Review Article

Evaluation of Recent Surgical Updates in the Management of Ulcerative Colitis: A Simple Literature Review

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Abstract

Background: Ulcerative colitis (UC) is a chronic inflammatory disease, which affects the mucosa of the colon and rectum. It is manifested by recurrent attacks of intestinal inflammation proceeded by partial healing. This will lead to long-term impairment in bowel function. Unlike Crohn's disease, UC can be curable by surgery because its manifestations are restricted to the rectum and colon. **Objective:** To evaluate recent surgical updates in the management of Ulcerative Colitis and discuss the recent literature that tackled this aspect. **Method:** A comprehensive search was done using biomedical databases; Medline, and PubMed for studies concerned with the recent surgical updates in the management of ulcerative colitis. Keywords used in our search through the databases were "Ulcerative Colitis Pathophysiology", "Ulcerative Colitis Surgical Management", and "Ulcerative Colitis Evaluation". **Conclusion:** One-fifth of UC patients during the course of the disease will require surgical intervention and around 16% undergo colectomy after a duration of 10 years of the disease. Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the surgical treatment of choice. Surgical intervention becomes indicated mostly when the disease becomes refractory to medical therapy especially if serious complications started to appear. Emergent surgeries for UC still exists despite the advancement of medical therapy. Nevertheless, the surgical intervention timing should be optimized and determined based on a clear understanding of the outcomes for the patient including quality of life.

Keywords: Ulcerative Colitis, Diagnosis, Management

Introduction

Ulcerative Colitis (UC) is a chronic disease that specifically affects the rectum and colon mucosa. The reported prevalence of UC may reach 249 per 100,000 people in North America while, in Europe, it is as high as 505 per 100,000 people [1]. Around 20% of patients with UC require surgery during their illness. The rate of colectomy after 10 years of illness is about 16% [2]. Different from Crohn's disease, UC can be cured by surgery since its manifestation is basically restricted to the colon and rectum [3, 4]. Therefore, in this review, we will discuss and evaluate the surgical approach in treating UC.

Methodology:

Sample

We performed a comprehensive search using biomedical databases; PubMed and Medline, for investigations regarding the recent surgical updates in the management of ulcerative colitis published in English. Keywords used in our search through the databases were "Ulcerative Colitis Pathophysiology", "Ulcerative Colitis Surgical Management", and "Ulcerative Colitis Evaluation". More relevant articles were recruited by scanning the list of references for each included study.

Analysis

No software was used, the data were extracted based on a

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specific form containing the title of the study, the name of the author, objective, summary, results, and outcomes.

Discussion:

The history of this inflammatory bowel disease started before 360 BC when Hippocrates described colitis-like diarrheal diseases [5]. Nevertheless, UC was not clinically distinguished from common infectious enteritis until the 19th century. Now, UC is recognized as a distinct disease entity for more than a century. In 1859, Sir Samuel Wilks of London described a case of a 42-year-old woman who passed away after a long history of fever and diarrhea. This was the first medical account of colitis. Examination after death showed a transmural ulcerative inflammation of the terminal ileum and the colon. This inflammation was originally determined as "simple ulcerative colitis", which may actually be Crohn's disease. Later in 1875, Wilks and Walter Moxon described the signs of inflammation and ulceration of the entire colon in a young woman suffering from severe bloody diarrhea. This report might be the first detailed description of UC [5-7].

Surgical distinguishing between Crohn's disease and ulcerative colitis of the large intestine was not difficult after the landmark description of regional enteritis by Burrill Crohn in the 1930s. Nevertheless, there is still an appreciated overlap between the two diseases in some of the pathologic features as well as in anatomic distribution [5].

Etiology and pathology:

Unfortunately, the pathogenesis of UC is still poorly understood. This chronic disease can be described as frequent episodes of the inflammation of intestines followed by a slight recovery. This repeatedly will eventually cause chronic bowel dysfunction. The idea behind the pathogenesis of UC is that the body sometimes fails to downregulate the sustained mucosal inflammatory response. This will enhance the activation and recruitment of numerous immune and inflammatory cells along with the release of pro-inflammatory mediators. This process will perpetuate inflammation and facilitate intestinal tissue damage. The pathogenesis of UC is thought to be a representation of the failure of the intestinal immune system by causing immune-mediated inflammatory events such as the dysregulation of cell-mediated immunity and hyper-reactivity against intestinal bacterial antigens. It is now thought that the major event in the pathogenesis of UC is the loss of tolerance against indigenous enteric flora [8, 9]. It has been observed that the colonic mucosa on gross inspection is congested and swollen even in mild patients. In advanced cases, the mucosa becomes eroded and only small islands of mucosa remain. These mucosal islands resemble polyps, but they are actually pseudo-polyps. Mostly, the mucosal erosions will unite together to form linear ulcers and superficial fissures that undermine the remaining mucosa, which becomes friable and erythematous with reduced haustral folds.

Clinical features:

UC disease course is characterized by frequent exacerbations and remissions [10, 11]. It is also characterized by subjective symptoms and unspecific general physical findings. Blood or pus may result from the inflammation of the large bowel mucosa and the ulceration. The ability of the colon to absorb water will be decreased because of this inflammation leading to increased mucus production. This will lead to more frequent and looser bowel motions expressed as urgency and diarrhea. Other prevalent symptoms of UC include weight loss, fatigue, a lack of energy, mucus and blood in stools, and crampy abdominal pain. The loss of blood may develop anemia as well [12].

