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Dolichocolon as an overlooked anatomical factor in chronic constipation: pathophysiology, diagnosis, and therapeutic implications

Abstract

Background: Chronic constipation is a highly prevalent gastrointestinal disorder affecting approximately 14–20% of the general population. Despite the availability of multiple therapeutic strategies, nearly half of patients report dissatisfaction with conventional treatments, reflecting the complexity and heterogeneity of its underlying mechanisms.[1]

Objective: To analyze the role of dolichocolon as an underrecognized anatomical factor contributing to chronic constipation and to discuss its diagnostic and therapeutic implications.

Methods: A narrative review of the literature was conducted, focusing on the pathophysiology, clinical presentation, diagnostic criteria, and management of dolichocolon in patients with chronic constipation.

Results: Dolichocolon, characterized by elongation and redundancy of the colon, has been associated with slow colonic transit, increased symptom severity, abdominal distension, and pain.[2] Diagnostic evaluation is primarily based on imaging studies such as barium enema and computed tomography colonography, with specific anatomical criteria used to define colonic redundancy. Although many individuals with dolichocolon remain asymptomatic, in selected patients it may represent a significant contributing factor to refractory constipation. Initial management is conservative; however, surgical intervention may be considered in severe, treatment-resistant cases, particularly when associated with dolichosigmoid and documented slow transit.[3,4]

Conclusions: Dolichocolon should be considered a relevant anatomical factor in the evaluation of chronic constipation, particularly in patients with persistent or refractory symptoms. Its recognition may improve patient stratification and support more individualized and effective therapeutic approaches, including surgical management in carefully selected cases.

Keywords: Chronic constipation, redundant colon, dolichocolon, dolichosigmoid, barium enema, colectomy

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Introduction

Chronic constipation is a common gastrointestinal disorder that is complex to manage and has significant repercussions on patients' quality of life. Its clinical presentation is diverse and its pathophysiology multifactorial, requiring the use of various diagnostic and therapeutic strategies and a multidimensional approach that includes dietary modifications, lifestyle changes, pharmacological treatments, modifications of the gut microbiome, and, in selected cases, surgical interventions. Among the many factors that can cause this disorder, anatomical factors such as dolichocolon or redundant colon can contribute to the development and perpetuation of chronic constipation. However, few studies mention its role in the development or persistence of this condition, and even fewer mention the possible surgical management of patients with this anatomical condition of the colon.[5]

Initial management should be conservative, based on dietary interventions, laxatives, and prokinetic agents. However, in patients with severe, persistent symptoms refractory to optimal medical treatment, segmental surgical resection, especially of the redundant sigmoid colon, can achieve favorable results in selected cases. In this context, it is pertinent to analyze the role of dolichocolon as part of the pathophysiological mechanism of chronic functional constipation, in order to optimize its diagnostic recognition and guide more effective therapeutic strategies.

Discussion

Chronic constipation is a persistent and common clinical condition characterized not only by a a reduced frequency of bowel movements, but also by a set of symptoms that include excessive or prolonged straining, a sensation of incomplete evacuation, unsuccessful or prolonged attempts to defecate, the need for digital maneuvers to facilitate defecation, abdominal distension, and hard stools. This broad definition reflects the complexity of the disorder and the need to evaluate it beyond simply counting weekly bowel movements.[5] From a clinical perspective, constipation should be understood as a syndrome with multiple underlying manifestations and mechanisms, rather than a single entity. The Rome IV criteria establish the diagnosis of functional constipation when a patient has presented, during the last six months, two or more of the following criteria: fewer than three spontaneous bowel movements per week, straining in more than 25% of defecation attempts, hard or fragmented stools in at least 25% of attempts, a sensation of anorectal obstruction or blockage in at least 25% of bowel movements, a sensation of incomplete evacuation in at least 25% of attempts, or the need for manual maneuvers to facilitate defecation in at least 25% of cases. Additionally, the patient must

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rarely have soft stools without the use of laxatives and must not meet the Rome IV criteria for irritable bowel syndrome.[6]

In epidemiological terms, some studies report that chronic constipation affects approximately 20% of the general population; which makes it one of the most common gastrointestinal symptoms worldwide.[7] Its prevalence is higher in women, older adults, and certain pediatric groups. Depending on its severity, it has a significant impact on quality of life and results in high healthcare resource utilization. In the pediatric population, functional constipation reaches a prevalence of nearly 30% and is a frequent reason for consultation, with significant behavioral and familial repercussions. In adults, chronic constipation is a common reason for referral to gastroenterology and colorectal surgery, especially when associated with refractory symptoms or anorectal complications.

