

Large Pancreatic Abscess Successfully Treated by Laparoscopy in a Bitch - A New Approach

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ABSTRACT

Background: Pancreatic abscesses in dogs are rare, life-threatening complication of acute inflammatory pancreatitis. While surgical intervention is often required, conventional open techniques - such as debridement, excision, and omentalization - are associated with high mortality rates, particularly in septic patients. To date, no veterinary literature has described a minimally invasive approach for the management of this condition in a dog.

Case: A 12-year-old bitch mixed-breed, weighing 12 kg, was presented with a 3-week history of anorexia, vomiting, and diarrhea. The dog previously underwent fecal examinations, as well as antibiotic and antiparasitic treatments, without achieving clinical improvement. A complete blood count revealed mild anemia, but no abnormalities in the white blood cell count. Abdominal ultrasonography identified a 10 cm hypoechoic cystic mass in the hepatic/pancreatic region, and a 2 cm splenic nodule. Analysis of fluid obtained via ultrasound-guided aspiration suggested the presence of neutrophils, and a pancreatic abscess. A laparoscopic approach was performed using a three-port triangulation pattern and a 30° optic. Following adhesiolysis and transperitoneal drainage of approximately 500 mL of purulent fluid, the abscess capsule was opened and removed as well as the necrotic tissue using an extraction bag. Omentalization was performed by fixing the omentum within the cavity using titanium clips. Concurrent splenic biopsies were also conducted. Histopathological examination confirmed necrotic pancreatic parenchyma within the abscess wall, while the splenic nodule was diagnosed as lymphoid hyperplasia. Bacterial cultures yielded no microbial growth. The patient showed rapid recovery, was discharged 24 h post-surgery, and remained free of clinical signs or recurrence through a 2 years follow-up period.

Discussion: This report describes the first successful resolution of a canine pancreatic abscess treated entirely via laparoscopy. The technique proved effective for debridement and omentalization, offering superior visualization and minimal invasiveness. The successful outcome suggests that laparoscopy is a viable and advantageous alternative to open surgery, potentially reducing hospitalization time and postoperative complications.

Keywords: videosurgery, omentalization, titanium clips, pancreatic necrosis, capnoperitoneum, dog.

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INTRODUCTION

Pancreatic abscesses are rare in dogs and are typically associated with severe complications resulting from acute inflammatory pancreatitis. [2,6] These abscesses are characterized as necrotic formations containing purulent material, which may or may not be associated with infectious processes. [2,11,12]

Veterinary literature seldom reports on the successful resolution of pancreatic abscesses through conservative treatments [2,9], with no established treatment guidelines existing for this condition. Surgical intervention, when indicated, is associated with high mortality rates, particularly in septic cases. [1,2,9] Surgical treatments described in the literature include debridement, excision, omentalization, and peritoneal drainage. [6,10]. In humans, minimally invasive treatments, such as endoscopies and percutaneous techniques, are favored due to their high success rates, since the mortality rate associated with pancreatic abscesses is significant in both human and veterinary medicine. [9].

The purpose of this case report is to present a novel approach to the laparoscopic removal of a pancreatic abscess capsule and omentalization in a bitch, which resulted in no complications or recurrence over a follow-up period of 2 years.

CASE

A 12-year-old bitch mixed-breed, weighing 12 kg was admitted to the Veterinary Hospital with a history of anorexia, vomiting, and yellowish diarrhea which lasted for 3 weeks. Previous fecal tests for helminths and protozoa were negative, and treatments with metronidazole, sulfadimethoxine, and fenbendazole did not result in a clinical response. A complete blood count revealed mild anemia (hematocrit 29% and hemoglobin 12 g/dL), with no abnormalities in the white blood cell count. Abdominal ultrasonography identified a hypoechoic cystic mass in the liver region, measuring approximately 10 cm, as well as a splenic nodule measuring 2 cm. Fluid analysis via ultrasound-guided puncture demonstrated a predominance of neutrophils, mesothelial cells, and macrophages, along with a total protein level of 3.2 g/dL and a total cell count of $6,200 \times 10^6$. A computed tomography (CT) scan was recommended and declined. No diagnoses or presumed diagnosis were provided prior to surgery.

