Postoperative Steroid Taper Is Associated With Pelvic Sepsis After Ileal Pouch-anal Anastomosis

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Objective: We hypothesized that postoperative oral steroid taper after ileal pouch-anal anastomosis for inflammatory bowel disease would not be associated with pelvic septic complications.

Background: Recent data has emphasized the possible association between biologic medication use and pelvic sepsis following ileal pouch-anal anastomosis. Limited contemporary data exist examining the effects of steroid use on these complications.

Methods: Consecutive patients undergoing ileal pouch-anal anastomosis for inflammatory bowel disease at a single institution from January 2009 to December 2013 were included. Factors associated with anastomotic leak and pelvic sepsis were assessed using univariate and multivariate analysis.

Results: A total of 686 patients were included (mean age 39.5 years, 59% males). Postoperative oral steroid taper was associated with both anastomotic leak and pelvic sepsis on univariate analysis. Stress dose intravenous steroid use was not associated with complications. Multivariate analysis indicated total proctocolectomy (odds ratio [OR] 2.2; confidence interval [CI] 1.01–4.7, $P = 0.047$), and postoperative oral steroid taper (OR 2.3; CI 1.06–5.1; $P = 0.035$) as independent factors significantly associated with pelvic sepsis.

Conclusions: Prolonged postoperative oral steroid taper after ileal pouch-anal anastomosis should be avoided. If preoperative steroid weaning is not possible before a planned total proctocolectomy and ileal pouch-anal anastomosis, patients should undergo an initial total abdominal colectomy.

Key Words: ileal pouch-anal anastomosis, perioperative steroids, pelvic sepsis

INTRODUCTION

Ileal pouch-anal anastomosis (IPAA) is the preferred standard in the surgical management of ulcerative colitis, indeterminate colitis,[1, 2] and selected cases of patients with Crohn's colitis.[3] The majority of candidates undergoing IPAA receive perioperative medical treatment for management of their underlying bowel disease. The influence of these therapies on surgical outcomes, however, is controversial. It is widely accepted that high-dose steroids are prohibitive to immediate IPAA,[4] and it has been suggested that preoperative use of anti-TNF agents may be associated with increased risk of perioperative complications.[5, 6] The recent emphasis placed on the relationship between anti-TNF medication use and morbidity has overshadowed investigations on the impact of perioperative use of steroids on outcomes following IPAA. We hypothesized that perioperative use of steroids would not be associated with an increase in perioperative septic complications, specifically anastomotic leak and pelvic sepsis, after IPAA.

METHODS

All patients who underwent elective J-pouch IPAA from January 2009 to December 2013 with an underlying diagnosis of inflammatory bowel disease (IBD, ulcerative colitis, indeterminate colitis, and Crohn's disease, either intentional IPAA or based on pathologic diagnosis) unresponsive to medical management were identified from a prospectively maintained Institutional Review Board–approved Ileal Pouch Registry. Patients with other indications for surgery, such as cancer, dysplasia, stricture, perforation or other complications of IBD, were excluded. Transabdominal redo pouch, other ileal pouch revision procedures, or IPAA using alternative pouch configurations (S pouch) were also part of exclusion criteria. Patients with acute severe disease requiring semi-urgent surgery or toxic/fulminant colitis were treated with an initial total abdominal colectomy followed by a delayed completion

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proctectomy and IPAA in 5 to 6 months. Patient-related, disease-related, and treatment-related variables were collected from the database and by retrospective chart review. Comorbidities were assessed using the age-adjusted Charlson Comorbidity Index.[7, 8]

