

Topical Reviews

A Case Report of Percutaneous Endoscopic Gastrostomy Left-Side Gastropexy to Resolve a Recurrent Gastric Dilatation in a Dog Previously Treated With Right-Side Gastropexy for Gastric Dilatation Volvulus



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A 6-year-old, large-breed, female dog was evaluated for gastric dilatation (GD). The dog was affected by GD volvulus, which had been surgically treated with gastric derotation and right incisional gastropexy. Recurrence of GD appeared 36 hours after surgery. The dilatation was immediately treated with an orogastric probe but still recurred 4 times. Therefore, a left-side gastropexy by percutaneous endoscopic gastrostomy (PEG) was performed to prevent intermittent GD. After PEG tube placement, the patient recovered rapidly without side effects. Several techniques of gastropexy have been described as a prophylactic method for gastric dilatation volvulus, but to the authors' knowledge, this is the first report of left-sided PEG gastropexy performed in a case of canine GD recurrence after an incisional right gastropexy.

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Introduction

Gastric dilatation volvulus (GDV) is a life-threatening emergency in large-breed and deep-chested dogs.¹ Risk factors for GDV include faster eating, being fed 1 meal daily, eating dry food only, and having a nervous or fearful temperament.² The lifetime risk of dogs predisposed to develop GDV has been estimated to be between 3.9% (0%–11.2%) for Rottweiler and 36.7% (25.2%–44.6%) for Great Dane.³ Recurrence and death in dogs medically treated for GDV are reported as being between 76%⁴ and 80%⁵; with medical and surgical treatment, a mortality rate of 15%–20% was recently reported.⁶ Standard treatment before surgery includes aggressive fluid therapy and attempts at gastric decompression. Surgical treatment of GDV includes gastric decompression, derotation, excision of devitalized tissue, if appropriate, and splenectomy in the presence of splenic torsion or thrombosed blood vessel to avoid reperfusion injury.^{7,8} Gastropexy is performed as a prophylactic procedure in predisposed dogs or as final step of a surgical GDV treatment, creating an adhesion between the pyloric antrum and right lateral abdominal wall.^{7,9} Several gastropexy techniques have been described, including incisional, belt loop, circumcostal, gastrocolopexy, and left or right tube gastropexy in open or laparoscopic surgery.^{7,10,11} For these techniques, recurrence rates between 0% and 15%^{7,12–16} have been described. The literature reports 54.5% recurrence of GDV for dogs that underwent surgery without gastropexy, against 4.3% of dogs treated with gastropexy. Moreover, gastropexy provides a median survival time of 547 days compared with 188 days in dogs not treated with gastropexy.^{10,17} The integrity and healing evolution of gastropexy is generally evaluated by abdominal ultrasonography, radiography, or other imaging techniques.^{9,18}

The purpose of this case description is to report a short-term follow-up of a double gastropexy performed on a dog affected by GDV, treated first with an incisional right-sided gastropexy and

further with left-side gastropexy by percutaneous endoscopic gastrostomy (PEG) to treat an unresponsive postoperative gastric dilatation (GD).

Case Description

A 6-year-old, large-breed, female dog was referred to the Veterinary Teaching Hospital of University of Bologna for nausea and abdominal discomfort. A previous GD, 1 month before, was spontaneously resolved. Physical examination revealed abdominal distension and a tympanic area in the cranial abdomen, sialorrhea, and unproductive retching. The dog showed a mild hypothermia (rectal temperature, 37.8°C [100°F]), tachypnea (90 bpm), and congested oral mucosae. Radiographic examination revealed, in the right and left lateral views, the pylorus cranially positioned to the fundus, giving the appearance of a separate, gas-filled pocket (“double-bubble” sign) highly indicative of GDV. Furthermore, an osteoarthritis of the lumbar spine with vertebral spondylosis at T9–T11 and vertebral ankylosis at T13–L4 was diagnosed (Fig. 1).

