




EMERGENCY SURGICAL APPROACH AND THERAPEUTIC MANAGEMENT IN THE TREATMENT OF SIGMOID VOLVULUS

ABORDAGEM CIRÚRGICA DE EMERGÊNCIA E CONDUTAS TERAPÊUTICAS NO TRATAMENTO DO VÓLVULO DE SIGMOIDE

ABORDAJE QUIRÚRGICO DE EMERGENCIA Y CONDUCTAS TERAPÉUTICAS EN EL TRATAMIENTO DEL VÓLVULO DE SIGMOIDES

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ABSTRACT

Sigmoid volvulus (SV) is an abnormal twisting of the sigmoid colon and represents the third most common cause of large bowel obstruction, carrying a potential risk of ischemia, necrosis, and intestinal perforation, being more prevalent in elderly male patients. Anatomical factors such as an elongated colon (dolichosigmoid) and a narrow mesenteric base are central to its pathophysiology. The present study is a narrative literature review that analyzed the surgical and therapeutic approaches to SV. Early diagnosis is supported by plain radiography (the “coffee bean” sign), but Computed Tomography (CT) is crucial to confirm obstruction, differentiate subtypes (mesenteroaxial and organoaxial), and identify vascular compromise. Endoscopic decompression is the initial treatment of choice in the absence of peritonitis or gangrene; however, the high recurrence rate requires surgical sigmoid resection as definitive treatment. In emergency cases complicated by necrosis or perforation, immediate resection, often through the Hartmann procedure, is mandatory. Advances in minimally invasive techniques, such as single-port laparoscopy, have shown promise for frail patients and are associated with lower morbidity. Careful definition of the therapeutic approach, based on risk stratification, is fundamental for effective management.

Keywords: Sigmoid Volvulus. Emergency Surgery. Intestinal Obstruction. Endoscopic Decompression. Surgical Resection. Hartmann Procedure.

RESUMO

O vólculo de sigmoide (VS) é uma torção anômala do cólon sigmoide, configurando-se como a terceira causa mais comum de obstrução do intestino grosso, com potencial risco de isquemia, necrose e perfuração intestinal, sendo mais prevalente em idosos do sexo masculino. Fatores anatômicos como o cólon alongado (dolico-sigmoide) e a base

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mesentérica estreita são centrais na sua fisiopatologia. O presente estudo é uma revisão bibliográfica narrativa que analisou a abordagem cirúrgica e terapêutica do VS. O diagnóstico precoce é apoiado pela radiografia simples (sinal do "grão de café"), mas a Tomografia Computadorizada (TC) é crucial para confirmar a obstrução, diferenciar subtipos (mesentero-axial e organo-axial) e identificar sofrimento vascular. A descompressão endoscópica é a conduta inicial de escolha na ausência de peritonite ou gangrena, mas a alta taxa de recorrência exige a ressecção cirúrgica do sigmoide como tratamento definitivo. Em casos de emergência complicados por necrose ou perfuração, a ressecção imediata, frequentemente pelo procedimento de Hartmann, é mandatória. Avanços em técnicas minimamente invasivas, como a laparoscopia de portal único, mostram-se promissoras para pacientes frágeis, associadas a menor morbidade. A definição criteriosa da abordagem terapêutica, baseada na estratificação de risco, é fundamental para o manejo eficaz.

Palavras-chave: Vólvulo de Sigmoides. Cirurgia de Emergência. Obstrução Intestinal. Descompressão Endoscópica. Ressecção Cirúrgica. Procedimento de Hartmann.

RESUMEN

El vólvulo de sigmoides (VS) es una torsión anómala del colon sigmoide y constituye la tercera causa más común de obstrucción del intestino grueso, con potencial riesgo de isquemia, necrosis y perforación intestinal, siendo más prevalente en hombres de edad avanzada. Factores anatómicos como el colon elongado (dolicosigmoides) y la base mesentérica estrecha son centrales en su fisiopatología. El presente estudio es una revisión bibliográfica narrativa que analizó el abordaje quirúrgico y terapéutico del VS. El diagnóstico precoz se apoya en la radiografía simple (signo del "grano de café"), pero la Tomografía Computarizada (TC) es crucial para confirmar la obstrucción, diferenciar subtipos (mesenteroaxial y organoaxial) e identificar compromiso vascular. La descompresión endoscópica es la conducta inicial de elección en ausencia de peritonitis o gangrena; sin embargo, la alta tasa de recurrencia exige la resección quirúrgica del sigmoides como tratamiento definitivo. En los casos de emergencia complicados por necrosis o perforación, la resección inmediata, frecuentemente mediante el procedimiento de Hartmann, es obligatoria. Los avances en técnicas mínimamente invasivas, como la laparoscopia de puerto único, se muestran prometedores para pacientes frágiles y se asocian con menor morbilidad. La definición cuidadosa del abordaje terapéutico, basada en la estratificación del riesgo, es fundamental para un manejo eficaz.

Palabras clave: Vólvulo de Sigmoides. Cirugía de Emergencia. Obstrucción Intestinal. Descompresión Endoscópica. Resección Quirúrgica. Procedimiento de Hartmann.



1 INTRODUCTION

Sigmoid volvulus (SV) consists of the anomalous twisting of the sigmoid colon around its own mesenteric axis, resulting in a potentially fatal closed-loop obstruction (Bayeh and Abegaz, 2021; Safioleas et al., 2007). It is the third most common cause of large bowel obstruction worldwide, with a high prevalence in regions that make up the so-called "volvulus belt", such as Ethiopia, Turkey, Africa and India. The condition is particularly frequent in elderly, male patients, often associated with chronic constipation and neuropsychiatric disorders (Bayeh and Abegaz, 2021).

