

Laparoscopic feeding jejunostomy: also a simple technique

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Summary. Placement of feeding tubes is a common procedure for general surgeons. While the advent of percutaneous endoscopic gastrostomy has changed and improved surgical practice, this technique is contraindicated in many circumstances. In some patients placement of feeding tubes in the stomach may be contraindicated due to the risks of aspiration, gastric paresis, or gastric dysmotility. We describe a technique of laparoscopic jejunostomy tube placement which is easy and effective. It is noteworthy that this method may be used in patients who have had previous abdominal operations, and it has the added advantage of a direct peritoneal view of the viscera. We suggest that qualified laparoscopic surgeons learn the technique of laparoscopic jejunostomy.

Key words: Laparoscopy – Surgical feeding tube – Small intestinal feeding

With the unprecedented popularity and increasing safety and efficacy of laparoscopic cholecystectomy [6], laparoscopy has been increasingly used for other purposes. Some of these new laparoscopic procedures include cholangiography [2, 12], appendectomy [5, 8], lysis of adhesions [9, 10], inguinal hernia repair [11], proximal gastric vagotomy, diagnostic laparoscopy for trauma [3, 4], laparoscopy for unexplained abdominal pain and tumor staging [7], and more recently, gastrostomy tube placement [4]. Using a modification of the latter procedure, we performed placement of a feeding jejunostomy tube as a new laparoscopic procedure.

History

The patient was a 62-year-old white male who presented to the neurosurgical service after a fall. He sustained a serious cervical spine fracture and remained a complete C-4 quadriplegic requiring mechanical ventilation. The patient's past medical history was sig-

nificant for previous "ulcer surgery" with exact type unknown and a well-healed upper midline scar. Because of chronic ventilator dependency and inability to take oral feedings, the general surgery service was consulted for placement of a permanent feeding tube. Because of an unstable cervical spine fracture and because of his previous gastric surgery, percutaneous endoscopic feeding tube placement was felt to be contraindicated. He was noted to have frequent appearance of bilious material in his pharynx, raising the suspicion of aspiration, and because of this, a jejunostomy tube was chosen over a gastrostomy tube.

Procedure

In the operating room, a general anesthetic was used. After preparation of the skin with iodophor solution and sterile drape, the abdominal cavity was insufflated with a Veress needle at the umbilicus. A 10-mm disposable trocar/port (Surgiport U.S. Surgical, Norwalk, CT) was inserted into the peritoneal cavity at the umbilicus. Initial inspection revealed adhesions present over the proximal jejunum, stomach, and liver which were easily dissected to clearly identify an isoperistaltic antecolic Bilroth II anastomosis. Two 5-mm trocar/ports were introduced in both the right and left upper quadrants to allow the insertion of grasping forceps (Fig. 1 inset). Using atraumatic grasping forceps as one would use their hands, we were able to "run" the small bowel and to clearly define the ligament of Treitz, the afferent, and the efferent limbs of the Bilroth II anastomosis.

The technique employed for jejunostomy tube placement was a modification of a technique which we have previously described for laparoscopic gastrostomy [4]. A loop of jejunum, at least 40 cm distal to the gastroenterostomy, was brought up to the abdominal wall while finger pressure was applied from the outside. Once the location of the jejunostomy tube was determined, a 3-0 polypropylene suture on a straight needle was passed through the anterior abdominal wall, leaving the distal suture free outside the skin. Using the grasping forceps, a jejunal seromuscular stitch was placed and the needle was brought back out through the abdominal wall. Two additional "transabdominal" sutures were placed, each with seromuscular "bites" of jejunum. These transabdominal sutures allow the intestine to be brought up to the anterior abdominal wall (Fig. 1).

For placement of the jejunostomy tube, the needle jejunostomy kit (Vivonex) was used. The introducer needle was passed percutaneously, visualizing the needle as it entered the abdomen. Then, while holding the jejunum in place with three-point traction, the introducer needle was placed through the jejunal wall. The feeding tube with guidewire was then passed through the introducer needle. Finally, the introducer needle and guidewire were removed, the jejunum was brought up flush to the anterior abdominal wall, and the polypropylene sutures were tied extracorporeally to the abdominal skin. Small pieces of retention suture bolster (latex rubber tubing) were placed beneath the polypropylene sutures to prevent pressure necrosis of the skin. These sutures rigidly affix the jejunum against the anterior