Nevertheless, the main concerns of the condition are from its colorectal and systemic complications, which contribute potentially to long- and short-term morbidity and mortality outcomes [13, 14]. In acute terms, life-threatening complications may develop such as episodes of fulminant colitis, severe bleeding, perforation, toxic megacolon, hypercoagulability with thromboembolism, or toxic multiple organ dysfunction. Long-term complications include growth retardation in children and cancer. In addition, medication-induced side effects are possible to occur such as steroids, pancreatitis, opportunistic infections, and extracolonic tumors [12, 15].

Surgical management:

As mentioned earlier, one-fifth of UC patients require surgery during the course of their illness. Around 16% undergo colectomy after a disease duration of 10 years [2]. Since the manifestation of UC is confined to the rectum and colon, unlike Crohn's disease, the disease is mainly curable by surgery. Surgery becomes indicated mostly when the disease becomes refractory to the medical therapy especially if dysplasia or neoplasia occurred. Moreover, in patients with UC, there are emergency indications for surgery, such as fulminant bleeding, perforation, and toxic megacolon. Severe bleeding occurs in about 4.5% of patients with UC [16]. If the patient requires more than four red cell concentrates per 24 h or when there is severe initial bleeding with hemodynamic instability and the need for catecholamines, this can be an indication for surgery [16]. A colonic dilation of more than 6 cm is the radiological criterion for toxic megacolon [17]. There are urgent indications for surgery such as intractable fulminant flare especially if intensive-care medical treatment cannot achieve any improvement over a period of 72 h [3, 16].

Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the surgical treatment of choice. The substrate of disease should be removed down to the dentate line with the restoration of the continuity. One of the advantages of this approach is that patients can stop using colitis-related medications especially immunosuppressants and immunomodulators, subsequently avoiding associated adverse effects. Moreover, IPAA reduces the risk for cancer or dysplasia to the pouch itself in rare cases where severe chronic pouchitis is uncontrollable [3].

By looking at the patient's individual risk profile, the operation will be conducted as a procedure with 1, 2, or 3 stages. Recently, the trend has been towards performing a three-step procedure [12]. The first step includes terminal ileostomy and subtotal colectomy with the formation of Hartmann stump. After consolidating the patient, the second step should be carried out when the remaining proctectomy with IPAA and the protective ileostomy is conducted. The 3rd step is the loop ileostomy. Pouchoscopy and pouchography are recommended to be done before the closure of ileostomy in order to rule out fistulas, stenosis, or an inflammation (pouchitis). The three-stage procedure sounds highly conservative and takes a longer time. On the other hand, it offers better control in this type of case. However, a one-stage operation should be reserved only for young patients with low inflammation activity, low-dose immunosuppressive therapy, good sphincter function, good general conditions, and a totally tension-free IPAA. 100-125 ml should be obtained by the configuration of the J-pouch, as well as around 15 cm of length. Laparoscopic restorative proctocolectomy with IAPP can be an alternative to open surgery especially in experienced centers [3]. Recently, Singh et al. [18] conducted a meta-analysis to compare the results of open restorative and laparoscopic proctocolectomy. Their results demonstrated a longer operating time with fewer postoperative wound infections and a shorter hospitalization for the laparoscopic approach. Nevertheless, both approaches produced similar rates of adverse events and long-term functional results. Speaking of which, chronic pouchitis is one of the most important limiting factors of surgical success in UC treatment. The presence of considerable side effects and complications can be burdening on the patient. However, a long-term pouch success rate can exceed 90% after 10 and 20 years of follow-up, which ultimately helps in achieving a normal quality of life. It is recommended to have a multidisciplinary approach from several specialties prior to and after the surgical intervention in order to obtain optimal outcomes for UC patients.

Cost analysis:

Day after day, therapeutic decisions in medicine become more guided by the financial situation because of the increasing cost of healthcare. Physicians should examine the cost of every treatment plan to see if it is more cost-effective than the other one. Devaraj and Kaiser [12] tackled this issue in their review article and evaluated the cost of surgical treatment compared to medical therapy primarily with a focus on biological therapy due to their increasing use in UC patients. Depending on the studied medication (adalimumab versus infliximab), the annual cost per remission with these medications accumulates up to $330,000 versus $150,000, respectively [19]. The analysis of cost-effectiveness comparing infliximab and colectomy treatment in UC patients showed a higher cost ($306,000 versus $270,000) and lower quality-adjusted life years for infliximab compared to colectomy [20]. However, in another analysis over a period of one year, infliximab treatment showed more cost-effectiveness compared to surgical treatment [21]. A model simulating 2 cohorts of UC patients (surgical versus medical) and following them out for eighty years found the cost to be higher in the medical than the surgical cohort ($236,370 versus $147,763, respectively) [22].

Considering these members, treatment with biologicals seems to be very expensive due to the need for repeated treatment, keeping in mind that analyzing and comparing financial data is always very difficult. Therefore, comparing pure medical cost versus surgical cost may not be appropriate, because medical therapy may show decreased efficacy over different periods along with a possibility of future need for surgical intervention [22].

Conclusion:

During the course of the disease, one-fifth of UC patients will need surgery and around 16% undergo colectomy after ten years of illness. Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the surgical treatment of choice. Surgical intervention becomes indicated mostly when the disease becomes refractory to medical therapy especially if serious complications started to appear. Emergent surgeries for UC still exist despite the advancement of medical therapy. Nevertheless, the surgical intervention time should be optimized and determined based on a clear understanding of the outcomes for the patient including quality of life.

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