Operative details including surgical approach (laparoscopic or open), operative time, type of colorectal resection at time of IPAA (completion proctectomy or total proctocolectomy), and use of diverting ileostomy were collected. For the purposes of this study and consistent with previous descriptions both by our group and others,[9–11] laparoscopic IPAA included cases where the rectal dissection could be completed under direct vision after laparoscopic mobilization of the colon or after initial laparoscopic rectal dissection in the course of completion proctectomy. Two-staged IPAA was defined as an initial total proctocolectomy and IPAA with loop ileostomy, followed by ileostomy closure. Three-staged IPAA was defined as an initial total abdominal colectomy with end ileostomy, subsequent completion proctectomy with IPAA and loop ileostomy, and finally ileostomy closure. A small subset of patients underwent a modified 2-stage procedure (completion proctectomy and IPAA without ileostomy) or a 1-stage procedure (total proctocolectomy and IPAA without ileostomy). These 2 latter procedures were grouped within the traditional staging classification according to the extent of their colorectal resection at the time of IPAA creation.

With respect to perioperative medications, preoperative steroid use was defined as any dose of systemic oral steroids taken up until the day of surgery. Patients previously treated with systemic steroids, but weaned off before the day of surgery were not considered on preoperative steroids. Inhaled or locally acting steroid medications were excluded. All reported doses were converted to prednisone equivalents. Postoperative steroid use was divided into rapid intravenous (IV) steroid taper (stress dose) and postoperative oral steroid taper. Stress dose was defined as perioperative intravenous steroid doses administered either before, during, or after IPAA. Patients only receiving steroids to manage postoperative nausea in the postanaesthesia care unit were not considered on steroids for the purpose of the present study. If patients were subsequently transitioned to an oral steroid course postoperatively, they were included in the postoperative oral taper group. The decision to use stress dose intravenous (IV) steroids only or to prescribe a postoperative oral steroid taper was at the discretion of the operating surgeon. Anti-TNF medication use was recorded and defined as infusion of infliximab (Janssen Biotech, Inc. Horsham, Pennsylvania, USA) within the 12 weeks preceding IPAA creation up to the time of surgery. This was the only biologic medication used in the present data set.

Postoperative complications were classified using previous institutional definitions[12–14] and included septic complications such as anastomotic leak, fistula, and pelvic sepsis. The criteria for organ space surgical infection from the Centers for Disease Control and Prevention[15] were utilized but separated into pelvic sepsis for infections occurring at or below the pelvic brim and intra-abdominal abscess for infections occurring above the true pelvis. Pelvic sepsis included an infective process present in the peri-pouch area or within the true pelvis, distal to the pelvic inlet, established by clinical, radiologic, or operative means. If patients had an infection straddling the pelvic brim, it was counted as both pelvic sepsis and an intra-abdominal infection. Small bowel obstruction (SBO), postoperative ileus, urinary retention/urinary tract infection (UTI), anastomotic stricture, thromboembolic complications, and postoperative bleeding were also recorded. Anastomotic leak was defined as a break in the integrity of the anastomosis and exodus of pouch luminal contents, as documented by a combination of clinical, endoscopic, radiologic, and operative findings in the perioperative period. The vast majority of anastomotic leaks were associated with pelvic sepsis. However, there were few cases of anastomotic leak which were not associated with typical signs of sepsis, for example, when presenting with anal bleeding or failure to thrive. Cases of symptomatic radiological leaks occurring in the perioperative period which could not be confirmed on examination under anesthesia were still counted as anastomotic leaks. Asymptomatic occult radiological leaks (eg, those detected on routine gastrografin enema before ileostomy closure) were not counted as anastomotic leaks in this study. Postoperative bleeding was defined as bleeding requiring either management with blood transfusion alone and/or by an associated surgical/procedural intervention. Complications were prospectively assessed postoperatively for 30 days. We then performed univariate and multivariate analysis of risk factors associated with anastomotic leak and pelvic sepsis.

Statistical analysis was performed using SAS v.9.4 (The SAS Institute, Cary, NC). A descriptive analysis was conducted to evaluate patient characteristics and outcomes. Data are reported as mean ± standard deviation or as frequency (%) for categorical data. Univariate analyses were done to evaluate potential risk factors for the occurrence of anastomotic leak and for the occurrence of pelvic sepsis. The Pearson χ^2 test or Fisher exact test were used for categorical variables, and ANOVA test was used for continuous variables. A $P < 0.05$ was considered statistically significant for all analyses. A multivariable logistic regression model was fit for pelvic sepsis with alpha = 0.05 stay criteria on the same set of variables and inserting infliximab use as a clinically relevant variable.

