How to Do It

Endo-Bowel Clamp (PL540S) for Safe Rectal Irrigation in Laparoscopy-Assisted Rectal Resection

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Abstract
We describe a technique of rectal irrigation using an endo-bowel clamp (PL540S) in laparoscopy-assisted rectal resection. One of the major concerns associated with current techniques of laparoscopy-assisted rectal resection is accidental tumor spillage because it is difficult to perform the necessary procedures without grasping and manipulating the bowel and mesorectum near the tumor. Therefore, sufficient intraoperative rectal irrigation is essential for preventing intraluminal implantation of rectal cancer. However, this can be difficult, especially if the tumor is located in the rectum. By placing a PL540S before transection, it is possible to occlude the rectum completely and irrigate it effectively. We think that the PL540S is a valuable device in laparoscopic surgery for rectal cancer.

Key words Rectal carcinoma · Rectal irrigation · Laparoscopic surgery

Introduction
In 1907, Ryall1 described cancers of the lip, tongue, larynx, breast, and rectum being implanted in the operative field, and called the phenomenon “cancer infection.” The concept of cancer implantation is now widely accepted, and there have been many clinical reports suggesting that the implantation of cancer cells caused recurrence. Intraluminal implantation is a concern for colorectal surgeons performing low anterior rectal resection, especially when using a laparoscopic technique. Yamamoto et al.2 reported recurrence of cancer at the anastomotic site in 2 (2.9%) of 70 patients who had undergone laparoscopic rectal resection, despite routine distal rectal washout immediately before the transection. They stated that it was often difficult to occlude and irrigate the bowel sufficiently in laparoscopic surgery, especially when the tumor was located in the lower rectum, and suggested that intraluminal implantation could be attributed to insufficient intraoperative rectal irrigation. The rate of recurrence at the anastomotic site after open surgery has been reported to be 2.7%–8.7%.3,4 Although the rate of recurrence in laparoscopic surgery is comparable, we should strive to improve laparoscopic techniques to achieve the lowest attainable recurrence rate. We think that devising a better method of intraoperative rectal irrigation in laparoscopic surgery for rectal carcinoma will help to achieve this goal. Frank et al.5 developed a detachable bowel clamp for gastrointestinal laparoscopic surgery; however, they did not describe the technique used to occlude the bowel before irrigation.

Surgical Technique
We use two devices to occlude the rectum: an endo-bowel clamp (PL540S, Aesculap, Tuttlingen, Germany) and a clamp applicator (PL502R, Aesculap). The bowel clamp can be attached to and detached from the clamp applicator (Fig. 1A). By gripping the handle of the clamp applicator, the bowel clamp opens (Fig. 1B) and the angle between the two devices can be adjusted (Fig. 1C).

The rectum and mesorectum are mobilized completely and the mesorectum is divided at the anticipated point of rectal transection. Before rectal resection, the rectum is occluded with the endo-bowel clamp just above the anticipated point of resection. The clamp is connected to the clamp applicator and introduced into the abdominal cavity through a 12-mm right lower abdominal port. The clamp is positioned at a right angle to the rectum (Fig. 2A) and the handle of the applicator is...
The advantages of laparoscopic colorectal surgery over conventional open surgery include less postoperative pain, a shorter period of postoperative ileus, a shorter hospital stay, and fewer effects on cytokine and hormonal responses. However, it is still uncertain whether laparoscopic surgery can achieve curability equivalent to that of conventional surgery for advanced colorectal cancer. Since a major concern of laparoscopy-assisted rectal resection is accidental tumor spillage, effective rectal irrigation is essential for preventing the intraluminal implantation of cancer cells.