One week after the imaging tests, the patient was referred for exploratory laparoscopy performed, which was performed with the patient in dorsal recumbency, obliqued to the left. The procedure was conducted using three ports arranged in a triangulation pattern, with a 10 mm, 30° optic. The 1st port (11 mm)¹ was positioned between the umbilical scar and pubic margin, the 2nd port (11 mm)¹ on the left abdominal wall, and the 3rd port (6 mm)¹ on the right abdominal wall. Following insufflation of the abdominal cavity with CO₂, an approximately 10-cm circular cystic structure was observed, adhering to the greater omentum and the transition between the body and antrum of the stomach wall. This structure, consistent with capsular tissue, appeared to originate from pancreatic region, possibly from right lobe, without distinct boundaries due to significant adhesions. A mild splenomegaly was observed, along with a circular nodule approximately 2 cm in size, distending the splenic capsule at the transition between its cranial border and ventral end. This nodule exhibited the same color, with whitish spots, and same consistency as that of the organ, without adhesions. Adhesiolysis was performed using hemostatic forceps and a vascular sealing device² starting at adherences of greater omentum (Figure 1).

After isolating the ventral portion of the cystic structure, which resembled an abscess, a puncture was made using a sterile catheter³ for transparietal drainage to allow for a better view of the cranial portion of the structure (Figure 2A). However, the drainage was minimal, with a limited amount of fluid leakage, which was controlled using gauze swabs (Figure 2B). The capsule was subsequently opened using small forceps and a laparoscopic suction cannula, allowing approximately 500 mL of yellowish purulent fluid to be

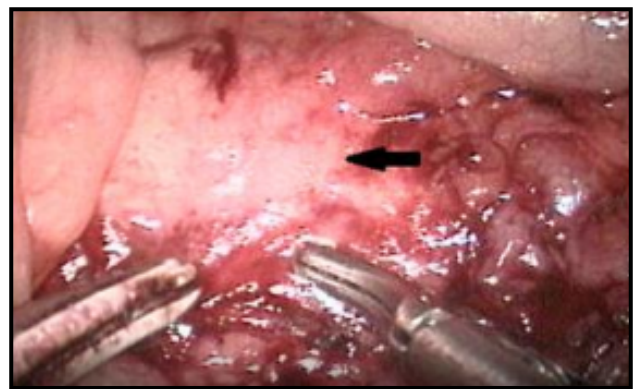


Figure 1. Laparoscopic view of an intra-abdominal mass in a bitch, showing adhesions to the omentum and tissue resembling pancreatic topography (black arrow).



Figure 2. Laparoscopic view of the drainage and incision of a pancreatic abscess in a bitch. A- Visualization of the transparietal puncture (black arrow). B- Extravasation of purulent content (asterisk) in the peripheral region. C- Abscess cavity with necrotic tissue (black arrow).

drained. Once the abscess wall was opened, the capsule was removed using advanced bipolar forceps (Figure 2C), revealing strong adhesion with the mesentery and duodenum at the medial portion of the structure. Due to the extensive adhesions in this area, it was not possible to visualize any remnants of pancreatic tissue or dorsal structures at this point. After complete drainage, the abscess cavity was thoroughly irrigated with sterile 0.9% NaCl solution⁴. Fibrous and necrotic tissue was observed within the cavity, floating freely inside the abscess (Figure 2D).

These tissues were extracted (Figure 3) using an extraction bag inserted through the 11-mm lateral portal incision. The extraction bag was fashioned from a sterile, talc-free surgical glove⁵, which was secured with a purse-string suture using a 2-0 nylon⁶ thread at one end. Both, the tissue from the abscess wall and a necrotic mass (Figure 3D) located within the abscess, were removed using this extraction bag.

Omentalization was then performed, with the omentum fixed in place using medium-wide titanium clips⁷ (Figure 4A & B), followed by irrigation of the area with 0.9% NaCl solution until the recovered fluid appeared clear. Biopsies of the splenic nodule were performed at 3 different sites using 5-mm laparoscopic biopsy forceps, controlling any hemorrhaging using gauze compression (Figure 4C & D).

