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Contents

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Contents

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Contents

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EDITORIAL

Pediatric stricturing Crohn's disease

Alessandro Boscarelli, Matteo Bramuzzo

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Abstract

Crohn's disease (CD) is a chronic inflammatory disease of the digestive tract. The incidence of pediatric CD is increasing and is currently 2.5–11.4 per 100000 worldwide. Notably, approximately 25% of children with CD develop stricturing CD (SCD) that requires intervention. Symptomatic stricturing diseases refractory to pharmacological management frequently require non-pharmacological interventions. Non-pharmacological therapeutic strategies include endoscopic balloon dilatation, stricturoplasty, and surgical resection of the strictured segment. However, strictures tend to recur postoperatively regardless of treatment modality. The lifetime risk of surgery in patients with childhood SCD remains at 50%–90%. Thus, new and emerging strategies, advanced diagnostic tools, and minimally invasive approaches are under investigation to improve the outcomes and overall quality of life of pediatric patients with SCD.

Key Words: Stricturing; Crohn's disease; Pediatrics; Insights; Future perspectives

Core Tip: Crohn's disease (CD) is a chronic inflammatory disease of the digestive tract, and approximately one out of four children develop stricturing CD (SCD) requiring intervention. Since strictures tend to recur postoperatively regardless of treatment modality and the estimated lifetime risk of surgery in patients with childhood SCD remains high, new emerging strategies may help to improve the outcomes and overall quality of life of patients with SCD.

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INTRODUCTION

Crohn's disease (CD) is a chronic inflammatory disorder that progressively damages the bowel and causes remarkable morbidity, disability, and reduced quality of life. The etiopathogenesis of CD is still being investigated. However, its underlying pathology is assumed to result from a dysfunctional interaction between the human immune system and intestinal commensal microbiota[1,2]. The overall incidence of CD is continuously increasing. A recent systematic review of population-based studies reported the highest prevalence in Germany (322 per 100000) and Canada (319 per 100000). The incidence of pediatric CD ranges from 2.5–11.4 per 100000 worldwide[3,4]. Common symptoms of CD in children include fever, abdominal pain, bloody or mucopurulent chronic diarrhea, anemia, poor growth, and signs of intestinal obstruction. Other symptoms include perianal anomalies, such as abscesses or fistulas, and extraintestinal manifestations like arthritis, erythema nodosum, and uveitis. Notably, despite available treatment strategies for reducing the progressive inflammatory process of the disease, approximately 25% of children with CD develop stricturing CD (SCD) that requires intervention[2,4,5]. Approximately 10% of patients present with complicated disease at diagnosis. In particular, duodenal SCD is a rare but serious complication, affecting nearly 1% of patients at diagnosis, with an annual incidence of 0.05 per 100000. Conversely, the most frequent CD location is the terminal ileum, which is the part of the bowel most often affected by complications[6,7]. Interestingly, Sato *et al*[8] conducted a retrospective, single-center study of a cohort of 520 patients with initial CD attacks and a mean age at diagnosis of approximately 25 years; they concluded that stenosis or fistula appeared in about half of the patients after 5 years. Moreover, in patients with upper gastrointestinal disease or small intestinal lesions at the time of diagnosis, the cumulative rate of initial surgery was seemingly higher[8].

INSIGHTS ON SCD DIAGNOSIS

Endoscopy is the gold standard for diagnosing and monitoring inflammatory bowel diseases in children. However, it is less desirable for pediatric than for adult patients because of its invasiveness, the need for sedation and bowel preparation, and additional procedural challenges. In addition, while irradiation should be limited in pediatric patients during follow-up of a chronic disease such as CD, suspicion of acute SCD remains an indication for abdominopelvic computed tomography[9,10]. Intestinal ultrasound (IUS) is an imaging tool that has recently been shown to have comparable accuracy to magnetic resonance enterography when evaluating transmural inflammation of the entire bowel. Advantages of IUS include being well-tolerated, non-radiating, and less expensive. Furthermore, IUS showed high sensitivity in detecting small bowel CD, particularly active ileal inflammation[11]. The International Bowel Ultrasound Group's Pediatric Committee proposed the first pediatric IUS monitoring algorithm to better assess and characterize complications such as SCD. Following endoscopy and trans-abdominal IUS, magnetic resonance enterography should be considered to establish disease extension and activity, leaving small bowel capsule endoscopy for selected cases in which clinical suspicion remains high[9,11].

Recently, Ungaro *et al*[12] identified panels of blood biomarkers, including the proteins C-C motif chemokine ligands 3 and C-C motif chemokine ligands 4 and cluster of differentiation 40 selected by random survival forest modeling, that appear to predict the development of complications. These biomarkers may assist with risk stratification at the time of diagnosis of CD in pediatric patients[12]. Further studies are needed to better investigate the capacity of these biomarkers to predict SCD.

ADVANCES IN SCD MANAGEMENT

A recent population-based study by Ley *et al*[13] evaluated the impact of current therapeutic strategies on long-term outcomes in a cohort of 1007 patients with CD recognized before the age of 17 years over 26 years. They concluded that the increased use of immunosuppressants and anti-tumor necrosis factor (TNF) antibodies decreased the likelihood of bowel resection and SCD within 5 years after diagnosis, leading to a reduction in surgical interventions. Anti-TNF therapy has been shown to have good short-term success but a modest long-term response in patients with SCD[13,14]. Moreover, a recent study suggested that early anti-TNF exposure may reduce disease progression, while body mass index was directly associated with an increased likelihood of surgery[15].

Notably, a retrospective analysis of a cohort of 57 children in 2022 highlighted that female gender, stricturing and/or penetrating disease, and perianal disease at diagnosis were independent risk factors for surgical intervention. In addition, Spencer *et al*[16,17] reported a recurrence rate of 46% within a pediatric CD cohort of 78 patients who had undergone ileocolic resection.

As stated above, endoscopy is a cornerstone for diagnosing and following up with children with CD, and video capsule endoscopy is considered a valuable adjunctive and alternative tool for managing these patients. Recent data suggest that endoscopic balloon dilatation is an emerging safe and effective alternative that should be considered in

selected cases. However, its use is limited by the need for dedicated centers and expert endoscopists[18-20].

CONCLUSION

Advanced interventional techniques, such as endoscopic stricturotomy and stricturoplasty or endoscopic stenting with self-expandable metal stents, are feasible and effective in treating SCD in adults. However, post-procedural complications and long-term follow-up have been poorly investigated, and data on indications, descriptions, and results in children with SCD are scarce[18-21]. Further studies are required to evaluate the application of these emerging techniques in pediatric patients. The concomitant advent of robotic technologies will likely influence this process of treatment evolution.

FOOTNOTES

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