The Transverse Colon Cancer with the Reversed Rotation of the Midgut Treated with Single Incision Laparoscopic Colectomy

Yasumitsu Hirano · Masakazu Hattori ·
Manami Fujita · Youji Nishida · Kenji Douden ·
Yasuo Hashizume

Received: 12 July 2011 / Accepted: 12 June 2012 / Published online: 23 June 2012
© Association of Surgeons of India 2012

Abstract

Background Reversed rotation of the midgut is a rare type of intestinal malrotation. Moreover, synchronous colon cancer has rarely been reported. Preliminary experience with single-incision laparoscopic colectomy (SILC) for colon cancer with reversed rotation of the midgut is reported.

Case An 82-year-old woman was admitted because of a fecal occult blood. A colonoscopy revealed transverse colon cancer. An air-barium contrast enema showed the right-sided sigmoid colon and the left-sided cecum. A computed tomography revealed that the duodenum and the transverse colon were situated at the ventral side of the superior mesenteric artery, and a preoperative diagnosis of suspicion of reversed rotation of the midgut was made.

Surgical Procedures First, a lap protector was inserted through a 4.0 cm transumbilical incision. Four 5 mm ports were placed in the lap protector. On the observation of laparoscopy, the cecum and the ascending colon were not fixed with the retroperitoneum and situated on the left, and the sigmoid colon was situated on the right. We successfully mobilized the transverse colon using a single-incision laparoscopic approach. Resection was achieved following extracorporealization, and the anastomosis was performed extracorporeally using staplers. The patient was discharged on the thirteenth

postoperative day. Postoperative follow-up did not reveal any umbilical wound complications.

Conclusion SILC for colon cancer associated with malrotation of the midgut is feasible and a promising alternative method because of its less invasiveness and its adaptability to the malrotation without extending the skin incision.

Keywords Reversed rotation · Malrotation of the midgut · Single incision laparoscopic colectomy · Laparoscopic colectomy

Introduction

Reversed rotation of the midgut is a rare type of intestinal malrotation which is a congenital anomaly, and it is rare for malrotation to occur in adulthood. Moreover, synchronous colon cancer has not been reported.

Management of a patient with a congenital anomaly of the midgut can be difficult for a surgeon since these abnormalities are extremely rare, particularly in adults, and the gold standard approach for this malrotation with colon cancer has not been existed. In limited reports with cases of the colon cancer with intestinal malrotation, laparotomy approach has been preferred because of its safety and reliability [1].

Recently, single-incision laparoscopic colectomy (SILC) has been described through case reports and small case series [2–4]. The single-incision technique results in improved cosmesis with the potential for decreased pain and fewer incisional hernias. Our department introduced SILC in August 2010 and applied this technique to many surgical procedures.

Y. Hirano (✉) · M. Hattori · M. Fujita · Y. Nishida · K. Douden ·
Y. Hashizume
Department of Surgery, Fukui Prefectural Hospital,
2-8-1 Yotsui,
Fukui 910-8526, Japan
e-mail: yasumitsu@fukui-hp.jp

Fig. 1 An air-barium contrast enema showed the right-sided sigmoid and descending colon and the left-sided ascending colon and cecum

To the best of our knowledge, this report is the first case of reversed rotation of the midgut associated with colon cancer in an adult successfully treated with SILC.

Case Report

An 82-year-old woman was admitted because of a fecal occult blood. She had not suffered previous episodes of abdominal colicky pain and distension. There was no medical history of abdominal surgery. A colonoscopy revealed a transverse colon tumor about 20 mm in size, and she was diagnosed as a well-differentiated adenocarcinoma by colon biopsy. An air-barium contrast enema showed the right-sided descending colon and the left-sided ascending colon and cecum (Fig. 1). A computed tomography revealed that the duodenum and the transverse colon were situated at the ventral side of the superior mesenteric artery, and a preoperative diagnosis of suspicion of reversed rotation of the midgut, the prearterial left-sided cecum type according to the classification by Amir-Jahed, was made.

Surgical Procedures

Under general anesthesia, the patient was placed in the modified lithotomy position. First, a lap protector (Hakkou-Shoji, Japan) was inserted through a 4.0 cm transumbilical incision, the wound was protected, and

Fig. 2 A lap protector mini with EZ-access is inserted through transumbilical incision—three 5 mm ports are placed in EZ-access

the operative field was secured. Four 5 mm ports were placed in the EZ-access (Fig. 2; Hakkou-Shoji, Japan) mounted with the lap protector. On the observation of laparoscopy, the cecum and the ascending colon were not fixed with the retroperitoneum and situated on the left, and the sigmoid colon was situated on the right (Fig. 3). The transverse colon was fixed with the retroperitoneum. The tumor was located at the transverse colon, and we successfully mobilized the transverse colon using a single-incision laparoscopic approach. Resection was achieved following extracorporealization,

Fig. 3 The cecum was not fixed with the retroperitoneum and the sigmoid colon was situated on the right

Fig. 4 Pathological examination revealed well-differentiated adenocarcinoma of the transverse colon infiltrating the submucosal layer

and the anastomosis was performed extracorporeally using staplers.

