



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2021; SP-10(8): 1040-1042  
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[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 13-06-2021  
Accepted: 15-07-2021

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## Surgical management of splenic hemangioma concurrent with open cervix pyometra in a German Shepard dog

**M Gokulakrishnan, M Bharathidasan, N Pazhanivel, G Sindhu and B Gowrishankar**

### Abstract

A 12-year-old female German Shepard was brought to the Madras Veterinary College with a history of lethargy, dysphagia, abdominal distension and vaginal discharge. Physical and haemato-biochemical evaluations revealed anaemia, neutrophilia shift to left and thrombocytopenia. Ultrasonography and radiologic examinations revealed the presence of diffused masses in the spleen and multiple sacculations in the uterus. Whole Blood transfusion in order to treat the anaemia and thrombocytopenia. Total splenectomy and ovariohysterectomy was performed after blood transfusion. Histopathological findings revealed splenic hemangioma. Post surgical survival was favourable with less systemic complications and the dog had an uneventful recovery.

**Keywords:** German Shepard, haemangioma, open cervix pyometra, splenic tumour, total splenectomy

### Introduction

The spleen has a diverse set of functions, including haematopoiesis, RBC filtration and storage, and immune surveillance. Despite its many functions, removal of the spleen is commonly performed in dogs and cats with rarely observed long-term adverse sequelae. Splenectomy is indicated in cases of splenic neoplasia, trauma, torsion, infiltrative diseases and occasionally as treatment for immune-mediated disorders (Johnson *et al.*, 1989) [1]. It is also commonly performed on an emergency basis for hemoabdomen of splenic origin. pyometra is a secondary infection that occurs as a result of hormonal changes in the female's reproductive tract (Hagman H, 2018) [2]. Following estrus (heat), the hormone progesterone remains elevated for up to two months and causes the lining of the uterus to thicken in preparation for pregnancy.

### Materials and Methods

A 12-year-old female German Shepard was brought to Madras Veterinary College Teaching Hospital with a history of lethargy, dysphagia, abdominal pain and uterine involvement. Pale mucous membrane with petechial haemorrhages were observed in the ventral abdomen through clinical examination. Haematological evaluation revealed that the dog had severe anaemia (Hb - 4.1g/dl) and thrombocytopenia (21,000/ $\mu$ l). A shift to left in neutrophils and marginal monocytosis were observed. Radiographic examination revealed an enlarged spleen and multiple sacculations in the uterine horns. Multiple hyperechoic masses diffused throughout the splenic parenchyma in an uneven fashion with rounded spleen borders were observed under ultrasound. The dog was diagnosed to have splenic tumour since it was confined to the spleen and no evidence of metastasis was noticed in the thoracic radiograph.

### Result and Discussion:

A total splenectomy was planned as there were multiple masses found diffuse throughout the spleen (Mokhyeon *et al.*, 2018) [3]. The haematological values were corrected by whole blood transfusion from a donor in pre-operatively (230ml) and during intra-operatively (120ml).

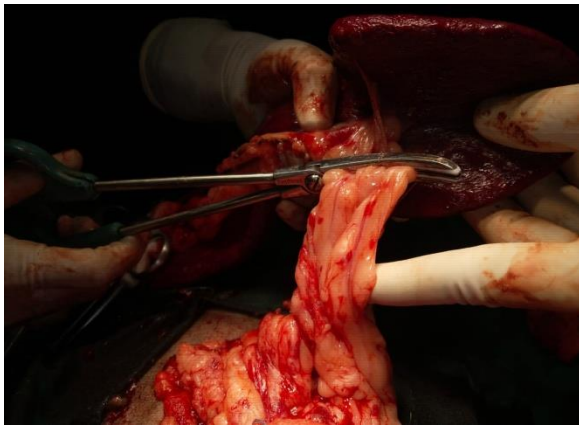
Cefotaxime (20mg/kg intravenously) was administered 1 hour prior to surgery as a pre-operative antibiotic. Anaesthesia was induced with propofol (3mg/kg intravenously) after pre-medicating the dog with butorphanol (0.2mg/kg intravenously) and diazepam (0.25mg/kg

intravenously). Anaesthesia was maintained with Isoflurane at 2% concentration in rebreathing circuit with 100% oxygen supplementation.

A linear skin incision was made on the ventral abdomen on the midline 5cm caudal to the xiphoid and the incision was extended for about 10cm. The subcutaneous tissue was dissected and a stab incision was made on the linea alba and the incision was extended for about 9cms. Sero-sanguinous fluid was noticed in the peritoneal cavity. Spleen was identified and exteriorised without damaging any abdominal viscera (Fig1). The splenic arteries from the celiac artery was ligated and resected using a vessel sealant device at two-points without damaging the pancreatic artery branching from the splenic artery and the left gastroepiploic artery. The Short gastric arteries at the gastrosplenic ligament were ligated (Fig 2) and resected by the same method close to the spleen as to avoid damage to the gastric blood supply. Then the spleen was resected.



