Surgery for Ulcerative Colitis in Elderly Persons

Changes in Indications for Surgery and Outcome Over Time

Gidon Almogy, MD; David B. Sachar, MD; Carol A. Bodian, DrPH; Adrian J. Greenstein, MD

Hypothesis: Medical therapy has changed the indications for surgery over the last 4 decades. Advances in perioperative care have significantly improved the outcome.

Design: The medical records of all patients 65 years and older who underwent surgery for ulcerative colitis during a 40-year period were analyzed retrospectively.

Setting: Tertiary referral center.

Patients: One hundred thirteen consecutive patients 65 years and older who underwent surgery for ulcerative colitis between January 1, 1960, and June 30, 1999.

Main Outcome Measures: Changes in elective and urgent indications for surgery. Changes over time in outcome and the factors that brought about these changes. Predictors of poor outcome in an elderly population with ulcerative colitis.

Results: One hundred thirteen patients were divided into 3 cohorts of 38, 38, and 37 consecutive patients admitted to the hospital during the periods 1960 through 1984, 1985 through 1993, and 1994 through 1999, respectively. Indications for surgery and morbidity and mortality rates have changed with time. Dysplasia has replaced carcinoma as a major indication for elective surgery (P = .001). Toxic megacolon has become significantly less common as an indication for urgent surgery (P = .001). Surgery-associated adverse outcomes have decreased significantly from 50% (13% deaths, 37% major complications) to 27% (3% deaths, 24% major complications) (P = .04). Male sex, an albumin level of 2.8 g/dL or less, and urgent surgery were found to be independent predictors of poor outcome.

Conclusions: In our referral center, the indications for urgent and elective surgery have changed during the past 4 decades from toxic megacolon and carcinoma, to disease refractory, to medical therapy and dysplasia, respectively. Morbidity and mortality have decreased dramatically over time. Urgent procedures, low levels of albumin, and male sex are all predictors of poor outcome.

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As the elderly population has increased, the recognition of ulcerative colitis (UC) in the older patient has become of increasing importance. Previous studies have suggested that UC in elderly patients is a different disease and follows a different pattern with a higher frequency of complications. The higher frequency of acute complications such as toxic megacolon, free perforation, and massive hemorrhage in older patients leads to a correspondingly higher case-fatality rate. It is unclear whether the higher mortality in elderly patients with UC, reaching 19% in some reports, is due to the disease process itself or to the adverse effects of concomitant illnesses.

Other studies have suggested that the occurrence of inflammatory bowel disease in the elderly population is, in fact, associated with a favorable outcome. These contradictory observations may have been due in part to misdiagnosis of conditions such as ischemic colitis and acute diverticulitis for UC, and also to the referral bias inherent in reports from tertiary referral centers.

The aim of this study was to summarize our surgical experience with an elderly population suffering from UC in a referral hospital. We analyzed the changes over time in terms of population characteristics, indications for surgery, surgical procedures, and short-term outcome in patients 65 years old and older who underwent surgery for UC. We further identified predictors of an adverse outcome in this elderly population.

Results

Overall 113 patients 65 years old and older had surgery for UC in the 40-year period from 1960 through 1999. The characteristics for all 3 groups are given in Table 1.
PATIENTS, MATERIALS, AND METHODS

We retrospectively reviewed the medical records of 119 consecutive patients aged 65 years and older who underwent surgery for the diagnosis of UC at Mount Sinai Hospital, New York, NY, between January 1, 1960, and June 30, 1999. The medical records of 42 patients operated on between 1960 and 1984 were retrieved from computer files kept at Mount Sinai Hospital (A.J.G.). The medical records of patients with UC who underwent surgery from 1985 through 1999 were retrieved from the medical records at Mount Sinai Hospital.

The diagnosis of UC was established by recognized radiological, endoscopic, and histopathological criteria. Six patients were excluded from the study. One patient had an exploratory laparotomy for metastatic colon cancer. Five patients initially diagnosed as having UC were found to suffer from different causes. One patient had ischemic colitis, 1 patient had collagenous colitis, 1 patient had idiopathic toxic dilatation of the colon, 1 patient had Crohn colitis, and 1 patient had an indeterminate form of inflammatory bowel disease.

All patients in this study were aged 65 years and older at the time of surgery. The 113 patients were divided into 3 cohorts of 38, 38, and 37 consecutive patients to analyze changes over time (groups 1 through 3, for the years 1960-1984, 1985-1993, and 1994-1999, respectively). Information regarding the extent of disease, albumin level, and hemoglobin was unobtainable for most of the patients in group 1. Therefore, this group was available only for analysis of changes that occurred over time in indications for surgery, surgical procedures, and short-term outcome. Analysis of predictors of an adverse outcome was performed for the remaining 2 groups, for which the information was more easily available.