RESULTS

A total of 686 patients treated by 22 surgeons were included, with a mean population age of 39 years, 59% males, and an overall mean BMI of 25.9 kg/m^2, with 20.3% of patients being obese (BMI >30 kg/m^2) at the time of operation. The primary indication for IPAA was ulcerative colitis, which included 95.8% of patients. Most patients underwent a completion proctectomy at the time of pouch creation, and 98.1% had a protective diverting ileostomy (Table 1). Thirteen patients had

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IPAA without diverting ileostomy, 10 of whom underwent a completion proctectomy (modified 2-stage IPAA) and 3 total proctocolectomy (1-stage IPAA).

Preoperatively, 29 (4.2%) patients were receiving systemic steroid medications at the time of IPAA construction, with a mean dose of 11.4 ± 7.7 mg of prednisone equivalents per day (Table 1). Of these 29, only 7 patients received high dose steroids (greater than 20 mg prednisone equivalents per day). The median reported duration of preoperative steroid treatment at the time of surgery was 8 months, ranging from 1 month to 20 years. The most common indication for preoperative steroid use was inability to completely taper off to maintain control of IBD activity (89%). A total of 86% of these patients had their colon in situ and underwent total proctocolectomy at the time of their IPAA creation. One patient with a history of liver transplant for primary sclerosing cholangitis required prednisone as part of their immunosuppressive regimen. Two other patients had coexisting rheumatologic disease or extraintestinal manifestation of IBD, requiring steroids for symptom management. Preoperative use of infliximab within 3 months of surgery was used in 28 patients (4.1%).

Postoperatively, 222 (32.4%) patients received any steroid dosing, with 119 (17.3%) of those patients receiving only stress dose IV steroids. These patients underwent a rapid IV taper for a mean of 1.2 days postoperatively. The remaining 103 (15%) patients were transitioned to oral steroid dosing following their initial intravenous doses and underwent postoperative oral steroid taper (Table 2). Seventy-six patients were prescribed oral steroids at the time of their discharge from the hospital, which were tapered off over a mean period of 3.7 weeks. There were no cases of adrenal insufficiency.

With regard to postoperative morbidity, small bowel obstruction/ileus was the most common complication, occurring in 16.9% of patients. Anastomotic leak and pelvic sepsis occurred in 4.2% and 5.3% of cases, respectively (Table 3). There was a significant association between occurrence of pelvic sepsis and anastomotic leak ($P < 0.001$), abdominal abscess ($P < 0.001$), and fistula ($P = 0.006$). There were no other statistically significant associations between pelvic sepsis and any other individual complications. The mean time to diagnosis of postoperative pelvic sepsis from the time of IPAA was 12.8 (±7.4) days and did not significantly differ based on the use of postoperative extended steroid taper ($P = 0.32$). The corresponding mean time to diagnosis of anastomotic leak was 12 days (±7.2) and was significantly shorter in patients receiving

TABLE 1. Preoperative Patient Demographics, Disease-related, and Treatment-related Characteristics in Patients Undergoing IPAA

	(n = 686)
Age at surgery (years)	39.5 ± 13.9
Male gender	404 (58.9)
Body mass index (kg/m^2)	25.9 ± 4.8
Age-adjusted CCI	1.6 ± 1.9
Hemoglobin (g/dl)	13.4 ± 1.7
White blood cell count (x10^3/μl)	8.6 ± 4.1
Albumin (g/dl)	4.2 ± 0.6
ASA classification	
ASA 1	11 (1.6)
ASA 2	483 (70.4)
ASA 3	190 (27.7)
ASA 4	2 (0.3)
Pathologic diagnosis	
Ulcerative colitis	657 (95.8)
Intentional IPAA for Crohn's disease	22 (3.2)
Indeterminate colitis	7 (1.0)
Preoperative systemic steroid use	29 (4.2)
Mean daily steroid dose (mg)	11.4 ± 7.7
Anti-TNF therapy (infliximab)	28 (4.1)
Surgical procedure	
Completion proctectomy	499 (72.7)
Total proctocolectomy	187 (27.3)
Diverting loop ileostomy	673 (98.1)
Stapled anastomosis	674 (98.3)
Open surgical approach	453 (66.0)
Operative time (min)	211 ± 74
Intraoperative transfusion	19 (2.8)

