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BRIEF ARTICLE

Laparoscopic total colectomy: Does the indication influence the outcome?

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Abstract

AIM: To assess and compare outcomes of laparoscopic total colectomy performed for a variety of indications.

METHODS: Sixty six patients underwent laparoscopic total colectomy for inflammatory bowel disease (IBD) (13) and other diseases (53). Data on demographics, pre- and post-operative outcomes were collected prospectively.

RESULTS: Mean operative time was 4.5 h. Conversion rate was 13.6%. Total colectomy performed for IBD was associated with a significantly higher anastomotic leak rate (23.1% *vs* 1.9%, $P < 0.05$). On univariate analysis, hand sewn anastomosis and treatment with more than 20 mg of prednisolone for at least 3 mo was associated with a higher anastomotic leak rate ($P < 0.05$). No significant difference was found in return of gut function and overall morbidity between disease groups.

CONCLUSION: Laparoscopic total colectomy is feasible and outcomes are equivalent whatever the indication, except for anastomotic leak rate which is higher for patients with IBD.

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Key words: Colectomy; Inflammatory bowel disease; Laparoscopy; Familial adenomatous polyposis; Constipation; Colonic neoplasms; Hereditary nonpolyposis; Diverticulosis; Treatment outcomes

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INTRODUCTION

Numerous studies have demonstrated the benefits of laparoscopic segmental colonic resection for benign and malignant disease[1,2]. Proven advantages include im-

proved cosmesis, decreased blood loss and a reduction in postoperative pain, fatigue and time to resumption of oral intake. In contrast, data concerning laparoscopic total colectomy has been less compelling. Common indications for total colectomy include familial adenomatous polyposis (FAP), Lynch syndrome, slow transit FRQVWLSDWLRQ DQG LQÁDPPDWRU\ ERZHO GLVHDVH (IBD) as Crohn's disease and ulcerative colitis (UC). Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the treatment of choice in UC. For selected patients presenting with mild disease in the rectum, no dysplasia and with normal rectal compliance, a subtotal colectomy with ileo-distal sigmoid anastomosis may be an alternative and was performed in this study. Few published reports exist and mainly report techniques performed for a single indication or include small numbers of patients[3-10]. The aim of this study was to report the outcomes of laparoscopic total colectomy based on indiFDWLRQ FRPSDULQJ ,%' ZLWK RWKHU LQGLFDWLRQV

MATERIALS AND METHODS

Patients

%HWZHHQ -XQH DQG -XQH SDWLHQWV underwent a laparoscopic total or subtotal colectomy for benign or malignant disease. Patients were admitted to two surgical departments of Hospices Civils GH /\RQ DQG RSHUDWHG RQ E\ VHYHUDO VXUJHRQV LQ WKH 6XUJLFDO 'HSDUWPHQW RI &HQWUH +RVSLWDOLHU (G RXDUG +HUULRW 7KLUWHHQ SDWLHQWV SUHVHQWHG ZLWK ,%' ZLWK 8& DQG ZLWK FRORQLF &URKQ·V GLVHDVH SDWLHQWV ZLWK)$3 SDWLHQWV ZLWK VORZ WUDQVLW FRQVWLSDWLRQ SDWLHQWV ZLWK FROLF GLYHUWLFXORVLV 3DWLHQWV RQ IRU IDLOXUH RI PHGLFDO WUHDWPHQW DQG SDWLHQWV ZLWK FROLF FDQFHU except 1 patient with UC received at least 3 mo of maintenance steroid treatment [azathioprine (n DQG F\FORVSRULQH @ 1R SDWLHQW ZLWK 8& KDG SUHRSHUDWLYH WUHDWPHQW ZLWK LQIOL[LPDE @ 7KH GRVDJH RI 6S0 mg/kg for 5 patients. 6L[SDWLHQWV ZLWK ,%' KDG SUHRSHUDWLYH WUHDWPHQW ZLWK LQIOL[LPDE @ 1R SDWLHQW ZLWK 8& KDG SUHRSHUDWLYH WUHDWPHQW ZLWK FRUWLFRVWHURLGV DQG GHÀQHG by two or more of the following findings: tachycardia (heart rate > 120 beats per minute), temperature greater WKDQ , peritoneal signs and white blood cell count greater than 11 000/mL.

