ORIGINAL CONTRIBUTION

Rescue Diverting Loop Ileostomy: An Alternative to Emergent Colectomy in the Setting of Severe Acute Refractory IBD-Colitis

Tara A. Russell, M.D., M.P.H.[1,2] • Aaron J. Dawes, M.D., Ph.D.[1] • Danielle S. Graham, M.D.[1]
Stephanie A.K. Angarita, M.D.[1] • Christina Ha, M.D.[3] • Jonathan Sack, M.D.[4]

1 Division of General Surgery, Department of Surgery, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, California
2 Veterans Affairs Health Services Research and Development, West Los Angeles Veteran Affairs Administration, Los Angeles, California
3 University of California Los Angeles Center for Inflammatory Bowel Diseases, University of California Los Angeles Vatche and Tamar Manoukian Division of Digestive Diseases, Department of Medicine, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, California
4 Section of Colon and Rectal Surgery, Division of General Surgery, Department of Surgery, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, California

BACKGROUND: Severe acute refractory colitis has traditionally been an indication for emergent colectomy in IBD, yet under these circumstances patients are at elevated risk for complications because of their heightened inflammatory state, nutritional deficiencies, and immunocompromised state.

OBJECTIVE: We hypothesized that rescue diverting loop ileostomy may be a viable alternative to emergent colectomy, providing the opportunity for colonic healing and patient optimization before more definitive surgery.

DESIGN: This was a retrospective case series.

SETTINGS: The study was conducted at a single academic center.

PATIENTS: Patients with severe acute medically refractory IBD-related colitis were included.

INTERVENTION: Rescue diverting loop ileostomy was the intervening procedure.

MAIN OUTCOME MEASURES: The primary outcome was avoidance of urgent/emergent colectomy. The secondary outcome was efficacy, defined by 3 clinical aims: 1) reduced steroid dependence or opportunity for bridge to medical rescue, 2) improved nutritional status, and 3) ability to undergo an elective laparoscopic definitive procedure or ileostomy reversal with colon salvage.

RESULTS: Among 33 patients, 14 had Crohn's disease and 19 had ulcerative colitis. Three patients required urgent/emergent colectomy, 2 with ulcerative colitis and 1 with Crohn's disease. Across both disease cohorts, >80% of patients achieved each clinical aim for efficacy: 88% reduced their steroid dependence or were able to bridge to medical rescue, 87% improved their nutritional status, and 82% underwent an elective laparoscopic definitive procedure or ileostomy reversal. A total of 4 patients (11.7%) experienced a postoperative complication following diversion, including 3 surgical site infections and 1 episode of acute kidney injury.

LIMITATIONS: The study was limited by being a single-center, retrospective series.

CONCLUSIONS: Rescue diverting loop ileostomy in the setting of severe, refractory IBD–colitis is a safe and effective alternative to emergent colectomy. This procedure has acceptably low complication rates and affords patients time for medical and nutritional optimization before definitive surgical intervention. See **Video Abstract** at http://links.lww.com/DCR/A520.

KEY WORDS: Acute colitis; Crohn's disease; Diverting ileostomy; Ulcerative colitis.

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Correspondence: Tara A. Russell, M.D., M.P.H., 10940 Wilshire Blvd, Suite 710, Los Angeles, CA 90024. E-mail: TRussell@mednet.ucla.edu

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Patients with IBD are at risk for acute disease exacerbations, which can present as acute colitis. Flares of acute colitis often require urgent hospitalization to treat pain, intractable diarrhea, fluid and electrolyte disturbances, anemia, malnutrition, and, at times, superimposed infectious colitis or sepsis. Although many patients improve with medical management, some progress to severe, acute, medically refractory colitis, which necessitates surgical intervention.[1] In such cases, emergent total abdominal colectomy (TAC) with a Hartmann pouch is frequently required.[2,3]

