Original Research

Long-term quality of life associated with early surgical complications in patients with ulcerative colitis after ileal pouch–anal anastomosis: A single-center retrospective study

Weimin Xu[a,1], Hairong Ye[b,1], Yilian Zhu[a,1], Wenjun Ding[a], Jihong Fu[a], Long Cui[a,**], Peng Du[a,*]

a Department of Colorectal Surgery, Xin-Hua Hospital, Shanghai Jiaotong University School of Medicine, Shanghai 200092, China
b Department of Anesthesia, Xin-Hua Hospital, Shanghai Jiaotong University School of Medicine, Shanghai 200092, China

ARTICLE INFO

ABSTRACT

Background: Ileal pouch-anal anastomosis (IPAA) is recommended for patients with ulcerative colitis (UC) in terms of surgical treatment. Measuring surgical complications of IPAA and long-term quality of life (QOL) are important to achieve an acceptable risk/benefit ratio for patients with UC.
Materials and methods: Patients with UC who underwent total proctocolectomy (TPC) with IPAA from February 2008 to July 2016 at our institute were included. Early surgical complications were defined as mechanical/infectious events within one month after IPAA. Assessment of QOL was performed using the Cleveland Global Quality of Life instrument (CGQL), with 50% improvement as a cut-off value. Demographic and clinical variables were compared with univariable analysis and step-wise logistic regression models were also performed.
Results: A total of 58 eligible patients had a median follow-up time of 78.5 months [interquartile range (IQR), 34.4–92.8] from February2008 to March 2017, including 25 cases (43.1%) developed early surgical complications. Age at pouch surgery and excessive blood loss were risk factors associated with early surgical complications (p < 0.05). In multivariate analysis, older age at surgery [odds ratio (OR), 1.05; 95% confidence interval (CI), 1.01–1.1] and significant blood loss ($\geq$400 ml) (OR, 4.31; 95% CI, 1.21–16.87) were contributing factors for developing early surgical complications. The CGQL score was significantly increased after IPAA (0.728 ± 0.151 vs. 0.429 ± 0.173, p < 0.001). Early surgical complications (OR, 5.55; 95%CI, 1.44–21.37), older age at surgery (OR, 1.06; 95% CI, 1.01–1.12) and use of immunomodulatory (OR, 17.50; 95% CI, 1.52–201.39) were associated with poor long-term QOL.
Conclusion: The study demonstrated that early surgical complications might contribute to develop a poor CGQL score, suggesting intentional control of risk factors associated with early surgical complications should be taken into consideration for patients with UC for pouch surgery.

1. Introduction

As a major form of inflammatory bowel disease (IBD), ulcerative colitis (UC) is characterized by a chronic course of recurrent relapse and remission and the need for long-term medical management. Approximately 25–30% of patients with UC eventually need to undergo colectomy for medically refractory disease or colitis-associated neoplasia [1]. The restorative proctocolectomy (RPC) with ileal pouch-anal anastomosis (IPAA), described in 1978 [2], has become the procedure of choice for the surgical treatment of the UC patients, which not only removes the affected colon and rectum, but also restores intestinal

continuity with sphincter conservation while avoiding a permanent ostomy. However, the procedure is a technically demanding operation which can be associated with serious surgical complications (pelvic sepsis, anastomotic leakage, etc.), which may have a detrimental effect on function, quality of life (QOL) and health status, including high stool frequency and fecal incontinence. Previous studies have shown that IPAA improves QOL for UC patients [3,4], while the risk factors of postoperative complications and its relationship with long-term QOL are still unclear. Mostly patients with UC undergoing pouch surgery are young and have a long life expectancy. Thus, measuring surgical complications and functional long-term QOL are important in order to

---

Table 1
Baseline characteristics of Patients and Univariable Analysis of risk factors for early surgical complications.