Pathological examination revealed well-differentiated adenocarcinoma of the transverse colon, infiltrating the submucosal layer without nodal involvement (Fig. 4). The patient received oral food on the third postoperative day. She was discharged on the thirteenth postoperative day. Postoperative follow-up did not reveal any umbilical wound complications or any recurrences.

Discussion

Many surgeons have attempted to reduce the number and size of ports in laparoscopic surgery to decrease parietal trauma and improve cosmetic results, and recently single-incision laparoscopic surgery (SILS) has been developed, which completed laparoscopic procedures by trocars located at one umbilical incision [5–7]. SILS was described as early as 1992 by Pelosi and Pelosi [8] who performed a single-puncture laparoscopic appendectomy and in 1997 by Navarra et al. [9] who performed a laparoscopic cholecystectomy via two transumbilical trocars and three transabdominal gallbladder stay sutures. SILS can be performed using refinements of existing technology, and surgeons can perform SILS without any new instruments, specific competence, or training. In the same way, single-incision laparoscopic colectomy (SILC) for colon cancer has been described through case reports and small case series [2–4]. This technique results in improved cosmesis with the potential for decreased pain and fewer incisional hernias.

Midgut malrotation has been estimated to occur in about 1 in 500 of all live births and 64–80 % of the patients present within the first month of life. It is classified into four types—non-rotation type, malrotation type, reversed rotation type, and paraduodenal hernia. The present case showed findings of reversed rotation type—right-sided descending colon, left-sided ascending colon, and transverse colon in front of the superior mesenteric artery. We believe that this is only the

third case of “prearterial” reversed midgut rotation existing with normally situated stomach and liver.

As regards the surgical technique for colon cancer with intestinal malrotation, the laparoscopic approach had not been preferred because this approach was considered not safe and not reliable [1]. However, in terms of the oncological safety, the UK Medical Research Council CLASICC trial concluded that the 5-year analyses confirmed the oncological safety of laparoscopic surgery for both colonic and rectal cancers, and the use of laparoscopic surgery to maximize short-term outcomes did not compromise the long-term oncological results [10]. Thus, it is important to identify the exact abnormality and plan the anatomical dissection appropriately at the surgery for intestinal malrotation because malrotation is usually found coincidentally and has a different feature in each case. In laparoscopic approach, we can easily obtain the information of the entire abdominal cavity and perform many types of procedures including mobilization of the colon with small incisions.

Our presented case demonstrates that SILC is a feasible and promising alternative method for colon cancer associated with malrotation of the midgut. We believe SILC may bring the safety and the less invasiveness for these patients.

References

1. Brilliantino A, Marano L, Schettino M, Torelli F, Izzo G, Cosenza A, Monaco L, Porfidia R, Reda G, Foresta F, Di Martino N (2009) Report of a rare case of colon cancer complicated by anomalies of intestinal rotation and fixation: a case report. *Cases J* 2:6555
2. Takemasa I, Sekimoto M, Ikeda M et al (2010) Transumbilical single-incision laparoscopic surgery for sigmoid colon cancer. *Surg Endosc* 24:2321
3. Choi SI, Lee KY, Park SJ et al (2010) Single port laparoscopic right hemicolectomy with D3 dissection for advanced colon cancer. *World J Gastroenterol* 16:275–278
4. Ramos-Valadez DI, Patel CB, Ragupathi M et al (2010) Single-incision laparoscopic right hemicolectomy: safety and feasibility in a series of consecutive cases. *Surg Endosc* 24:2613–2616
5. Hirano Y, Watanabe T, Uchida T et al (2010) Laparoendoscopic single site partial resection of the stomach for

- gastrointestinal stromal tumor. *Surg Laparosc Endosc Percutan Tech* 20:262–264
6. Hirano Y, Watanabe T, Kato H et al (2010) Single-incision laparoscopic hernioplasty for obturator hernia. *Surg Laparosc Endosc Percutan Tech* 20(3):e144–145
 7. Hirano Y, Watanabe T, Uchida T et al (2010) Single-incision laparoscopic cholecystectomy: single institution experience and literature review. *World J Gastroenterol* 16(2):270–274
 8. Pelosi MA, Pelosi MA III (1992) Laparoscopic appendectomy using a single umbilical puncture (minilaparoscopy). *J Reprod Med* 37:588–594
 9. Navarra G, Pozza E, Occhionorelli S, Carcoforo P, Donini I (1997) One wound laparoscopic cholecystectomy. *Br J Surg* 84:695–695
 10. Jayne DG, Thorpe HC, Copeland J, Quirke P, Brown JM, Guillou PJ (2010) Five-year follow-up of the Medical Research Council CLASICC trial of laparoscopically assisted versus open surgery for colorectal cancer. *Br J Surg* 97(11):1638–1645