

The Occlusive Tourniquet: A Simple Method for Rectal Stump Washout During Open and Laparoscopic Surgery

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Rectal stump washout with cytolytic agents is recommended and usually performed during anterior rectal or rectosigmoid resection. The use of a linear stapler instrument during ultralow anterior resection makes the placement of pelvic clamps difficult for rectal stump washout prior to resection. The objective of this work is to demonstrate the use of a simple procedure, the occlusive tourniquet for rectal stump washout. Occlusive tourniquet applied to open technique: after complete dissection of the rectum and sigmoid colon according to the usual technique, a simple piece of tubing from an intravenous line is passed behind and around the rectum/sigmoid colon at some point distal to the tumor to form an occlusive tourniquet. Occlusive tourniquet applied to laparoscopic technique: similar to the open technique, tubing is passed through the left iliac fossa trocar and passed behind the sigmoid mesocolon. This simple procedure allows easy exposure and dissection of the mesorectum, without traumatizing the rectum/sigmoid colon or the tumor and lavage can be performed without the need for clamps or other instruments which may traumatize the rectum and provoke anastomotic failure. In conclusion, the occlusive tourniquet is a simple method for rectal stump washout so this step can be done.

KEY WORDS: Rectal cancer; Rectal stump washout; Occlusive tourniquet; Laparoscopic surgery; Open surgery.

INTRODUCTION

Rectal stump washout with cytolytic agents is usually recommended and performed during anterior rectal or rectosigmoid resection.¹⁻³ During ultralow anterior resection, placement of the pelvic clamps for rectal stump

washout is often difficult, especially when the Contour™ instrument (Ethicon Endo Surgery, Cincinnati, OH) is used. Similarly, this maneuver has been omitted during laparoscopic anterior resection because of technical difficulties and lack of adequate instruments.⁴

This work demonstrates the use of a simple procedure, the occlusive tourniquet for rectal stump washout, and its use during dissection of the mesorectum to avoid direct manipulation of the tumor, and the applicability in both laparoscopic and open rectal cancer surgery.

TECHNIQUE

Open Resection

After complete dissection of the rectum and sigmoid colon according to the usual technique, a simple piece of 80-cm tubing from an intravenous infusion set (KDL® IHT Medical SA, Barcelona, Spain) is passed behind and around the rectum at some point distal to the tumor and through a 10-cm piece of Argyle™ thoracic catheter (Tyco Healthcare UK LTD, Gosport, United Kingdom) to form an occlusive tourniquet with a Kocher clamp (Fig. 1). This technique occludes the rectum for rectal stump washout without interfering with the vascularization, and avoids direct manipulation of the tumor. The technique also permits *en bloc* mobilization of the surgical specimen and easy exposure of the mesorectum for dissection and division with a linear stapler instrument (Figs. 2 and 3).

Laparoscopic Resection

Following the usual laparoscopic technique with high ligation of the vascular pedicle, dissection of Told's fascia and the mesosigma,⁵ a 40-cm piece of tubing from an intravenous infusion set (KDL® IHT Medical SA, Barcelona, Spain) is introduced completely into the abdomen through the 5-mm left iliac fossa trocar. Both ends of the tube are grasped with a clamp while a second grasper is passed behind the sigmoid mesocolon to grasp the middle of the tube. The two ends are then passed through the loop formed by the tubing, and the tourniquet is completed. The tourniquet is closed using a slip knot in an area proximal or distal to the tumor together with the rectum and mesorectum. While the tourniquet is held

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FIGURE 1. Components of the occlusive tourniquet in open surgery.

with one grasper, the knot can be adjusted and tightened with the other to fit the size of the rectum and mesorectum. The knot is kept in place using a laparoscopic bowel grasping instrument (Fig. 4) by the assistant who must maintain the traction and adequate exposure for dissection. The tourniquet is mobile and the knot can be loosened or tightened to lie above or below the tumor as needed. Once the intestinal lumen is completely occluded with the tourniquet, rectal stump lavage can be performed in the same simple way as for the open technique without the need for clamps⁶ or other instruments which may traumatize the rectum and risk anastomotic failure (Figs. 5 and 6). Division of the rectum is then carried out with a linear cutting stapler through the right iliac fossa 10-mm port or at a lower level using the Contour™^{7,8} instrument which is introduced through a suprapubic incision (mini-Pfannenstiel).

FIGURE 2. Rectal stump washout with the occlusive tourniquet in open surgery.