The pathophysiology of chronic constipation is multifactorial and not fully understood. It may involve complex interactions such as anatomical variations that impede transit, alterations in colonic motility, rectal sensory dysfunction, ineffective pelvic floor coordination, and gut-brain axis factors. In irritable bowel syndrome with predominant constipation, multiple etiological factors have been implicated, including visceral hypersensitivity, intestinal dysbiosis, and psychological components, although the exact mechanisms remain unclear. Factors such as low-fiber diets, insufficient fluid intake, sedentary lifestyle, medication use, endocrine or neurological diseases, and psychological comorbidities may contribute to the development and maintenance of constipation.

From a clinical perspective, functional chronic constipation comprises subtypes that may overlap, including slow transit constipation, dyssynergic defecation, and irritable bowel syndrome with constipation.[8] The Rome criteria are a useful tool for the clinical diagnosis of functional constipation, allowing for classification based on symptoms and duration. Physiological studies have shown that a significant proportion of patients present with more than one concomitant functional disorder, such as slow colonic transit associated with pelvic floor dysfunction or upper gastrointestinal transit abnormalities.

In this multifactorial context, dolichocolon is a relevant anatomical factor in chronic constipation. Redundant colon, or dolichocolon, is considered primarily a congenital variant, observed even in fetuses, newborns, and infants, although its clinical expression can manifest throughout life. A characteristic clinical triad of constipation, abdominal pain, and distension has been described, with evidence that colonic transit time increases proportionally to the number of colonic redundancies present. This elongation of the colon can contribute to a functional slowing of transit, exacerbating fecal retention and symptoms, and explaining cases of chronic constipation refractory to conventional treatments.[9]

The diagnosis of chronic constipation requires a comprehensive evaluation, as no single test allows for a complete assessment of the disorder. After the failure of initial empirical management, functional studies are recommended to identify the underlying pathophysiology. Among the most useful tools are colonic transit studies with radiopaque markers, anorectal manometry with balloon expulsion testing, and imaging studies. (Table 1) In the case of dolichocolon, the diagnosis is established by radiological visualization of the colon using barium enema or computed tomography colonography.

Table 1 Diagnostic studies in the evaluation of chronic constipation

Diagnostic Method	Description	Primary Clinical Utility
Plain X-Ray	Abdominal x-ray in supine and standing projections to identify fecal load, fecal impaction, intestinal obstruction or fecaliths.	Differentiate between functional constipation, fecal impaction, and obstruction; detect complications.
Abdominal Computed Tomography	Allows the identification of intra-abdominal abscesses and the evaluation of colonic dilation with an empty rectum.	Evaluate for structural, inflammatory, or obstructive causes.
Anorectal Manometry	It assesses the motor and sensory function of the rectum and sphincters. Useful in pelvic floor dysfunction.	Identify defecation dyssynergia and neuromuscular disorders.
Colonic Manometry	Colonoscopic catheter for measuring segmental pressures of the colon.	Evaluate severe colonic motility disorders.
Colonic Transit Studies	Use of radiopaque markers to measure intestinal transit speed.	Identify constipation due to slow transit.
Defecography	Fluoroscopic evaluation of the defecation act with barium in the rectosigmoid.	Detecting anal canal obstruction and functional disorders.
Barium Enema	A barium enema is a radiologic contrast study in which contrast material is introduced into the colon via the rectum to visualize colonic anatomy on X-ray.	It helps confirm excessive colonic length and redundant loops, assess colonic configuration, and rule out associated complications such as volvulus or structural obstruction.

Recognizing the dolichocolon as a structural contributing factor is fundamental for proper diagnostic stratification and for guiding more effective and personalized therapeutic strategies.

