

Surgical Treatment of Crohn's Disease in Children: A Review Article

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Abstract

Crohn's disease (CD) is an inflammatory bowel disease with chronic transmural inflammation of the intestinal wall. It can be observed from oral cavity to anus and it typically involves the ileum, ileocecal portions of the entire colon. Surgery still has a role in the management of this entity in children when medical treatment is unsuccessful. In this review article, when medical treatment is unsuccessful, it is aimed to review the surgical treatment of CD under the light of relevant literature. During surgical management of these children, risks and benefits of surgical options should be carefully assessed and an appropriate surgical intervention should be performed promptly in order to avoid future complications and to gain future growth of the child with an acceptable quality of life.

Keywords: Crohn's Disease; Children; Surgical Treatment

Introduction

Crohn's disease (CD) is a rare inflammatory bowel disease with chronic transmural inflammation of the intestinal wall from oral cavity to anus. It typically involves the ileum, ileocecal portions of the entire colon. Symptoms of CD in children include diarrhea (sometimes bloody), abdominal pain, fever and weight loss. Twenty percent of the patients with CD present before the age of 20 years [1]. Growth failure is present in 15 - 40% of pediatric CD cases [2,3].

The treatment choices of CD include medications, nutritional and diet therapy and surgery. CD is not curable by surgery alone and is reserved for patients in whom previous medical therapies such as medications and diet and nutrition modifications have failed. Other treatment modalities of CD are beyond the scope of this article and it is aimed in this study to review surgical management strategies of CD in children.

In surgical treatment of CD, diseased tissue is usually removed but the disease often recurs in nearby tissues and it has been reported that as many as 50% of children who undergo surgery require a second surgical intervention later on.

Generally surgical procedures in children with CD can be classified into 3 major groups: ileo-cecal and colonic resections for achieving remission, treatment of complications and salvage procedures [4].

Ileocecal resection

Before decision of ileocecal resection, it is essential to prove that signs and symptoms are due to active CD and specific bowel segment is responsible for those symptoms. It has been reported that surgical resection is not curative for CD and relapse, both at nearby tissue and other sites occurs within 5 years postoperatively [5].

There are two consensus statements derived from guidelines from the paediatric inflammatory bowel disease Porto group of ESPGHAN [4]. These are:

1. Surgery may be considered as an alternative to medical therapy when a patient has active disease limited to a short segment(s) despite optimized medical treatment (Agreement 100%).
2. Surgery should be considered in children in prepubertal or pubertal stage if growth velocity for bone age is reduced over a period of 6 to 12 months in spite of optimized medical and nutritional therapy (Agreement 100%).

Other consensus statements are suggestions of limited intestinal resection in the case of localized CD, avoidance of extensive intestinal resections because of short bowel syndrome (SBS) and in the case of pancolic disease, subtotal colectomy and ileostomy procedures. One stage ileorectal anastomosis is no longer recommended when a patient has CD [4].

Treatment of complications

Complications of CD in small and large bowel disease include fistulae, localized peritonitis, abdominal abscess and intestinal obstruction. Fistulae may develop between diseased bowel and adjacent tissues. These are entero-enteric (fistula between the intestinal segments), entero-vesicular (fistula between the intestinal segment and bladder), entero-genital (fistula between the intestinal segment and genital structure) and enterocutaneous fistulae (fistula between the intestinal segment and skin). Surgical management of these fistulae include removal of fistula between the tissues and closure of the defect. Other treatment modalities include immunomodulators, biologic agents, antibiotics, total parenteral nutrition with bowel rest.

Localized peritonitis and abdominal abscesses are managed initially with antibiotics and drainage of abscesses that are bigger than 2 cm in diameter together with optimization of CD therapy. Surgical resection of the diseased bowel is often added to the treatment because abdominal abscesses are usually due to bowel perforations (typically in the ileum).

As the disease progresses small bowel obstruction in the form of luminal obstruction due to stricture formation may be observed. Although surgical resection of stricturized bowel segment and anastomosis may be an option, for single and multiple site disease, stricturoplasty is the best choice to preserve bowel length. Surgical resection of strictures in children with multiple site disease may put these patients at risk for SBS.

