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Splenectomy in a female German shepherd dog

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Abstract
Splenic haematoma is a benign mass of clotted blood on the spleen. This is a case report on the most common benign splenic mass in canines, but a rarely diagnosed, evaluated and surgically intervened condition, canine splenic haematoma. The article discuss about the first reported case of splenic haematoma in a 9yr old female German Shepherd dog from Kerala, Multispeciality Veterinary Hospital, Kudappanakunnu, which has undergone total splenectomy. The animal was presented to the clinic with the history of left limb lameness and mild exercise intolerance. The animal was active and its physiological parameters were normal. No abnormalities could be detected on orthopaedic examination. But abdominal palpation revealed a large painful mass on left side. Lateral abdominal radiograph shown dorsal displacement of intestinal mass by a soft tissue structure. Ultrasonographic examination revealed regions of hypoechogenicity around liver and spleen. Based on history, clinical examination and diagnostic imaging, decided to conduct explorative laparotomy. Identified a round, about to rupture mass on spleen and total splenectomy, which was the only option to save the patient was performed under general anaesthesia. Macroscopic examination showed blood clots within the splenic mass and on histopathologic examination focal extensive areas containing packed RBC in the splenic parenchyma suggestive of splenic haematoma was found. Haematological evalutaions were carried out on alternate day of surgery. On fifth post-operative day all the blood parameters fall within the normal range and the animal had an uneventful recovery. The case stimulates the decision to conduct splenectomy in dogs as a life saving procedure.

Keywords: German shepherd dog, lameness, exercise intolerance, splenectomy, histopathology, splenic haematoma

Introduction
Spleen, the largest of the lymphatic organs, is located in the upper left region of abdomen. The functions of spleen include hematopoiesis, circulation, destruction and preservation of red blood cells and immunologic function. Enlargement of spleen is known as splenomegaly. This may either be generalized or localized. Localized splenomegaly refers to focal palpable enlargement of spleen, referred as splenic masses. The term splenic mass refers to a discrete enlargement of a portion of the spleen. These masses can either be neoplastic or non-neoplastic depending on their histological features. It includes hemangioma, hemangiosarcoma, hematoma, lymphoma etc. Among non-neoplastic splenic masses haematoma were found to be most common type. This can cause severe enlargement of spleen, which can be felt during abdominal palpation. Unfortunately, the splenic mass is certain to bleed again and if not removed can eventually lead to death. Splenectomy is the surgical procedure to remove the spleen. It is most often performed in dogs and cats to treat splenic neoplasia, rupture or torsion. The prognosis for benign tumors and non- neoplastic masses are excellent after splenectomy. A case of splenectomy done in a nine year old female German Shepherd with splenic haematoma is mentioned here.

Materials and Methods
A 9 year old female German Shepherd dog presented at Multi Speciality Veterinary Hospital Kudappanakunnu formed the material for study.

Table 1: Signalment

Animal	Species	Breed	Sex	Age	Colour	Parity	Body weight
Dog	Canine	German Shepherd	Female	9 years	Black and tan	1	35 Kg

Owner's Complaint: The owner reported an anomaly while the dog places its left hind limb along with slight exercise intolerence since last few weeks.

Clinical Examination Findings: Animal was active and alert. Physiological parameters were within in normal limits with temperature 103.4°F, respiration rate 29/min, pulse rate 112/min and pale roseate mucous membrane. The body condition was good and hydration status was adequate. No abnormalities could be detected on orthopedic examination of limbs. Upon abdominal palpation a firm mass could be palpated on the left lateral abdomen. Animal showed pain on palpation of the mass. Radiography of lateral (fig.1) and ventro dorsal (fig.2) view of pelvis was taken and identified arthritic changes at both hip joints. On left (fig.3) and right (fig.4) lateral abdominal radiography, dorsal displacement of intestinal mass by a soft tissue structure could be seen. On ultrasonographic examination, a homogenous hypoechoic region could be detected around spleen and liver.

Fig 1: Lateral radiograph of left hindlimb

Fig 2: Ventro dorsal view of pelvis showing arthritic changes of hip joint

Fig 3: Left lateral abdominal radiograph showing soft tissue mass displacing intestinal mass dorsally

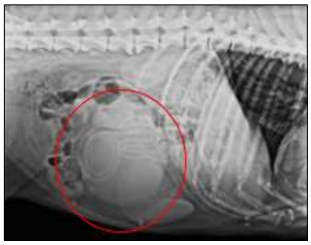

Fig 4: Right lateral abdominal radiograph showing large round soft tissue mass beyond ribcage

