

# Surgical management of ulcerative colitis: a short review and a retrospective analysis of our experience at the University Medical Center Ljubljana

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## KEY WORDS

ulcerative colitis, surgical management, postoperative results

## SHORT REVIEW

SURGERY SURG ENDOS 2019;1: 31-37

## Abstract

**Background.** Ulcerative colitis requires surgical therapy in about a third of patients. A staged colectomy with end ileostomy should be performed in the acute setting, whereas a total proctocolectomy with ileal pouch–anal anastomosis is the current gold standard in the elective setting. Overall morbidity after surgery of ulcerative colitis is high. Surgical treatment in acute setting results in a higher incidence of postoperative complications as well as higher mortality rates. The laparoscopic approach tends to lower the incidence of septic complications and shortens the hospital stay.

**Methods.** The aim of our study was to learn how many patients with ulcerative colitis were surgically treated at the Ljubljana University Medical Center during a 5-year period and what the results were of the different approaches we chose. We performed a retrospective analysis of patient data from 2010 to 2015. Thirty-nine patients operated on for the first time were identified over a period of 5 years. Thirty-four operations were performed in an elective setting and five operations were acute (urgent) due to failure of medical salvage therapy.

**Results.** There were 27 non-restorative resections with terminal ileostomy (17 proctocolectomies and 10 total colectomies) and 12 restorative resections (four total colectomies with ileo-rectal anastomosis and eight proctocolectomies with ileal pouch–anal anastomosis). In 25 cases open surgery was performed, and in 12 cases resections were performed laparoscopically, with two cases converted to open surgery. The overall morbidity rate was 41%, with four major postoperative complications requiring surgical reintervention. One patient died as a result of serious septic complications.

**Conclusions.** Morbidity after surgery for ulcerative colitis remains significant and affects 25 to 50% of patients. The most important postoperative complication is pelvic sepsis as a result of anastomotic dehiscence or less frequently an infected



hematoma. Mortality rates are low, not exceeding 1% for operations performed in an elective setting. Higher rates are seen for urgent resections in acute colitis, especially in malnourished, steroid-dependent patients.

## Introduction

### Disease characteristics

Ulcerative colitis (UC) is a chronic inflammatory bowel disease characterized by a continuous inflammation that is limited to the mucosa of the colon and rectum. However, some patients with proctitis or left-sided colitis might have a cecal patch of inflammation. The symptoms are local with or without systemic disturbances. Increased stool frequency with passage of bloody diarrhea and mucus associated with abdominal pain are the most characteristic complaints. Diagnosis of UC is based on these clinical symptoms and confirmed by findings from endoscopic and histological examinations. Both infectious and noninfectious causes of diarrhea should be ruled out before a definitive diagnosis of UC is made [1].

About 50% of patients have the disease confined to the rectum at the time of diagnosis. In 20% UC extends to the left colon and in the remainder beyond the splenic flexure. Disease is therefore classified as proctitis, left-sided colitis, or pancolitis. The disease severity, based on the number of daily stools and presence or absence of systemic signs of inflammation, such as fever and tachycardia, should be assessed as well [2]. The treatment strategy for UC should consider the extent, severity, and pattern of the disease. The pattern includes relapse frequency, the course of the disease, response to previous medications, possible side-effects of medical treatment, and extra-intestinal manifestations. Medical treatment controls the disease most of the time and mainly consists of mesalazine, corticosteroids, immunosuppressive drugs, and monoclonal antibodies to tumor necrosis factor  $\alpha$  (TNF- $\alpha$ ). Around 30% of UC patients eventually require surgical therapy, either in an acute or elective setting [3].

### Acute colitis

Surgery in an acute setting is performed for life-threatening complications of fulminant colitis that are unresponsive to medical treatment (toxic megacolon, colonic perforation, and rarely hemorrhage) as well as for patients with severe UC admitted to the hospital that do not respond to intensive medical treatment [4].

Acute UC occurs in about 10% of all UC patients and is the initial presentation in 30%. According to the guidelines of the European Crohn's and Colitis Organisation (ECCO), patients with bloody diarrhea  $\geq 6$ /day and any signs of systemic toxicity (tachycardia  $> 90$  bpm, fever  $> 37.8$  °C, Hb  $< 10.5$  g/dl, or an erythrocyte sedimentation rate  $> 30$  mm/h) have severe colitis and should be hospitalized for intensive treatment. This treatment is based on intravenous corticosteroids, and concomitant infection with *Clostridium difficile* and cytomegalovirus must be ruled out [5]. More than two-thirds of these patients respond to such treatment [6]. However, steroid treatment should not be extended beyond 7 to 10 days because such extended therapy does not benefit the patients. Moreover, the duration of medical therapy before colectomy seems to be the only factor associated with major surgical complication rates [7]. Hence, the response to steroid therapy should be thoroughly evaluated, preferably with the gastroenterologist and the attending surgeon discussing the patient's progress at least once daily. Steroid refractory disease must be recognized early (preferably no later than day 3) and a decision must be made whether to start medical salvage therapy or proceed to colectomy, which must be regarded as a life-saving procedure [8]. A staged colectomy with end ileostomy should be performed in the acute setting, which is a relatively straightforward and safe procedure even in very ill UC patients. Patients are cured from the burden of toxic colitis and, while they are regaining their general health, they are able to consider the option of either an ileal pouch-anal anastomosis (IPAA) or permanent ileostomy. Leaving the rectal stump avoids the complications of pelvic dissection and a possible bowel anastomosis in critically ill patients. Moreover, in many patients with severe acute colitis unresponsive to medical therapy the distinction between the UC and Crohn's disease is made only after the final pathology report is finished. One of the major disadvantages of leaving the diseased rectum behind is the continuation of active

