

Surgical Approach to Perforated Sigmoid Diverticulitis: A Case Report

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Abstract: Perforated sigmoid diverticulitis is a relatively uncommon but severe complication of diverticular disease, which itself is a leading cause of gastrointestinal morbidity. Although diverticulosis is prevalent, particularly in the aging population, perforation occurs in a smaller subset of cases and presents significant clinical challenges. This case report offers a thorough examination of the epidemiology, pathophysiology, clinical features, diagnostic techniques, and surgical management of perforated sigmoid diverticulitis. The condition most frequently affects middle-aged to older adults, with a bimodal age distribution that includes both the elderly and younger individuals with risk factors such as obesity, smoking, and low-fiber diets. The pathogenesis is characterized by increased intraluminal pressure within the diverticula, resulting in mucosal perforation, bacterial infiltration, and peritoneal inflammation. Symptoms typically include acute left lower quadrant pain, fever, and systemic signs of infection, although some patients may present with more subtle manifestations without overt signs of peritoneal irritation. Diagnostic assessment is largely reliant on advanced imaging techniques, with CT scanning considered the gold standard for confirming the diagnosis, revealing bowel wall thickening, fat stranding, and extraluminal gas. Additional laboratory tests, such as a complete blood count and inflammatory markers, are used to support the diagnosis and guide treatment. Surgical intervention is the primary treatment approach, with options ranging from resection with primary anastomosis, Hartmann's procedure, or laparoscopic surgery, depending on the severity of the perforation and the patient's clinical status. The prognosis is closely linked to the timing of surgical intervention, and potential postoperative complications such as abscess formation, sepsis, and anastomotic leaks require vigilant management. This report aims to provide a deeper understanding of perforated sigmoid diverticulitis and emphasizes the importance of early diagnosis, appropriate treatment strategies, and improved patient outcomes based on the latest clinical evidence.

Keywords: Perforated Sigmoid Diverticulitis, Management Strategies, Exploratory Laparotomy, Sigmoidectomy with end Colostomy/Hartmann's Procedure, Appendectomy.

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I. INTRODUCTION

A 33 year old male patient presented to the emergency department with a one-week history of abdominal discomfort, fever, nausea, and constipation. The discomfort worsened when the bladder was full and improved after urination. The patient also reported a recent episode of infection within his family, with similar symptoms of fever, abdominal pain, and diarrhea. On physical examination, the patient appeared non-toxic but exhibited tenderness to palpation (TTP) in the epigastric, right upper quadrant (RUQ), and left upper

quadrant (LUQ) areas, with associated guarding. Laboratory analysis of the complete blood count (CBC) revealed leukocytosis, with an elevated white blood cell (WBC) count of 12.1k/mm cu and neutrophils at 9.4 k/mm cu, indicating an active inflammatory or infectious process. CT imaging of the abdomen and pelvis with IV contrast demonstrated sigmoid diverticulosis with bowel wall thickening and surrounding fat stranding, consistent with acute diverticulitis (Figure 1). Additional findings included marked bowel wall thickening (Figures 2 and 3) and outpouching of the sigmoid colon (Figure 4). The patient underwent exploratory laparotomy,

followed by sigmoidectomy with end colostomy (Hartmann's procedure), left ureterolysis, appendectomy, abdominal washout, and surgical drain placement. Postoperative management focused on infection control, pain management, and complication prevention. The patient received intravenous antibiotics, and close monitoring was conducted to detect potential complications such as abscess formation or anastomotic leaks.



Fig 1 Sigmoid Diverticulosis with Bowel Wall Thickening and Surrounding Fat Stranding, Consistent with Acute Diverticulitis



Fig 2, 3: Bowel Wall Thickening



Fig 4 Outpouching in Sigmoid Colon

II. DISCUSSIONS

Diverticulitis, characterized by inflammation or infection of diverticula, is the most frequent complication associated with diverticulosis, impacting approximately 20% of individuals with colonic diverticula [1]. This condition can lead to various complications, including abscess formation, bleeding, obstruction, and fistula development. Among these,

fistula formation is relatively uncommon, accounting for about 20% of surgical interventions for complicated diverticulitis [1]. It occurs when a diverticular abscess extends or ruptures into nearby structures such as the bladder, vagina, or small intestine. The most prevalent type of fistula associated with colonic diverticulitis is a colovesical fistula, followed by a colovaginal fistula [2]. The perception of diverticulitis has evolved from being regarded exclusively as an acute surgical emergency to acknowledging it as a chronic condition with the potential for recurrent episodes [3]. This change highlights the necessity of a personalized approach to patient management, integrating both medical and surgical interventions based on disease severity and individual patient characteristics. Surgical intervention remains crucial in cases of perforation, with procedures such as resection with primary anastomosis or the Hartmann procedure being dictated by clinical severity and intraoperative findings [4]. New minimally invasive techniques show promise in certain cases, promoting faster recovery and lowering complication risks. Ongoing management involves dietary adjustments, increased fiber intake, and lifestyle modifications to reduce recurrence. Continued research is essential to enhance treatment approaches and improve patient outcomes.

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