Hematobiochemical examination revealed a mild increase of transaminases (aspartate transaminase = 105 U/l, reference interval = 20–42 U/l; alanine transaminase = 75 U/l, reference interval: 20–55 U/l), creatinine level (1.9 mg/dL, reference interval: 0.65–1.35 mg/dL), urea level (62.37 mg/dL, reference interval: 18–55 mg/dL), glucose (159 mg/dL, reference interval: 70–125 mg/dL), phosphorus (5.1 mEq/L, reference interval: 2.6–4.9 mEq/L), and prothrombin time (8.4 seconds, reference interval: 5–7.5 seconds), and mild hypoalbuminemia (2.78 g/dL, reference interval: 2.80–3.70 g/dL). Venous blood gas analysis showed a reduction of pH (7.25, reference interval: 7.39–7.44), pO_2 (57 mm Hg, reference interval: 80.9–103.3), and HCO_3^- (19.6 mm Hg, reference interval: 20.8–24.2 mm Hg) and an increase of pCO_2 (49.0 mm Hg, reference interval: 33.6–41.2 mm Hg) and anion gap (27.8 mmol/L, reference

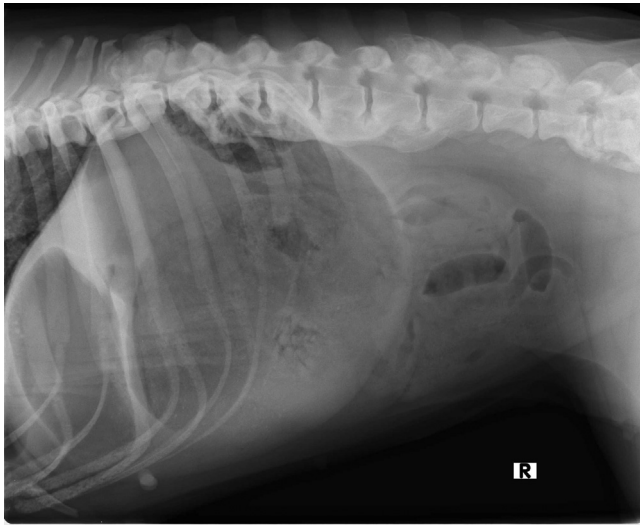


Fig. 1. Right lateral abdominal x-ray. Notice the severe gastric meteorism and separate gas-filled pocket. Moreover, T9-T11 spondylosis and T13-L4 vertebral ankylosis are well recognized.

interval: 9.0–22.0). Plasma lactate concentration at the time of hospital admission was 4.5 mmol/L (reference interval: 0–2.0 mmol/L). A cephalic intravenous administration (IV) catheter was placed for rapid infusion of Ringer's lactate solution (50 mL/kg/h) and succinylated gelatin (Gelofusine,^a 5 mL/kg/h) to treat circulatory shock; flow-by oxygen was also administered for respiratory support. An attempt of preoperative orogastric intubation for gastric decompression was unsuccessful, and gastrocentesis was performed in the caudal right costal arch with an 18-gauge needle. Gastric emptying was performed after gastrocentesis to allow placement of orogastric probe to complete gastric drainage. Once stabilization was completed, the dog was submitted to surgery for an explorative laparotomy.

After premedication with methadone hydrochloride (Eptadone,^b 0.3 mg/kg, intramuscular administration [IM]), general anesthesia was induced with propofol (Rapinovel,^c 3 mg/kg, IV) and maintained with isoflurane in 2% oxygen. Cardiac and respiratory rates, spirometry, oxygen, end-tidal CO₂, and noninvasive pressure were routinely monitored. The dog was placed in dorsal recumbency and the abdomen prepared for aseptic surgery. A ventral midline celiotomy was performed; abdominal exploration showed a 90° clockwise gastric volvulus and right dislocation of the spleen. After gastric detorsion, a 4-cm standard incisional gastropexy was performed on the right side. The spleen vessels were normal on inspection and palpation, and the abdominal wall was routinely closed.

Postoperative care included antibiotic treatment with ampicillin-sulbactam (Unasyn,^d 20 mg/kg, IV) and omeprazole (Antra,^e 0.7 mg/kg, oral administration) and analgesic treatment with methadone hydrochloride (Eptadone,^b 0.1 mg/kg, IM) and Ringer's lactate solution (5 mL/kg/h). Postoperative venous blood gas analysis and blood examination showed normal parameters after 12 hours, and plasma lactate concentrations were 2.5 mmol/L and 1.6 mmol/L at 1 and 8 hours, respectively, after surgery. At 36 hours postoperatively, a recurrence of GD occurred with a severe retrocostal abdominal distension; decompression of the stomach with an orogastric probe was possible 4 times in 72 hours, each time followed by a recurrence of the dilatation. Orogastric

^a Braun Milano spa, Italy.

