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Appendicitis as a rare cause of mechanical small-bowel obstruction: A literature review of case reports

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ABSTRACT

INTRODUCTION: Although bowel paralysis accompanying acute appendicitis is well known, mechanical bowel obstruction as a direct consequence of appendicitis remains a rare, but potentially life-threatening, acute abdomen. The aim of our literature review was to find all documented cases of this particular complication and compare them with our own case study.

METHODS: We searched the PubMed database for relevant articles published from 1963 to 2015. The study included patients for whom direct links between appendicitis and strangulation of the terminal ileum were found, and for which the disease course had been documented in detail. The study also included our own case report since it met the inclusion criteria. A total of 190 articles were examined with a final yield of 17 case reports from 13 articles.

RESULTS: 17 patients (11 men and 6 women), with a mean age of 48 ± 23.9 years, met the inclusion criteria. The average period between symptom onset and surgery was 3.4 ± 3.7 days. Symptoms of the disease were consistent with small-bowel obstruction. Treatment included simple appendectomy ($n = 7$), possibly supplemented by segmental resection ($n = 5$), followed by ileocecal resection ($n = 4$), and one case that required a right-sided hemicolectomy ($n = 1$).

CONCLUSION: We found mechanical bowel obstruction directly related to appendiceal inflammation to be extremely rare, and relatively few individual cases involving this potentially life-threatening complication have been documented in the literature. Clinical signs of the disease are variable, non-uniform, and consistent with symptoms of small-bowel obstruction during their progression.

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1. Introduction

Intestinal obstruction is a common acute abdomen that can have multiple causes. Although bowel paralysis accompanying acute appendicitis is well-known, mechanical obstruction that is directly caused by chronic or acute appendiceal inflammation is an extremely rare acute abdomen, and only isolated cases have been described in the literature (see Table 1). Although individual case studies have been described in the literature since as early as 1901, very few literature reviews exist on the subject [1,2].

Mechanical obstruction, with or without strangulation, can result from loops of the small bowel becoming entangled and pinched by the inflamed appendix, or adhesion of the distal end of the appendix to loops of the small bowel, cecum, or retroperitoneum [3]. This creates conditions wherein the small bowel can herniate through the ring-like structure formed by the inflamed

appendix; herniation can occur with or without strangulation (Fig. 1).

Mechanical obstruction is also very difficult to diagnose preoperatively; a conclusive diagnosis usually has to wait until surgery. Treatment depends upon the severity and extent of bowel loop involvement (see Table 1) and varies from a simple appendectomy, to ileocecal and segmental resection, to a right-sided hemicolectomy. Thus, mechanical bowel obstruction as a direct consequence of appendiceal inflammation remains a rare, but potentially life-threatening, acute abdomen that requires early diagnosis and surgical management. The aim of our literature review was to find all documented cases of this disease in the literature and compare them with observations from our own case study.

2. Case study

A 62-year-old female patient was examined at the Emergency Department of our University Hospital. She complained of 3 days of upper abdominal cramping pain, described as intermittent and non-radiating. In the morning prior to admission, the patient had repeatedly vomited dark brown contents. On admission, she was

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Table 1

Epidemiological data from all published patients with mechanical blockage due to appendiceal strangulation/constriction of the small bowel.

No.	Author	Year	Sex	Age (ys ^c)	Symptom duration (days)	Symptoms	Intraoperative findings	Surgical procedure
1	Naumov [5]	1963	M	58	1	Epigastric pain, vomiting, constipation	Strangulated small bowel	Appendectomy, segmental resection
2	Naumov [5]	1963	M	45	1	Lower abdominal pain, fever	Strangulated small bowel	Appendectomy
3	Srinivasan [8]	1964	F	40	12	Abdominal colic, vomiting, constipation	Strangulated terminal ileum due to appendiceal constriction	Right-sided hemicolectomy
4	Gupta [9]	1969	M	15	2	Abdominal pain, vomiting, constipation	Strangulated terminal ileum due to appendiceal constriction	Ileocecal resection
5	Gupta [9]	1969	M	65	13	Diffuse peritonitis, dehydration, vomiting, oliguria	Strangulated terminal ileum due to appendiceal constriction	Ileocecal resection
6	Bose [10]	1973	M	50	1	Abdominal colic, vomiting, constipation	Strangulated ileum due to appendiceal constriction	Retrograde appendectomy, segmental resection
7	Bose [10]	1973	M	35	1	Right-sided abdominal pain, vomiting	Strangulated terminal ileum due to appendiceal constriction	Retrograde appendectomy
8	Ivoulosou [11]	1996	M	22	2	Severe abdominal pain, vomiting, constipation	Strangulated terminal ileum due to appendiceal constriction, bloody effusion	Retrograde appendectomy, segmental resection
9	Yang [12]	2002	M	19 mos. ^a	Sudden onset	Abdominal pain, vomiting, atonic fluid	Strangulated terminal ileum due to long necrotic appendix	Retrograde appendectomy
10	Assenza [1]	2004	F	78	1	Crampy abdominal pain, vomiting, diarrhea	Volvulus of ileum due to appendiceal constriction, bloody effusion	Ileocecal resection
11	O'Donnell [2]	2006	F	83	3	Diffuse abdominal pain, vomiting	Strangulation of bowel with chronically changing appendix	Retrograde appendectomy, segmental resection
12	Bhandari [4]	2009	M	24	7	Diffuse abdominal pain, intermittent temperatures, vomiting, constipation	Strangulated terminal ileum due to appendiceal constriction, hemorrhagic effusion, loops were not necrotic	Retrograde appendectomy
13	Harrison [13]	2009	F	62	4	Abdominal pain, nausea, vomiting	Strangulated terminal ileum due to appendiceal constriction	Retrograde appendectomy
14	Harrison [13]	2009	M	83	4	Right-sided abdominal pain, vomiting, constipation	Strangulated terminal ileum due to appendiceal constriction	Retrograde appendectomy
15	Chatterjee [3]	2013	M	26	2	Diffuse abdominal pain, vomiting, constipation	Strangulated terminal ileum due to appendiceal constriction, hemorrhagic effusion, gangrenous ileum	Ileocecal resection
16	Soriano [14]	2013	F	66	1	LRQ ^b abdominal pain, vomiting	Strangulated terminal ileum due to appendiceal constriction	Retrograde appendectomy
17	Malý (current study)	2013	F	62	3	Crampy abdominal pain, vomiting, atonic fluids, constipation	Strangulated terminal ileum due to appendiceal constriction, incidental discovery of asymptomatic Meckel's diverticulum	Retrograde appendectomy, prophylactic resection of Meckel's diverticulum

^a Mos., months.^b LRQ, lower right quadrant.^c Ys, years.

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