Abbreviations: CCI, Charlson Comorbidity Index

TABLE 2. Postoperative Steroid Dosing (n = 222)

Postoperative Steroids	
Stress dose IV only	119 (17.3)
Postoperative oral taper	103 (15.0)
Duration of treatment, days	
Stress dose IV only	1.2 ± 2.5
Postoperative oral taper	25.9 ± 11.0

TABLE 3. Postoperative Complications

SBO/ileus	116 (16.9)
Urinary retention/UTI	41 (6.0)
Pelvic sepsis	36 (5.3)
Anastomotic leak	29 (4.2)
Postoperative bleeding	24 (3.5)
Thromboembolic complication	23 (3.4)
Abdominal abscess infection	16 (2.3)
Fistula	14 (2.0)

SBO, small bowel obstruction

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postoperative extended steroid taper (8.2 ± 5.3 vs 14.0 ± 7.4, $P = 0.045$).

Univariate analysis did not indicate any association between development of anastomotic leak and baseline disease-related factors (Table 4). Patients who developed a leak were more likely to have received an intraoperative blood transfusion than those who did not develop an anastomotic leak. Patients with a leak were also associated with a lower preoperative serum albumin level ($P = 0.03$) and a higher white blood cell count ($P = 0.007$), but neither the mean albumin level nor white blood cell counts were outside normal physiologic ranges. A higher proportion of patients with leaks were an ASA 4 (American Society of Anesthesiologists), but patients without leaks had a higher proportion of ASA 3 scores ($P < 0.001$). On univariate analysis, preoperative steroid or infliximab use were not statistically associated with an increased risk for anastomotic leak (Table 4). Postoperative rapid IV steroid taper was similarly not significant, but the use of extended course oral steroid taper was associated with a significantly increased risk of anastomotic leak ($P = 0.003$). Of the 29 patients that developed a postoperative anastomotic leak, 34.5% had been treated with an extended course oral steroid taper compared with only 14.2% of patients without leak.

TABLE 4. Risk Factors Associated with Anastomotic Leak

	No Leak (n = 657)	Leak (n = 29)	*P*
Age at surgery (years)	39.6 ± 14.0	38.2 ± 12.1	0.61
Male gender	386 (58.8)	18 (62.1)	0.72
Body mass index (kg/m^2)	26.0 ± 4.8	25.8 ± 4.8	0.83
Age-adjusted CCI	1.6 ± 1.9	1.8 ± 2.2	0.49
Hemoglobin (g/dl)	13.5 ± 1.6	13.5 ± 1.8	0.87
White blood cell count (x10^3/µl)	8.5 ± 3.8	10.6 ± 8.0	0.007
White blood cell count > 10.5 × 10^3/µl	137 (20.9)	9 (31)	0.19
Albumin (g/dl)	4.2 ± 0.59	3.9 ± 0.75	0.03
Albumin < 3.5 g/dl	51 (10.1)	4 (20)	0.15
ASA score			<0.001
ASA 1	9 (1.4)	2 (6.9)	
ASA 2	461 (70.2)	22 (75.9)	
ASA 3	186 (28.3)	4 (13.8)	
ASA 4	1 (0.2)	1 (3.4)	
Surgical indication			0.85
Ulcerative colitis	629 (95.7)	28 (96.6)	
Intentional IPAA for Crohn's colitis	21 (3.2)	1 (3.4)	
Indeterminate colitis	7 (1.1)	0 (0.0)	
Surgical procedure			
Total proctocolectomy	176 (26.8)	11 (37.9)	0.19
Diverting loop ileostomy	644 (98.0)	29 (100)	0.44
Stapled anastomosis	646 (98.3)	28 (96.6)	0.48
Open surgical approach	436 (66.4)	17 (58.6)	0.39
Intraoperative transfusion	16 (2.4)	3 (10.3)	0.01
Operative time (min.)	210 ± 74	227 ± 92	0.24
Postoperative transfusion	16 (2.4)	1 (3.4)	0.73
Perioperative medications			
Preoperative systemic steroid use	26 (4.0)	3 (10.3)	0.09
Mean steroid dose (mg)	11.8 ± 7.9	8.3 ± 4.7	0.48
Anti-TNF therapy (infliximab)	25 (3.8)	3 (10.3)	0.08
Rapid IV steroid taper	112 (17.0)	7 (24.1)	0.32
Extended course oral regimen	93 (14.2)	10 (34.5)	0.003

