

Original Article

OUR PRELIMINARY EXPERIENCE WITH LAPAROSCOPIC TREATMENT OF RECTAL CANCER

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Received: November 23, 2011

Revision received: December 14, 2011

Accepted: December 22, 2012

Summary

Evidence from randomised controlled trials has shown that laparoscopic colon and rectal cancer resection not only confers short-term benefits but also does not differ considerably in terms of its long-term oncological outcomes, as compared with open surgery. The aim of this article was to present our preliminary experience with laparoscopic resections for rectal cancer. All laparoscopic started resections of the rectum performed between January 2008 and December 2010 in First Clinic of Surgery, University Hospital St. Marina were included in our study. Over this period, 29 patients (9 male), median age 65 years (range 24 to 88), underwent laparoscopic resection of the rectum. The majority of the procedures were performed for malignant disease (86.3 %) and the most common procedure was anterior resection with TME (Total Mesorectal Excision) – in 79.4% of cases. The median duration of surgery was 135 minutes (range 65 to 330), with conversions to open surgery in 3 patients (12.5%). Complications occurred in 5 patients (18%), including anastomotic leaks in 1 (4 percent). The median length of hospital stay was five days (range 3 to 90) and the median follow-up was 19 months (range 1 to 46). The principles of good open surgery are relevant to laparoscopy, but the subtleties of pelvic surgery, however, may not make rectal cancer entirely ideal for laparoscopy. To establish the equivalency of the laparoscopic approach, all laparoscopic rectal resections should be completed in an environment wherein outcomes can be meaningfully evaluated and the clinical relevance of laparoscopic resection can be determined.

Key words: laparoscopic resection, rectal carcinoma, short term results, long term results, oncological safety

Introduction

Colon and rectal cancer incidence was negligible before 1900. The incidence of colorectal cancer has been rising dramatically following economic development and industrialization.

Currently, colorectal cancer is the third leading cause of cancer deaths in both males and females in the United States. In Europe it is the highest incidence cancer and the second most deadly after lung cancer [1]. Yet, colorectal cancer is highly treatable. If diagnosed early, it is in fact the most treatable of all the gastrointestinal cancers. More than 90% of all patients survive if the cancer is

diagnosed at an early stage [2].

The rectum extends from the anorectal junction to the sigmoid. The rectosigmoid junction is arbitrarily defined as 18 cm above the anal verge. A tumor more than 18 cm above the anal verge is regarded and treated as a sigmoid tumor.

Rectal cancer can be divided into:

- Low rectal cancer: distal border is 0-5 cm from the anal verge.
- Mid rectal cancer: distal border is 5-10 cm from the anal verge
- High rectal cancer: distal border is 10-15 cm from the anal verge.

Being a real challenge for the abdominal surgeon, the treatment of rectal cancer has significantly evolved during the past decades. A serious increase in the rates of sphincter-preserving operations has been observed due to the development of the surgical technique against the background of the decreasing number of abdominoperineal resections with permanent colostomy [3]. The concept of total mesorectal excision (TME), currently considered the golden standard of rectal surgery, led to a considerable improvement on the oncologic outcome by decreasing the local recurrence rate [3]. The use of laparoscopic technique to rectal resection is still not widely applied but it has its clear aims: improvement of postoperative recuperation while keeping the same surgical principles and aiming for the same oncologic outcomes as in open surgery [3, 4].

Patients and Methods

We have adopted the laparoscopic technique for rectal malignancies since 2008. All laparoscopic started resections of the rectum performed between January 2008 and December 2010 in First Clinic of Surgery, University Hospital St. Marina were included in our study. The most common procedure was anterior resection with TME, aiming for distal margin of 2 cm below the tumor. The decision to preserve the sphincters or complete an abdominoperineal resection was based on the ability to gain clear of tumor cells distal margins and to maintain good functional outcome [3, 5].

All the procedures which included TME were performed regarding the established principles, or as follows: dissection closer to the pelvic walls with maintaining the integrity of the mesorectum; preserving the autonomous nerves, identification

and preserving of the ureters. LigaSure instrument or Harmonic Scalpel were the instruments of choice to perform the TME, because their ability to first coagulate and then cut the tissues, providing excellent bleeding control (Figure 1, Figure 2) [6].