Emergent colectomy in patients with IBD is associated with exceedingly high rates of morbidity when compared with elective colectomy, which is partially explained by the acute inflammatory state, malnourishment, anemia, and recent corticosteroid exposure experienced by patients with IBD and acute colitis.[4,5] Although it has been demonstrated that both laparoscopic and open approaches are safe and effective for managing acute colitis, patients are more likely to undergo an open procedure in the acute setting.[6] Undergoing an initial open colectomy commits patients, who will require restorative proctocolectomy (RPC), to a series of procedures through this approach. Although equally safe during the initial procedure, the open approach has been repeatedly associated with increased complication rates and longer hospital length of stay (LOS) as compared with the laparoscopic counterpart.[7,8]

There is substantial, historical literature that supports the use of diversion among patients with Crohn's disease (CD). Diversion in these patients typically provides the opportunity to trial additional medical therapies and attain increased disease control.[9,10] Similar literature has also presented diversion as an option for fulminant Clostridium difficile colitis and pregnant women with acute ulcerative colitis.[11]

Collectively, these clinical findings led us to propose a new algorithm for the staging of surgical intervention for severe acute medically refractory IBD–colitis. Under this new schema, rescue diverting loop ileostomy (RDLI), a short minimally invasive procedure, serves as the first stage with elective RPC with IPAA, TAC with ileorectal anastomosis (IRA), or total proctocolectomy with end ileostomy being shifted to the second stage, once the patient has recovered from their acute state. RDLI is intended to provide an opportunity for colonic rest and mucosal healing through fecal stream diversion. During this period, patients are able to improve their nutritional status and reduce steroid exposure before undergoing major surgery. This time may also allow a bridge to medical rescue, permitting sufficient recovery to attempt induction with other medical therapies before committing to colectomy.

We herein report our experience with RDLI as a first-stage procedure for severe acute medically refractory IBD–colitis. The primary aim is avoidance of urgent or emergent colectomy. The secondary aims, defined to assess RDLI efficacy, include reduced steroid dependence or ability to bridge to medical rescue, improvement in nutritional status, and ability to undergo a definitive laparoscopic procedure or ileostomy reversal with colon salvage. We hypothesized that RDLI is a safe and efficacious alternative to emergent colectomy as a first-stage procedure for severe acute medically refractory IBD–colitis.

PATIENTS AND METHODS

Patients and Data Source

This study was reviewed and approved by our institutional review board. Patients from a single academic institution who underwent RDLI for severe acute medically refractory IBD–colitis in the setting of CD or chronic ulcerative colitis (CUC) between October 2013 and October 2016 were identified. Patient diagnosis of CD or CUC was defined by review of surgical pathology. Severe colitis was defined as an acute flare or disease exacerbation that required inpatient hospitalization and reached a severity score of >9 by Mayo criteria or of >16 by the Harvey–Bradshaw Index.[12,13] Medically refractory colitis was defined as either inadequate response, loss of response, or intolerance to biologic therapy or an inadequate response, intolerance, or dependence on corticosteroids (with a minimum dose of 40 mg of oral prednisone or any intravenous corticosteroid). Patients were referred to surgery either by their primary or consulting gastroenterologist. The decision to undergo surgery was made jointly by the patient, surgeon, and gastroenterologist. All of the patients with severe, medically refractory IBD–colitis at our institution were offered RDLI beginning in October 2013.

Surgical Approach

All of the patients who underwent RDLI had their surgery performed by the same board-certified colon and rectal surgeon (J.S.). All of the procedures were performed through a single-incision laparoscopic surgery approach. An abdominal wall defect was created at the ileostomy site by excising a 2-cm skin disk. A transverse incision was made in the anterior rectus sheath, rectus fibers were divided, and a transverse incision was then made in the posterior rectus sheath. A GelPoint Mini (Applied Medical, Rancho Santa Margarita, CA) single-incision laparoscopic surgery device was placed through the fascial defect, and the abdomen was insufflated to 15 mm Hg. Diagnostic laparoscopy was performed to assess the colon for viability, extent of disease, and signs of perforation. The terminal ileum and ileocecal junction were identified, and the anticipated apex of the ileostomy was grasped 15 cm proximal to the ileocecal junction (or proximal to any ileal disease involvement in ileocolitis). The abdomen was then desufflated. The preidentified loop of ileum was brought through the incision and matured as a Brooke loop ileostomy.