Dolichocolon, also known as redundant colon, is an anatomical variant characterized by elongation and redundancy of the large intestine, which has been consistently associated with chronic constipation, abdominal pain, and distension. Available evidence suggests that dolichocolon is predominantly a congenital condition,

as colonic redundancies have been identified in fetuses, newborns, and infants; however, its clinical expression may manifest or worsen

in later stages of life, depending on the interaction with functional and motility factors.

The dominant symptom of dolichocolon is constipation, reported consistently in multiple clinical series.[4] Classic and contemporary studies have demonstrated a significant association between redundant colon and chronic constipation, particularly in patients with slow-transit constipation. In 1962, Brumer et al.[10] documented that approximately one-third of patients with chronic constipation presented with colonic redundancies in barium enema studies, while this anomaly was exceptional in subjects without constipation, supporting the existence of a causal relationship between the two conditions. Subsequent research has confirmed that, in patients with slow colonic transit, the dolichocolon is consistently identified as the underlying anatomical substrate.[11]

From a pathophysiological standpoint, this excessive elongation of the colon promotes fecal stasis, increases the intraluminal load, and creates a vicious cycle of retention, distension, and abdominal pain, frequently colicky and localized to the lower abdomen. In some cases, a tender abdominal mass corresponding to redundant colonic loops filled with fecal matter may be palpable. Furthermore, nonspecific symptoms such as asthenia, headache, and mild febrile episodes have been described, historically attributed to autointoxication secondary to prolonged fecal stasis.

The diagnosis of dolichocolon is established by radiological visualization of the non-dilated colon in situ, with the barium enema (Figure 1) and computed tomography colonography (Figure 2&3) as the most commonly used imaging methods. Colonic redundancy is defined based on specific anatomical criteria: cranial displacement of the sigmoid colon above the iliac crests, descent of the transverse colon below these crests, or the presence of redundant loops in the hepatic or splenic flexures; in exceptional cases, the same patient may meet all three criteria.[12,13] Taken together, these findings underscore the importance of considering the dolichocolon as a central anatomical factor in the assessment and management of chronic constipation, especially in patients with persistent symptoms and slow colonic transit.

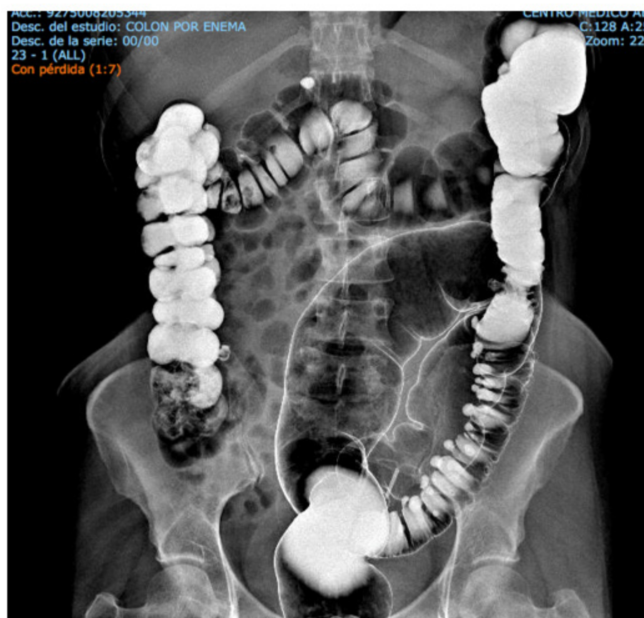

Figure 1 Colon enema with presence of dolichocolon and sigmoid diverticula.

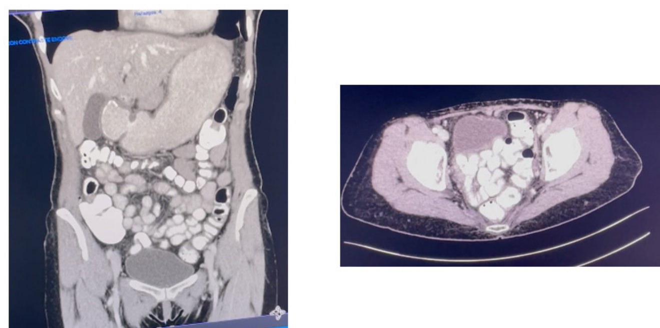

Figure 2 Computed tomography scan showing redundant colon "dolichocolon"

Figure 3 Computed CT reconstruction that shows redundance in the sigmoid colon (dolichosigma).