Complication and death rates were similar for patients who had the disease for 2 to 10 years and for patients suffering from UC for longer than 10 years. Therefore, these groups were combined; duration of disease was defined as short or long according to a cutoff of 2 years or less from the onset of disease to the operative procedure. The number of patients with emergent indications for surgery was small. We therefore grouped all patients with emergent indications for surgery (eg, free perforation) and all patients with urgent indications for surgery (eg, toxic megacolon and failure of medical therapy administered in the hospital) as having urgent indications for surgery.

The indications for surgery were defined as follows: (1) refractory to medical therapy (persistent symptoms such as diarrhea, abdominal pain, rectal bleeding, and weight loss, despite maximal medical therapy, with or without steroid dependency); (2) toxic megacolon as previously described and confirmed by the operative findings; and (3) dysplasia and invasive carcinoma that were diagnosed by accepted pathologic criteria.

Only procedures performed at our institution were included in the study. Most patients underwent only 1 operation. For patients who underwent more than 1 operation, statistical analysis was performed for the initial procedure.

Complications requiring intervention or those prolonging the hospital stay were considered major complications. Mortality was defined as death within 30 days of the operative procedure or directly related to the surgical procedure. Adverse outcome was defined as a major complication or death.

Statistical analysis was performed using \( \chi^2 \) tests and \( \chi^2 \) tests for trends, Fisher 2-tailed exact test, and the Wilcoxon rank sum test, as applicable. Statistical analysis for predictors of an adverse outcome was performed using multivariate logistic regression analysis. Results were considered statistically significant when the \( P \) value was <.05.

The number of surgical procedures performed for all patients with UC at our institution has significantly increased during the past 4 decades. The number of surgical procedures performed for patients older than 65 years has also increased from 4.2 surgical procedures per year in group 2 to 6.2 surgical procedures per year in group 3. The diagnosis of UC was made preoperatively in most cases. In 3 patients the preoperative diagnosis was missed; 1 was diagnosed preoperatively as having acute diverticulitis, 1 as having ischemic colitis, and 1 as having Crohn colitis.

Universal colitis was twice as prevalent as left-sided colitis. For both, there was little difference between male and female patients (23 males and 27 females with universal colitis; 11 males and 14 females with left-sided colitis). Two patients had benign strictures.
changes over time and most of the urgent surgical procedures performed for dysplasia and a decrease in the number of operations performed for carcinoma over time (P<.01, $\chi^2$ test). Group 1 indicates those patients operated on from 1960 through 1984; group 2, those patients operated on from 1985 through 1993; and group 3, those patients operated on from 1994 through 1999. The asterisks indicate statistically significantly different from groups 2 and 3 by $\chi^2$ test for trends; dagger, 5 patients underwent surgery for benign strictures.

**MORTALITY**

Mortality has decreased over time. Five patients (13%) in group 1, 3 patients (7.9%) in group 2, and 1 patient (2.7%) in group 3 died after surgery, but this trend did not reach statistical significance ($P=10$). Of the 5 patients who died during the early postoperative period in group 1, the cause of death was intra-abdominal sepsis in 4 patients and massive upper gastrointestinal tract hemorrhage in 1 patient. Of the 3 deaths in group 2, 1 patient died of intra-abdominal sepsis, 1 of pulmonary embolism, and 1 from massive upper gastrointestinal tract hemorrhage. Intra-abdominal sepsis was the cause of death for the only patient who died in group 3.

Toxic megacolon was associated with a high mortality rate in all 3 groups. Three (33%) of 9 patients in group 1, and 1 (50%) of 2 patients in both groups 2 and 3 died after undergoing surgery for toxic megacolon.

**MORBIDITY**

The major complications for all patients are given in Table 2. Six patients (16.6%) had more than 1 complication.
There was a significant decrease in the complication rate for patients with duration of disease for 2 years or less, extent of disease, and urgency of surgery (Table 4). We identified several factors that have changed over time: (1) The complication rate for patients aged 75 years or older at surgery has significantly decreased ($P = .03$), whereas the decrease for younger patients was less notable. (2) The complication rate for patients with duration of disease of longer than 2 years has significantly decreased over time ($P = .02$), while there was no change for patients with a short duration of disease (duration of $\leq 2$ years). (3) There was a significant decrease in the complication rate for female patients over time ($P = .046$) but not for male patients. The decrease in complication rate was comparable for both elective and urgent surgery.

**ADVERSE OUTCOME**

To analyze the overall adverse outcome, deaths and major complications were grouped together. Surgery-associated adverse outcome has decreased significantly over time from 50% to 27% ($P = .04$) (Table 4). To better understand the decrease in complications and deaths, we analyzed the data to see if the decrease over time was uniform for all 3 groups for factors such as age, sex, duration of disease, indication for surgery, extent of disease, and urgency of surgery (Table 4). We identified several factors that have changed over time: (1) The complication rate for patients aged 75 years or older at surgery has significantly decreased ($P = .03$), whereas the decrease for younger patients was less notable. (2) The complication rate for patients with duration of disease of longer than 2 years has significantly decreased over time ($P = .02$), while there was no change for patients with a short duration of disease (duration of $\leq 2$ years). (3) There was a significant decrease in the complication rate for female patients over time ($P = .046$) but not for male patients. The decrease in complication rate was comparable for both elective and urgent surgery.

