Perioperative Considerations in Crohn Disease and Ulcerative Colitis

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Abstract

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The management of inflammatory bowel disease (IBD) is medically and surgically complex. Numerous patient- and disease-oriented factors must be considered in treating patients with IBD, including nutritional replenishment/support, effect of immunosuppressive medications, extent of resection, and use of proximal diversion. Perioperative planning and optimization of the patient is imperative to ensuring favorable outcomes and limiting morbidity. These perioperative considerations in Crohn disease and ulcerative colitis are reviewed here.

Given the complexity, multimodal, and multisystem medical management of inflammatory bowel disease (IBD), patients have the potential to present with numerous surgical challenges. While surgical intervention in Crohn disease (CD) serves to limit complications or alleviate symptoms, it is a potentially curative option in patients with chronic ulcerative colitis (CUC). More than 50% of the patients with CD will ultimately require surgical intervention during the course of their disease[1] and an additional one-third or more will require reoperation for recurrence.[2] There are numerous considerations in treating these patients, including nutritional replenishment/support, effect of immunosuppressive medications, extent of resection, and use of proximal diversion. Perioperative optimization is imperative to ensuring favorable outcomes.

Perioperative Nutrition

Surgical intervention is often employed as a last resort in treating patients with IBD, particularly in the case of CD. Poor oral intake secondary to illness or abdominal pain, malabsorption secondary to mucosal inflammation, and adverse medication effects often leads to inadequate nutritional reserve in these patients.[3] Ultimately, an appropriate response to surgical stress is inhibited and results in an increase in morbidity, particularly infectious septic complications and wound complications.[4,5] Studies have demonstrated that protein-calorie deficiency is significantly higher in hospitalized IBD patients compared with non-IBD patients.[6]

Serum albumin, prealbumin, and transferrin have all been described as surrogate markers for nutritional status. However, no single test can reliably predict overall nutritional status and a global perspective of the patient must be taken into account.[7] Patients with weight loss >10%, body mass index < 18.5 kg/m², or albumin < 30 g/L have been shown to be at significantly increased risk of postoperative complications.[8] A variety of interventions—dietary modification and enteral or parenteral nutrition—are often necessary.

Enteral nutrition is generally preferred over parenteral nutrition given the decreased infectious complications, promotion of gastrointestinal tract health, and decreased cost. Parenteral nutrition is often required in patients with high output intestinal fistulae, intolerance to enteral feedings, or those unable to maintain enteral access.[7]

Postoperatively, a low-residue diet can be safely instituted immediately, as per the protocol of many enhanced recovery pathways[9]; however, maintenance with additional nutritional supplementation may be required in those patients who were severely malnourished preoperatively.

Immunosuppressive Medications

Corticosteroids

Effective medical management of CD or CUC often involves the use of immunosuppressive medications, including corticosteroids, biologic therapies, or immunomodulators. These all have the potential to affect surgical outcomes and increase infectious complications.[10,11] Management of these medications is generally dependent upon the disease process and urgency of surgery.

The use of glucocorticoids in IBD is ubiquitous and they are typically employed to induce remission of active disease. Concern exists that high dose or prolonged use of corticosteroids may increase postoperative complications.[11] Reported rates of anastomotic leakage in IBD patients on glucocorticoids are variable with some studies demonstrating an increased rate[12,13] and others with no significant difference.[14,15] These differing results have been thought to be due to the wide variation in reported doses, duration of use, and definition of anastomotic leak. However, a recent systematic review of 12 studies did demonstrate that anastomotic leakage was more frequent in patients who received glucocorticoids preoperatively when compared with those who did not (6.8 vs. 3.3%).[16]

In the setting of CUC, the impact of steroid use in the perioperative period on postoperative complications has been investigated.[13,17,18] A study from the Mayo Clinic demonstrated that intravenous or oral steroids greater than 40 mg per day were associated with increased early complications.[19] In CUC patients on significant doses of steroids, consideration should be made for a multistaged approach. In particular, a three-stage ileal pouch anal anastomosis (IPAA) should be considered in patients on high-dose oral or intravenous steroids or in the presence of fulminant disease.

The impact of steroids in CD is less clear. The Crohn Therapy, Resource, Evaluation, and Assessment Tool (TREAT) Registry demonstrated higher infectious complications associated with glucocorticoid use, regardless of a patient being postoperative or not (OR 2.21).[20,21] However, other studies have demonstrated no significant difference in postoperative septic complications.[22,23]

Given these controversies regarding steroid use, particularly with CD, it is generally believed that in an effort to minimize complications related to glucocorticoid use, the lowest effective dose that induces remission should be used, along with early institution of steroid-sparing medications. If early operative intervention is necessary while on glucocorticoids, the surgeon must consider the potential increased risk of anastomotic leak, which may have a dose-dependent relationship, and consider either end or loop ileostomy to limit the potential morbidity associated with this complication.