disease, which may require a subsequent urgent proctectomy. However, this problem is very uncommon.

## Elective surgery

Indications for surgery in an elective setting include cancer, risk for cancer (dysplasia), strictures, medical intractability, and unresponsive extra-intestinal manifestations. In children, growth retardation is equally an indication for surgery.

Intractability is a clinically defined condition that can occur in either the acute or chronic state of UC. In the latter, it refers to refractory colitis, chronically active despite maximal medical therapy, as well as to inability to taper steroids to a reasonable maintenance dose or the development of severe drug-related side effects.

**Table 1.** Patient demographics.

Demographic	Value
Total patients	39
Sex (male:female)	17:22
Average age (years)	44 (32–80)
Average hospital stay (days)	22 (9–75)
Average ASA	2.4 (1–4)
Mortality, n (%)	1 (2.6%)
Morbidity, n (%)	16 (41.0%)

The risk of colon cancer in a UC patient becomes obvious after 10 years and rises to 50% and 75% after 30 and 40 years of disease, respectively. The most important risk factors are the extent of the disease and longer duration. Most cases are believed to arise from dysplasia, and surveillance colonoscopy is therefore recommended. Multiple (at least 32) random biopsy specimens from all segments of the colon should be obtained (approximately three to four biopsies every 10 cm). Recently, with the advent of video endoscopy and new endoscopic technologies, many investigators are reporting that most dysplasia discovered in patients with inflammatory bowel disease are visible. This paradigm shift could have important implications for the surveillance and management of dysplasia [9]. However, despite the evolving evidence regarding newer endoscopic methods to detect dysplasia, current European evidence-based consensus on surgery for UC recommends colectomy not only for carcinoma but also for patients with the following [11]:

- Flat high-grade dysplasia (HGD) due to the immediate and subsequent risk of carcinoma;
- Non-adenoma-like dysplastic raised lesions due to the high association with metachronous or synchronous carcinoma;
- Adenoma-like lesions if they cannot be completely resected or there is dysplasia present in the surrounding mucosa.

Indications for the management of flat low-grade dysplasia (LGD) are less clear than for HGD. The current evidence is insufficient to assess the balance of risks and benefits of colectomy for flat

**Table 2.** Operative details and postoperative data.

	Open surgery	Laparoscopic	Conversion
Patients, n	25	12	2
Scheduled procedures, n (%)	20 (80.0%)	12 (100%)	2 (100%)
Urgent procedures, n (%)	5 (20.0%)	0 (0%)	0 (0%)
Average operation time (minutes)	162 (65–350)	233 (95–410)	236 (215–257)
Postoperative complications, n (%)	10 (40.0%)	4 (33.0%)	2 (100%)
Need for transfusion, n (%)	8 (32.0%)	3 (25.0%)	0 (0%)
Average hospital stay (days)	21.3 (10–60)	17.9 (9–59)	45.0 (15–75)
Reoperation within 30 days, n (%)	2 (8.0%)	2 (16.7%)	0 (0%)

LGD. Hence, the decision should be individualized and discussed with the patient. Polyps in colonic segments proximal to the UC involvement should be treated as sporadic adenomas. The same is true for adenoma-like raised lesions if they can be completely endoscopically resected, provided there is absence of dysplasia at the margins and there is no evidence of flat dysplasia elsewhere in the colon.

In the elective setting, total proctocolectomy with IPAA is the current gold standard. In patients with a preoperative diagnosis of dysplasia or cancer, the proctocolectomy should include oncologic lymphadenectomy with ligation of the vessels at their origins. Anastomosis should be covered with protective ileostomy most of the time. In rare cases, a colectomy with ileorectal anastomosis can be offered to patients with relative rectal mucosal sparing on endoscopy, absence of dysplasia with a distensible rectum on air insufflation, and a competent anal sphincter. Only a few patients fulfil the aforementioned criteria. Nevertheless, this type of resection should be sometimes considered, especially in fertile female patients because it is now clear that the risk of infertility after IPAA is increased threefold. If restorative surgery is not an option based on general and mental health, sphincter function, and motivation, then conventional total proctocolectomy with a Brooke ileostomy is performed.

The aim of our study was to learn how many patients with UC were surgically treated at the Ljubljana University Medical Center during a 5-year period and what the results were of the different approaches we chose.

