

Case Report

Laparoscopic-assisted one-stage resection of rectal cancer with synchronous liver metastasis utilizing a pfannenstiel incision

Murad Aljiffry, Mawaddah Alrajaji, Salman Al-Sabah¹, Mazen Hassanain²

Department of Surgery, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia, ¹Steinberg-Bernstein Center for Minimally Invasive Surgery and Innovation, McGill University Health Centre, Montreal, Canada, ²College of Medicine, King Saud University, Riyadh, Saudi Arabia

Address for correspondence:

Dr. Murad Aljiffry,
Department of Surgery, College of Medicine, King Abdulaziz University Hospital,
P.O. Box 80215, Jeddah 21589,
Saudi Arabia.
E-mail: dr.aljiffry@gmail.com

ABSTRACT

Laparoscopic approaches have been increasingly used in selected patients with either colorectal or liver cancer. However, simultaneous resection of colorectal carcinoma with synchronous liver metastases is still a subject of debate. The present case describes combined laparoscopic rectal and liver resections for a patient with primary rectal cancer and a synchronous liver metastasis utilizing a Pfannenstiel incision for specimen extraction. The operative time was 370 min and estimated blood loss was 400 mL. Postoperatively, the patient required parenteral analgesia for 48 h, resumed normal diet on day 3 and was discharged on day 7 after the operation. A laparoscopic approach utilizing a Pfannenstiel extraction incision may present an advantageous and attractive option for simultaneous laparoscopic rectal and liver resection in selected patients with the aim of improving short-term outcomes.

Key Words: Colorectal cancer, liver metastasis, laparoscopic, Pfannenstiel incision

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The incidence of colorectal cancer has increased alarmingly worldwide during the past few decades, ranking as the third most common malignancy in the world.^[1] Liver metastasis remains a substantial problem affecting 20%–30% of patients upon presentation, becoming the most prevailed site of involvement.^[2] Generally, surgical resection is the most effective and a potentially curative approach. However, different modalities of treatment have been observed in this field.^[3-5]

This era has witnessed an overwhelming success of laparoscopic technology due to its advanced technique as an alternative approach in the management of colorectal cancer liver metastasis in selected patients.^[6,7] One-stage laparoscopic resection of both malignancies is considered as an effective curative strategy in certain patients.^[8]

Reports suggest that this technique is feasible, safe, and effective. Therefore, using a second operation is avoided.^[9,10] Furthermore, it provides significant decrease in morbidity, hospitalization time, and operative transfusion rate, without compromising curability or increasing mortality in comparison with open procedure.^[11,12] Hence, simultaneous resection is considered a safe favorable option in selected patients with resectable synchronous colorectal liver metastasis.^[11,13,14]

This is a case of a one-stage laparoscopic resection of rectal cancer and synchronous liver metastasis utilizing a Pfannenstiel incision to extract both specimens. Nevertheless, the experience of surgeons in advanced laparoscopic colorectal and hepatic surgery is fundamental to the success of this type of collaborative surgery.

CASE REPORT

This is a case of a 51-year-old man, diagnosed with rectal adenocarcinoma. The patient did not have any pertinent past surgical or medical history. Presenting symptom was episodes of blood in his stool. Upon rectal examination and rigid proctosigmoidoscopy, he was found to have a tumor at 6 cm from the anal verge. An endoscopic rectal

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ultrasound was done showing the presence of a rectal tumor extending to the perirectal fat (uT3), it was later on confirmed by a pelvic magnetic resonance imaging, which also revealed the presence of a suspicious 9 mm lymph node in the mesorectum. A positron emission tomography-computed tomography scan showed the presence of a single hepatic metastasis in the left lobe of the liver (segments 2/3) measuring 4 × 3 cm Figure 1. Laboratory tests indicated an elevated Carcinoembryonic antigen (CEA) 27.4 µg/L, whereas the rest of the blood test results were within normal limits. He received six cycles of neoadjuvant chemotherapy (FOLFOX + bevacizumab), followed by a short course of pelvic radiation (25 Gy in 5 daily fractions). Afterward he underwent a one-stage laparoscopic liver and rectal cancer resection followed by adjuvant chemotherapy (FOLFOX + bevacizumab). Pathology of the resected specimens showed moderately to poorly differentiated adenocarcinoma for both the rectum and the liver with negative margins. However, one of 14 mesorectal lymph nodes was positive. The estimated blood loss was 400 mL and the operative time was 370 min. Postoperatively the patient required parenteral analgesia for 48 h, and resumed a normal diet on postoperative day 3 and was discharged on postoperative day 7. At 1-year follow up, the patient had no evidence of recurrence Figure 2.