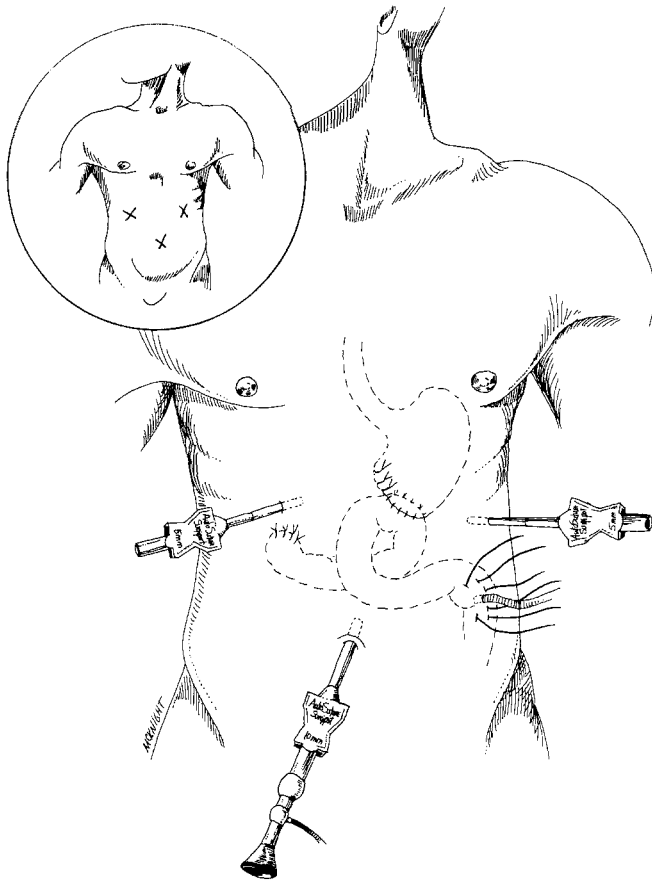


Fig. 1. Inset showing trocar sites. Larger depiction of anatomical findings, jejunal catheter, and transabdominal fixation sutures

abdominal wall. The last step was to perform a roentgenogram after instillation of water-soluble radiographic contrast material to document intraluminal location. The patient returned to the intensive-care unit and was started on tube feedings immediately.

Discussion

The choice of the small intestine as a site for feeding may be preferable in some patients. Those with gastric atony and hypomotility may be poor candidates for gastric feeding and be better served by small-intestinal feeding. Those at risk for gastric aspiration may also be best served by jejunal feeding tubes. Patients who have physiologic "short gut" or postvagotomy syndromes may be poor candidates for small intestinal feedings.

Although this procedure was made slightly more difficult by the fact that the patient had undergone previous gastric surgery, the technique described above is a modification of that used repeatedly in our institution for gastrostomy tube placement and allowed uncomplicated placement of a jejunostomy tube. The technique is relatively easy and can be performed in less than 1 h by anyone skilled in the use of laparoscopy. Although we used a needle catheter jejunostomy kit in this case, there is no reason why a larger catheter could not be used in place of the needle catheter kit. It

is also possible that this small needle catheter could be changed to a larger one by fluoroscopic Seldinger techniques. We leave the polypropylene sutures in place for 2 weeks to insure that the jejunum becomes attached to the anterior abdominal wall.

While our procedure has been without complications, a number of potential complications could occur. These include volvulus at the jejunostomy site, late obstruction, and fistula formation. Catheter occlusion has been a problem in the past with small-caliber feeding catheters particularly when used for administration of pulverized medications. Additional complications could be anticipated similar to other laparoscopic procedures including insufflation peritonitis, diaphragmatic irritation with shoulder pain, trocar injuries, and electrocautery or laser injuries.

Presently, the role of laparoscopy in feeding-tube insertion is in a state of evolution. It is certainly invasive and requires at least some form of anesthesia. It may have less-favorable economics than percutaneous endoscopic techniques, but is most applicable in those in whom percutaneous endoscopic techniques are contraindicated or technically impossible. Whether laparoscopic feeding-tube placement offers the same diminished morbidity as laparoscopic cholecystectomy is unknown. It is our opinion that there is substantially less invasion and less abdominal-wound morbidity.

As the age of laparoscopic surgery appears to have arrived, the possible applications are limited only by our imagination, instruments, and practice. We would urge qualified laparoscopic surgeons to add feeding jejunostomy to their armamentarium.

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References

1. Berci G, Dunkelmann D, Michel SL, Sanders G, Wahlstrom E, Morgenstern L (1983) Emergency minilaparoscopy in abdominal trauma: an update. *Am J Surg* 146: 261-265
2. Berci G, Sackier JM, Paz-Partlow M (1991) Routine of selected intraoperative cholangiography during laparoscopic cholecystectomy? *Am J Surg* 161: 355-360
3. Kathouda N, Mouiel J (1991) A new technique of surgical treatment of chronic duodenal ulcer without laparotomy by videocoelioscopy. *Am J Surg* 161: 361-364
4. Murphy C, Albrink MH, Rosemurgy AS, Carey LC (in press) Laparoscopic gastrostomy: a simple technique. *Surg Gynecol Obstet*
5. Peir A, Gotz F (1991) Laparoscopic appendectomy: report of 625 cases. *Surg Laparosc Endosc* 1: 8-13
6. Peters JH, Ellison EC, Innes JT, Liss JL, Nichols KE, Lomano JM, Roby SR, Front ME, Cary LC (1991) Safety and efficacy of laparoscopic cholecystectomy: a prospective analysis of 100 initial patients. *Ann Surg* 213: 3-12
7. Sackier JM, Berci G, Paz-Partlow M (1991) Elective diagnostic laparoscopy. *Am J Surg* 161: 326-313
8. Schreiber JH (1990) Laparoscopic appendectomy in pregnancy. *Surg Endosc* 4: 100-102
9. Semm K. Advances in pelviscopic surgery. *Curr Prob Obstet Gynecol* 1982;15
10. Semm K. (translated by Frederich ER) (1987) Operative manual for endoscopic abdominal surgery. Yearbook Medical Publishers, Inc., Chicago
11. Some new twists to one of the most common procedures in US general surgery (1989) *JAMA* 262: 3248-3249
12. Sopor NJ (1991) Laparoscopic cholecystectomy. *Curr Prob Surg Sept.* XXVII (9)