## Methods

We performed a retrospective analysis of UC cases hospitalized and surgically treated at our institution over a period of 5 years, from 2010 to 2015. A database search revealed 39 patients. Basic demographic information of the patients was extrapolated, along with the setting and the mode of the operation performed. Potential postoperative complications, need for transfusion, and the length of hospital stay were also noted. Statistical analysis was mostly based on simple calculations of the average values of certain numeric variables.

## Results

Among 39 patients operated on for the first time, 34 operations were performed in an elective setting and five were acute (urgent) due to failure of medical salvage therapy.

There were 27 non-restorative resections with terminal ileostomy. In 17 of these cases, proctocolectomy was performed and 10 underwent total colectomy. Twelve resections out of 39 were restorative; four total colectomies with ileorectal anastomosis and eight proctocolectomies with IPAA. In 25 cases open surgery was performed, and in 12 cases resections were carried out laparoscopically. Two of the laparoscopically initiated cases were converted to open surgery.

In the emergency group, all five patients underwent open surgery. Four of these patients had some kind of postoperative complications (80.0%), yet none needed a reoperation within 30 days. The elective group of patients included all of the laparoscopically initiated procedures. Among 34 patients operated on in the elective setting, four underwent reoperation within 30 days (11.8%). The rate of postoperative complications in this group was 35.3% (12 patients).

The overall morbidity rate was 41.0%. The most common postoperative complication was surgical wound infection (four cases; 10.2%), followed by postoperative ileus (two cases) and fistula formation (two cases). Four cases required surgical re-intervention due to major postoperative complications. One patient in the emergency group died after serious septic complications (2.6% mortality rate). The patient demographics and operative/postoperative data are summarized in Table 1 and Table 2, respectively.

## Discussion

Despite the fact that surgery for UC is technically demanding and is often performed in very ill patients, the mortality rates are low. In patients undergoing elective procedures postoperative mortality does not exceed 1.0%, and in patients undergoing emergency surgery the rates go up to 6.9% [12]. The results of our small series show a similar conclusion because only one patient was lost due to septic complications (mortality rate



of 2.6%). However, the morbidity rates are high, even in elective cases. Early postoperative complications ( $\leq 30$  days postoperatively) occur overall in 9 to 65% of patients and late complications ( $> 30$  days postoperatively) in 17 to 55% [13]. Wound infection, small bowel obstruction, and pelvic sepsis are the most common early complications. Less commonly, one can expect ileostomy-related complications and hemorrhage. Our own results are in accordance with such reports in the literature because 41.0% of patients had some kind of early postoperative complications. Apart from surgical complications, pneumonia and thromboembolic complications with pulmonary embolism are also an important contributor to postoperative morbidity [14]. Morbidity is higher in patients undergoing surgery in an acute setting [12]. Such results were also seen in our series, with elective cases presenting with postoperative complications in 35.3% and emergency cases in 80.0%.

Patients should be preoperatively optimized, especially if they are malnourished. An enhanced surgical recovery is to be applied because it appears to yield an outcome advantage in terms of hospital stay and postoperative morbidity. Preoperative steroids, hypoalbuminemia, and malnutrition are associated with an increased rate of surgical complications, as are probably anti-TNF- $\alpha$  agents. On the other hand, preoperative thiopurines and calcineurin inhibitors do not increase the risk of postoperative complications [15].

A laparoscopic approach, even in an emergency setting as long as the patient is not critically ill or unstable, results in a shorter hospital stay and in reduction of postoperative infectious complications [11]. Hence, it is our strong goal to perform more laparoscopic procedures, even in patients needing emergency surgical treatment. This has not been the case so far (Table 2) because none of the patients in the emergency group were operated on laparoscopically. Moreover, we would like to offer every UC patient scheduled for elective surgery a laparoscopic colectomy.

Finally, it is a well-established fact that the most important parameter in the long run for IPAA patients is bowel function. Incontinence affects around 5% of patients, who are usually satisfied with the functional results because there is no urgency, which is the most incapacitating symptom of UC. However, functional results must be objectively measured, preferably through reliable, validated, and sensitive instruments (i.e., question-

naires). Such quality-of-life assessment was not systematically carried out for our patients; hence this important endpoint of our surgery could not be properly investigated in this study.

## Conclusions

Morbidity after surgery for UC remains significant and affects 25 to 50% of patients. The most important postoperative complication is pelvic sepsis as a result of anastomotic dehiscence or less frequently an infected hematoma. Mortality rates are low, not exceeding 1% for operations performed in an elective setting. Higher rates are seen for urgent resections in acute colitis, especially in malnourished, steroid-dependent patients. Morbidity rates are higher in an acute setting surgery. Laparoscopic resections should provide a lower risk of septic complications and shorter hospital stay when compared to open surgery. The results of our series correlate well with reports from the literature. However, the relatively small number of patients operated on during the 5-year period analyzed failed to provide statistically significant results. Restorative proctocolectomy with IPAA should be offered to all suitable patients, regardless of their chronological age. Colectomy with ileorectal anastomosis is rarely justified. However, it can be proposed to young female patients as a possible interim procedure, based on concerns about infertility.

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