

Open & Laparoscopic-Assisted Incisional Gastropexy

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Gastric dilatation–volvulus (GDV) is a life-threatening medical and surgical emergency. The acute medical crisis is brought on by massive gastric distension, which compresses critical vasculature, causing gastric ischemia, impaired venous return, and poor cardiac output. This leads to hypovolemic shock, myocardial ischemia, cardiac arrhythmia, electrolyte imbalance, visceral necrosis, and other detrimental effects.

Large- and giant-breed dogs, underweight dogs, and dogs with a large thoracic depth:width ratio are at greater risk for developing GDV. This risk increases with age. One study found large and giant purebred dogs to have a lifelong risk for developing GDV of 24% and 21.6%, respectively.¹

What Is a Gastropexy?

Gastropexy is a surgical procedure that creates a permanent adhesion between the pyloric antrum and the right abdominal wall, preventing gastric volvulus. When used to treat patients with GDV, recurrence rates drop to less than 5% compared with more than 50% if no gastropexy is performed.² In a recent

GDV = gastric dilatation–volvulus, PDS = polydioxanone suture

study, at-risk dogs treated with prophylactic incisional gastropexy had no episodes of GDV after a mean follow-up time of 2 years—results that are the same as or better than those for other reported techniques.³

Several gastropexy techniques have been described, including incisional, belt-loop, circumcostal, tube, incorporating, gastrocolopexy, endoscopically assisted, laparoscopic-assisted, and laparoscopic gastropexy.⁴ The minimally invasive procedures employ an incisional gastropexy in their technique. The authors prefer the incisional gastropexy technique because it is relatively safe, effective, and technically simple to perform.³ Prophylactic gastropexy can be performed alone or at the same time as sterilization in at-risk breeds. This article serves as a reference for performing incisional gastropexy using both open and laparoscopic-assisted⁵ techniques.

Patient Positioning

For both open and laparoscopic-assisted incisional gastropexy, the patient should be positioned in dorsal recumbency and the abdomen prepared using standard aseptic technique.

What You Will Need

For Open Incisional Gastropexy

- Standard surgical pack
- 2-0 polydioxanone suture (PDS) or other monofilament absorbable suture of choice

For Laparoscopic-Assisted Incisional Gastropexy

- Standard surgical pack
- 2-0 PDS or other monofilament absorbable suture of choice
- #11 blade
- Video laparoscopy tower (A) with camera (B), insufflation tubing (C), light cable (D), and video capture device
- 10-mm laparoscopic Babcock forceps (E)
- 5-mm laparoscope 0° (F)
- 5-mm trocar (G) and 10-mm trocar (H)



continues

STEP-BY-STEP ■ OPEN INCISIONAL GASTROPEXY

STEP 1

After standard abdominal draping, make a ventral midline abdominal incision extending from the xyphoid to 2–3 cm caudal to the umbilicus. Remove the falciform fat using electrosurgical dissection or ligation and en-bloc removal if necessary (*not shown*).

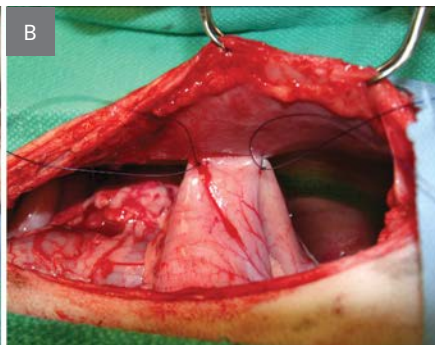
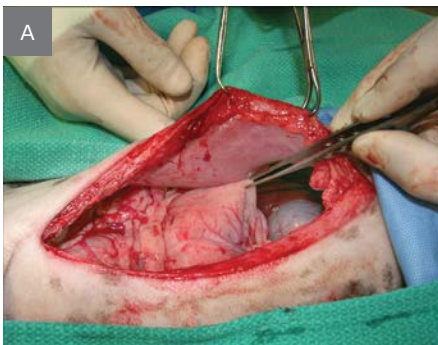


STEP 2

Place two towel clamps in the abdominal musculature of the right body wall, and have an assistant elevate them to further improve visualization of the right cranial abdomen. Then bring the pyloric antrum to the intended gastropexy site in the transversus abdominis muscle (**A**). Using 2-0 PDS on a taper needle, place a simple

interrupted suture first through the cranial-most aspect of the proposed antral incision site and then through the corresponding cranial point of the planned transversus incision, roughly 1 to 2 cm caudal to the 13th rib (**B**). Do not remove the needle from this suture, and leave tags long enough to tie. Using a second reel of suture,

repeat this step for the caudal aspect of the proposed gastropexy site. The needles will remain on these suture lines, as they will be used to suture the gastropexy in a continuous pattern after incisions are made.