Data Abstraction

Clinical data were abstracted from the medical chart, including demographics and preoperative and postoperative factors. Preoperative factors included nutritional status, degree of systemic inflammatory response syndrome (SIRS) or sepsis, preoperative medical therapy, and severity and extent of colitis. Poor nutritional status was defined by an albumin <3 g/dL and the Malnutrition Universal Screening Tool (MUST) score of ≥3 points, indicating a high risk of malnutrition.[14] The MUST score typically defines high risk as ≥2 points, yet because 2 points are assigned for acute illness or GI surgery, we used a higher threshold. Each patient's previous exposure to medical therapies (classified as steroids, biologics, cyclosporine, or thiopurines) was categorized as either naïve (never exposed or recent exposure) within the current colitis episode or past exposure (received outside current colitis episode). Severity and extent of colitis were measured by Mayo sores, Harvey–Bradshaw Index, and Montreal classification. SIRS and sepsis were defined by standard criteria.[15,16] Operative time and postoperative outcomes were abstracted from our American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database. Operative time is inclusive of time from the first incision until completion of all procedures (RDLI with or without sigmoidoscopy or examination under anesthesia). Patients not initially sampled within our institution's ACS-NSQIP sampling design were abstracted by a certified ACS-NSQIP abstractor. Missing operative time (n = 3) was imputed as the median value for the entire cohort. Hospital LOS was defined as days from admission to discharge and postoperative LOS from RDLI to discharge.

Outcomes

The primary aim was to determine whether RDLI was a safe alternative to emergent colectomy. Failure to reach this aim was defined as undergoing emergent or urgent colectomy after RDLI at any time during the course of follow-up. Cases that failed to reach this aim were reviewed to assess contributing patient or clinical factors.

The secondary aim focused on RDLI efficacy as an alternative to emergent colectomy through the achievement of 3 predetermined clinical aims: 1) reduced steroid dependence or bridge to medical rescue (defined by an ability to taper off preoperative intravenous steroids, taper an oral regimen that began at ≥40 mg of prednisone, or trial new biologic agents), 2) improvement in enteral intake and nutritional status (defined by resumption of an oral diet and improvement in MUST score), and 3) ability to undergo a definitive laparoscopic procedure or ileostomy reversal with colon salvage. A definitive laparoscopic procedure included RPC with IPAA, TAC with IRA, or TPC. Colon salvage was defined by ileostomy reversal after recovery from acute colitis and evidence of complete mucosal healing, defined by interval sigmoidoscopy or colonoscopy, which demonstrated no ulcerations or erosions. Patients eligible for colon salvage no longer had an indication for colectomy. Eligibility for achieving each aim was based on data availability and follow-up time.

Additional operative outcomes included avoidance of any ACS-NSQIP–defined 30-day postoperative surgical complication. Surgical complications included surgical site infection ((SSI) classified as superficial, deep, or organ space), wound dehiscence, pneumonia, unplanned reintubation, pulmonary embolism, acute kidney injury or renal failure, urinary tract infection, cerebrovascular event, myocardial infarction, cardiac arrest, and deep vein thrombosis. Use outcomes included LOS, which was abstracted through chart review.

Statistical Analysis

Patient demographics and disease characteristics were tabulated for the entire cohort and by disease subgroup. Bivariate comparisons by diagnosis were performed using a χ^2 test for binary outcomes, ANOVA for categorical outcomes, and *t* tests or Mann–Whitney *U* test for continuous data. Overall event rates and corresponding ranges are reported for each of the primary and secondary outcomes. Operative factors and LOS are presented with descriptive statistics.

