furthermore, hypoechoic loops, about 3 cm in diameter, were found in the middle and caudal abdominal area and were presumed to be convoluted uterine horns filled with fluid. Ultrasonographic guided biopsy was done taking care not to damage any large blood vessels. Routine hematobiochemical profile was performed to rule out organ status which revealed neutrophilia with shift to left, marginal anaemia, thrombocytopaenia, hypoalbuminemia and concurrent increase in the alanine phosphatase with an altered calcium phosphorous ratio was

observed. Results of ultrasound guide biopsy revealed leiomysosarcoma which showed a malignant mesenchymal tumour with cells arranged in cellular, large interlacing bundles or streams with little stroma. A small degree of collagen production was present, while tumour necrosis covered approximately 25% of the examined area. The tumour cell population was overall uniform and was composed of moderately to highly pleomorphic cells morphologically consistent with smooth muscle cells, with plump, large spindle or oval nuclei that were often vesicular with prominent nucleoli, while the mitotic index was low (<1 mitosis/high power field)

A large number of small, newly formed vessels were observed as well as some large vascular spaces lined by tumour cells. Severe and extensive inflammation, with both chronic and acute inflammation cellular elements, was present in places at the serosal surface of the tumour. Severe endometritis with often mildly distended endometrial glands was also present, while no cystic endometrial hyperplasia or infiltration of the endometrium by the mass was observed in the areas examined. Based on the above, a presumptive diagnosis of intermediate grade leiomyosarcoma was offered. Absence of metastasis and successful pre-operative management of anaemia, surgery was planned. The pet was sedated with diazepam and butorphanol at the dose rate 0.25mg and 0.1mg/kg body weight intravenous, following sedation the pet was surgically prepared with alternate scrubbing with spirit and povidone iodine. Anaesthesia was induced with propofol at the dose rate of 4mg/kg body weight intravenously, following induction the pet was intubated with no.6.0 i.d. and was maintained under isoflurane with oxygen as a carrier gas.

A midventral laparotomy was performed, on surgical exploration a firm mass (10·5×14·5 cm) was found in the uterine body (Fig 1). Adhesions were observed between the mass and the left ovary and ulcerated areas were also found on its ventral surface. The adhesions caused torsion of the uterine body rostrally reducing its lumen patency. Both uterine horns were enlarged and filled with a thick red-brownish exudate. The mass was removed as part of the ovariohysterectomy procedure and was sent for histopathology. The peritoneal cavity was lavaged and closed routinely. Grossly, the mass appeared heterogeneous, with areas of hard consistency and contained a blood-filled cyst (2·6×5·2 cm) (Fig 2) which did not communicate with the uterine lumen or the peritoneal cavity. Recovery from anaesthesia was uneventful and the bitch was administered 20 mg/kg intravenous cefazolin (twice a day) and 10 mg/kg subcutaneous ciprofloxacin (once a day) for 7 days. The bitch was reassessed 6, 12 months postoperatively, and the clinical examination, haematological and serum biochemical analysis, and urinalysis revealed no abnormalities. Abdominal and thoracic radiography and abdominal ultrasonography did not show evidence of metastatic disease. The pet had an uneventful recovery.

Discussion

Malignant uterine neoplasms are more common in bitches 5 to 12 years old but there are also some reports in young animals 10 months to 2·5 years old [5]. The clinical signs of uterine neoplasms depend on the tumour size, presence of metastases and other concurrent disease, such as mucometra [6] or pyometra [3], as was observed in the present case. Vomiting, anorexia, tenesmus, stranguria and ascites [5] are often the clinical signs that are indicative of an abdominal mass. Weight loss and vulvar discharge have also been reported [5, 7]. In the present case, symptoms arose due to the rapidly developing large and probably long existing neoplasm along with open cervix pyometra. Leiomyosarcomas arising within abdominal organs tend to achieve a large size before becoming clinically apparent [8], as was observed in our case, although signs due to compression of the abdominal organs were not evident. Uterine neoplasms may coexist with other forms of reproductive disease. Although there is one report of uterine leiomyosarcoma accompanied by cystic glandular hyperplasia, the present case of uterine leiomyosarcoma coexisting with pyometra is the rarest in dog. Until now, there are no reports indicating that uterine leiomyosarcoma may play a role in the pathogenesis of pyometra. Furthermore, muscle tumours have not been reported to produce hormones such as progesterone or oestrogen that may have otherwise predisposed the animal to pyometra. Presence of a large malignant mass may predispose to infections due to immunosuppression and loss of local defence mechanisms, and thus, the presence of leiomyosarcoma probably contributed to the development and the severity of pyometra in the present case. Leiomyosarcomas are usually non-encapsulated invasive tumours with a 50% incidence of metastasis [2], although metastasis of genital leiomyosarcomas has not been reported. In the present case, diagnosis of a metastasis, although possible, was not established.

Fig 1: Gross apperance of leiomyosarcoma- Uterus with Normal Ovaries in a Bitch

Fig 2: Intra-operative image of leiomyosarcoma in a Bitch

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