**Author Insight**

Inadvertent incision into the diaphragm can occur if the gastropexy incision in the transversus abdominis is made too cranially or too dorsally. Pay special attention to muscle fiber direction in determining the appropriate location for the gastropexy incision. Diaphragm muscle fibers run obliquely and should be identified and avoided.

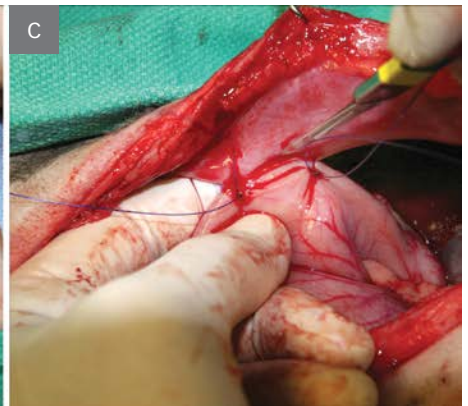
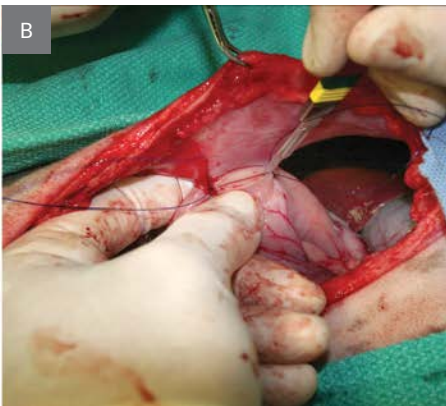
STEP 3

Use the left hand to pinch the stomach at the intended gastropexy site so the submucosa can be felt slipping out of grasp (**A**) (Debaquey forceps show the location of the submucosa and mucosa after the slip). With the stomach and body wall sutured in position, use a scalpel to make a 4- to 5-cm

longitudinal incision in the seromuscular layer of the pyloric antrum between the two stay sutures (**B**). Incise only the seromuscular layer of the stomach without entering the gastric lumen. Then make a mirror incision into the transversus abdominis between the stay sutures (**C**).

Author Insight

Pinching the stomach wall allows the surgeon to feel the mucosal layer slip out of the grip from the seromuscular layer and helps isolate the cut to the seromuscular layers, preventing accidental incision into the gastric lumen.

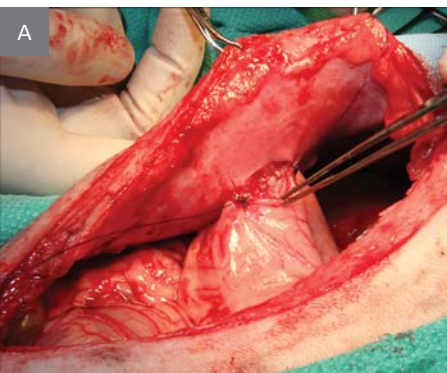


STEP 4

Using the previously placed stay sutures as anchor points for the continuous suture pattern, appose the abdominal and gastric incisions (**A**). Suture the more dorsal and lateral

incision first with the cranial stay suture strand. Finish this suture line, and tie it to the tag of the caudal stay suture. Finally, suture the more ventral and medial incisions in apposition using

the caudal suture line (**B**). To complete the gastropexy, tie the suture to the tag of the cranial suture knot. Close the abdomen (routinely).