Two types of surgical interventions may be used in strictures. These are standard Heinecke-Miculicz for short segment strictures, Finney type stricturoplasty for strictures up to 20 cm long. Longer strictures may necessitate complex surgical interventions as well.

Salvage procedures

Salvage procedures such as subtotal colectomy (e.g. proctocolectomy) for severe refractory colitis; or small bowel resection for refractory jejuno-ileitis may be necessary for the management of children with CD [6].

Complications following surgery of CD include short term and long term complications. Short term postoperative complications of

bowel surgery in CD include anastomotic leak, small bowel obstruction, ileus, infections, need for ileostomy, wound complications, fistulae, gastrointestinal bleeding, venous thromboembolism and it seems that complication rates are slightly lower in children compared to adults [7-9]. It has also been reported that anemia and weight loss before surgery are also associated with a worse prognosis [10].

Long term postoperative complications include bile acid malabsorption, vitamin B12 deficiencies, risk of bowel obstruction, SBS and intestinal failure. Ideally surgical treatment should preserve as much bowel segment as possible [11,12].

Conclusion

In conclusion; as the rates of CD increase, surgery still has a role in the management of CD in children especially in cases when medical treatment is unsuccessful in relieving symptoms, preventing disease progression and complications. Risks and benefits of surgical choices should be carefully assessed and a timely and appropriate surgical intervention should be performed promptly in order to avoid future complications and to gain future growth of the child with an acceptable quality of life.

Conflicts of Interest

The author certifies that he has no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter or materials discussed in this manuscript.

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Author Contribution to the Manuscript

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Bibliography

1. Kappelman MD., *et al.* "Recent trends in the prevalence of Crohn's disease and ulcerative colitis in a commercially insured US population". *Digestive Diseases and Sciences* 58.2 (2013): 519-525.
2. Griffiths AM. "Growth retardation in early-onset inflammatory bowel disease: should we monitor and treat these patients differently?" *Digestive Diseases* 27.3 (2009): 404-411.
3. Werksetter KJ., *et al.* "Long-term development of bone geometry and muscle in pediatric inflammatory bowel disease". *American Journal of Gastroenterology* 106.5 (2011): 988-998.
4. Amil-Dias J., *et al.* "Surgical management of Crohn disease in children: guidelines from the paediatric IBD Porto group of ESPGHAN". *Journal of Pediatric Gastroenterology and Nutrition* 64.5 (2017): 818-835.
5. Blackburn SC., *et al.* "Surgery for children with Crohn's disease: indications, complications and outcome". *Archives of Disease in Childhood* 99.5 (2014): 420-426.
6. Bemelman WA and Allez M. "The surgical intervention: Earlier or never?" *Best Practice and Research: Clinical Gastroenterology* 28.3 (2024): 497-503.

7. McMullin CM., *et al.* "A comparison of outcomes for adults and children undergoing resection for inflammatory bowel disease: is there a difference?" *ISRN Gastroenterology* (2014): 410753.
8. Barrena S., *et al.* "Surgical treatment of chronic inflammatory bowel disease in children". *Pediatric Surgery International* 27.4 (2011): 385-390.
9. Frolkis A., *et al.* "Postoperative complications and emergent readmission in children and adults with inflammatory bowel disease who undergo intestinal resection: a population-based study". *Inflammatory Bowel Diseases* 20.8 (2014): 1316-1323.
10. Nguyen GC., *et al.* "Consensus statements on the risk, prevention, and treatment of venous thromboembolism in inflammatory bowel disease: Canadian Association of Gastroenterology". *Gastroenterology* 146.3 (2021): 835.e6-48.e6.
11. Ambe R., *et al.* "A comprehensive review of strictureplasty techniques in Crohn's disease: types, indications, comparisons, and safety". *Journal of Gastrointestinal Surgery* 16.1 (2012): 209-217.
12. Shaffer VO and Wexner SD. "Surgical management of Crohn's disease". *Langenbeck's Archives of Surgery* 398.1 (2013): 13-27.

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