Surgical technique

All patients underwent bowel preparation with polyethylene glycol or sodium phosphate. Under general anesthesia patients were placed in supine position with legs slightly abducted and arms tucked to the sides. A nasogastric tube was inserted during surgery but postoperative use depended on the individual surgeon's routine practice. Pneumoperitoneum was established with a Veress needle at an abdominal pressure of 12 mmHg. A 10 mm port was placed at the umbilicus for the 30° oblique viewing laparoscope. Four additional ports were placed under laparoscopic vision: one 12 m port in the right lower quadrant, one 10 mm port in the right and left upper quadrants and one 5 mm port in the suprapuELF SRVLWLRQ 'LVVHFWLRQ DQG G was performed with a 10 mm laparoscopic Ligasure (Covidien, Mansfield, MA, United States) or a 5 mm blade Harmonic Scalpel (Ultracision 6KHDUV +DUPRQLF 6FDOSHO /&6 (Ethicon, Issy-Les-Moulineaux, France) according to the surgeon's preference, without mesenteric lymphadenectomy except for malignancy. Total colectomy was performed from right to left (lateral to medial dissection). The procedure involved right colonic mobilization as well as hepatic ÁH[XUH PRELOL]DWLRQ IROORZHG E section. The omentum was elevated off the transverse colon (except for cancers involving the transverse colon). 7KH VSOHQLF ÁH[XUH DQG ÀQDOO\ W were followed by division at the rectosigmoid junction using a laparoscopic linear stapler. Patients had either an ileo-distal sigmoid or ileorectal anastomosis. For an ileodistal sigmoid anastomosis (subtotal colectomy), a short lower midline incision was made for exteriorisation and resection of the specimen and formation of a hand sewn anastomosis. For an ileorectal anastomosis (total colectomy), the bowel was divided at the rectosigmoid junction and the specimen removed through a short transverse incision in the right lower quadrant. After re-establishment of the pneumoperitoneum, a stapled end-to-end ileorectal anastomosis was performed with an endoluminal stapling gun. A pelvic drain was used selectively.

Outcome measures

Data concerning patients, operative procedures and postoperative outcomes, were collected prospectively for all patients. The principle outcome measures were (1) Intraoperative data: operative times, surgical procedures performed, conversions and their reasons, creation of a stoma; and (2) Postoperative outcomes: time with nasogastric tube, time to first flatus, time with patient controlled analgesia, anastomotic leak, radiological intervention, reoperation, length of hospital stay.

The period of inclusion was divided into two 5-year periods and the results were compared.

Statistical analysis

6WDWLVWLFDO DQDO\VLV ZDV SHUIR (SPSS Inc., Chicago, IL, United States). Results are exSUHVVHG DV WKH PHDQ “ 6' &RPSDU were performed using the Student *t* test for continuous data and χ^2 or Fisher exact test for categorical data. Multivariate analysis was performed using a logistic regression. A PRGLÀHG OLWKRWRP\ SRVLWLR

tomy was performed for Crohn's disease. Conversion rate was 5.2% (11/211) and 3.8% (8/211) for the two time periods. Conversion was not statistically different between the two periods. Conversion was necessary for intra-abdominal adhesions. Super obesity (body mass index > 50) was responsible for one conversion and rectal trauma during stapling of an ileorectal anastomosis for the other. The conversion rate was not statistically different between the two periods. Conversion was necessary for intra-abdominal adhesions in 5.2% (11/211) and 3.8% (8/211) of patients for the two time periods. Super obesity (body mass index > 50) was responsible for one conversion and rectal trauma during stapling of an ileorectal anastomosis for the other. The conversion rate was not statistically different between the two periods. Conversion was necessary for intra-abdominal adhesions in 5.2% (11/211) and 3.8% (8/211) of patients for the two time periods.

Early postoperative outcomes

There were no postoperative deaths (30 d mortality). A naso-gastric (N-G) tube was left in situ in 211 patients. In 185 patients (87.7%) the N-G tube was removed on the first postoperative day. Twenty-six patients had postoperative small bowel ileus resulting in the N-G tube being left in situ for a median of 6 d (range 2-10 d). In 211 patients (87.7%) the N-G tube was removed on the first postoperative day. Twenty-six patients had postoperative small bowel ileus resulting in the N-G tube being left in situ for a median of 6 d (range 2-10 d). In 185 patients whose N-G tube was removed immediately after surgery, 7 developed ileus requiring N-G tube insertion. In patients whose N-G tube was removed immediately after surgery, 7 developed ileus requiring N-G tube insertion. Overall anastomotic leak was more frequent following surgery for Crohn's disease (8/211, 3.8%) than for other conditions (2/211, 0.9%) but not significantly so. Overall anastomotic leaks for hand sewn anastomosis vs stapled anastomosis, 5/211 (2.4%) vs 5/211 (2.4%). Complications that increased the length of stay were fuse diarrhea lasting 10 d (1) and prolonged ileus (1). In patients with FAP: aspiration pneumonia (1), prolonged ileus (1), segmental portal vein thrombosis (1) and intra-abdominal bleeding requiring reoperation in 2 patients, percutaneus radiological drainage in 1 and treatment with antibiotics in another. In patients with Lynch syndrome: intra-abdominal abscess without anastomotic leak treated by antibiotics only (1), lymph leak which delayed intra-abdominal drain removal (1) and small bowel obstruction treated non-operatively (1). For diverticular disease: intra-abdominal bleeding requiring

WKLV 5HÀQHPHQW LQ SDWLHQW VHOHFWLRQ DQG RXWFRPH PD\ DOV
H[SODLQ IHZHU SDWLHQWV ZLWK ,%' XQGHUJRLQJ V\QJHU\ RYHU
time.

