

Laparoscopic Witzel jejunostomy

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Abstract

The placement of a feeding jejunostomy can be indicated in malnourished patients with gastric and oesophagogastric junction cancer to allow for enteral nutritional support. In these patients, the jejunostomy tube can be suitably placed at the time of staging laparoscopy. Several techniques of laparoscopic jejunostomy (LJ) have been described, yet the Witzel approach remains neglected, due to the perceived difficulty of suturing the bowel around the tube and securing them to the abdominal wall. Here, we describe a novel technique for LJ, using a single barbed suture for securing the bowel and tunnelling the jejunostomy catheter according to the Witzel approach.

Keywords: Enteral nutrition, oesophagogastric junction cancer, gastric cancer, jejunostomy, laparoscopic jejunostomy

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INTRODUCTION

The placement of a feeding jejunostomy can be indicated in malnourished patients with foregut malignancy to allow for enteral nutritional support during neoadjuvant therapy and in the perioperative period.^[1] In these patients, feeding jejunostomy is suitably placed at the time of explorative laparoscopy, which is usually performed for proper staging of gastric and oesophagogastric junction cancers.

Several techniques of laparoscopic jejunostomy (LJ) have been described, yet the Witzel approach remains neglected due to the perceived difficulty of suturing the bowel around the tube and securing them to the abdominal wall. Direct access to the bowel, the use of T tubes, the simultaneous placement of multiple holding sutures, the

use of peel-away introducers, sealing the entry site with barbed sutures: all these technical variations testify to the complexity of this operation, which is quite often underestimated.^[2-10]

Here, we present our original technique for LJ, using a single barbed suture for securing the bowel and tunnelling the jejunostomy catheter according to the Witzel approach [Video 1].

PREOPERATIVE PREPARATION

A single absorbable polyglyconate knotless wound closure device (V-Loc™ 180, Medtronic, USA) with a taper point needle and a 14 Fr jejunostomy catheter is required. The proposed jejunostomy site is located preoperatively with the patient in the supine, sitting and standing positions and drawn on the skin with a permanent marker.

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POSITIONING OF PATIENT AND PORTS

Positioning of the patient

The patient is placed supine, with the right arm at the side [Figure 1a].

The surgeon is on the patient's right side; the assistant stays on the surgeon's left side; the monitor stays behind the patient's left shoulder.

Port site placement

A 10-mm trocar (U-T) is placed in the midline just above the umbilicus. A 10-mm trocar (RIF-T) is placed in the right iliac fossa, 2 cm below the McBurney's point. Then, a 5-mm trocar is placed in the hypogastric midline (HYP-T) [Figure 1b].

Operative steps

Step 1: Selection of the jejunal loop

The patient is placed in the reverse Trendelenburg position, the left side inclined upward. The laparoscope is inserted through the RIF-T. The U-T and the HYP-T are used by the surgeon [Figure 1c].

The greater omentum is placed in the supramesocolic space; the small bowel is displaced to the right and inferiorly, and the duodeno-jejunal junction is identified.

A loop of jejunum is chosen 30–40 cm from the ligament of Treitz and marked with a clip [Figure 1d].

Step 2: Preparation of the jejunostomy site

A 5-mm trocar is inserted at the jejunostomy site (J-T), with the tip placed just below the peritoneal plane [Figure 2a]. The suture begins 1.5 cm cranial to the tip of the J-T, where the needle is passed clockwise through the abdominal wall [Figure 2b] and then through the anchoring hole of the barbed suture [Figure 2c]. Finally, the needle is passed again through the abdominal wall 5 mm below to bring the suture to the left side of the J-T [Figure 2d].

Step 3: Anchoring the selected jejunal loop to the abdominal wall

The needle is passed clockwise through the seromuscular layer of the selected jejunal loop and then through the abdominal wall 5 mm before the tip of the J-T [Figure 3a and b]. The jejunal loop is gently brought toward the abdominal wall and the suture is secured. This passage is repeated, with the needle going through the seromuscular layer of the bowel and finally through the abdominal wall, just before the tip of the J-T [Figure 3c]. The suture is secured again [Figure 3d].