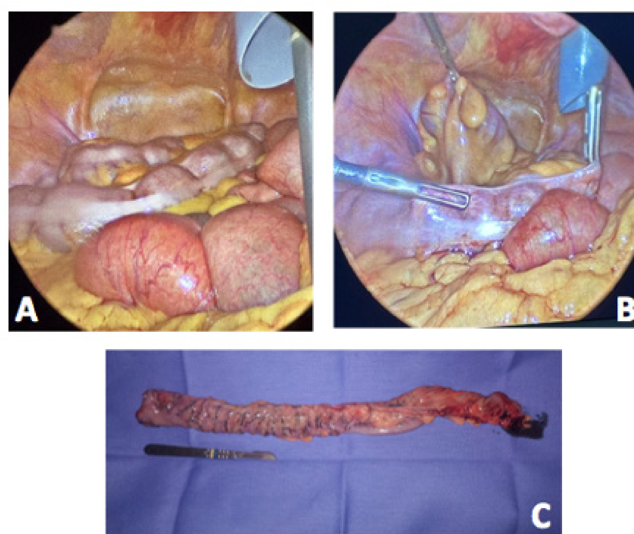

Figure 4 A) Laparoscopic visualization of dolichocolon, B) Laparoscopic manipulation of dolichocolon, C) Excised segment of dolichocolon.

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The management of dolichocolon is initially conservative, beginning with lifestyle and dietary modifications, with particular emphasis on adequate fiber and fluid intake. When these measures are insufficient, pharmacologic therapy may be introduced, including osmotic laxatives such as lactulose or polyethylene glycol, or stimulant laxatives such as sennosides or bisacodyl. In patients with pelvic floor dyssynergia, biofeedback therapy is considered the first-line treatment.

In selected situations, such as severe constipation refractory to medical therapy or complications such as volvulus, surgical intervention may be required.[14–18] When constipation persists despite optimal medical management and imaging studies demonstrate a dolichosigmoid associated with slow colonic transit, surgery becomes a therapeutic option. In such cases, as reported in the study by Weber et al.,[18] resection of the affected colonic segment has shown favorable clinical outcomes, with a high proportion of patients experiencing significant improvement in bowel function and symptom relief (Figure 4) Therefore, dolichocolon may be considered a potential surgical condition in patients with severe constipation refractory to conventional treatment.

The surgical strategy should be individualized. In patients with dolichosigmoid, colectomy with ileorectal anastomosis has demonstrated satisfactory outcomes and has been sufficient to relieve functional symptoms in most patients. However, this procedure is not without morbidity and mortality and should be reserved for carefully selected cases.[2] Other procedures, such as total colectomy, may be considered in cases of generalized colonic inertia. Laparoscopic resection of the sigmoid colon has been highlighted as a safe and effective approach, offering advantages such as reduced postoperative pain, lower morbidity, faster recovery, shorter hospital stay, and improved cosmetic outcomes. Consequently, although most patients with constipation can be managed medically, surgical resection—particularly via laparoscopy—represents an effective treatment option in carefully selected patients with severe constipation associated with dolichocolon that does not respond to conventional therapy.[18]

Conclusion

Chronic constipation is a frequent gastrointestinal disorder with a multifactorial etiology that requires a structured and comprehensive evaluation to identify the underlying pathophysiological mechanisms. Given its high prevalence and significant impact on quality of life, management should be based on an accurate clinical, functional, and anatomical classification rather than on empirical treatment alone. Dolichocolon should be recognized as a relevant anatomical condition that may contribute to delayed colonic transit and therapeutic refractoriness in a subset of patients with chronic constipation. Imaging studies play a key role in its identification, allowing better clinical stratification and facilitating a more rational selection of therapeutic strategies. Conservative management remains the first-line treatment; however, in patients with severe, persistent symptoms associated with documented colonic elongation and failure of optimized medical therapy, surgical treatment may be considered. Appropriate recognition of dolichocolon as a potential structural cause of chronic constipation can prevent prolonged ineffective treatments and help identify patients who may benefit from surgical intervention. Careful patient selection and correlation between clinical findings, functional studies, and anatomical abnormalities are essential to achieve favorable long-term outcomes.

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