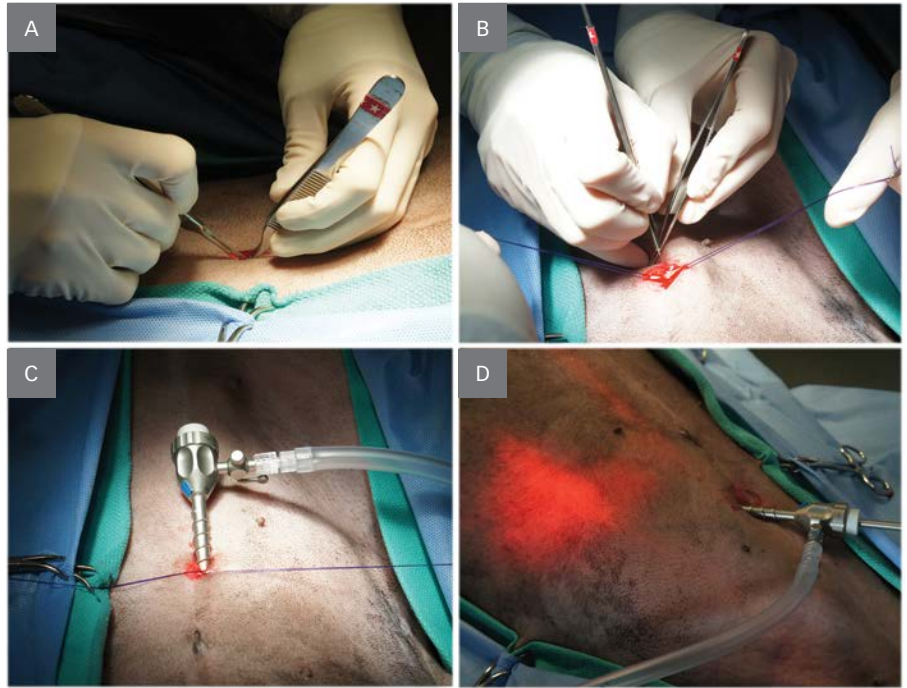


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STEP-BY-STEP ■ LAPAROSCOPIC-ASSISTED GASTROPEXY

STEP 1

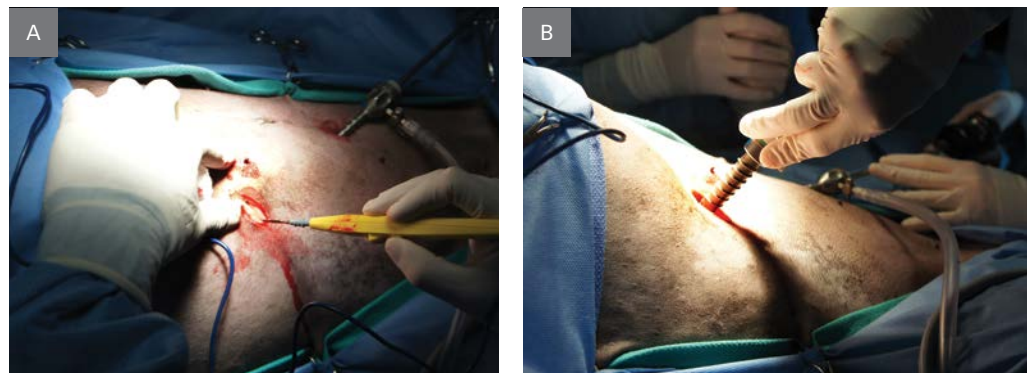
Using the modified Hasson technique, place a 5-mm cannula 1 to 2 cm caudal to the umbilicus on the midline as follows. Using a #11 blade, make an incision through the skin no longer than the inner diameter of the cannula (A). Continue the incision through the subcutaneous tissue into the linea alba. Place stay sutures in the linea to provide outward traction on the body wall while placing the port (B). Place a trocar-cannula assembly or threaded screw-in cannula through the incision and into the abdomen (C). Once the cannula is in place, attach CO₂ insufflation tubing and pressurize the peritoneal cavity to a maximum 10 to 12 mm Hg. Insert the laparoscope into the cannula and observe the peritoneum briefly to ensure that no iatrogenic trauma or hemorrhage has occurred.

**Author Insight**

To avoid the cranial epigastric vasculature when making the next incision, use the laparoscope light to trans-illuminate the proposed site for the second port (D).

STEP 2

Make the port incision just lateral to the right margin of the rectus abdominis muscle and 1 to 2 cm caudal to the 13th rib (A). Place the 10-mm cannula in a similar fashion under laparoscopic visualization. Once both ports are in place, reduce insufflation to 8 mm Hg (B).