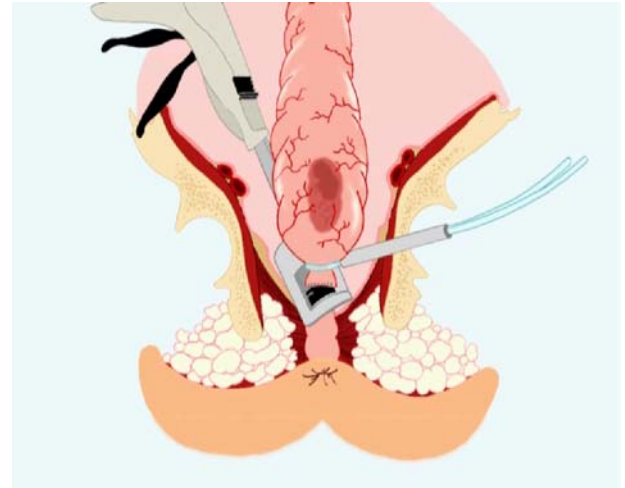
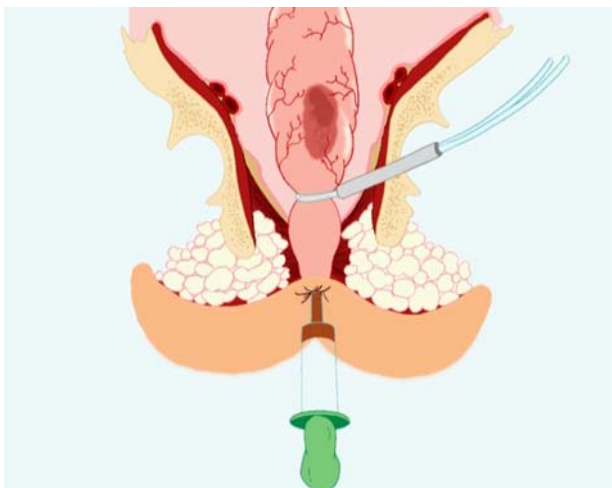


FIGURE 3. Exposure of the mesorectum with the occlusive tourniquet for dissection and division with a linear stapler instrument.

DISCUSSION

As large numbers of viable tumor cells can be found in the lumen of the colon at the time of operation,⁹ the use of a cytotoxic washout prior to anastomosis is generally accepted as a sensible precaution to reduce the risk of anastomotic recurrence.³ We described a useful and simple technique for rectal stump washout which is recommended in both open and laparoscopic rectal surgery as a good clinical practice.³ The technique is particularly useful when using a linear stapler in a low narrow pelvis, especially with the Contour™ stapling device since it is not easy to apply intestinal clamps above the device for rectal stump washout. However, full discussion of the indications of rectal stump lavage does not lie within the scope of the technical note.

FIGURE 4. Components of the occlusive tourniquet in laparoscopic surgery.



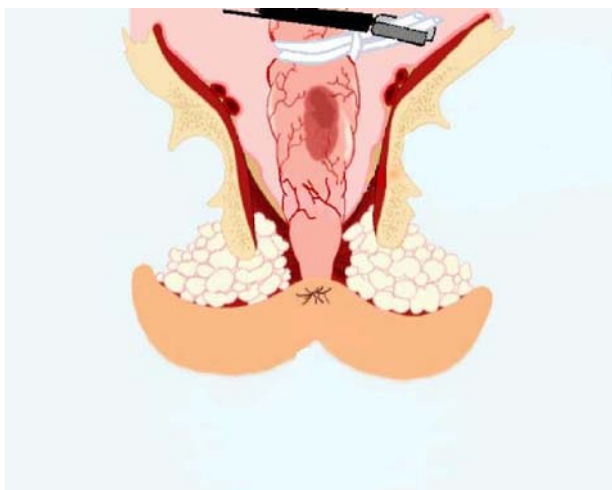
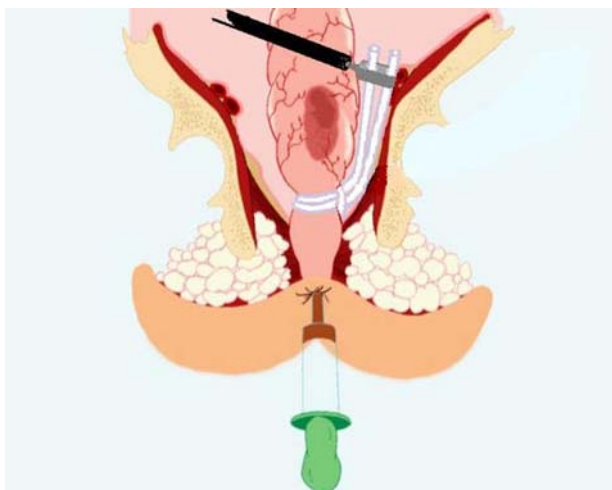


FIGURE 5. Exposure and dissection of the mesorectum with the occlusive tourniquet in laparoscopic surgery.

The implementation of laparoscopic rectal cancer surgery is slow, probably because of technical difficulties such as dissection to the pelvic floor,¹⁰ and a lack of adequate instruments. Only recently, with the advancement of technology and accumulation of experience, has laparoscopic total mesorectal excision been reported with success.¹¹ The occlusive tourniquet seems to be of more interest during laparoscopic surgery, since this procedure allows easy exposure and dissection of the mesorectum without traumatizing the rectum or the tumor. The occlusive tourniquet also allows rectal stump washout prior to division of the rectal stump. The tourniquet is mobile and the knot can be loosened and tightened around the rectum and mesorectum to lie above or below

FIGURE 6. Rectal stump washout with the occlusive tourniquet in laparoscopic surgery.



the tumor as needed, allowing rectal mobilization and washout respectively. Other authors have described the use of a Gelport® (Applied Medical Resources, Rancho Santa Margarita, CA) for exteriorization of the rectal stump and exposure of the posterior and lateral planes.¹² However, laparoscopic bowel grasping instruments are still required for additional exposure and tension and Lee *et al.*¹² do not mention rectal stump washout prior to division.

CONCLUSION

The occlusive tourniquet is a simple and cheap method which allows for rectal stump washout and can facilitate laparoscopic rectal dissection without damaging the mesorectum.

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