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Preparation of Stomach Pouch Without Interruption of Vagal Supply.***FRANKLIN HOLLANDER AND EDWARD E. JEMERIN.***From the Laboratories of the Mount Sinai Hospital, New York City.*

As demonstrated previously,¹ the ventral and dorsal gastric vagus trunks in the dog run symmetrically with each other along the lesser curvature of the stomach. Their secondary branches pass across the stomach, transversely to its long axis (Fig. 1). The Pavlov pouch technic was based upon the erroneous anatomical concept that only the ventral trunk runs along the lesser curvature, whereas the dorsal trunk courses along the greater curvature. In consequence, the bulk of the vagal supply to the pouch was unwittingly sacrificed by the operative procedure. To determine whether there exists a physiological counterpart to this anatomical deficiency, it is necessary to compare the Pavlov type of pouch with one in which the vagi are anatomically undisturbed. Such a pouch has been successfully made in 6 animals by the following technic:

An upper abdominal incision is made slightly to the left of the midline, to avoid the falciform ligament. The stomach is delivered through the wound, milked out, and a single gastric clamp is applied parallel to its long axis and across both fundus and pylorus, as high up as the exposure will permit (Fig. 1). The abdomen is then packed off in the usual manner. The anterior vagal trunk may be seen accompanying the right and left gastric arteries along the lesser curvature of the stomach; its secondary branches accompany the secondary vascular branches (not shown) as they run transversely to the long axis of the stomach. The initial incision in the stomach starts at A on the greater curvature, about 1 inch proximal to the junction of the pyloric antrum with the body of the stomach. From this point it runs about half way across both the anterior and posterior stomach walls in a direction parallel to the secondary vagal branches. The incision is made through the entire thickness of both gastric walls, terminating at B on the anterior wall and at C on the posterior. Preliminary ligation of the gastro-epiploic vessels or their branches is not necessary since these can usually be separated bluntly from the greater curvature for a sufficient distance

* Supported in part by a grant from the Friedsam Foundation.

¹ Jemerin, E. E., and Hollander, F., *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **88**, 139.

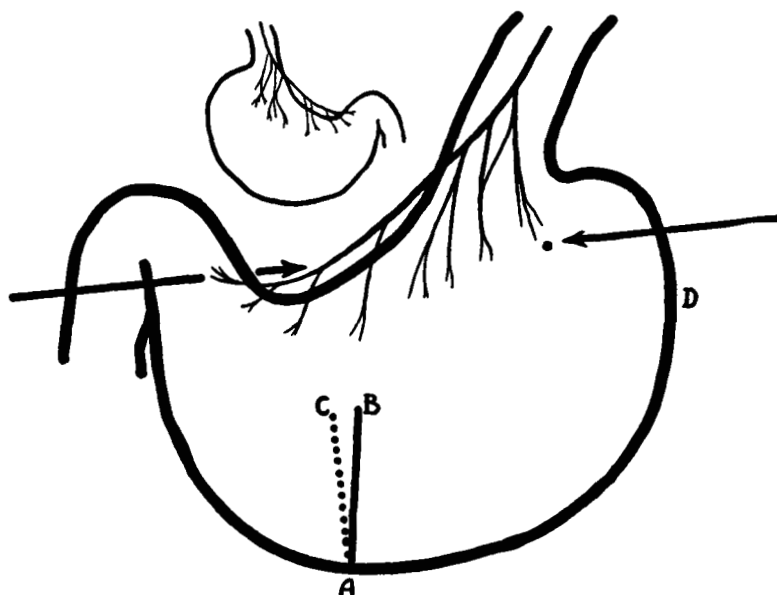


FIG. 1.

Diagram of anterior surface of dog's stomach showing direction of initial incisions in relation to course of anterior vagus trunk and branches. Insert shows symmetrical position of posterior vagus.

A-B: Initial anterior gastric wall incision.

A-C: Corresponding posterior gastric wall incision.

D: Proximal, fundal limit of pouch.

Arrows: Approximate position of gastric clamp.

to permit the incision to be effected. To demarcate the fundal, proximal limit of the pouch, point D on the greater curvature is now selected by projecting a line from B (or C) to the greater curvature in the direction of the long axis of the stomach. The point is marked by a double threaded suture, both ends of which are passed from without inward so that traction may later be made by the suture from within the lumen of the stomach. The portion of the stomach to be converted into the pouch, about $\frac{1}{3}$ of the whole, is now outlined by the points A, B, C, and D.

