Splenic Abscess in a Dog

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ABSTRACT

Background: Splenic abscesses are rare in dogs, representing less than 1% of splenic injuries. Therefore, it has been seldom reported. The cases reported in veterinary medicine suggest trauma as the main cause of abscess formation in this organ. Due to the lack of information about the subject, the aim of this paper is to report the case and treatment of a splenic abscess in a dog.

Case: A 4-year-old intact female Bernese Mountain dog was referred to the veterinary hospital with apathy and abdominal pain. The owner related estrous followed by artificial insemination three weeks prior to the referral. On physical exam the patient was mildly dehydrated and presented pale mucosal. Besides the abdominal pain and prostration, others signs were not found. The ultrasound images suggested uterine fluid collection and peritonitis. The patient was referred to laparotomy. During the procedure the uterus was normal, however it was verified peritonitis and a splenic mass of 15x10x5 cm. A total splenectomy was performed to remove the mass and two drains were placed in order to treat the inflammation of the peritoneum. The spleen with the mass was sent to histological examination and subcapsular splenic abscess was diagnosed. After the surgery, the patient was treated with antibiotics and lavage of abdominal cavity until the complete recovery. At the end of the eighth day post-surgery the dog was discharged and after 12 months it presented good clinical condition.

Discussion: Splenic abscesses are rare and seldom discussed in the literature of veterinary medicine. In a study with 1480 dogs where it was assessed the prevalence and type of lesion found in the spleen, in only four cases (less than 1%) splenic abscess were present [10]. The causes of this condition are divided into infection, trauma, haematological disorders and immunodeficiency. In the case presented here, the etiology was not identified considering that the patient had no historical that could fit in one of these categories. However, the authors do not rule the possibility of a trauma not observed by the owner. Clinical signs of splenic abscess are nonspecific. Normally apathy, cranial abdominal pain, vomiting and anorexia can be seen [9]. In this report, the patient had similar presentation, except for the vomiting. Others signs such as chest pain, splenomegalia, fever and diarrhea may be also present. For the diagnosis of splenic abscess, diagnostic imaging is essential. The ultrasound is a good tool, but its sensitivity is 76% [5]. In this case, the ultrasound examination did not allow the diagnosis. The difficulty in identifying the presence and origin of the mass can be attributed to the echogenic content and its size. The splenic mass had 15x10x5 cm and it was located in the upper left quadrant, anatomically compatible with the left uterine horn. Besides that, the echogenic content is a condition routinely observed in hemometra or piometra. When ultrasound is not helpful, computed tomography is indicated because it has approximately 98% sensibility. The treatment was total splenectomy, abdominal cavity lavage and broad-spectrum antibiotics. Splenectomy is the recommended treatment for these cases. However, percutaneous drainage guided by ultrasound or computed tomography may also be performed [4]. Splenectomy and antibiotic therapy was effective in managing the disease leading to a rapid and safe clinical improvement of the patient.

Keywords: spleen, splenectomy, spleenite, infection, canine.
INTRODUCTION

The spleen is a defense organ. The immunological functions consist in imprisonment of blood antigens, production of antibodies, and B and T cells, phagocytosis and removal of old erythrocytes, microorganisms and cellular debris [3]. Despite the exposure to infectious agents, the occurrence of pyogenic splenic abscess is rare. The incidence of spleen abscess is 0.2 to 0.7% of autopsies in humans. In veterinary medicine, few cases have been described. Reports state that abscesses represent less than 1% of splenic lesions in dogs [10]. Considering the lack of literature regarding splenic abscesses in veterinary medicine, this study aims to report the occurrence and treatment of this disease in a dog.

CASE

A 4-year-old intact female Bernese Mountain dog with anorexia, lethargy and pain was referred to veterinary medical care. On physical examination the patient was in good nutritional condition, with mild dehydration (4%), pale mucous and capillary refill time of 2 s, normothermia and abdominal pain on palpation. The last estrous occurred three weeks prior, when the animal was submitted to intravaginal artificial insemination. The owner also denied trauma history and administration of corticosteroids. Laboratory tests were performed including complete blood count (CBC), serum biochemistry panel and ultrasound. The CBC accused normocytic normochromic anemia (red blood cells 3.99 x 10^6/µL, hemoglobin 9.7 g/dL, hematocrit 29.4%, VCM 73.9 fl, MCHC 32.9 %) and leukocytosis with left shift (Total leukocyte WBC 55,900/µL, immature neutrophils 31.500/µL). The values of alanine transaminase enzyme and alcaline phosphatase were within the normal range. Abdominal ultrasonography suggested presence of severely distended uterus with echogenic content with presence of hyperechoic structure, suggesting pyometra/hemometra. Also, free fluid in the abdominal cavity and mesentery with increased echogenicity. The spleen was not recognized during the exam and other organs did not present particularities (Figure 1).

