The American Journal of Surgery (2016) 212, 345-351

The American Journal of Surgery®

Review

Current challenges in the surgical management of Crohn's disease: a systematic review

Andrew T. Schlussel, D.O.[a], Scott R. Steele, M.D., F.A.C.S, F.A.S.C.R.S[b], Karim Alavi, M.D., M.P.H., F.A.C.S., F.A.S.C.R.S.[a,*]

[a]Division of Colorectal Surgery, University of Massachusetts Memorial Medical Center, 67 Belmont Street, Suite 201, Worcester, MA 01605, USA; [b]Division of Colorectal Surgery, University Hospitals Case Medical Center, Case Western Reserve University, Cleveland, OH, USA

KEYWORDS:
Crohn's disease;
Surgery;
Strictureplasty;
Anastomosis;
Resection;
Systematic review

Abstract

BACKGROUND: Crohn's disease is a chronic inflammatory disorder, and the broad variability in phenotypic presentations makes the treatment of this disease a true multidisciplinary approach. We sought to review the current recommendations regarding the surgical management of Crohn's disease.

DATA SOURCE: A Systematic literature review of surgical techniques was performed from 1979 through 2015. We evaluated 30 articles focusing on findings over the past 5 years.

CONCLUSIONS: Crohn's is a complex disease with no surgical cure. Invasive techniques vary from strictureplasty to resection and percutaneous drainage of penetrating disease when indicated. There is a paucity of well-controlled randomized studies evaluating these surgical techniques, and therefore, we continue to rely on smaller studies and historical data. The surgical goals are to minimize postoperative complications while preserving intestinal length and slowing the progression to clinical recurrence. The evidence discussed is one strategy against this complex pathology.

Crohn's disease is a chronic idiopathic multisystem disorder, which results in progressive transmural inflammation of the mucosa and may develop anywhere from the mouth to the anus. Despite the advances in medical and surgical therapy, Crohn's disease (CD) continues to burden patients of all age groups around the world. In the United States, the prevalence of CD is 50/100,000 and incurs millions of dollars annually of health care costs for both inpatient and outpatient therapy; therefore, providing a rapid diagnosis and effective treatment strategy is paramount.[1–3] Based on its phenotypic progression, Crohn's can be characterized as inflammatory, fibrostenotic, or fistulizing and may progress to extraintestinal or systemic manifestations.[4] The broad clinical spectrum of CD portends a diagnostic challenge and requires a multidisciplinary approach to provide the appropriate management. The aim of this systematic review is to provide an evidence-based assessment, and recommendations, specifically regarding the current status in the surgical management of CD.

Methods

This systematic review was conducted according to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses group.[5] A comprehensive, current search of MEDLINE, PubMed, and Cochrane Database of Collected Reviews, as well as embedded references in reviewed articles were performed from 1979 through

The authors declare no conflicts of interest.

* Corresponding author: Tel.: +1 508 334 8195; fax: +1 508 334 8130.
E-mail address: Karim.Alavi@umassmemorial.org

Manuscript received October 27, 2015; revised manuscript November 19, 2015

0002-9610/$ - see front matter © 2016 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.amjsurg.2015.12.027

2015. Keywords used for this organized search included "Crohn's disease," "medical management," surgical management," "stricture," "fistula-in-ano," "abscess," "endoscopy," and "biologics." Authors independently reviewed selected abstracts to determine the scientific relevance to the goals of this systematic review, and any variation in interpretation was resolved through discussion. A total of 590 titles were initially reviewed. All articles older than 10 years that did not provide a current or updated recommendation, based on a review of more recent publications of the surgical management of CD, were excluded. Additional articles listed as greater than 10 years old were included to provide supportive statements or to discuss a historical approach to CD. Previous systematic reviews and meta-analyses were included to provide support of current recommendations. The review focused primarily on English language articles including patients older than 18 years. A completed full text evaluation of all relevant articles was performed. Thirty articles provided directed guidelines for recommendations, and these were graded based on level of evidence. This included 16 retrospective reviews, 4 prospective studies, 2 randomized controlled trials, and 8 systematic reviews or a meta-analysis. Selected studies over the last 5 years and the level of evidence are listed in Table 1.

Surgical management

The development of CD is multifactorial, and the pathophysiology includes a genetic origin, environmental factors, bacterial infections, failure of intestinal barriers, and the interactions of the innate and adaptive immune system. A disease-specific history is essential, emphasizing symptoms, risk factors, underlying comorbidities, and signs of advanced disease. Although the ileum and colon are the most commonly affected sites, the presentation and extent of disease will predict the potential complications and guide appropriate management.[18] The medical treatment of CD is critical as there is no surgical cure. Despite the advances in pharmacologic therapy, approximately 80% of patients with CD will require a surgical intervention within 10 years of diagnosis.[19,20] It should be intuitive that patients who present with signs of free perforation should undergo an immediate operation with resection of the involved segment; however, not all management of CD related complications are as straightforward. Although surgery is not curative, it may be the most appropriate and safest option for patients with complications of the disease and those who are nonresponders or noncompliant with medical therapy. Table 2 provides clinical scenarios in which surgery may be indicated.[21,22]

Operative approach

As experience and technology in minimally invasive techniques continue to grow, the safety and efficacy of this approach has been demonstrated in CD. Perioperative complications, including anastomotic leak, have been shown

Table 1 Studies including the surgical management of Crohn's disease (5 years) in the text and the level of evidence

Study/year	Type of study	Number of patients/studies	Benefits	Level of evidence
Samimi et al[6] (2010)	Retrospective review	53 patients	Outcomes after medical management of stricturing or penetration CD are poor, with a high rate of progression to surgery.	3
Campbell et al[7] (2012)	Systematic Review/ Meta-analysis	32 studies	Nonconventional strictureplasty had similar outcomes to conventional techniques	1
Geltzeiler et al[8] (2014)	Retrospective review	256 patients	Complications after strictureplasty remain low as utilization of this technique decreases	3
Bellolio et al[9] (2012)	Retrospective review	94 patients	Supports the use of strictureplasty with safe long-term outcomes	3
Tonelli et al[10] (2010)	Retrospective review	28 patients	Outcomes after ileocecal strictureplasty and resection are similar	3
Uchino et al[11] (2010)	Retrospective review	526 patients	Strictureplasty is safe and effective in stricturing CD	3
He et al[12] (2013)	Meta-analysis	18 studies	Favors that side-to-side anastomosis has after ileocolic resection.	1
Kono et al[13] (2011)	Retrospective review	69 patients	Favors Kono-S anastomosis to prevent surgical recurrence	3
Katsuno et al[14] (2015)	Retrospective review	30 patients	Supports the use of the Kono-S anastomosis	3
Riss et al[15] (2014)	Retrospective review	116 patients	Favors ileocolic resection	3
Bellolio et al[16] (2013)	Retrospective review	434 patients	Penetrating CD is associated with a complex operation, higher rate of ileostomy, and longer hospital stay.	3
Nguyen et al[17] (2014)	Meta-analysis	9 studies	Primary surgical management may be superior to medical therapy in CD related intra-abdominal abscess	

CD = Crohn's disease.