**PREDICTORS OF ADVERSE OUTCOME**

We analyzed the rate of adverse outcome as a function of age, sex, duration of disease, extent of disease, albumin level, hematocrit, indication for surgery, and urgency of surgery. We performed a multivariate regression analysis only for patients in groups 2 and 3, as these data for patients in group 1 were incomplete, to identify independent predictors of adverse outcome. Using a stepwise logistic regression procedure, male sex ($P = .03$; odds ratio = 3.7) and albumin level of 2.8 g/dL or less ($P = .001$; odds ratio = 7.2) were found to be independent predictors of poor outcome. However, data for the albumin level were missing for 7 of the 75 patients (groups 2 and 3), so the analysis was repeated without considering the albumin level. Then, elective surgery was found to correlate inversely with the complication rate ($P = .01$; odds ratio = 0.24). Age at surgery of 75 years or older, duration of disease for 2 years or less, extent of disease, and toxic megacolon were not found to be predictors of an adverse outcome.

**COMMENT**

Acute complications, namely, toxic megacolon, free perforation, and uncontrolled bleeding were considered the major indications for urgent surgery in patients older than 60 years who had UC. The reported incidence of toxic megacolon in patients with UC has ranged from 1.6% to 22%. The overall mortality rate varies greatly but has been reported to be as high as 20%. Our data show that toxic megacolon has become much less common as an indication for surgery. This is probably because of earlier diagnosis, more aggressive treatment including nasointestinal decompression, broad-spectrum antibiotics, parenteral nutrition, and the use of high-dose intravenous steroids. Although significantly less prevalent than in the past as an indication for surgery, toxic megacolon is still associated with a fatality rate of 37.5% (5 of 12 patients) in our series. This high fatality rate has not improved over time.

Restorative proctocolectomy has become the procedure of choice for younger patients with UC. Im-
proven perioperative care and surgical techniques have brought about a decrease in morbidity and mortality and, thus, have made these procedures possible. Some authors believe that the surgical stress associated with restorative proctocolectomy in the elderly population is prohibitively high.13 Recent reports, however, have shown that there is no increase in surgical morbidity and mortality among older patients undergoing restorative proctocolectomy.14 The median age of patients in these reports was between 55 and 56 years. Since 1985, we have performed total proctocolectomies with J-shaped ileal pouch–anal anastomosis pullthroughs for 14 patients older than 65 years (median age, 68 years; age range, 65-74 years) with minimal morbidity and no mortality. We believe that restorative proctocolectomy should be considered with caution for a select and limited number of elderly patients, omitting those with findings of significant comorbidity and poor overall nutritional status, as reflected in low serum albumin levels.

It was commonly believed that older patients had higher complication rates.15 In fact, mortality rates in patients requiring urgent surgery were reported to be as high as 50%.16,17 However, the number of elderly patients who underwent surgery in these reports was small. Recent reports have shown a decrease in mortality and morbidity rates.18,19 To our knowledge, we present the largest series of elderly patients with UC who underwent surgery. Our data show that the mortality rate is lower than 3%. This improvement in outcome is secondary to better results for female patients, for patients aged 75 years and older, for elective procedures, and for patients who have a longer duration from the onset of disease to the surgical procedure. Better perioperative care and improvements in anesthesia also account for the increase in survival.

Previous reports have suggested that the proportion of male to female patients is higher in elderly patients who have UC.1 Male patients also seem to have more limited and less aggressive disease.19 However, most patients in these reports were not referred for surgery. In this study, male patients aged 65 years and older who underwent surgery for UC had significantly higher complication and death rates than female patients. Female patients also seemed to do better over time. These sex differences were not due to differences in the age at surgery, duration of disease, indication for surgery, extent of disease, or the proportion of patients requiring urgent surgery. It is unclear whether elderly male patients with UC who require surgery have a different disease process, as some have suggested, or whether other factors, as yet unknown, make elderly male patients more prone to complications.

**CONCLUSIONS**

We reviewed our 40-year surgical experience with 113 patients aged 65 years and older who have UC. Over the past 4 decades the indications for urgent and elective surgery have changed. Failure of medical therapy has replaced toxic megacolon as the main indication for urgent surgery at our institution. The complication and death rates have decreased significantly over time; the current overall mortality for patients aged 65 years and older is less than 3%. Urgent procedures, low levels of albumin, and male sex are predictors of an adverse outcome in the elderly population. Low complication and death rates should be expected for elective procedures in the elderly population.

**REFERENCES**