Steroid dose reported as prednisone equivalent. Missing data: albumin = 159; white blood cell count = 3.

In our overall study population, 36 patients developed pelvic sepsis. On univariate analysis, the only significant patient-related difference was again the preoperative white blood cell count (mean 8.5 × 10^3/µL vs 10.6 × 10^3/µL). There were no other differences in patient-related or disease-related factors identified. Patients who developed pelvic sepsis had a higher rate of total proctocolectomy at the time of IPAA formation as compared with those who did not develop sepsis ($P < 0.001$). Additionally, preoperative use of steroids and anti-TNF therapy (infliximab) were both associated with increased risk for pelvic sepsis (Table 5). Similar to the analysis of anastomotic leak, extended course oral steroids were also significantly associated with the risk of pelvic sepsis ($P < 0.001$). Logistic regression indicated total proctocolectomy rather than completion proctectomy at the time of IPAA creation and postoperative oral steroid taper as independent factors significantly associated with the development of pelvic sepsis (Table 6).

DISCUSSION

Our data indicate that extended postoperative steroid taper and total proctocolectomy at the time of IPAA are independently associated with pelvic sepsis, which is widely recognized to have an adverse effect on long-term pouch function.[16, 17] The data on the individual effect of perioperative steroid use on pelvic sepsis,[18] however, remain limited. The novel and somewhat surprising finding of our study was that steroid administration prolonged beyond the brief perioperative intravenous course and converted into a longer postoperative oral taper was associated with an increased risk of both anastomotic leak and pelvic sepsis. These findings retained significance in the multivariate regression for pelvic sepsis. To the best of our knowledge, no other study to date has examined the effects of prolonged postoperative steroid administration in this patient population.

It is accepted that high-dose preoperative steroids are associated with the risk of postoperative infection following IPAA[18, 19] and the risk of postoperative adrenal insufficiency.[20] The current guidelines of the American Society of Colon and Rectal Surgeons caution against the use of high-dose steroids when contemplating the construction of an IPAA.[21] The

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TABLE 5. Risk Factors Associated with Pelvic Sepsis