RESULTS

Patient Characteristics

Thirty-three patients underwent RDLI, 14 (42%) with CD and 19 (58%) with CUC. Follow-up time ranged from 0.73 to 3.50 years (median = 1.50 y). Follow-up time was significantly shorter in the CD group (mean difference = 0.69 y; $p < 0.001$). Descriptive statistics for the entire cohort and disease subgroups are included in Table 1. The groups did not differ by age, sex, race, nutritional status, rate of SIRS, or sepsis. Within the overall cohort, 48.5% met SIRS criteria preoperatively, among which 1 patient met sepsis criteria because of superimposed cytomegalovirus colitis. The rate of SIRS was higher in the CUC cohort but did not reach statistical significance (63.2% versus 26.7%; $p = 0.13$). Overall, by MUST scores, 18 patients (54.6%) were at high risk for malnutrition; scores did not differ between cohorts.

Operative time ranged from 23 to 132 minutes (median = 50 min). Cases >60 minutes typically included a second procedure (anorectal examination under anesthesia, enteroscopy, or flexible sigmoidoscopy). For cases where RDLI occurred alone, the median time was 47 minutes. There were no intraoperative complications or conversions to colectomy. Table 2 provides details on RDLI operative outcomes.

TABLE 1. Patient characteristics and surgical procedures to date

Patient and Surgical Characteristics	*Entire cohort (N = 33)*	*CD (N = 14)*	*CUC (N = 19)*	*CD vs CUC, p*
Patient characteristics				
Age, median (range), y	32 (16 – 71)	32 (16 – 51)	32 (21 – 71)	0.20
Women, n (%)	16 (48.5)	7 (50.0)	9 (47.4)	0.88
Race, n (%)				
White	26 (78.8)	9 (64.2)	17 (89.5)	0.29
Black	4 (12.1)	3 (21.4)	1 (5.3)	
Asian	2 (6.1)	1 (7.1)	1 (5.3)	
Unknown/not reported	1 (3.0)	1 (7.1)	0 (0.0)	
Preoperative health status, n (%)				
Nutritional deficiency				
Preoperation (MUST ≥3)	18 (54.6)	7 (50.0)	11 (57.9)	0.65
MUST score 2	15 (45.5)	7 (50.0)	8 (42.1)	0.72
MUST score 3	4 (12.1)	1 (7.1)	3 (15.8)	
MUST score ≥4	14 (42.4)	6 (42.9)	8 (42.1)	
Albumin <3.0 g/L, preoperation	14 (42.4)	6 (37.5)	8 (44.4)	0.97
Hemoglobin, <10.0 g/dL, preoperation	16 (48.5)	9 (60.0)	7 (36.8)	0.54
SIRS, preoperation	16 (48.5)	4 (26.7)	12 (63.2)	0.13
Severity of colitis				
Harvey–Bradshaw Index, n, median (range)	14, 22 (17–27)	22 (17–27)		
Mayo score, n, median (range)	19, 11 (10–12)		11 (10–12)	
Extent of colitis, n (%)				
Ileocolitis ± proctitis	4 (12.1)	4 (28.6)		
Colitis ± proctitis	10 (30.3)	10 (71.4)		
Left sided	5 (15.2)		5 (26.3)	
Extensive	14 (42.4)		14 (73.7)	
Preoperative medical therapy, n (%)				
Steroids				
Naive	1 (3.0)	0 (0)	1 (5.3)	
Recent exposure	23 (69.7)	9 (64.3)	14 (73.7)	
Past exposure	9 (27.3)	5 (35.7)	4 (21.1)	
Biologics				
Naive	3 (9.1)	1 (7.1)	2 (10.5)	
Recent exposure	18 (54.5)	9 (64.3)	9 (47.3)	
Past exposure	11 (33.3)	3 (21.4)	8 (42.1)	
Cyclosporine				
Naive	28 (84.8)	13 (92.9)	15 (78.9)	
Recent exposure	5 (15.2)	1 (7.1)	4 (21.1)	
Thiopurines				
Naive	10 (30.3)	6 (42.9)	4 (21.1)	
Recent exposure	8 (24.2)	4 (28.6)	4 (21.1)	
Past exposure	15 (45.5)	4 (28.6)	11 (57.9)	