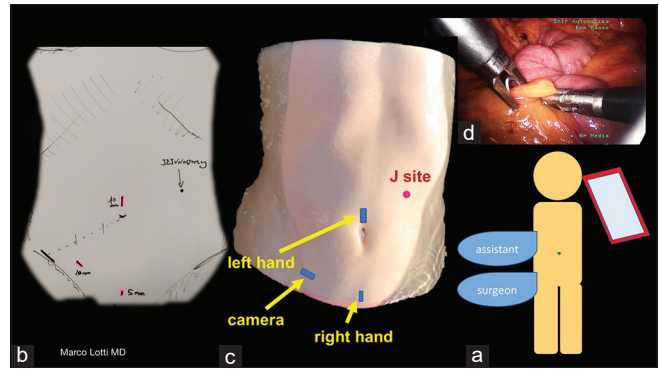


Figure 1: (a) Positioning of patient, (b) ports and (c) instruments

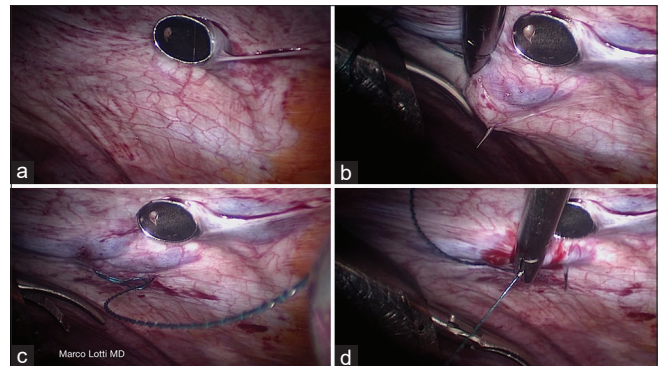


Figure 2: Preparation of the jejunostomy site. (a) Insertion of the trocar, (b) first bite, (c) anchorage of the suture, (d) second bite

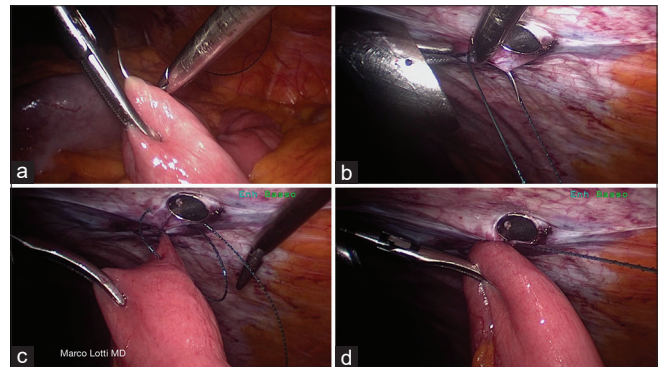


Figure 3: Anchoring the selected jejunal loop to the abdominal wall. (a) First bite through the bowel, (b) first bite through the abdominal wall, (c) second bite, (d) securing the suture

Step 4: Placement of the feeding tube

A small incision is made with the monopolar hook on the antimesenteric border of the jejunum, 4.5 cm caudal to the anchorage site [Figure 4a]. The feeding tube is inserted in the J-T, and the J-T is pushed forward to guide the tube through the hole of the bowel [Figure 4b and c]. Finally, the feeding tube is pulled and guided into its final position [Figure 4d].

Step 5: Getting into the tunnel

The J-T is retrieved. The needle is passed clockwise through the bowel wall, then over the feeding tube,

then again through the bowel wall and finally through the abdominal wall just below the entry point of the tube [Figure 5a-c]. The suture is secured, thus creating the conditions to start with the tunnelling of the jejunostomy [Figure 5d].

