

A Modification of the Method of Hollander and Jemerin for Making Pavlov Pouches.

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On the basis of their study of the distribution of the vagus nerves to the stomach of the dog, Hollander and Jemerin^{1, 2} developed a technic of making the Pavlov type of gastric pouch. They found fewer vagal nerve fibers were divided in their procedure than in the original Pavlov operation.³ Jemerin and Hollander emphasized the finding that in the dog, as in man, both vagus nerves course along the lesser curvature of the stomach. From the left vagus nerve, which lies anteriorly, branches traverse the anterior wall of the stomach toward the greater curvature while, from the right vagus nerve, branches supply the posterior wall as they pass toward the greater curvature.

As a result of these studies, new technics for making Pavlov pouches have been developed in the last few years. Cope, MacMahon, Hagströmer and Thompson,⁴ having confirmed the findings of Hollander and Jemerin with respect to the distribution of the vagus nerves to the stomach, developed a two-stage operation for making a pouch with an open but non-leaking stoma. Neuwelt, Olson and Neeheles⁵ have presented a simplification of the Hollander-Jemerin procedure in which, however, four-fifths of the vagal nerve supply to the anterior wall of the pouch is sacrificed. We wish to present another modification of the Hollander-Jemerin technic as applied to the dog, which we have found renders the operation less difficult and which preserves most of the vagal nerve supply to the anterior wall of the pouch and all of the supply to the posterior wall of the pouch.

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¹ Jemerin, E. E., and Hollander, Franklin, *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **38**, 139.

² Hollander, Franklin, and Jemerin, E. E., *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **39**, 87.

³ Pavlov, I. P., *The Work of the Digestive Glands*, J. B. Lippincott Company, 1910.

⁴ Cope, Oliver, MacMahon, C. E., Hagströmer, Anders, and Thompson, R. H., *Arch. Surg.*, 1940, **40**, 717.

⁵ Neuwelt, F., Olson, W. H., and Neeheles, H., *PROC. SOC. EXP. BIOL. AND MED.*, 1940, **44**, 74.

With the dog under ether anesthesia and with aseptic technic, the abdominal cavity is entered either through an incision in the median line or through an oblique incision passing about 2 cm caudal to the left costal margin and dividing the left *rectus abdominis* muscle and the abdominal musculature lateral to it. The spleen is delivered to the outside and wrapped in a warm, moist towel. The stomach is drawn into the wound and a rubber bootied clamp is placed across it, close to the lesser curvature and parallel to the long axis of the dog (Fig. 1 b). After the rest of the peritoneal cavity has been protected by gauze packs, a curved incision is made in the stomach parallel to the greater curvature and about 1 or 2 mm from the point of disappearance of the gastro-epiploic vessels into the muscular wall of the organ. As a rule this incision does not extend beyond the corpus of the stomach. It should stop 1 cm or more to the oral side of the antrum and usually need not be carried into the fundus. To control bleeding the larger gastro-epiploic vessels, as they lie between the muscle and the mucosa, are clamped in small hemostats. This incision, placed as it is, near the greater curvature, leaves the vagal nerve supply to most of the anterior wall of the pouch intact and that to the posterior wall untouched.

The next step in the operation is to prepare the septum of mucous membrane which is to separate the main stomach from the pouch (Fig. 1 a). This is done by means of an incision in the mucosa of the stomach, running obliquely downward from the fundus above toward the junction of the corpus and antrum below. The incision is carried through the mucous membrane of the anterior and of the posterior wall of the stomach, with corresponding points on the anterior and posterior segments being equidistant from the greater curvature and a sufficient distance from the lesser curvature to allow room for the passage of food (Fig. 1 a). The incision in the mucosa of the anterior wall is joined superiorly and inferiorly with that of the posterior wall so that at this stage of the operation the incision presents an oval appearance (Fig. 1 c). A cuff of mucous membrane, sufficient to allow easy inversion, is dissected free from the underlying muscle at the edges of the incision. The free edge of the cuff lying nearest the lesser curvature on the anterior wall is joined by the Connell type of suture to the corresponding mucosal edge of the posterior wall, effecting an inversion of mucosa into the main stomach (Fig. 1 c). Then, the remaining 2 mucosal flaps are sutured in such a way that they are inverted into the pouch, completing the formation of a mucosal septum in the stomach (Fig. 1 d). The original incision in the stomach is closed in 2 layers. As a

routine, the pouch has been drained by a number 18 dePezzer rubber catheter (Fig. 1 e). In a few instances the Neuwelt, Olson and Necheles type of stainless steel cannula has been used. The rubber tube or cannula is threaded through the omentum and brought out through the abdominal incision or through a separate stab wound in the abdominal wall. Results have indicated that an exit for the tube or cannula separate from the incision allows more rapid healing of the wound. Care must be taken properly to invert the mucosa and