CD = Crohn's disease; CUC = chronic ulcerative colitis; MUST = Malnutrition Universal Screening Tool; SIRS = systemic inflammatory response syndrome.

Postoperative LOS varied, with a range of 2 to 20 days (median = 5 d). On average, patients were started on a liquid diet by postoperative day (POD) 1 (range, 0–2 d) and were tolerating a regular diet by POD 2 (range, 0–8 d).

Among the CD cohort, to date 9 patients have undergone an additional operation after RDLI, with 3 attaining colon salvage, 5 a definitive laparoscopic procedure, and 1 an emergent TAC. (One patient underwent IPAA because of a low rectal stricture and refusal of a permanent ileostomy.) Among those attaining colon salvage, follow-up time post-RDLI takedown was 1.43, 0.82, and 0.70 years. Five patients underwent no additional surgery (follow-up of 0.56–1.95 y; median = 1.24 y).

Among the UC cohort, 18 patients have undergone an additional operation, with 3 attaining colon salvage and 15 undergoing laparoscopic RPC with IPAA. Among those achieving colon salvage, follow-up time after RDLI takedown was 2.71, 2.24, and 0.43 years. One UC patient underwent no additional surgery (follow-up time = 9.10 mo).

Primary Outcome

Three patients (9.0%, 3/33) required urgent/emergent colectomy after RDLI. Within the CUC cohort the overall failure rate was 10.5% (2/19), with both requiring urgent colectomy. The first underwent urgent laparoscopic proctocolectomy with IPAA and diverting ileostomy during the initial admission on POD 11 because of persistent abdominal pain and uncontrolled liquid stool output. The second was readmitted on POD 29 because of lower abdominal pain, nausea, and vomiting; had CT findings suggestive of recurrent colitis

TABLE 2. Operative and postoperative outcomes

Outcomes	*Entire cohort (N = 33)*	*CD (N = 14)*	*CUC (N = 19)*
RDLI operative factors			
Operative time, median (range), min	50 (28–132)	50 (28–132)	47 (31–111)
Length of stay, median (range), d			
Total hospital LOS	12.0 (2–42)	12.5 (2–22)	11.0 (2–42)
Total postoperative LOS	5.0 (2–20)	4.5 (2–20)	5.0 (2–19)
Surgical procedures to date, n (%)			
RDLI + no additional procedures	6 (17.6)	5 (35.7)	1 (5.6)
RDLI + ileostomy reversal + colon salvage	6 (17.6)	3 (21.4)	3 (16.7)
Open TAC + Hartmann pouch + ileostomy	1 (2.9)	1 (7.1)	0 (0.0)
Laparoscopic TAC + IRA	3 (8.8)	3 (21.4)	0 (0.0)
Laparoscopic RPC + IPAA	16 (47.1)	1 (7.1)	15 (83.3)
Laparoscopic TPC + end ileostomy	2 (5.9)	1 (7.1)	0 (0.0)
Subsequent surgical intervention, median (range), d			
Time from RDLI to TAC/RPC	75.5 (11–354)	150.0 (53–354)	41.0 (11–138)
Time from RDLI to colon salvage	199.5 (34–368)	212.0 (34–259)	166.0 (161–368)

RDLI = rescue diverting loop ileostomy; LOS = length of stay; TAC = total abdominal colectomy; IRA = ileorectal anastomosis; RPC = restorative proctocolectomy; TPC = total proctocolectomy.

and appendicitis; and ultimately underwent urgent laparoscopic TAC plus Hartmann pouch. Within the CD cohort the failure rate was 7.1% (1/14), with 1 patient requiring emergent colectomy. This patient was readmitted on POD 49 because of abdominal pain, high ileostomy output, and rectal discharge. During this readmission, she underwent colonoscopy complicated by perforation, leading to emergent open TAC with Hartmann pouch on POD 53.