Histopathological analysis identified the tissue from the abscess cavity as diffusely necrotic pancreatic parenchyma with degenerated neutrophils, associated with adipose tissue interspersed with fibrous strands. The splenic nodule was diagnosed as nodular lymphoid hyperplasia. Bacteriological and fungal cultures yielded no microbial growth. During the 1st 4 postoperative days, the patient was treated with metamizole⁸ [25 mg/kg TID, PO], tramadol hydrochloride⁹ [4 mg/kg TID, PO], and meloxicam⁹ [0.1 mg/kg SID, PO], and was discharged 1 day after surgery. During

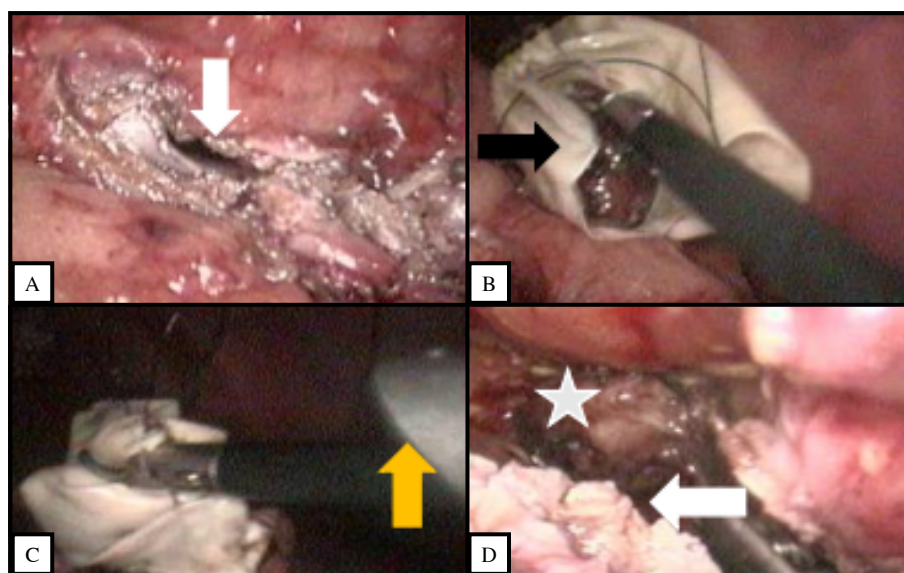


Figure 3. Laparoscopic view of the removal of the pancreatic abscess wall and necrotic tissue in a bitch. A- Residual abscess wall tissue (white arrow). B- Encapsulation of the abscess wall in an extraction bag (black arrow). C- Extraction of the bag through the trocar (yellow arrow). D- Necrotic mass (asterisk) within the pancreatic abscess (white arrow).