After the placement of ligatures, the passage was stopped with flat automatic stapler. According to the operator's choice of approach, a minilaparotomy was performed with the proximal bowel end being exposed. A resection with ablative margins was completed.

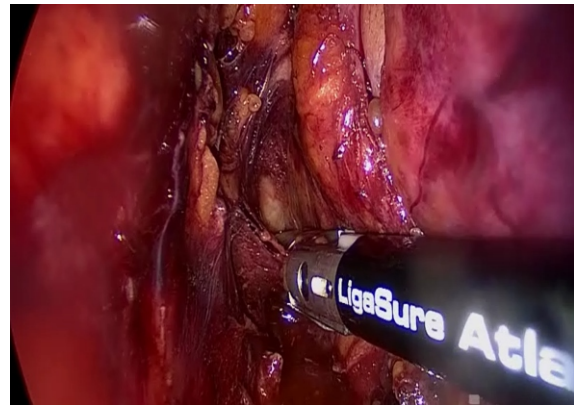


Figure 1. Performing the TME with LigaSure Instrument

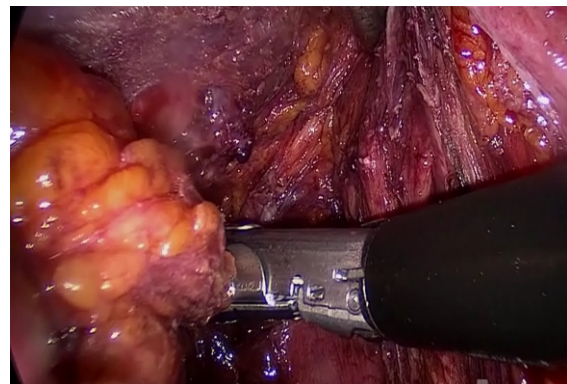


Figure 2. Another moment of TME

The next step was to complete the anastomosis with the use of round automatic stapler. The head was inserted into the proximal bowel (Figure 3, Figure 4) and the box of the stapler was inserted through the rectum. An end-to-end anastomosis was created to restore the continuity.

The final stage of the procedure was the closure of the peritoneum, performed again laparoscopically.

All the patients underwent bowel preparation prior to the surgery [3, 6]. We report our preliminary experience in adopting a new approach for treating rectal cancer.



Figure 3. Placement of the head of the round stapler

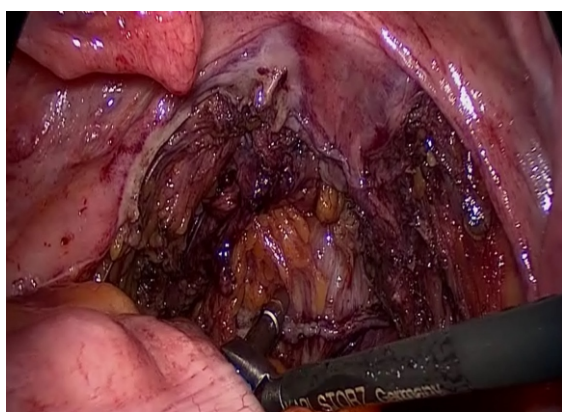


Figure 4. Completion of anastomosis

Results

The study included 29 patients (9 males, 20 females) who underwent laparoscopic resection of the rectum, median age 65 years (range 24 to 88). The median Body Mass Index (BMI) was 22.5 (range 13.5 to 39.3).

All the procedures were performed for rectal cancer. The most common procedure was anterior resection with TME (79.4%). The median duration of surgery was 135 minutes (range 65 to 330), with conversions to open surgery in 3 patients (12.5%). Complications occurred in 5 patients (18%), including anastomotic leaks in 1 (4%). The median length of hospital stay was five days (range 3 to 90). The median follow-up was 19 months (range 1 to 46).

Negative resection margins, including radial margins, were achieved in all patients. Lymph node retrieval was adequate, with a mean of 14 lymph nodes (range 2–23) after TME for low rectal cancer, 15 (range 2–40) after anterior resection for high rectal cancer, and 8 (range 2–30) after abdominoperineal resection.

