

Preoperative localization of colonic tumors using transabdominal illumination of the colonoscope

Cheng-Jen Ma · Chien-Yu Lu · Chao-Wen Chen ·
Koung Shing Chu · Fang-Jung Yu · Yu-Tang Chang ·
Jan-Sing Hsieh · Jaw-Yuan Wang

Accepted: 3 July 2007 / Published online: 27 July 2007
© Springer-Verlag 2007

Dear Editor:

Colonoscopy is recommended for colorectal polyps in both diagnostic and therapeutic purposes. It was estimated that more than 85% of polyps could be removed by means of colonoscopic polypectomy, although this mainly depends on the size, type, and location of the lesion as well as on the experience and judgment of the performing endoscopist. Those unsuitable for colonoscopic polypectomy are referred to surgeons for surgical resection, which has options

of either the laparoscopic or open approach. Laparoscopic resection requires instruments and surgical skill to perform, whereas open surgery results in larger wounds and longer hospitalization for recovery.

Precise location of colonic polyps is a critical aspect but is difficult to establish during surgery. Although techniques such as localization by endoscopically placed clips, radiographic and magnetic imaging, and intraoperative colonoscopy have all been suggested, surgical localization is optimized by endoscopically placing a four-quadrant tattoo with India ink before surgery. It has been established that preoperative endoscopic tattooing is efficient and reliable for localizing polypectomy sites at operation with successfully visualized tattoos in 88–97% of cases; however, the injection of an optimal volume of India ink into the submucosa is difficult: Too much ink or an injection too deep dyes the whole peritoneum, obscuring the location of the polypectomy site.

Herein, we developed a simple method composed of preoperative colonoscopic localization of the sites of polyps by means of transabdominal illumination to mark the sites of incision on the day before the planned operation. The following transcolonic polypectomy or partial colectomy were executed through a minilaparotomy depending on the results of the frozen section. This method has advantages of a short time of recovery of bowel function and consequent short hospital stay, as well as no additional instruments are required for the tumor site detection.

From May 2006 to February 2007, a total of 20 consecutive patients underwent resection of colonic polyps at the Department of Surgery of Kaohsiung Medical University Hospital. The colonic polyps were either hard to approach, potentially malignant polyps, too large for snare resection, or had a high possibility of leading to complications of bleeding or perforation and were conse-

C.-J. Ma · Y.-T. Chang · J.-S. Hsieh · J.-Y. Wang (✉)
Department of Surgery, Kaohsiung Medical University Hospital,
No. 100, Tzyou 1st Road,
Kaohsiung 807, Taiwan
e-mail: cy614112@ms14.hinet.net

J.-S. Hsieh · J.-Y. Wang
Department of Surgery, Faculty of Medicine,
College of Medicine, Kaohsiung Medical University,
Kaohsiung, Taiwan

K. S. Chu
Department of Anesthesia, Faculty of Medicine,
College of Medicine, Kaohsiung Medical University,
Kaohsiung, Taiwan

K. S. Chu
Department of Anesthesia,
Kaohsiung Medical University Hospital,
Kaohsiung, Taiwan

C.-Y. Lu · F.-J. Yu
Department of Internal Medicine,
Kaohsiung Medical University Hospital,
Kaohsiung 807, Taiwan

C.-W. Chen
Department of Emergency Medicine,
Kaohsiung Medical University Hospital,
Kaohsiung, Taiwan

quently enrolled into this study by a single group of colorectal surgeons. Preoperative colonoscopy (CF-240; Olympus Medical System, Tokyo, Japan) was performed for each patient on the day before the planned operation to localize the sites of polyps, and marks were made consequently at the abdomen for incisions through trans-abdominal colonoscopic illumination. During the operation, minilaparotomy was created at the marks we made, and subsequent transcolonic polypectomy was performed. If the intraoperative frozen section reported that the polyp was malignant, an additional partial colectomy was performed. The resected colonic specimens were further sent for pathologists to verify the presence or otherwise of pericolic lymph node metastasis.

Of 20 patients, 11 were men and nine were women with a mean age of 65 years (range 41–84 years). Preoperative biopsy pathology all reported benign neoplasm. Three patients had two synchronous polyps at referral with a total of 23 polyps included in this study. The average size of the polyps resected in the surgical pathology reports was 2.2 cm (range 1.5–3.8 cm). Seven (30.4%) polyps were sessile, and 16 (69.6%) were pedunculated. The majority (18; 78.3%) were located in the sigmoid colon, while two (8.7%) in the ascending, two (8.7%) in the transverse colon, and one (4.3%) was in the descending colon near the splenic flexure. The surgical pathology reported that 12 (52.2%) were tubular adenoma, six (26.1%) were tubulovillous adenoma, one (4.3%) was a hamartomatous polyp, and four (17.4%) were adenocarcinoma arising from the polyps, which were converted to partial colectomy because of malignancy. Among the four polyps with adenocarcinoma, three were categorized into International Union Against Cancer (UICC) stage T1N0M0, and one case was carcinoma in situ (UICC stage TisN0M0).

Our current method is trying to offer a procedure for those whether laparoscopy is unavailable or surgeons who prefer open surgery. The results were satisfactory in that most polyps could be removed through a small wound created (average wound length=5.2 cm) and a short hospital stay of around 5 days. The average operating time was 52.6 min, and the operative time was more than 60 min in four patients with partial colectomy for malignancy. The distances between the sites of preoperative localization and the polyps were classified into three groups: less than 3 cm, between 3 and 6 cm, and more than 6 cm. Most (69.6%)

polyps were within 3 cm, and furthermore, 87% were within 6 cm to the preoperative localization marks. Only three (13%) of them were distanced more than 6 cm, and two were located in the transverse colon and one in the descending colon near the splenic flexure. Colonoscopic localization is unreliable for the transverse colon, which is an intraperitoneal organ, and is dependent on the degree of distension and stretching of the colon, which makes the transverse colon moving greatly in the peritoneum. On the contrary, the splenic flexure or the hepatic flexure is relatively fixed in the peritoneum and is not easily manipulated during operation like other parts of the colon. In consistency with previous observations, our three inaccurately located polyps were in either the transverse colon or near the splenic flexure. However, our modified method can compensate for that at some point, as minilaparotomy is created relatively closer to the polypectomy site. Our present method also has the advantage of providing concurrent partial colectomy, which creates an additional edge when the intraoperative frozen section report is malignant.

The postoperative recovery was also encouraging and approaching figures of laparoscopic resection. The average time of recovery of bowel function of flatus or defecation was within a day (23.7 h, range 12–41 h), and 16 out of the 20 patients were discharged within 5 days, while the average time of hospital stay was 5.3 days (4–9 days). However, no additional instruments or facilities were necessary for this procedure. No prominent procedure-related morbidity and mortality developed, and three patients had complications of postoperative fever, which subsided spontaneously; wound infection developed in another patient, which could be managed by wound drainage and dressing.

In conclusion, the method we developed is simple, readily available, and easily performed with encouraging results comparable to laparoscopic resection of colon polyps but with a shorter operative time. This treatment modality seems to be an attractive alternative that may be superior to conventional transcolonic polypectomy or conventional colectomy with the advantage of being minimally invasive. However, a long-term follow-up with a larger number of patients is required to confirm its long-term results for adenocarcinoma arising from colonic polyps.