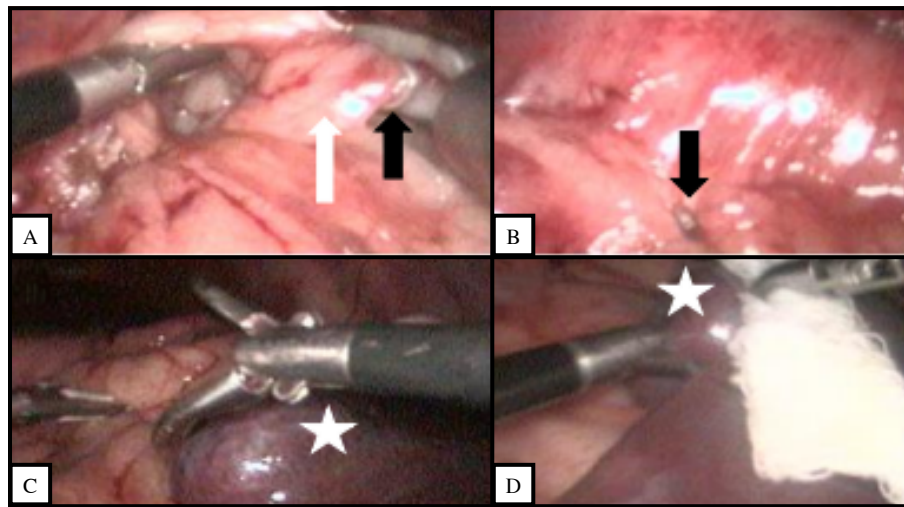


Figure 4. Digitalized laparoscopic image of omentalization of a pancreatic abscess and biopsy of a splenic nodule. A- Omentalization within the remaining abscess tissue (white arrow) with positioning of the titanium clip (black arrow). B- Titanium clip (black arrow) securing the omentum to the abscess wall. C- Splenic nodule (asterisk). D- Hemostasis of the spleen achieved with a gauze swab.

the initial 10 postoperative days, the patient exhibited no clinical signs or abdominal pain. Moreover, at the 2-year follow-up, the abdominal ultrasound did not show recurrence of the abdominal structure.

DISCUSSION

Despite the significant size of the cystic structure and its direct connection to the pancreatic parenchyma, laparoscopy proved to be an effective surgical technique, successfully removing nearly all of the necrotic tissue and capsule without necessitating conversion to open surgery. The procedure lasted 90 min. Additionally, although some extravasation of the cyst contents was observed, lavage with saline solution via the laparoscopic route effectively prevented the development of detectable peritonitis. This outcome contrasts with conventional surgeries, which are more likely to cause peritonitis due to increased tissue manipulation, exposure of adjacent structures, and an increased risk of infection. [5].

In the present case, the use of feeding tubes, such as jejunostomy tubes or tubes for postoperative abdominal lavage, was unnecessary, contrary to the recommendations of some authors. [2,8]. Even with the extended surgical time, the patient remained free of intraoperative pain, owing to effective anesthetic management. This obviated the need for feeding tube insertion, as the patient maintained satisfactory oral intake prior to the intervention. The absence of any other visible organ abnormalities led to the decision not to place an abdominal drain. It was also feasible to

reduce the hospitalization period to 24 h following the procedure, given the absence of abdominal pain, the maintenance of clinical parameters, and the patient's ability to feed spontaneously.

The absence of bacterial growth in this case aligns with findings in the veterinary literature, which indicate that 15-25% of dogs with similar conditions exhibit bacterial processes despite the mucopurulent appearance of the secretions [3,6]. This observation raises questions about the necessity of antibiotics for treating these conditions, particularly when ultrasound-guided puncture does not reveal infectious processes. Based on the pre-existing clinical signs and literature [4,12], the pancreatic abscess may have developed as a sequela of previously undiagnosed and untreated pancreatitis.

Although a pre-surgical CT scan was not performed, limiting the ability to fully plan the procedure, the location and dimensions of the mass were sufficiently defined and suggested an abscess or cyst. Consequently, the placement of the ports was planned to facilitate a splenic biopsy in conjunction with the removal of the abscess capsule, provided the patient remained hemodynamically stable. An additional limitation was the inability to fully dissect the structure in its dorsal aspect. As an alternative, an additional port could be placed caudal-lateral to the structure to allow for complete dissection, although the ports used were sufficient to perform omentalization and obtain a splenic biopsy.

For unstable patients with sepsis or those who experience septic shock, the authors do not recommend this technique due to the need for an experienced surgeon to achieve complete visualization of the structure and important abdominal vessels and organs that may be adhered. Additionally, the potential hemodynamic changes associated with the use of capnoperitoneum may pose further risks.

In this case, laparoscopy provided an enhanced view of abdominal structures, allowing for accurate definition and comprehensive visualization. Due to the procedure's minimally invasive nature, the position of the ports, and the patient's anesthetic stability, splenic biopsies were performed concurrently, which enabled conservative management and avoided the need for a splenectomy in the postoperative period.

This report describes a novel minimally invasive technique for the treatment of pancreatic abscesses, utilizing a 3-port technique, and achieving good short- and long-term outcomes in this case, given the current lack of documented laparoscopic approaches

for pancreatic abscess treatment in the literature. Furthermore, the results of the present case illustrate the feasibility of incorporating splenic biopsies into the same procedure when necessary.

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