^b Molteni & f.lli Alitti spa, Italy.

^c Intervet Italia srl, Italy.

^d Pfizer Italia srl, Italy.

^e Astrazeneca spa, Italy.

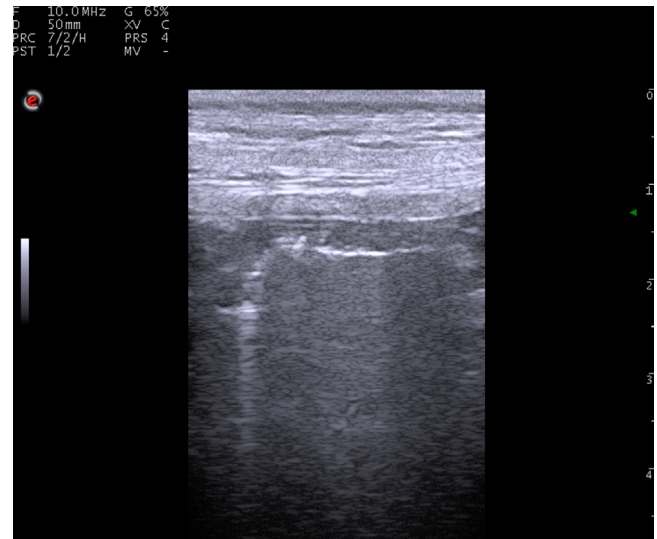


Fig. 2. Longitudinal ultrasonographic appearance of the right cranial part of the abdomen at the gastropexy site 4 days after incisional gastropexy. The stomach wall is thicker than normal and hypochoic; its serosal surface cannot be distinguished from that of the abdominal wall.

administration of charcoal to reduce stomach pain caused by excess gas did not produce clinical improvement. The dog was not eating spontaneously 72 hours after surgery, and the stomach was still dilated. Endoscopic examination showed the dilated stomach in normal position; a copious amount of fluid and grass was associated with a reddish and edematous mucosa. Erosions and hemorrhages were evidenced at the greater curvature of the stomach. Peristaltic movements were present, although reduced, and no anatomic or functional pyloric obstruction was observed. Methadone hydrochloride was replaced with buprenorphine hydrochloride (Temgesic,^f 10 µg/kg, IM) to reduce side effects of gastrointestinal hypomotility; cytoprotective agent sucralfate (Sucralfin,^g 1 mg/kg, oral administration) and metoclopramide (Plasyl,^h 0.2 mg/kg, IV) were added to the therapeutic protocol for gastric mucosa protection. Plasma lactate concentration was analyzed every 8 hours and ranged from 0.8–1.0 mmol/L. The gastropexy site was examined ultrasonographically by use of a 10-MHz transducer (Fig. 2). The location of the right gastric wall was well observed, but no more information was achieved for the abnormal stomach bloating. To provide correct gas removal from the stomach toward functional gastric recovery, a percutaneous, endoscopically directed gastrostomy tube was placed, following the technique of Bright and Burrows¹⁹ developing a left-side gastropexy (Fig. 3). Gastric meteorism was counteracted by opening the PEG tube every 2–3 hours during the first 24 hours, and after 12 hours of fasting, the patient was fed through the probe (Recovery Royal Canin). At 24 hours after PEG insertion, the subject ate spontaneously. The dog was discharged 6 days after surgery, and 15 days postoperatively, it returned for suture and PEG removal (Fig. 4). Ultrasound and x-ray examinations showed normal healing at gastropexy sites (Figs. 5–7). At 60-, 90- and 180-day of follow-up, the dog showed excellent functional gastrointestinal recovery.

Discussion

GD and volvulus is an acute, often fatal syndrome of uncertain etiology occurring primarily in large, deep-chested breeds of

^f Schering Plough spa, Italy.

^g Sanofi-Aventis spa, Italy.

^h Gruppo Lepetit srl, Italy.

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