Operative technique

The patient was placed in supine position with legs apart. A central line was inserted prior to surgery in order to monitor the central venous pressure, which was maintained at 4–5 cm H₂O during the liver resection. Pneumoperitoneum was established at 12 mmHg by means of a supraumbilical Hasson technique. Operative trocars were placed as shown in Figure 3, and two additional trocars were then placed in the upper abdomen/quadrants for hepatic resection after the rectal resection was completed.

Rectal resection

Rectal resection was performed before the liver. A careful abdominal inspection was done to rule out peritoneal carcinomatosis. Rectal resection with total mesorectal excision (TME) was carried out using our standard technique. This includes two 5 mm working trocars in the right lower quadrant using a hook cautery for dissection and A-Trac® bowel graspers (Applied Medical, Rancho Santa Margarita, CA, USA) for traction. In addition, another trocar in the epigastrium was used for retraction and the camera was placed in the umbilical port. The inferior mesenteric artery is divided in a high ligation fashion with a Ligasure® after identifying the left ureter in the retroperitoneum. The descending and sigmoid colon are mobilized in a medial-to-lateral fashion. The dissection is continued distally in the retrorectal “Holy” plan. The cleavage plane between the presacral fascia and the visceral layer that

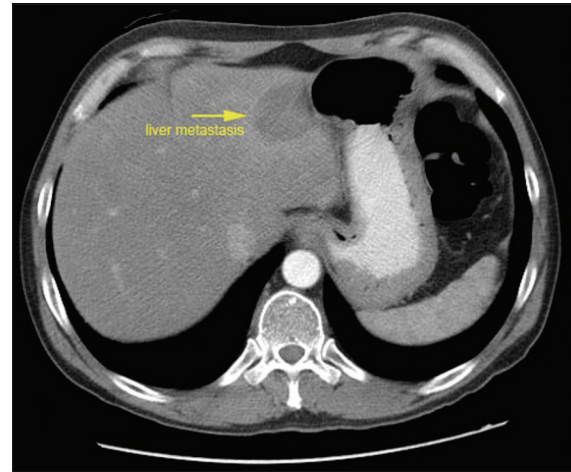


Figure 1: Preoperative CT of the liver



Figure 2: Postoperative CT of the liver

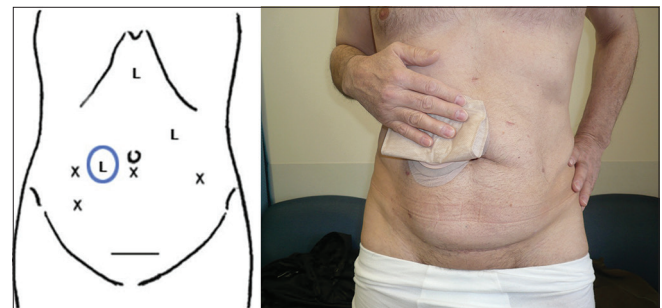


Figure 3: Port sites for laparoscopic anterior resection (total mesorectal excision). The surgeon uses the two right side 5 mm ports for 5 mm instruments and the camera assistant will use the 5–12 mm subumbilical port and a 5 mm port. Two additional ports were added to facilitate the liver resection. X - Port site for Laparoscopic Anterior Resection L- Additional Port site for Laparoscopic Liver Resection ----- Pfannenstiel incision

underlies the mesorectum was identified at the level of the sacral promontory. Mesorectal dissection was then carried out circumferentially using hook cautery. The proximal

resection was performed using Endo-GIA staplers (3.5 mm load, Covidien, Mansfield, MA, USA). Measurement of the distance between the tumor and the distal resection line was performed by digital exploration and flexible endoscopy. Once the TME was completed, a Pfannenstiel skin incision was made and an Alexis wound-protector® was placed for protection and exposure. The distal rectum was divided using a Contour stapler, and the specimen was removed and examined. A stapled side-to-end anastomosis was created transanally with a circular stapler (CDH #29, Ethicon Endo-Surgery, Inc, USA).