Step 6: Getting out of the tunnel and securing the bowel

The tunnel is created as per the procedure described in Step 5, the only difference being that the abdominal wall is pierced only once, halfway between the beginning and the end of the tunnel [Figure 6a and b]. This trick allows for a better compliance of the bowel wall and facilitates the control over the suturing to warrant the complete covering of the catheter without tension [Figure 6c]. When the tunnel is finished, the abdominal wall is pierced two times and the suture is finally secured [Figure 6d]. When securing the bowel to the abdominal wall, a cranio-caudal direction is maintained [Figure 7].

POSTOPERATIVE CARE

The feeding tube is flushed with saline to check for easy flow and then it is secured to the skin. The jejunostomy can be used since the 1st postoperative day.

CONCLUSION

The Witzel approach is often the preferred one during open surgery for several reasons. Placing the exit to the skin far from the entrance of the tube into the bowel is a way to reduce the occurrence of reflux of the bowel contents from the skin orifice, which usually causes inflammation, granulation and infection. Moreover, the complete covering of the entrance of the tube into the bowel by the seromuscular suture, and the wider contact of the bowel with the abdominal wall, can reduce the risk of detachment, dislodgement and peritonitis. Finally, compared to the needle catheter techniques, the Witzel approach allows for the use of larger catheters, reducing the risk of clogging and obstruction.

We developed our LJ technique to reproduce laparoscopically the Witzel approach as in open surgery, since the several techniques of LJ we found available in the literature are compromises that do not allow for the same effectiveness in the tunnelling of the jejunostomy catheter. We did not observe intraoperative complications, and our average operative time is 45 min. This technique is minimal-equipment and cheap; moreover, the J-T can be used also for the explorative laparoscopy, before being the entry site of the catheter.

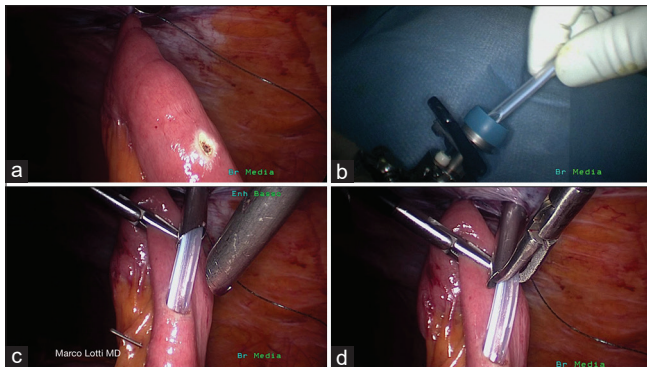


Figure 4: Placement of the feeding tube. (a) Bowel incision, (b) inserting the tube through the trocar, (c) placing the tube and (d) guiding it into position

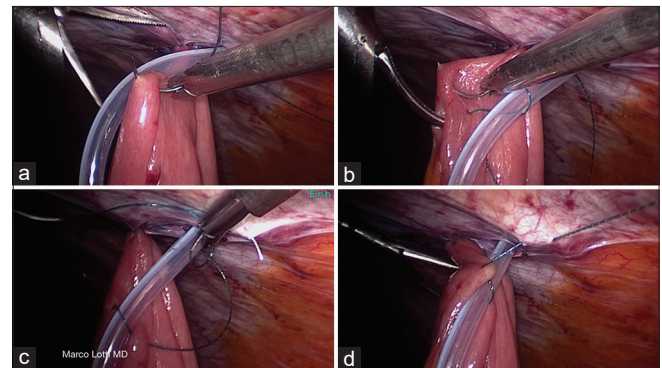


Figure 5: Starting with the tunnelling. (a) Driving the needle through the bowel, (b) over the tube, (c) through the abdominal wall and (d) securing the suture