**Fig 1:** Splenic Tumor



**Fig 2:** Ligating the splenic vessels for Splenectomy

After performing splenectomy ovariohysterectomy was performed to remove the pyometra infected uterus. Peritoneal cavity was examined for any haemorrhage and then the linea alba and subcutaneous tissues were closed with PGA 1 in a continuous fashion and the skin was closed with polyamide 2-0 in a cross-mattress pattern.

Upon macroscopic examination, the spleen exhibited a large, 40 × 10 × 15 cm, nodular, poorly demarcated, mass with a similar consistency and colour to the remainder of the spleen, growing from the ventral aspect of the organ and bulging on the surface of the organ. The spleen weighed around 2 kg with the mass. The animal was weaned off isoflurane and she was monitored overnight and buprenorphine was administered at

0.01mg/kg intramuscularly every 4 hours after surgery until 12 hours. The dog returned to its comfortable self in 24hours. The dog was put oral cefpodoxime (10mg/kg) for 7 days and oral Tramadol (3mg/kg) for 3 days. The sutures were removed on day 12 with an uneventful recovery.

Histopathological examination of the mass revealed a hemangioma in the splenic parenchyma. Histologically, the mass was composed of a poorly cellular, well demarcated, partially encapsulated and expansile neoplastic proliferation forming large blood-filled cavernous spaces separated by a thin fibrous stroma and lined by a single layer of spindled and flattened cells.

Haemangioma and haemangiosarcoma are common in dogs (*Canis lupus familiaris*), the dermis and subcutis being the most common primary sites for the haemangioma, and the spleen, skin, subcutis, right atrium and liver being the most common sites for haemangiosarcoma (Hendrick, 2020) [4]. The main differential diagnosis for a large splenic mass like the one observed in the present case, excluding hemangioma, is splenic hematoma and hemangiosarcoma, although the latter seems less likely considering such a large mass not associated with clinical signs or evidence of gross and micro-metastases in the main organs sampled. Splenic hematoma and hemangiosarcoma are far more common than hemangioma in dogs (*Canis lupus familiaris*). Splenic tumors commonly observed in older dogs can be life-threatening. Clinical signs in dogs with splenic tumors range from specific signs such as acute collapse with splenic tumor rupture to non-specific signs such as weakness, anorexia, and lethargy (Robinson WF and Robinson NA, 2015) [5]. Splenic tumors present a risk of metastasis and spontaneous rupture; therefore, it is important to obtain a quick and accurate assessment before treatment begins. The outcome is inconsistent with those in most studies reporting on the incidence of benign and malignant splenic tumors in dogs (Johnson *et al.*, 1989). The difference might be due to bias in the selection of cases. Even with this aggressive treatment approach, the reported survival times for dogs with splenic hemangiosarcoma is only around 4-6 months, whereas dogs with benign splenic tumors are often cured with surgery alone (Wood *et al.* 1998) [6].

Hammond and Pesillo-Crosby (2008) [7] reported that the dogs with splenic hemangiosarcomas have low platelet concentrations than the dogs with other splenic masses and also stated that no other markers were useful in differentiating dogs with hemangiosarcoma which was similar in the presented case of hemangioma however the systemic influence of pyometra could have led to altered blood profile.

Collard, Nadeau and Carmel (2010) [8] opined that it was better to perform a splenectomy through laparotomy rather than a laparoscopic splenectomy for cases involving large hemangiomas which has a potential complication of uncontrollable haemorrhage and hemabdomen both pre and intraoperatively which made the decision to perform a laparotomy to the presented case easier. Mallinckrodt MJ and Gottfried SD (2011) [9] have reported that the mass-to-splenic volume ratio might be useful in differentiating between the hemangiosarcomas and other benign splenic masses explained by the significantly higher mean mass-to-splenic volume ratio in the benign splenic tumours which is in agreed to the presented case.

There is no significance of Survival time of dogs with splenic hemangiosarcoma treated by splenectomy with or without adjuvant chemotherapy (Wendelberg *et al.*, 2015) [10].

In the present case splenectomy was performed without adjuvant chemotherapy.

### Conclusion

Prompt presentation, early diagnosis, surgical intervention and chemotherapy favours good prognosis for splenic hemangioma in dogs.

### Acknowledgement

The authors are thankful to the Director of Clinics, TANUVAS for the facilities provided to perform the study.

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