Apart from the potential septic or infectious complications, chronic steroid use also leads to suppression of the hypothalamic–pituitary–adrenal axis and secondary adrenal insufficiency. The practice of administering high-dose perioperative glucocorticoids to aid in prevention of an Addisonian crisis and hemodynamic instability is largely based on dated and anecdotal evidence.[24–26] More recently, a randomized, noninferiority trial had demonstrated that low-dose perioperative steroids are equivalent to high-dose steroids, with decreased infectious complications in the low-dose group.[26] Given these findings, some have proposed standardized algorithms for the management of perioperative stress dose steroids in an effort to balance patient safety and risk.[27]

Immunomodulators

Use of immunomodulators such as 6-mercaptopurine, azathioprine, or methotrexate do not seem to lead to increased perioperative infectious complications despite their suppressive effect on bone marrow and resultant leukopenia.[17–19,22,28]

Cyclosporine has primarily been utilized as a rescue therapy in patients with steroid-refractory CUC and occasionally in patients with CD. Smaller series do not seem to demonstrate increased perioperative complications following colectomy for severe, acute UC.[29,30] Use of this medication as a rescue therapy, however, should not delay surgical intervention if there is a lack of response. Any such delay would predictably increase complications should the patient become toxic or develop perforation.[17]

Biologic Agents

The introduction of biologic agents such as infliximab, an anti–tumor necrosis factor (anti-TNF) chimeric antibody, or adalimumab (human monoclonal antibody) has significantly altered the natural history of IBD.[31] Biologics have been demonstrated to improve the quality of life, spare the use of steroids, and decrease the rates of surgical intervention.[32]

Numerous retrospective studies have not demonstrated any difference in postoperative complications in CD patients treated with preoperative infliximab.[22,28,33–37] A recent nationwide Danish cohort study also demonstrated no difference in 30- and 60-day postoperative complications in 2,293 patients. This was true whether they were last treated with infliximab at 12 weeks or < 2 weeks prior to surgery.[38] Studies on the other side of the debate, however, reported increased intra-abdominal sepsis, anastomotic leak, and re-admissions at 30 days postoperatively.[39,40] The TREAT registry also demonstrated increased infectious complications with infliximab use; however, disease severity and prednisone use were associated with an even higher risk.[20,21] Given the conflicting evidence, some surgeons consider delay of surgical intervention or more liberal use of proximal diversion in patients with recent biologic use.[41] However, one must balance the risks associated with this with early operative intervention, and the decision to delay surgery or utilization of proximal diversion should not be made on the basis of biologic use alone.

Despite advances in medical treatment for UC, approximately 30% of the patients still require colectomy.[42] Preoperative infliximab use in UC has been demonstrated to increase the rate of infectious complications including anastomotic leak.[43,44] Selvasekar and colleagues reported a multivariate analysis of 301 UC patients undergoing IPAA and found that infliximab was the only factor associated with infectious complications.[44] Patients receiving infliximab did have more severe colitis, were more

commonly taking a combination of immunosuppressive medications, and had a nearly three-fold increase in pouch-specific and infectious complications.

A European study by Ferrante and colleagues reported opposing results and found that steroids and ileal pouch without diversion were associated with an increased risk of complications.[45] However, the majority of patients who received infliximab in this study underwent a three-stage pouch.

Consideration should be made for a three-stage approach to ileal pouch in patients with UC who are presently on infliximab or other combination of immunosuppressive medications. This provides the patient with the opportunity to discontinue medications and improve their nutrition and overall health prior to construction of the ileal pouch.

Two-Stage versus Three-Stage IPAA

The approach to operative management of UC patients largely relies upon the acuity of presentation. In toxic patients presenting with fulminant disease and undergoing emergent surgery, a three-stage approach is often employed with abdominal colectomy and end ileostomy as the initial operation. Proctectomy and pouch creation is performed at a later stage, once patients are off immunosuppressive medications, nutritionally replete, and in improved general health.

Several factors influence the decision to proceed with the use of two or three-stage approaches in patients with UC presenting for elective or semi-urgent surgery.[46,47] In a comparison of patients undergoing two- and three-stage IPAA, those undergoing three-stage IPAA were more likely to be receiving more aggressive medical therapy, and overall complication rates were similar between groups; however, infectious complications were higher in the two-stage group (38.2 vs. 21%).[47] Another single center review revealed that the decision to perform a three-stage operation was affected by emergency presentation, hemodynamic instability, but not by age, sex, body mass index, use of steroids, or use of anti-TNF agents. A multivariate analysis demonstrated that increased complications in two-stage operations were largely due to surgeon experience.[46]

Reported trends of two- and three-stage pouch have not recently changed, and the two-stage approach is more commonly performed.[48] Whether a two- or three-stage operation is selected, it should be individualized to the patient and clinical scenario. Insufficient data exist to determine which approach is superior, and further study is needed.

Severe Perineal Crohn Disease

The management of severe perineal CD has evolved toward upfront, combined, aggressive medical and surgical therapy. Following this approach, initial response rates to treatment have increased and recurrence rates have decreased significantly.[49] Extensive fistulizing disease and/or severe proctitis, however, increase the likelihood of needing proctectomy.

Fecal diversion is often required to manage severe disease; however, less than 20% ultimately have intestinal continuity successfully restored, and the use of biologic therapy has not

improved these rates.[50] Diversion has been shown to be beneficial to a septic perineum and improve symptoms in majority of the patients.[51] This may facilitate surgical intervention by limiting the pelvic inflammation or promote postoperative healing after planned proctectomy.

If a large tissue defect is anticipated, one should consider involvement of a plastics/reconstructive surgeon for use of a myocutaneous flap.[52] Alternatives are the use of vacuum-assisted closure device applied to the perineum or a pedicled omental flap to fill the pelvis.[17]

Conclusion

Patients with IBD frequently undergo surgical intervention for the treatment of their disease. The risk of postoperative complications may be increased by a variety of factors, and these combined with the overall complexity of treatment mandate that physicians and surgeons understand how to mitigate any adverse outcomes. An individualized, patient-centric approach to the management of preoperative medications and surgical decisionmaking is recommended.

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