	No Pelvic Sepsis (n = 650)	Pelvic Sepsis (n = 36)	*P*
Age at surgery (years)	39.5 ± 14.0	39.9 ± 13.1	0.86
Male gender	383 (58.9)	21 (58.3)	0.94
Body mass index (kg/m^2)	26.0 ± 4.8	25.6 ± 4.8	0.64
Age-adjusted CCI	1.6 ± 1.9	2.0 ± 2.3	0.22
Hemoglobin (g/dl)	13.5 ± 1.6	13.3 ± 1.7	0.62
White blood cell count (x10^3/μl)	8.5 ± 3.9	10.6 ± 7.1	0.003
White blood cell count > 10.5 × 10^3/μl	136 (21)	10 (27.8)	0.34
Albumin (g/dl)	4.2 ± 0.6	4.1 ± 0.6	0.36
Albumin < 3.5 g/dl	51 (10.3)	4 (13.3)	0.59
ASA score			0.53
ASA 1	11 (1.7)	0 (0.0)	
ASA 2	454 (69.8)	29 (80.6)	
ASA 3	183 (28.2)	7 (19.4)	
ASA 4	2 (0.3)	0 (0.0)	
Surgical indication			0.17
Ulcerative colitis	624 (96.0)	33 (91.7)	
Intentional IPAA for Crohn's disease	19 (2.9)	3 (8.3)	
Indeterminate colitis	7 (1.1)	0 (0.0)	
Surgical procedure			
Total proctocolectomy	168 (25.8)	19 (52.8)	<0.001
Diverting loop ileostomy	637 (98.0)	36 (100.0)	0.39
Stapled anastomosis	639 (98.3)	35 (97.2)	0.63
Open surgical approach	430 (66.2)	23 (63.9)	0.78
Intraoperative transfusion	18 (2.8)	1 (2.8)	0.22
Operative time (min.)	211 ± 74	216 ± 77	0.65
Postoperative transfusion	15 (2.3)	2 (5.6)	0.22
Perioperative medications			
Preoperative systemic steroid use	23 (3.5)	6 (16.7)	<0.001
Mean steroid dose (mg)	11.5 ± 6.2	11.0 ± 11.6	0.86
Anti-TNF therapy (infliximab)	23 (3.5)	5 (13.9)	0.002
Rapid IV steroid taper	115 (17.7)	4 (11.1)	0.31
Extended course oral regimen	90 (13.8)	13 (36.1)	<0.001

Steroid dose reported as prednisone equivalent. Missing data: albumin = 159; white blood cell count = 3.

TABLE 6. Independent Factors Associated With Pelvic Sepsis and Anastomotic Leak

Multivariate Logistic Regression of Factors Independently Associated with Pelvic Sepsis

	Odds Ratio	CI	*P*
Total proctocolectomy	2.2	1.01–4.7	0.047
Infliximab	2.1	0.68–6.4	0.19
Extended course oral steroids	2.3	1.06–5.1	0.035

Multivariate Logistic Regression of Factors Independently Associated with Anastomotic Leak

	Odds Ratio	CI	*P*
Extended course oral steroids	2.9	1.3–6.7	0.01
Infliximab	2.0	0.53–7.4	0.31

Abbreviations: CI, confidence interval.
Odds ratios for continuous variables are based on a one-unit increase.

European Crohn's and Colitis Organization (ECCO) more specifically states that the use of prednisolone at the dose of 20 mg daily or equivalent for more than 6 weeks before surgery is a risk factor for surgical complications. Failure to wean from this dose for longer than 6 weeks before surgery should therefore result in the decision to postpone IPAA.[22] Advancements in medical management of ulcerative colitis, however, have reduced the therapeutic role of systemic corticosteroids to management of acute disease flares rather than maintenance treatment.[23] It is therefore not surprising that only approximately 4% of our patients were on steroids preoperatively. At a mean dose of approximately 11 mg of prednisone-equivalent daily, such doses were significantly decreased when compared with the currently recommended ECCO cutoff of 20 mg. Indeed, only 1% of patients were on greater than 20 mg of steroids at the time of their operation, suggesting the widespread recognition of the deleterious effects of preoperative steroid use. Interestingly, the relationship between preoperative steroids and pelvic sepsis did not retain statistical significance on multivariate analysis, likely due to the strong significance of extended postoperative steroid course and the relatively low doses of steroids taken preoperatively. Stress dose intravenous steroids were not associated with either anastomotic leak or pelvic sepsis, thus confirming the results of previous work from our institution.[24]