The pathophysiology of SV involves a progressive increase in luminal pressure, which compromises blood supply and triggers vascular stasis, ischemia, necrosis, and intestinal perforation. Although dietary factors and cultural bowel habits are considered contributors, specific anatomical dimensions such as an elongated sigmoid colon (dolichosigmoid) and a narrow mesenteric base play a central role in predisposing to this torsion. Agile clinical and surgical management is imperative to reduce mortality rates, which can reach high levels in cases of gangrene or failure to diagnose early (Bayeh and Abegaz, 2021; Safioleas et al., 2007).

2 METHODOLOGY

The present study is a narrative literature review, structured with the aim of synthesizing and analyzing contemporary scientific frameworks on the surgical and therapeutic approach to sigmoid volvulus. The investigation was operationalized in the PubMed database, using the descriptors "Sigmoid Volvulus" and "Therapeutics", articulated by Boolean operators AND and OR, in accordance with the Medical Subject Headings (MeSH) terminology. The selection of evidence prioritized studies published in full texts and written in Portuguese or English that dealt directly with the topic. Searches without direct relevance to the central theme, duplicates and non-indexed articles were excluded. The selection process involved the screening of titles and abstracts, followed by full critical reading to ratify relevance. The information collected was synthesized and organized from a descriptive perspective.

3 RESULTS AND DISCUSSION

The analysis of anatomical dimensions reveals that patients with SV have a significantly higher sigmoid colon length and mesosigmoid height than individuals without



a history of the disease. A long, redundant colon, associated with a wide mesentery but with a narrow attachment base, creates the ideal mechanical conditions for the development of torsion. Recently, SV has been classified into two main subtypes: meenteroaxial (torsion around the mesenteric axis, with two transition points and swirl sign on CT) and organoaxial (torsion around the colon axis itself, with a single transition point). The meenteroaxial type is more frequent in endemic regions and is associated with more rapid ischemic progression due to closed-loop obstruction (Memis and Aydin, 2025).

The diagnosis is initially based on simple radiographs, which show classic signs such as the "coffee bean" or the sign of northern exposure in about 60 to 80% of cases. Computed Tomography (CT), however, offers diagnostic accuracy close to 100%, being vital to identify signs of ischemia, such as intestinal pneumatosis and reduced wall enhancement, and in the differentiation between the mesenteroaxial and organoaxial subtypes, relevant information for prognostic and therapeutic definition (Memis; Aydin, 2025). In pediatrics, the diagnostic investigation must include rectal biopsy to exclude Hirschsprung's disease, which is present in approximately 10% of children with SV (Safioleas et al., 2007; Memis and Aydin, 2025; Grayson et al., 1968).

Regarding therapeutic approaches, endoscopic decompression (detorsion by sigmoidoscopy) remains the initial intervention of choice in the absence of peritonitis or gangrene, with success in the immediate resolution of the obstruction. However, the recurrence rate after isolated detorsion is high, ranging from 42% to higher values, which justifies the indication of elective or semi-elective sigmoid resection during the same hospitalization. In emergency situations with evidence of necrosis or perforation, immediate surgical resection is mandatory, and the Hartmann procedure is the most common technique in these critical conditions (Choi et al., 2015; Klymenko et al., 2025).

Advances in minimally invasive surgery, such as single-port laparoscopy (SPLS), have been shown to be a safe and viable alternative, reducing surgical stress in elderly and frail patients, with operative times comparable to conventional laparoscopy (Bayeh and Abegaz, 2021). Despite the technical limitations related to the reduced operative space and manipulation of the dilated colon, the technique has shown low surgical morbidity, lower incidence of surgical wound complications, and satisfactory postoperative recovery (Choi et al., 2015).

In the paediatric setting, successful detorsion should be followed by early resection



with primary anastomosis, using technologies such as indocyanine green fluorescence angiography (ICG) to ensure viability of the resection edges. In summary, although clinical decompression is effective in the emergency room, the definitive therapy of sigmoid volvulus is surgical (Choi et al., 2015; Klymenko et al., 2025).

4 CONCLUSION

Sigmoid volvulus represents an important surgical emergency, being one of the main causes of large bowel obstruction globally. The literature shows that anatomical factors, especially the elongation of the sigmoid colon and the presence of a narrow-based mesosigmoid, play a central role in the predisposition to torsion, favoring obstruction with risk of ischemia, necrosis, and intestinal perforation.

From the diagnostic point of view, although plain radiography remains useful in the initial evaluation, computed tomography has established itself as the main diagnostic method, allowing the confirmation of obstruction, the identification of early signs of vascular distress, and the treatment of patients.

Regarding treatment, endoscopic decompression plays an important initial role in stable patients without signs of peritonitis or gangrene. However, due to the high rate of recurrence after isolated detorsion, surgical resection of the sigmoid remains the definitive treatment. In cases complicated by necrosis or perforation, emergency surgical intervention, often through the Hartmann procedure, remains the safest approach. In addition, advances in minimally invasive techniques have shown promising results, especially in frail patients, as they are associated with faster recovery and lower postoperative morbidity.

Thus, the effective management of sigmoid volvulus depends on early diagnosis, adequate risk stratification, and careful definition of the therapeutic approach. Improvements in surgical techniques and management protocols may contribute to better clinical outcomes, although prospective, multicenter studies are still needed to strengthen the available evidence and consolidate more robust therapeutic guidelines.

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