Secondary Outcomes: Efficacy

Table 3 indicates the proportion of patients overall and by diagnosis who achieved each of the 3 clinical aims. Overall, >80% of patients reached each of the clinical aims.

Secondary Outcomes: Postoperative Complications

Four patients (12.1%) experienced a postoperative complication within 30 days of RDLI. In the UC cohort, 1 patient had a pelvic fluid collection identified within the initial hospitalization (deep space SSI). In the CD cohort, 2 patients had mucocutaneous junction separation noted at the RDLI that required wound packing or were treated empirically with antibiotics (classified as superficial SSI), and 1 had evidence of acute kidney injury.

DISCUSSION

The clinical course of patients with IBD is marked by intermittent disease flares, which often present as acute colitis. After a trial with medical management, some patients fail to improve and are faced with undergoing emergent TAC with end ileostomy and a Hartmann pouch, which is associated with high rates of morbidity and prolonged hospital stays.[4,17,18] We therefore explored an alternative approach, treating these patients initially with RDLI, which both reduces the risk of undergoing a major operation in the emergent setting and provides an opportunity for an elective laparoscopic definitive surgical procedure or ileostomy reversal with colon salvage.

In this series of 33 patients who underwent RDLI, >90% were able to avoid urgent or emergent colectomy throughout the entire follow-up period. Furthermore, we demonstrate that, across each of the clinical aims, RDLI performed very well, with >80% of patients achieving each aim. This demonstrates that RDLI is safe and efficacious as a first-stage procedure, given that the majority of patients were able to avoid urgent/emergent colectomy, reduce steroid dependence or attain medical rescue, improve their nutritional status, and ultimately undergo a definitive laparoscopic procedure or attain colon salvage. Of note, >80% of patients who underwent a definitive surgical intervention were able to do so laparoscopically. Given that this approach has been shown to have lower morbidity and mortality, as compared with an open approach, proceeding with RDLI in the acute setting followed by elective TAC/RPC likely reduced the individual patient risk of complications.[4,19–21]

A unique finding of this study was the opportunity for patients to attain colon salvage. These 6 patients, 3 with CUC and 3 with CD, were able to attain a bridge to medical rescue after RDLI and to attain adequate mucosal healing so that they no longer had an indication for colectomy. To date, the majority of these patients have attained >1 year of follow-up, and all have proceeded without recurrence of colitis or other indication for additional surgery, demonstrating the durable impact of RDLI. Among the 3 young adults with CUC, the patients had a short disease course, were relatively biologic naive, and demonstrated significant preference for colon preservation with surveillance over TAC; the decision for salvage was informed and made jointly among the patient, surgeon, and treating gastroenterologist.

TABLE 3. Rescue diverting loop ileostomy clinical aims

	Entire cohort (N = 33)		*Crohn's disease (N = 14)*		*Ulcerative colitis (N = 19)*	
Variable	*n/N*[a]	*%*	*n/N*[a]	*%*	*n/N*[a]	*%*
Primary aim						
Avoid urgent or emergent colectomy	30/33	90.9	13/14	92.9	17/19	89.5
Secondary aims: efficacy						
Decreased steroid dependence or bridge to medical rescue	29/33	87.9	13/14	92.9	16/19	84.2
Improvement in enteral intake and nutritional status	27/31	87.1	13/14	92.9	15/18	83.3
Allow elective laparoscopic definitive procedure or colon salvage	22/27	81.5	9/10	81.8	13/16	81.3

[a]Denominator varies based on available data or patient follow-up.