STEP 3

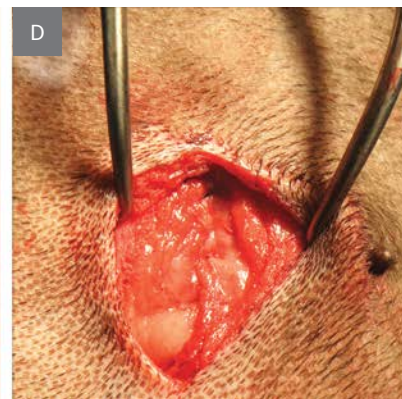
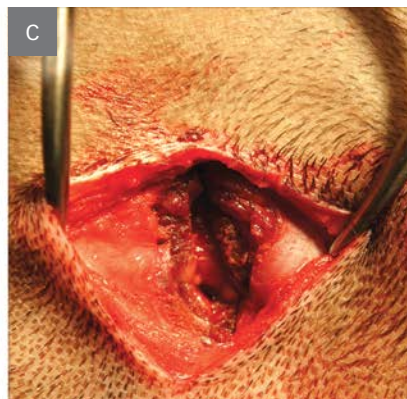
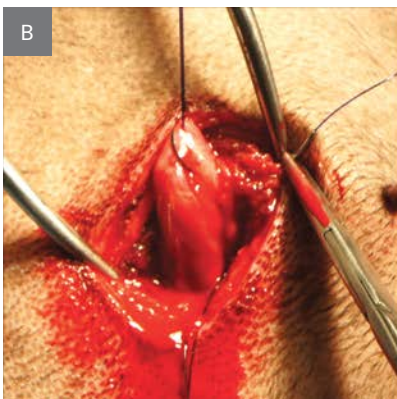
Place laparoscopic Babcock forceps into the cranial port, and grasp the pyloric antrum midway between the greater and lesser curvatures (**A**). Once the pylorus is firmly grasped, deflate the abdomen. Remove the Babcock forceps and cannula at the same time, exteriorizing the pyloric antrum (**B**).

Extend the incision in the abdominal wall musculature to a length of 4–5 cm in a direction parallel to the last rib (*not shown*). Using 2-0 PDS on a taper needle, place a simple interrupted suture through the cranial-most extent of the proposed gastropexy site and then through the corresponding cranial point of the incision into the transversus abdominis. Do not remove the needle from this suture. Repeat the same step for the caudal extent of the proposed gastropexy site using a new reel of suture, roughly 4 cm caudal to the first suture. The needles will remain on these stay sutures, as they will be used to suture the gastropexy in a continuous pattern after the incision into the antrum is made. After stay sutures are placed, release the Babcock forceps from the antrum.



STEP 4

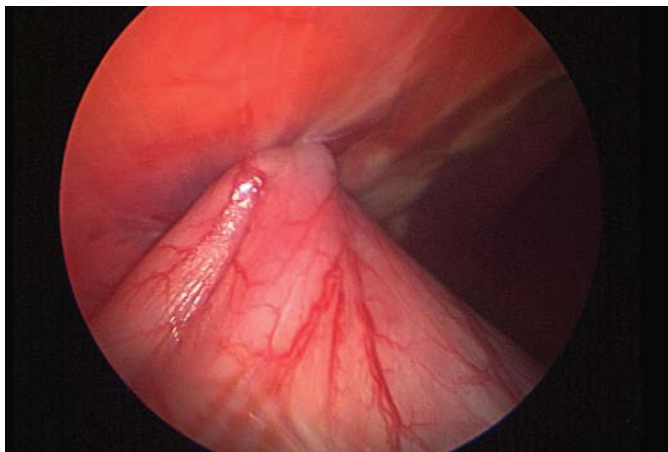
Make a 4-cm incision in the seromuscular layer of the pyloric antrum (**A**). Starting from the previously placed stay sutures, suture the seromuscular incision to the edges of the incision in the transversus abdominis (**B**) as described with the open technique until both edges are sutured and there is 360° contact between them (**C**). Close the external and internal abdominal oblique muscles over the gastropexy site using 2-0 PDS (**D**).



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STEP 5

Before routine closure of the subumbilical laparoscope port, observe the gastropexy site laparoscopically to ensure that no malposition of the antrum resulted from the procedure. If no problems are identified, remove the port and close the body wall, subcutaneous tissue, and skin routinely. ■ **cb**



PDS = polydioxanone suture

References

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