Variables	All cases	Early surgical complications group (Group A) n = 25	Non-complications group (Group B) n = 33	p value
Clinical data				
Postoperative follow-up time [mo, median (IQR)]	78.5 (34.4–92.8)			
Preoperative CGQL score (mean ± SD)	0.429 ± 0.173	0.474 ± 0.185	0.398 ± 0.160	
Postoperative CGQL score (mean ± SD)	0.728 ± 0.151	0.696 ± 0.135	0.751 ± 0.159	
Disease duration [yr, median (IQR)]	3.5 (2.0–8.0)	3.0 (2.0–8.0)	4.0 (1.8–7.5)	0.823
Median age at surgery [yr, median (IQR)]	37.5 (27.8–52.0)	45.0 (35.0–56.0)	30.0 (26.0–50.5)	0.015
Male: female	19:39	10:15	9:24	0.306
Body mass index (kg/m^2, mean ± SD)	20.2 ± 3.4	20.0 ± 2.8	20.3 ± 3.8	0.683
Stage of surgery, n (%)				0.951
II-stage IPAA	42 (72.4)	18 (72.0)	24 (72.7)	
III-stage IPAA	16 (27.6)	7 (28.0)	9 (27.3)	
Surgical urgency, n (%)				0.305
Urgent surgery	4 (6.9)	3 (12.0)	1 (3.0)	
Elective surgery	54 (93.1)	22 (88.0)	32 (97.0)	
History of abdominal surgery, n (%)	10 (17.2)	2 (7.7)	8 (25.0)	0.160
Surgical approach, n (%)				0.216
Open	39 (67.2)	19 (76.0)	20 (60.6)	
Laparoscopic	19 (32.8)	6 (24.0)	13 (39.4)	
Steroids, n (%)	30 (51.7)	13 (52.0)	20 (60.6)	0.512
Immunomodulators, n (%)	7 (12.1)	2 (8.0)	5 (15.2)	0.687
Extent of UC, n (%)				0.731
Left side	10 (17.2)	5 (20.0)	5 (15.2)	
Pancolitis	48 (82.8)	20 (80.0)	28 (84.8)	
Laboratory and anesthetic Data				
ASA Grade, n (%)				0.674
I	8 (13.8)	4 (16.0)	4 (12.0)	
II	50 (86.2)	21 (84.0)	29 (87.9)	
Opioids, n (%)	50 (86.2%)	21 (84.0)	29 (87.9)	0.715
Blood transfusion, n (%)	6 (10.3)	1 (4.0)	5 (15.2)	0.222
Anesthesia method, n (%)				1.000
General anesthesia (GA)	54 (93.1)	23 (92.0)	31 (93.9)	
General and Epidural anesthesia (EP)	4 (6.9)	2 (8.0)	2 (6.1)	
Preoperative hemoglobin (g/L, mean ± SD)	38.4 ± 5.7	116.2 ± 20.9	113.7 ± 23.7	0.676
Preoperative albumin (g/L, mean ± SD)	114.8 ± 22.4	38.0 ± 7.0	38.7 ± 4.4	0.668
Blood loss (ml, mean ± SD)	259.3 ± 185.4	325.2 ± 167.8	223.0 ± 189.3	0.037
Urine volume (ml, mean ± SD)	378.6 ± 251.8	378.0 ± 275.4	379.1 ± 236.8	0.987
Transfusion volume (ml, mean ± SD)	2100.0 ± 548.8	226.0 ± 671.6	2004.5 ± 420.1	0.156
Colloidal amount (ml, mean ± SD)	637.9 ± 257.4	680.0 ± 244.9	606.1 ± 265.7	0.283

achieve an acceptable risk to benefit ratio for both surgeons and UC patients.

In this study, we mainly assessed risk factors associated with long-term functional outcome by using the Cleveland Global Quality of Life (CGQL) instrument and evaluated the early surgical complications of UC patients after IPAA. It is important to explore treatment strategies and methods to reduce the incidence of postoperative adverse events and to improve the long-term QOL.

2. Methods

2.1. Participants and setting

Patients who underwent total proctocolectomy (TPC) with pouch creation between January 2008 and July 2016 at our institute were eligible for inclusion. Patients were identified, and their clinical data was obtained from a prospectively maintained, institutional review board-approved pouch database. Long-term CGQL scores were conducted by telephone interview and outpatient examination.

2.2. Inclusion and exclusion criteria

Inclusion criteria were patients who: (1) diagnosed as UC; (2) received TPC with pouch creation; (3) underwent pouch surgery at 16–65 years old; and (4) received a regular follow-up at our department.

Exclusion criteria were patients who: (1) underlying as familial adenomatous polyposis (FAP) or indeterminate colitis (IC); (2) were with status of temporary or permanent diverting ileostomy; and (3) had impaired general health status, and/or lost follow-up.

2.3. Quality of life scale

We used the questionnaires to obtain both pre- and postoperative CGQL score, which has been determined to assess long-term QOL in UC patients after IPAA [3,5]. Patients were asked to score each of the three items (current quality of life, current quality of health, and current energy level), each on a scale of 0–10 (0, worst; 10, best). The scores were added and the cumulative score is divided by 30 to obtain the ultimate CGQL score. In the present study, we used the CGQL instrument before surgery to evaluate the preoperative status, then we subtracted the preoperative score from the latest postoperative CGQL score and the difference is divided by preoperative score so as to obtain the improvement of CGQL scores in percentage. We then respectively divided into two groups based on the improvement percentage of CGQL scores, with 50% improvement as a cut-off value.

2.4. Statistical analysis

Statistics to describe the data are appropriately represented by the numbers and percentages, mean and standard deviations (SD), or the median and interquartile range (IQR). Continuous variables were described according to the median and IQR or mean and SD. Two-sample Student's t-test was used to compare the population means between two different continuous variables and Wilcoxon's rank-sum test was used for ranked variables respectively. Categorical variables were evaluated using Chi-squared or Fisher's exact test, as appropriate. Multivariable