Result and Discussion

Based on history, clinical signs, physical examination, radiographic and ultrasonographic examination findings, decided to conduct explorative laparotomy to find the mass within the abdomen and radical surgery. Food and water were withheld from the dog for a period of 12 hours preoperatively. Hair over the ventral abdomen from xiphoid to pubic region were removed. Skin over the ventral midline of abdomen was aseptically prepared for surgery by spraying povidone iodine. Ceftriaxone Tazobactum injection was given intravenously as prophylactic antibiotic. The dog was premedicated with atropine and dexamethasone subcutaneously. Anaesthetic induction was done with ketamine and xylazine. Maintenance of anaesthesia was done with ketamine and midazolam. The animal was placed on dorsal recumbency (fig.5). Surgical site was draped with a sterile surgical drape exposing ventral midline. An intravenous infusion of isotonic normal saline and hydroxyl ethyl starch was administered throughout the surgery. A linear incision was made over the ventral midline of abdomen between the xiphoid cartilage of sternum and umbilicus. Subcutaneous tissue was dissected and exposed the linea alba. Linea alba was incised, passed fingers through the incision and explored for the mass inside. Huge mass on spleen was identified (fig.6) and affected spleen was exteriorized (fig.7) after removing its adhesions on the lateral wall of abdomen. Double ligated and transected all the vessels at the splenic hilus with polyglactin 910 (3-0) suture material. The gastro splenic omentum was divided after ligating the vessels passing along its length. Total splenectomy was done. A round firm mass about to rupture was found on the spleen, which weighed around 800 grams (fig.8). The mass was dissected and sample for histopathology was taken. The mass on dissection showed blood clots inside. Linea alba and subcutaneous incision were closed by simple continuous suture pattern using polyglactin 910 (2-0) sutures. Skin apposed using nylon 2-0 sutures by cross mattress suture pattern (fig.9). Applied antiseptic drssing on the suture line. Postoperative antibiotic therapy was instituted using intravenous administration of Ceftriaxone –Tazobactum at the dose rate of 15mg / kg, analgesic tramadol at the rate of 2 mg/kg, anti-histaminic chlorpheniramine maleate 10 mg intramuscularly for 5 days. Complete blood count was evaluated on day 2, day 5 after surgery. Leukocyte count was elevated (13.4 x 10^3µl), lymphocyopenia (6.4%) was observed and RBC count remained within the normal limit (4.46 x 10^6/µl) on day 2. After 4 days of antibiotic therapy on day 5, leukocyte count fell within the normal range (5.8 x 10^3/µl). Percentage of lymphocytes (9.6%) showed elevation, but not up to the normal limit. On microscopic examination, focally extensive area containing packed RBC in the parenchyma (fig.10, fig.11), severe atrophy of lymphoid follicles and infiltration of fibrocytes suggestive of haematoma was observed. In general, moderate to severe depletion of white pulp, dilated vessels with endothelial lining containing RBC, hemorrhage in the sinusoids, fibrosis, neovascularization and depletion of lymphocytes were noted. Skin sutures removed on 14th postoperative day. Postoperative complications were not observed in the present case and the animal had an uneventful recovery.

Fig 5: Animal placed on dorsal recumbency

Fig 6: Identifying the huge mass on spleen

Fig 7: Exteriorizing the splenic mass

Fig 8: Splenic mass weighing 800 gms, containing blood clots inside

Fig 9: Laparotomy incision closed by cross mattress suture pattern

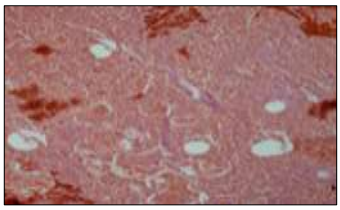

Fig 10: Focally extensive area containing packed RBC in parenchyma (10X magnification)

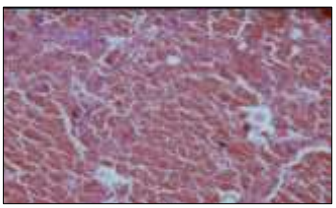

Fig 11: 40X Magnification of splenic parenchyma with packed RBC

The discovery of this splenic mass was quiet accidental in this patient as the history reveled no connection with its diagnosis. The etiology for the occurrence of splenic haematoma in this patient was not clear. It can occur due to some traumatic cause as automobile accidents or fall from stairs (Kolata and Johnston 1975, Patten *et al.* 2016) [2, 3]. A painful mass was recognized on abdominal palpation of left side and this probably was the reason for appearance of left hind limb lameness rather than the arthritis as the lameness disappeared post-surgery. The mass was unrecognizable to the owners as the animal had a thick hair coat. Clinical signs associated with splenic haematomas are non-specific (Eberle *et. al* 2012) [1]. And the haematological parameters are also non-specific for splenic masses (Wrigley *et. al* 1989) [5] and this makes it difficuilt to diagnose the condition. Abdominal radiography and ultrasonography can be used as diagnostic aids to detect the mass, but are not always reliable to confirm the splenic mass. Eberle *et al*. (2012) [1] detected a mid-cranial abdominal mass in abdominal radiograph of 137 affected dogs similar to what we observed in this case. The ultrasonographic appearance of haematoma is extremely variable, depending on its age (Wrigley *et al.* 1988) [6]. It is very difficuilt to diagnose a case of splenic haematoma pre-operatively. Once diagnosed it should be immediately removed to save the animal. No higher incidence of infectious disease occurs in splenectomised dogs, except when they are exposed to erythroparasites (Spankgler and Kass 1997) [4].

Conclusion

The present case report suggests that splenic masses can occur in dogs without any previous history, specific clinical signs and with a normal haematological profile. A specific diagnosis can be made only via histopathological examination of the mass. Performing a total splenectomy to a healthy animal do not cause any post-surgical complication. The 9 year old German Shepherd mentioned in this study is still alive without any post-surgical complications. An unattended case of splenic haematoma in dogs can lead to condition like haemoperitoneum and the animal may die out of shock. So the chances for occurrence of splenic haematoma should always be considered and there should be any delay in taking decision to conduct splenectomy in dogs which are really in need of it.

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