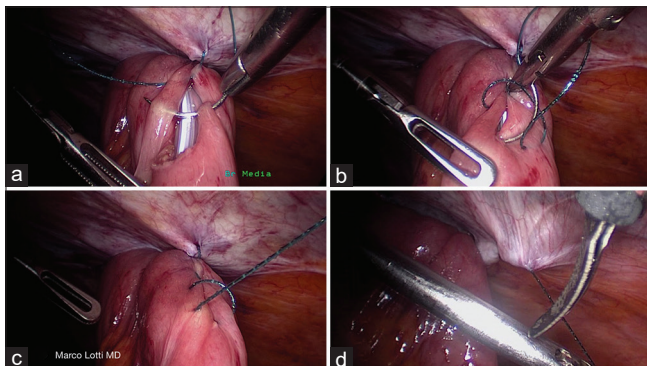


Figure 6: (a and b) proceeding with the tunnel, (c) completing the covering of the tube and (d) securing the bowel to the abdominal wall

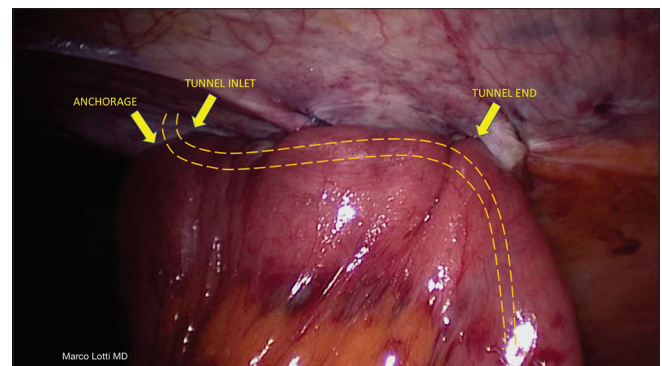


Figure 7: The jejunostomy onsite

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Tapia J, Murguia R, Garcia G, de los Monteros PE, Oñate E. Jejunostomy: Techniques, indications, and complications. *World J Surg* 1999;23:596-602.
2. Collard MK, Genser L, Vaillant JC. Direct laparoscopic feeding jejunostomy. *J Visc Surg* 2019. pii: S1878-7886(19)30101-8.
3. Siow SL, Mahendran HA, Wong CM, Milaksh NK, Nyunt M. Laparoscopic T-tube feeding jejunostomy as an adjunct to staging laparoscopy for upper gastrointestinal malignancies: The technique and review of outcomes. *BMC Surg* 2017;17:25.
4. Irwin MP, Chan KJ, Fenton-Lee D. How to do a simple laparoscopic jejunostomy. *ANZ J Surg* 2018;88:504-5.
5. Tsujimoto H, Hiraki S, Takahata R, Nomura S, Ito N, Kanematsu K, *et al.* Laparoscopic jejunostomy for obstructing upper gastrointestinal malignancies. *Mol Clin Oncol* 2015;3:1307-10.
6. Yang SM, Hsiao WL, Lin JH, Huang PM, Lee JM. Laparoscopic percutaneous jejunostomy with intracorporeal V-loc jejunopexy in esophageal cancer. *Surg Endosc* 2017;31:2678-86.
7. Speer EA, Chow SC, Dunst CM, Shada AL, Halpin V, Reavis KM, *et al.* Clinical burden of laparoscopic feeding jejunostomy tubes. *J Gastrointest Surg* 2016;20:970-5.
8. Pili D, Ciotola F, Riganti JM, Badaloni A, Nieponice A. Autoadjustable sutures and modified seldinger technique applied to laparoscopic jejunostomy. *World J Surg* 2015;39:325-7.
9. Ye P, Zeng L, Sun F, An Z, Li Z, Hu J. A new modified technique of laparoscopic needle catheter jejunostomy: A 2-year follow-up study. *Ther Clin Risk Manag* 2016;12:103-8.
10. Bakhos C, Patel S, Petrov R, Abbas A. Jejunostomy-technique and controversies. *J Vis Surg* 2019;5. pii: 33.