The patient was submitted to surgery for ovariohysterectomy. During the laparotomy, it was found that the uterus was normal and there was a mass of 15x10x5 cm in the left upper quadrant adhered to the omentum and spleen. The spleen along with the mass and omentum was removed and sent to histopathologic evaluation. The abdominal cavity lavage was performed with 0.9% sterile saline solution (4L) and due to peritonitis, two drains were placed before abdominal cavity closure. The patient remained hospitalized until the resolution of peritonitis. Postoperative treatment included intravenous ringer’s lactate (Ringer com Lactato⁶), ceftriaxone (Triaxin⁷), metronidazole (Metroniflex⁸), meloxicam (Melocox⁹), tramadol hydrochloride (tramal¹⁰) and dipyrone (novalgina¹¹). Abdominal lavages were performed three times daily for three days with warm sterile saline (1L). As the patient was anemic, it was transfused whole blood and complete blood count was repeated daily until decrease of leukocytosis and anemia. On the eighth day postoperative the patient was discharged and oral antibiotics were continued for a week. By telephone contact after twelve months, the owner related no clinical signs.

Histopathological examination of the spleen presented severe diffuse necrotic splenitis associated with intralesional basophilic bacterial aggregates, resulting in subcapsular splenic abscess (Figure 2).
DISCUSSION

The main non-neoplastic splenic diseases of dogs and cats are hyperplastic nodules, haematomas and accessory or ectopic spleen [10]. In a study with 1480 dogs, in which it was assessed the prevalence and types of lesion in the spleen, only in four cases (less than 1%) splenic abscesses were diagnosed [10]. This low incidence was confirmed by another paper where the author performed 87 splenic biopsies in dogs and abscesses were found in two cases [2]. The causes are divided into five categories: infectious metastases, trauma, infection in adjacent organs, blood disorders and immunodeficiency. In veterinary literature, one author describes a foreign body penetration in the spleen as the cause of abscessation [2] and two others suggest that a possible splenic trauma has progressed to an abscess [1,9]. In the presented case, the cause of splenic abscess was not identified since the patient had no history that fit into one of the five categories above. However, the authors do not discard a possible trauma not seen by the owner. Clinical signs of splenic abscess are nonspecific: apathy, cranial abdominal pain, vomiting and anorexia may be present [9]. In our case, the patient had similar clinical signs, except for the vomiting episodes. Other clinical presentations described in medicine literature are chest pain, splenomegaly, diarrhea and fever [5]. Laboratory abnormalities are also nonspecific and leukocytosis is frequently observed [7], as found in this case.

Combined with clinical signs, diagnostic imaging is essential for the diagnosis of splenic abscess. Ultrasound is a good tool, but its sensitivity is 76% [5]. In this case, the ultrasound examination did not allow the patient’s diagnosis. The difficulty in identifying the presence and the origin of the mass can be attributed to echogenic content and its size. Abdominal masses, when extensive, deslocate the organs of their topographic anatomy causing errors in the origin classification [6]. The splenic abscess had 15x10x5cm and it was located in the left upper quadrant, anatomically compatible with the left uterine horn. Besides, it had echogenic content, routinely observed in condition such as hemometra ou pyometra.

When ultrasound is not helpful, magnetic resonance imaging and computed tomography (CT) are indicated [9]. In cases of splenic abscess, computed tomography is considered the best method, presenting about 98% sensitivity [5]. Unfortunately, this resource is not yet available in the institution where the case was attended.

The treatment was total splenectomy, abundant abdominal lavage and broad-spectrum antibiotics. Splenectomy is the treatment recommended for such cases. However, percutaneous drainage guided by ultrasound or CT scan may be performed in cases of single abscesses, without septations and fluid content [4]. Moreover, the percutaneous aspiration can be used as a temporary measure in order to stabilize the patient until the splenectomy, or as a definitive treatment in patients that can not undergo to surgery [8]. The drainage was not considered in this case due to the lack of preoperative diagnosis. Besides that, the presence of free intraperitoneal fluid and signs of peritonitis indicated the need of surgery. The guided drainage contraindications are: abdominal conditions that require surgical repair, coagulopathy, multiple abscesses, ou septated, diffuse ascites and no safe image window [11].

Antibiotic therapy consisted of ceftriaxone and metronidazole for 15 days. The same therapeutic scheme described in literature [5]. An alternative antibiotic therapy consists in amoxicilina/clavulanic acid administration [9]. Both therapies were successful. In our case, the association used was satisfactory, after four days of treatment there was an improvement on clinical presentation and decrease of leukocytosis (total WBC 19.900/µL). On the eighth day, leukocytes were within the reference values and the dog was discharged, where antibiotics medication were continued orally. However, it is noteworthy that the choice of antibiotics should be based on culture and sensitivity when possible. These laboratorial tests were not performed because it was believed that the excised mass was neoplastic. Bacterial agents found in splenic abscesses in human are *Staphylococcus aureus*, *Streptococcus viridans*, *Klebsiella* spp. and *Salmonella Enteritidis* [5]. In veterinary medicine, the presence of *Staphylococcus epidermidis* and *Staphylococcus pseudintermedius* was found in a case of splenic abscess in a German shepherd dog [1]. Unfortunately in this case there was no collection of material for culture for the same reasons mentioned above.

Splenic abscesses are rare, however, it should be part of the differential diagnosis in cases of spleen injuries in dogs. Clinical examination and imaging studies are the guidelines to early diagnosis. Considering the success of the treatment in this case report, splenectomy combined with antibiotic therapy may be efficacious in the management of this disease.
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REFERENCES