,%' LV QRW D FRPPRQ LQGLFDWLRQ IRU WRWDO FROHFWRP\
In our series, it was performed principally for UC. Restorative proctocolectomy with IPAA is the treatment of choice in UC. However, in patients, especially young women, with mild rectal disease, no dysplasia and normal rectal compliance, a subtotal colectomy may be an alternative to IPAA that may give better functional results ZLWK UHGXFHG ULVN RI LQIHUWLOLW\ (YDOXDWLRQ RI WKH ORQJ
term results of total colectomy for UC was not the aim of this study and would require a controlled trial with large numbers of patients.

Morbidity in this study was higher than for segmental FROHFWRP\ ZLWK D UHSRUWHG UDWH RI LQ D UHFHQW VWXG\ XVLQJ D ODUJH QDWLRQDO GDWDEDVH[1]), but equivalent to segmental laparoscopic colectomies RWKHU VWXGLHV RI WRWDO FROHFWRP\ IRU ,%' 7DEOH
:H FRPSDUHG ,%' ZLWK RWKHU LQGLFDWLRQV IRU WRWDO colectomy. No difference in operative time, conversion rate, the length of stay or overall morbidity was seen. +RZHYHU WKHUH ZHUH VLJQLÀFDQWO\ PRUH DQDVWRPRWLF OHDNV LQ SDWLHQWV ZLWK ,%' HVSHFLDOO\ &URKQ·V GLVHDVH %RWK patients with Crohn's disease suffered anastomotic leaks although one had a defunctioning stoma. Several studies UHSRUW KLJK PRUELGLW\ UDWHV XS WR ZLWK D PRQWK VLRQ UDWH UHDFKLQJ IRU ODSDURVFRSLF VXUJHU\ LQ &URKQ·V disease[2-9]. In our opinion, all patients with Crohn's disease who undergo total colectomy should be prepared IRU D GHIXQFWLRQLQJ VWRPD)RU SDWLHQWV ZLWKRXW ,%' WKH DQDVWRPRWLF OHDN UDWH ZDV HTXLYDOHQW WR VHJPHQWDO FROHFWRP\ ZKLFK YDULHG EHWZHHQ DQG
sewn anastomosis and maintenance treatment with more than 20 mg of prednisolone daily were risk factors for anastomotic leak in univariate but not multivariate analysis. 3DWLHQWV ZLWK ,%' ZHUH PRUH OLNHO\ WR SRVVHVV ERWK WKHVH factors but larger numbers are required to evaluate these factors fully. Tilney et al[10], in a meta-analysis of outcomes DIWHU ODSDURVFRSLF RU RSHQ WRWDO FROHFWRP\ UHSRUWHG patients who underwent a restorative laparoscopic total FROHFWRP\ 2XU VHULHV LV RQH RI WKH ODUJHVW UHSRUWLQJ ODSD oscopic total colectomy in the literature and involved two surgical centers although a large multicenter prospective study would help clarify many issues raised.

In conclusion, laparoscopic total colectomy is feasible HYHQ IRU SDWLHQWV ZLWK ,%' EXW FRPSOLFDWLRQ UDWHV DUH higher and return to normal gut function slower than for VHJPHQWDO FROHFWRP\ 2XWFRPHV DUH HTXLYDOHQW ZKDWHYHU the indication, except for anastomotic leak rate which is KLJKHU IRU SDWLHQWV ZLWK ,%' 7R DFKLHYH WKH EHVW RXW comes in this group, careful patient selection with a low threshold for a defunctioning stoma is essential.

COMMENTS

Background

Numerous studies have demonstrated the benefits of laparoscopic segmental colonic resection for benign and malignant disease. Proven advantages include improved cosmesis, decreased blood loss and a reduction in postoperative pain, with the consequent reduction of oral intake. In contrast, data concerning laparoscopic total colectomy has been less compelling. The aim of this study was to report the outcomes of laparoscopic total colectomy based on indication, comparing inflammatory bowel disease (IBD) with other indications.

Research frontiers

In the area of mini-invasive surgery, laparoscopy was applied to colorectal surgery. The aim was to reduce the surgical stress to improve the post-operative course.

Innovations and breakthroughs

Based on a large series, this study describes the outcomes of laparoscopic total colectomy and is a reference for comparison in future studies.

Applications

The study results show that laparoscopic total colectomy is feasible and outcomes are equivalent whatever the indication, except for anastomotic leak rate which is higher for patients with IBD. The study results suggest that all patients with Crohn's disease who undergo total colectomy should be prepared for a defunctioning stoma.

Peer review

This paper demonstrates the outcomes of laparoscopic total colectomy performed for a variety of indications.

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