

Volvulus

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KEYWORDS

• Volvulus • Small bowel • Sigmoid • Cecum • Gastric • Ischemia • Intestine

KEY POINTS

- Intestinal volvulus is a rare disease process but has a high morbidity/mortality if not diagnosed in a timely fashion.
- Most patients with intestinal volvulus require some form of surgical intervention whether emergent or in a delayed fashion.
- High suspicion for intestinal volvulus is required given its rare nature and often vague symptoms to limit intestinal necrosis and prevent perforation because this carries the highest risk of mortality.
- The goals with any intestinal volvulus surgical management are as follows: reduction of the volvulus, removal of a septic source, restoration of bowel continuity if possible, and prevention of recurrence. Because every patient and situation are different, it is important to understand the various surgical options to accomplish these goals and provide good patient outcomes.

INTRODUCTION

The term volvulus is derived from the Latin word “volvare,” which means “to roll or twist.”¹ This twisting or torsion of a segment of the alimentary tract was first described around BC 1550 in the Papyrus Ebers, where the natural course of the disease led to “rotting” of the intestines.² Hippocrates also studied this disease, describing perhaps the first treatment with the insertion of a suppository 10 digits long, or approximately 22 cm in length. Coincidentally, modern proctoscopic decompression requires similar instrument length.¹

It was not until 1841 when von Rokitansky first described volvulus in Western literature, describing it as a cause of intestinal strangulation.¹ Modern Western therapy began to evolve with Gay’s publication of transanal volvulus reduction on the cadaver of a patient with sigmoid volvulus.^{1,2} Furthermore, Atherton described the first laparotomy and adhesiolysis for treatment of volvulus in 1883.^{1,3–5} By the mid-20th century,

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surgical management of volvulus had become the mainstay of volvulus treatment with three surgical techniques: (1) detorsion and plication of the mesentery, (2) bowel resection with anastomosis, and (3) the Hartmann procedure for colonic volvulus (CV).¹

Volvulus remains a rare disease process in the United States affecting 2 to 3 out of 100,000 individuals per year.⁶ A volvulus is defined as a loop of intestine that twists around itself and the mesentery that supports it.⁶ This often results in an obstructive pathophysiology. If the mesentery is further twisted tight enough or the bowel dilation is excessive, blood flow to the involved intestine can become compromised resulting in ischemia. The mortality related to volvulus is highest in cases that have progressed to necrosis, putting emphasis on the surgeon's ability to quickly identify the disease and intervene.

The small bowel, stomach, and colon are all subject to volvulus. There are a variety of reasons that can cause a volvulus to develop including anatomically variations, medications, lifestyle, changes in physiology, and just bad luck. The various forms of volvulus are discussed in greater detail in the remainder of this article including epidemiology, diagnostic work-up, presentation, and management for these assorted disease processes.

SMALL BOWEL VOLVULUS

Epidemiology

Defined as the torsion of the small bowel around its mesenteric axis, small bowel volvulus (SBV) is typically thought to be a diagnosis in newborns. Approximately 1 in 500 live births have intestinal malrotation with roughly 80% of these patients presenting with SBV within the first month of life.⁷⁻⁹ As a result, SBV secondary to intestinal malrotation is most common in children and young adults.¹⁰ Adult patients, however, present with either primary SBV (no predisposing anatomic abnormalities) or secondary SBV (precipitated by underlying anatomic abnormalities).^{7,11} Patients presenting with small bowel obstruction secondary to SBV tend to be older (>65 year old) and are more commonly female (56%).¹⁰ Examples of anatomic abnormalities causing secondary SBV include adhesions, tumors, previous stoma, pregnancy, Meckel or other small bowel diverticula, and complications following laparoscopic surgery.¹¹⁻¹⁴ Given the rare nature of SBV in the adult population, limited studies have been completed examining the epidemiologic nature of this disease process. Studies over the last several decades suggest the annual incidence of SBV is 1.7 to 5.7 per 100,000 adults in Western countries and 24 to 60 per 100,000 adults in Africa, Middle East, and Asia.^{10,15-17} The large discrepancy in incidence between Western countries and these regions is associated with fiber-rich and serotonin-rich diets and increased fasting in Africa, Middle East, and Asia comparatively.¹⁶

A recent study by Coe and colleagues¹⁰ examined the US Nationwide Inpatient Sample database from 1998 to 2010 and found that of the 10.33 million hospital admissions for adult small bowel obstruction, only 1% was attributable to SBV. Furthermore, of this 1% with SBV, 0.82% were patients presenting with SBV and intestinal malrotation.¹⁰ This further demonstrates the rarity of this disease process, especially within the United States. Despite the rare nature of this disease, SBV must be kept in the differential diagnosis of all patients with bowel obstruction to appropriately manage these individuals. This is important because the mortality from small bowel obstruction is significantly higher in the SBV patient population (7.92%) compared with the non-SBV patient population (5.61%), making timely recognition of the disease all that more imperative.¹⁰ Although the exact rationale behind this statistic is not yet

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