Liver resection

A laparoscopic left lateral segmentectomy of the liver was performed after placing two additional 5 mm ports in the upper abdomen. The lesser omentum was sectioned and the falciform ligament was divided partially to apply counter traction. The left triangular ligament was then divided. The first few centimeters of the liver parenchyma was transected using Salient EndoSH2.0 Monopolar Sealer (formerly Tissue-link) (Salient Surgical Technologies, Inc., Portsmouth, NH, USA) down to the level of the portal pedicle. Following that, a laparoscopic vascular stapler (Covidien) was used to ligate the major vessels. Definitive hemostasis was obtained with monopolar coagulation in spray modality on the transected liver surface and finally applying Surgicell®. No bile leaks or major bleeding were encountered. The specimen was extracted through the same Pfannenstiel incision. Finally, a loop ileostomy was created in the right lower quadrant by expanding the trocar incisions.

DISCUSSION

In this case, we highlighted the advantages of performing a simultaneous laparoscopic rectal and hepatic resections, which has been advocated due to its benefit in avoiding a second operation, reducing morbidity, providing a shorter treatment time, less operative trauma, and yielding similar cancer outcomes to that of conventional treatment.^[6,15] Despite the favorable short-term results, which are based on a small number of reported cases, more studies should be conducted on a larger scale assessing both short- and long-term outcomes compared with the conventional multioperation approach. In a recent cohort and meta-analysis review of laparoscopic liver resections, the following concerns were mentioned:^[11,16]

- Laparoscopic procedure requires extensive experience and expertise; and under the hands of unskilled or inexperienced surgeons, difficulty in controlling hemorrhage when adjacent major vascular structures are injured is a potential concern
- Not all patients are candidates as the oncological R0 resection is closely related with location and number, size, and complexity of metastasis, especially when the

liver lesion is located near the hilum or measures over 10 cm in size. Also the possible difficulty exposing metastasis situated in the posterior or superior aspects of the right hepatic lobe. It is highly recommended to implement intraoperative ultrasound examinations in order to correctly identify the stage of the disease to more accurately achieve a complete tumor clearance in laparoscopic procedures.

To date, collected data are limited to observational studies and literature reviews, which may present some bias, considering the multifactorial technical complexity of laparoscopic approach, patient selection, and the disease stage.^[10] The direction of many surgical institutes worldwide toward increasing the use of laparoscopic major hepatic resection encourages further multidisciplinary research with the aim to postulate inclusion criteria for appropriate surgical options and proper patient selection to avoid adverse events.

On the other hand, the exact technique and type of incision is still a subject of debate, in patients with synchronous colorectal liver metastasis. Simultaneous laparoscopic resections of rectal cancer and liver metastases have been reported utilizing either midline or transverse incisions.^[14] However, one of the important steps of laparoscopic liver resection is specimen extraction, and the size of the specimen is usually a limitation for the use of laparoscopy.^[17] The present technique allows an expeditious extraction of intact specimens through a standard suprapubic Pfannenstiel incision. This technique has additional functional and cosmetic advantages over other techniques of specimen retrieval.^[18] In addition to improved cosmetic outcome compared with midline incision,^[17] it has been established that the Pfannenstiel incision is associated with a lower incidence of wound infection and future hernia.^[18,19]

In our opinion, the described combined technique is feasible and can be easily and rapidly performed in selected patients. Furthermore, it facilitates the one-stage laparoscopic liver and rectal resection by reducing the technical difficulties for specimen removal.

CONCLUSION

In experienced hands, laparoscopic-assisted combined rectal and left lateral liver resection with Pfannenstiel incision is a feasible procedure for the treatment of rectal cancer with synchronous liver metastases. Nevertheless, larger studies are needed to confirm the feasibility of this approach.

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