In addition to achieving the clinical aims of RDLI, operative and postoperative findings indicate that patients recover quickly after diversion with very few complications. In particular, patients resumed a regular diet and achieved hospital discharge at a median of 2 and 5 days, which is substantially shorter than the reported postoperative LOS after emergent colectomy (mean = 18.2 ± 15.8 d), the alternative first-stage procedure.[4] Furthermore, the rate of complications was low in this high-risk group, with only 3 SSIs (2 superficial (6.1%) and 1 deep (3.0%)) and 1 episode of acute kidney injury (3.0%). Again, in comparison with the rates of complications after emergent colectomy (57.7% for any major complication and 24.2% for SSI), RDLI as an alternative first-stage procedure has rates that are dramatically lower.[4]

We acknowledge that the collective results of this study encompass 2 distinct patient cohorts who ultimately have different underlying diseases. Although the overarching goal for many patients with CD will be bowel salvage, a subset, as seen in this study, may require additional surgery because of either fistulizing disease or extensive anorectal involvement. Alternatively, patients with CUC will ultimately require proctocolectomy, yet there is a subset who may wish to avoid additional surgery while pursuing additional biologic therapy. We therefore suggest that, in either disease process, RDLI may be pursued with either intent to defer or to avoid colectomy. We hypothesize that the physiologic improvement that results from RDLI is attributed to breaking the vicious cycle of severe colonic mucosal damage initiated by IBD and perpetuated by loss of the mucosal barrier because of continued immersion of the colon in an injurious bath of enteric contents. Diversion of the fecal stream most likely leads to barometric decompression, reduced bacterial translocation, and protection of the denuded colon, allowing mucosal regeneration to occur. Under such conditions, resumption of enteric feeding can be expedited because meal-stimulated diarrhea is averted. Finally, by interrupting the injury cycle, adrenocortical steroids can be tapered, creating a more optimal environment for tissue healing and improving immunocompetence.

Our study demonstrates many advantages of RDLI as the first of a planned multistage approach. First, patients requiring urgent operation undergo a procedure that requires minimal dissection, short operative time, and is lower risk compared with TAC with ileostomy and Hartmann pouch. Second, RDLI is performed laparoscopically, allowing subsequent operations to be undertaken laparoscopically, which is associated with reduced LOS and postoperative pain and improved cosmetic results.[19,20,22,23] Third, RDLI eliminates the need for completion proctectomy to be performed in a reoperative field and allows laparoscopic IPAA or IRA to be performed in a relatively virgin abdomen with fewer adhesions. Fourth, RDLI allows subsequent procedures to be performed under more optimal conditions, including improved nutritional status, decreased steroid immunosuppression, and absence of anemia and acute inflammatory state. Finally, RDLI may provide patients the opportunity to undergo induction of new medical regimens and attain remission of disease, providing the option for colon salvage.

Limitations

Our present study is limited by its retrospective case series design. We therefore present overall trends but are unable to make statistical comparisons with a control group. In addition, our patient population is relatively diverse, with inherently different diseases and indications for surgery or eligibility for colon salvage.

CONCLUSION

We demonstrate that RDLI is a safe alternative to emergent colectomy for severe, medically refractory IBD–colitis. Patients undergoing RDLI have acceptably low complication rates, and most achieve medical and nutritional optimization postoperatively. Finally, the majority of patients who have proceeded with definitive surgery have done so through an elective laparoscopic approach, reducing their overall surgical risk, and a subset of patients have avoided colectomy altogether.

Future study is required to compare RDLI followed by RPC and IPAA with the current standard of care (emer-

gent TAC plus ileostomy and Hartmann pouch followed by RPC plus IPAA). We plan to address this through a prospective trial of RDLI in acute refractory CUC.

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