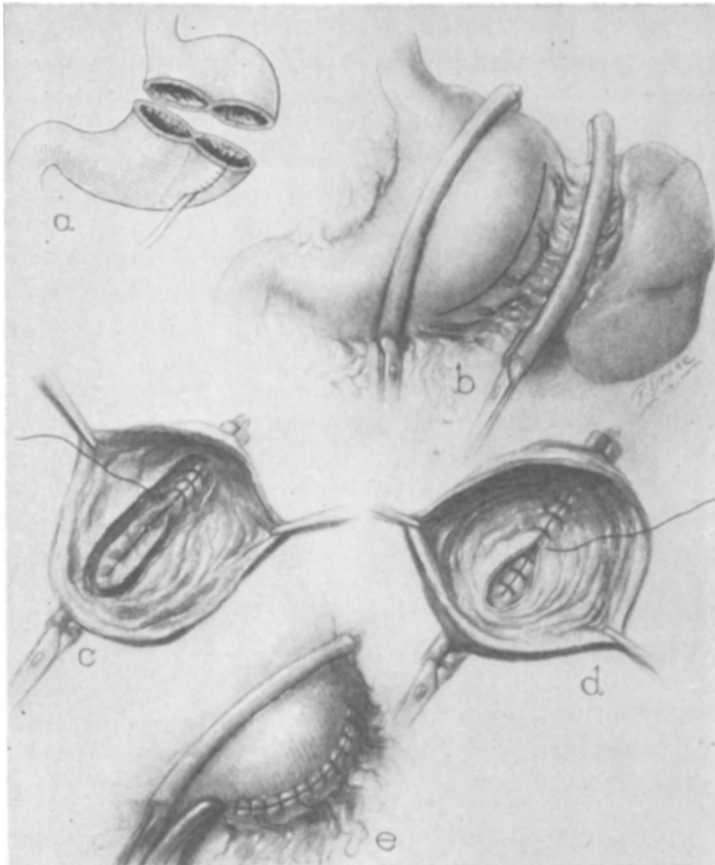


FIG. 1.

Method of preparing Pavlov type of gastric pouch: *a*, cross section of stomach removed to show pouch and main stomach separated by mucosal septum; *b*, incision into stomach; *c*, oval incision in mucosa with posterior edges of mucosa sutured to form one layer of mucosal septum; *d*, oval incision in mucosa with anterior edges partly sutured to complete part of the mucosal septum; *e*, pouch closed and drained with de Pezzer catheter. Sutures shown in drawings are diagrammatic. Actually the mucosa is inverted and closed in all instances by a Connell suture and the muscle and serosa of the incision into the stomach are brought together by a simple over and over suture.

muscle around the catheter or cannula. The abdominal incision is closed in two layers; the peritoneum with linen and the fascia with number 1 chromic catgut.

Postoperatively the animals often molest the dePezzer catheters and at times it has been necessary to place a new catheter in the pouch. This complication can be avoided by directing the catheter into a rubber balloon to catch the material which drains forth and protecting the balloon and catheter with a basket strapped to the animal. In this study, however, the basket and balloon were seldom used. Our experience indicates that the presence of the soft rubber catheter in Pavlov or Heidenhain pouches is well tolerated. Fasting values of 0.0 to 0.05 cc of juice per half hour, with no free acid present, are obtained routinely from pouches drained by rubber catheters. Observations in the course of this investigation on pouches drained by the Neuwelt, Olson and Necheles stainless steel cannulas have been too limited to justify conclusions.

In response to a meat meal a Pavlov pouch, prepared by the procedure outlined in this report, quickly yields a highly acid gastric juice (Table I).

Summary. By modification of the Hollander-Jemerin technic of making a Pavlov type pouch, the vagal nerve supply to most of the anterior wall of the pouch, and to all of the posterior wall, is preserved.

TABLE I.
Responses of a Pavlov Pouch in a Dog Weighing 7 kg to 7 Feedings of 100 g of Raw, Lean Horse Meat. Samples Collected at Half-hour Intervals Before and After Feeding.

Half-hour samples	Volume of juice, cc			% free HCl in juice			Avg HCl output, mg per hr
	Max.	Min.	Avg	Max.	Min.	Avg	
Control	0.6	0.0	0.18	.0	.0	.0	0.0
1	14.9	7.0	10.2	.551	.408	.476	49.6
2	21.3	13.6	17.8	.602	.537	.569	102.0
3	21.3	13.7	16.6	.602	.569	.581	96.7
4	15.6	11.7	13.5	.598	.572	.581	78.5
5	13.4	9.2	10.8	.613	.562	.579	62.3
6	10.8	6.5	7.8	.584	.558	.570	44.2
7	6.1	3.5	5.2	.555	.537	.546	28.1
8	5.0	1.8	3.2	.533	.486	.512	17.4
Total 4-hour output			85.1				