In order to complete the separation of pouch and stomach, B and C are next connected to D by incision of the mucosa and part of the thickness of the submucosa. This is effected as follows. The stomach is turned inside out along the line B-D, this being facilitated by traction on the suture at D. The assistant's finger is placed under the serosal aspect of the line B-D, exposing the mucosal side; the mucosal corrugations are eliminated by applying the proper degree of tension. With a very sharp scalpel, the mucosa is incised along the line B-D, and without releasing the position or tension,

flaps of mucosa about three-eighths of an inch wide are dissected back on either side of the incision by sharply splitting the submucosa. Care must be taken not to traumatize or shred the mucosa, and not to dissect deeper than the submucosa. The same process is repeated along C-D, thus completing the mucosal incision from B to D to C without affecting seromuscular continuity. Hence, the branches of the vagus nerve pass uninjured from the main stomach into the pouch.

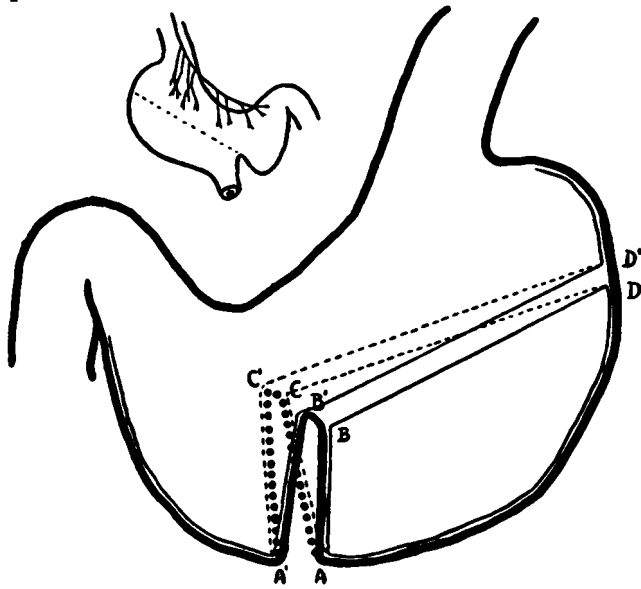


FIG. 2.

Diagram illustrating stomach with incisions completed. Fine lines represent mucosa; heavy lines sero-muscular layers. Insert shows completed pouch (posterior aspect) with uninterrupted vagal supply.

AB: Edge of incision through all gastric layers; anterior surface; pouch side.

AC: Edge of incision through all gastric layers; posterior surface; pouch side.

A'B' and A'C': Corresponding incision edges; gastric side.

BD: Edge of incision through mucosa only; anterior surface; pouch side.

CD: Edge of incision through mucosa only; posterior surface; pouch side.

B'C' and C'D': Corresponding incision edges; gastric side.

For descriptive purposes, points on the stomach side of the incision will now be called A', B', C', etc., corresponding to A, B, C, etc., on the pouch side (Fig. 2). Beginning at D, flap D-B is now sutured to flap D-C, using a running inverting suture of fine silk or Pagenstecher linen. In order to prevent excessive purse-stringing, the suture is interrupted every few stitches by locking or tying. On the stomach side, D'-B' is similarly sutured to D'-C'. This results in the separation of the stomach from the pouch by a double-layered septum of mucous membrane. Sutures should be small and closely

spaced. They should pass through the submucosa only and must not pierce the flap, as this predisposes to future communications between the pouch and the stomach. Particular care must be taken in laying down this suture line since the extensive length of the septum increases the likelihood of its perforation. Such perforation occurred several times during our early operative efforts, but rarely thereafter—as indicated by the absence of ingested carmine from the pouch contents.

Closure of the stomach is now completed by suturing B'-A' to C'-A'. Similarly, B-A is sewed to C-A, leaving, however, an opening at A for the pouch mouth. We prefer having this fistula no larger than sufficient to admit a 16 French catheter.

A small counter-incision is made in the abdominal wall, to the left of the main wound, at the site where the pouch can be brought up with the least possible tension. Skin and fascia are incised, while muscle is separated bluntly. After incising the peritoneum, the pouch mouth is brought up through this counter-incision and sutured to peritoneum, fascia and skin. The small size of the pouch stoma, plus the natural tonus of the bluntly separated musculature through which it has been brought out upon the abdominal wall, usually result in sufficient sphincter action so that gastric juice will be retained within the pouch. Thus, retention experiments, unaccompanied by the disadvantages of an indwelling catheter, can be performed as previously described by Hollander and Cowgill.²

The main wound is closed in layers. A soft, rubber, 16 French catheter must be inserted into the pouch at the end of the operation and left there for several days. Otherwise, tension due to accumulated blood and gastric secretion may lead to rupture of the septum or to perforation into the free peritoneal cavity.

Fig. 2 insert is a diagram of the completed pouch, illustrating its uninterrupted vagal supply. Experiments are now in progress, comparing the psychic response of such pouches with that of typically constructed Pavlov and Heidenhain pouches.

² Hollander, F., and Cowgill, G. B., *J. Biol. Chem.*, 1931, **91**, 151.