A New Laparoscopic Rectal Transection Method via Umbilical Incision Using Endo GIA™ Radial Reload

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Abstract We have developed a new laparoscopic rectal transection method via umbilical incision using Endo GIA™ Radial Reload with a Tri-Staple™ Technology (RR) (Covidien, New Haven, CT) stapler. A 65-year-old woman with a rectal carcinoid tumor underwent a laparoscopic low anterior resection. We successfully performed a rectal transection via umbilical incision using this stapler. The postoperative course was uneventful. The possibility of a rectal transection via umbilical incision was demonstrated in the current case. However, further studies are needed to confirm the safety and feasibility of this procedure.

Keywords Laparoscopic rectal transection · Rectal cancer · Umbilical incision · Laparoscopic surgery

Introduction

Only limited data have been reported in the literature concerning single-incision laparoscopic rectal surgery, because the conventional laparoscopic stapler does not allow low rectal transection at the umbilicus port. We developed a new rectal transection method via umbilical incision using Endo GIA™ Radial Reload with a Tri-Staple™ Technology (RR) (Covidien, New Haven, CT) stapler (Fig. 1).

Case Presentation

A 65-year-old woman with a rectal carcinoid tumor underwent a laparoscopic low anterior resection. Under

general anesthesia, the patient was placed in the modified lithotomy position. First, a Lap-Protector (LP; Hakkou Shoji, Japan) was inserted through a 2.5-cm transumbilical incision, protecting the wound. Next, an EZ-access (Hakkou Shoji, Japan) was mounted to the LP and three 5-mm ports were placed in the EZ-access. A 5-mm port was inserted in the right lower quadrant which could be used for the route of pelvic drainage at the end of the operation. Almost all the procedures were performed using usual laparoscopic instruments, and the operative procedures were much the same as in a usual laparoscopic low anterior resection of the rectum.

After rectal lavage, the RR was inserted directly into the abdominal cavity by connecting the handle extra-abdominally with the shaft of the RR through the 12-mm port mounted on the EZ-access (Fig. 2). The curved head of the RR was rotated to the sagittal orientation at the anal side of the rectal clamp to insert the rectum between the jaws of the stapler. The stapler

Fig. 1 Endo GIA™ Radial Reload with Tri-Staple™ Technology (RR) (Covidien, New Haven, CT) stapler

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Fig. 2 The RR was inserted directly into the abdominal cavity by connecting the handle extra-abdominally with the shaft of the RR through the 12-mm port mounted on the EZ-access (**a**, **b**, **c**)

was closed and fired, and a rectal transection was thus performed (Fig. 3).

The proximal colon was extracted through the umbilical incision. Resection was achieved following extracorporealization,

and the anastomosis was performed applying the double stapling technique using a transanally inserted circular stapler (EEA 28; Covidien, New Haven, CT). Ileostomy was performed because the anastomosis was below

Fig. 3 The curved head of the RR was rotated to the sagittal orientation at the anal side of the rectal clamp to insert the rectum between the jaws of the stapler (**a**). The stapler was closed and fired, and a rectal transection was thus performed (**b**). Model of sagittal placement of the RR (**c**)

4 cm from the anal verge. The postoperative course was uneventful.

Discussion

Single-incision laparoscopic colectomy has been described through case reports and small case series [1, 2]. However, there is limited data in the literature about single-incision laparoscopic rectal surgery [3], because the conventional laparoscopic stapler does not allow low rectal transection from the umbilicus port.

The tip of the laparoscopic stapler can only bend a maximum of 45°, which makes it very difficult to transect the lower rectum with sufficient distal margin from the umbilicus port without multi-firing, which is a significant risk factor for anastomotic leakage [4].

We have developed single-incision plus one laparoscopic anterior resection of the rectum, which uses the incision for drainage as an additional access route for laparoscopic procedures, including the transection of the lower rectum. During this procedure, we inserted a 12-mm port in the right lower quadrant for the stapling device [5]. In our cases, no complications were found related to the additional 12-mm incision; however, the risk of relevant complications would certainly be higher than that of a 5-mm incision.

In this case, we were able to transect the lower rectum from the umbilical wound for SILS using the RR. The RR is a

curved, low-profile stapling device specifically designed to reach the ultra-low rectum.

The possibility of rectal transection via umbilical incision was demonstrated in the current case, and this procedure may enable completion of single-incision laparoscopic rectal surgery without any additional ports. However, further studies are needed to confirm the safety and feasibility of this procedure.

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