One of the advantages that should be stated here is the significant shortening of hospital stay as compared to that after open surgery – 10.4 ± 2.9 vs. 12.5 ± 4.1 . The postoperative pain control was achieved using mainly metamizole, and pethidine (a narcotic analgesic) was administered in a few patients. The smaller number of patients on a narcotic analgesic can be explained with the smaller incision. The latter had another advantage – a better cosmetic result.

The mean time for complete patient mobilization was 1.9 (range 1–5) days; for passing flatus – 2.9 (range 1–10) days, and for passing stools – 3.3 (range 1–10) days.

The patients were encouraged to start liquid diet immediately after the first passing of gas, and to return to solid food diet after the first bowel movement.

Discussion

The laparoscopic approach to a wide variety of pathologies has already proved to be as effective as open surgery. Starting from mostly benign diseases as cholecystitis and hiatus hernia, the laparoscopic methods have kept developing, and their use has extended to treatment for malignant diseases and such with more difficult access. Colon cancer is one such condition, in which very good short term and long term oncological results have been achieved [3, 7, 8]. The laparoscopic approach to rectal cancer is clearly the logical extension of the procedures for colon cancer but it has not yet gained wide popularity and acceptance [7, 9, 10].

There are several studies, some of them comparative, which comprise thousands of patients. The results are very encouraging: operative time is around 4 hours, and conversion rates are similar to those reported for colon cancer. Morbidity is significant but not dissimilar to that after open surgery, with an anastomotic leak rate of about 17%. Postoperative mortality is rare. The laparoscopic operation yields an acceptable specimen with good surgical margins and appropriate number of retrieved lymph nodes. The long-term outcome is as good as after open surgery. The local recurrence is in acceptable ranges and survival is also 5 years [11].

The results of our study are similar to those reported from bigger studies, as concerns mean time of operation and conversion rate. We are still not able to determine long term results due to the short time of our study.

The experience of the surgeon is also crucial for the final results. After gaining anatomical knowledge and technical expertise, the surgeon enjoys certain advantages offered by laparoscopy such as better lighting, better view and more accurate dissection under magnification [1, 4]. There are significant differences in single surgeon series and smaller series originating from a teaching institution – as in our study. This could be the clue to a better understanding why laparoscopic rectal resections are not yet widely accepted. While anterior resection for high rectal cancer may be considered a relatively easy procedure for an experienced laparoscopic surgeon, laparoscopic TME for mid- and low-rectal cancer is a demanding procedure. Good knowledge of deep pelvic anatomy is a prerequisite, and mastery of laparoscopic techniques is required in order to complete a safe and thorough dissection of the rectum out of the pelvis, which is often deep and narrow. Avoiding injury to adjacent structures, along with autonomic nerve identification and preservation, are important for avoiding complications and achieving a good genitourinary functional outcome [12].

The debate regarding the outcomes of laparoscopic approach is still active. As most authors state, laparoscopy has clear and indisputable short term benefits: smaller incisions, shorter hospital stay etc. [7, 9, 13]. But when conversion to open surgery is needed or complications occur, the above stated advantages are no longer present. Nevertheless, when the postoperative stay is uneventful, the advantage of minimally invasive surgery is apparent. The weakness of this approach is related to its long-term results [9]. There are several studies reporting good oncologic results but more data is still needed [11, 13].

Conclusion

Laparoscopic resection seems a safe and feasible alternative to open surgery in colonic cancer. The subtleties of pelvic surgery, however, may not make rectal cancer entirely ideal for laparoscopy. The principles of good open surgery are relevant to laparoscopy. Learning curves affect not only technique but also the outcome of the operation, such as lymph node harvest, intraoperative complications and conversion rates. Yet, the final piece of the jigsaw will be results of longer-term studies. If survival and functional benefit cannot

be demonstrated, the short-term benefits often reported may well be deemed of uncertain relevance to many patients with rectal cancer. To establish the equivalency of the laparoscopic approach, all laparoscopic rectal resections should be completed in an environment wherein outcomes can be meaningfully evaluated and the clinical relevance of laparoscopic resection can be determined.

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