Our study is also notable for the association between total proctocolectomy at the time of IPAA and the development of pelvic sepsis. Previous institutional predictive modeling in patients undergoing IPAA found that pouch failure was higher in patients undergoing completion proctectomy as compared with total proctocolectomy at time of pouch creation.[25] These data, however, were collected over an extended time period starting in the 1980s, when medical and surgical management of IBD varied from currently accepted practices. More recent institutional data (2006 to 2012) comparing patients undergoing 3-stage vs 2-stage IPAA for ulcerative colitis indicated a border-line increased rate of pelvic sepsis among patients receiving total proctocolectomy at time of pouch construction when compared with the group undergoing a completion proctectomy (11.1% vs 6.2%).[26] A similar study based on over 1400 cases from the American College of Surgeons National Surgical Quality Improvement Project

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(ACS-NSIQIP)[27] demonstrated a significant association between 2-stage procedures and organ-space infections, which again suggest that total proctocolectomy at the time of IPAA is a risk factor among contemporary patients.

The statistically significant relationship between white cell count and pelvic sepsis is more difficult to explain clinically. These elevated white blood cell counts may have been driven in part by the concurrent use of steroids in this patient population, which has the known side effect of persistent leukocytosis.[28] In the absences of other markers of infectious etiologies or active inflammatory disease, the clinical significance of these results in unclear. It is particularly hard to translate these results into changes in clinical practice considering that the mean count in patients experiencing pelvic sepsis was statistically higher but still within normal physiologic ranges.

The results of our analysis should prompt reassessment of perioperative steroid management in patients with inflammatory bowel disease undergoing IPAA. It is notable that almost 90% of our patients receiving postoperative steroids were not taking steroids preoperatively, yet 1 out of 6 patients received postoperative oral steroid taper, suggesting overutilization. Patients who are not on steroids at the time of surgery should theoretically require at most only stress dose steroids with rapid postoperative IV taper, thus avoiding a higher, prolonged postoperative steroid course. A review by Zaghiyan et al of patients with IBD previously on corticosteroids within the year preceding surgical therapy found that the use of perioperative steroids was not associated with a difference in hemodynamic instability.[29] Similarly, an evaluation of low-dose IV perioperative steroids for IBD patients on steroids at the time of colorectal surgery found minimal effects on hemodynamic parameters, and no patients required vasopressor support or high dose steroids for adrenal insufficiency.[30] These data suggest that perioperative corticosteroid therapy may be drastically reduced or at times even unnecessary in this patient population at a theoretically elevated risk of adrenal insufficiency. As previously mentioned, decisions regarding postoperative steroid regimens were at the discretion of the attending surgeon and may have been influenced by other clinical factors, such as history of corticosteroid use, even if not being used at the time of surgery and especially if used for long periods. Further work is required to determine what clinical factors are driving these decisions postoperatively.

Other patients required continued treatment with corticosteroids to control their primary disease symptoms and/or extraintestinal manifestations of disease before their IPAA. If in this group of patients, preoperative weaning of steroids and possible use of alternative medications to control symptoms are clinically unrealistic, they should be preferentially treated with an initial total abdominal colectomy rather than total proctocolectomy with immediate IPAA. Steroids should be comfortably weaned off after total abdominal colectomy so that the delayed completion proctectomy and IPAA would be expected to be associated with decreased risk of postoperative pelvic sepsis.

The main limitation of this study is related to its retrospective nature and associated risk of selection bias, for which we have attempted to adjust with multivariate analysis. Unfortunately, cumulative lifetime duration of steroid treatment and the total dose of steroids received could not be assessed. This is often a critical variable prompting the decision to prolong steroid weaning and utilization of extended postoperative steroid course in patients who were not using steroids at the time of their operation. And while a comprehensive preoperative steroid assessment was not performed, the detailed evaluation of postoperative steroid regimens provides a unique insight into the effects of steroids on the risk for septic complications. Despite these limitations, our study adds incrementally to the available literature and suggests a re-evaluation of current practice patterns and the need for further research into the postoperative effects of corticosteroids.

In conclusion, postoperative use of steroids should be minimized in patients undergoing IPAA due to an increased risk for pelvic sepsis with extended courses of oral steroid therapy.

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