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COMPARATIVE EVALUATION OF THE RESULTS OF LAPAROSCOPIC AND TRADITIONAL METHODS OF SURGICAL TREATMENT OF DOLICHOSIGMA

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Abstract

Objective: to compare laparoscopic sigmoid resection with intracorporeal colorectal anastomosis versus open surgery in patients with dolichosigma complicated by sigmoid volvulus. **Materials and methods:** a retrospective comparative study included 81 patients treated in an emergency surgical setting. The laparoscopic group comprised 41 patients and the open-surgery group 40 patients. Perioperative outcomes, Clavien–Dindo complications and functional results up to 6 months were analyzed. **Results:** laparoscopy was associated with shorter hospital stay, earlier bowel recovery and lower overall morbidity (22.0% vs 52.5%). Severe complications were observed only after open surgery. **Conclusion:** laparoscopic sigmoidectomy is a safe and clinically advantageous option for selected patients after decompression and stabilization.

Keywords

dolichosigma, sigmoid volvulus, laparoscopic sigmoidectomy, overlap anastomosis, emergency abdominal surgery.

Introduction

Dolichosigma remains one of the most common colonic malformations and has a wide clinical spectrum—from asymptomatic elongation of the sigmoid colon to chronic colon stasis and life-threatening volvulus. The problem is of particular clinical significance in the "volvulus belt" regions, where sigmoid volvulus is one of the leading causes of acute colonic obstruction.

Modern treatment strategies for such patients are based on a stepwise approach: early endoscopic decompression in the absence of ischemia and perforation, followed by radical resection of the sigmoid colon, and accelerated postoperative recovery. The expansion of laparoscopic surgical capabilities, the introduction of small-diameter linear staplers, and the development of the ERAS concept have paved the way for the widespread use of minimally invasive procedures, even in emergency colorectal surgery.

Despite the obvious advantages of laparoscopy, open surgery remains widely used in the CIS and Central Asian countries, and local comparative data remain limited. Therefore, analyzing our own clinical results is not only scientifically but also practically valuable.

Study objective

To evaluate the clinical efficacy of laparoscopic sigmoid colon resection with intracorporeal overlap anastomosis in patients with dolichosigmoid colon complicated by sigmoid volvulus, compared with traditional open surgery.

Materials and Methods

The study was conducted at the Samarkand branch of the Republican Scientific Center for Emergency Medicine. The study included 81 patients with confirmed sigmoid volvulus secondary to dolichosigmoid colon. The study group included 41 patients who underwent a staged approach: colonoscopic detorsion and decompression, placement of a transrectal tube for 48–72 hours, followed by laparoscopic sigmoid resection with intracorporeal side-to-side overlap colorectal anastomosis. The control group consisted of 40 patients who underwent laparotomy, sigmoid resection, and manual colorectal anastomosis.

Inclusion criteria included age 18–80 years, confirmed sigmoid volvulus, and no signs of generalized peritonitis on admission. The duration of surgery, need for conversion, time to restoration of peristalsis and enteral nutrition, length of hospitalization, incidence and severity of complications, and long-term functional outcomes at 1, 3, and 6 months were assessed.

Statistical analysis was performed using a comparative analysis of quantitative and qualitative parameters. The clinical significance of the results was assessed taking into account the structure of complications according to the Clavien-Dindo classification and the dynamics of functional parameters.

Table1. General characteristics of the study groups

Indicator	Laparoscopic group (n=41)	Open group (n=40)
Men/women, n	26/15	30/10
Average age, years	55.6	55.6
Endoscopic detorsion before surgery	Yes, in most patients	Not used as a standard step
Type of anastomosis	Intracorporeal side-to-side (overlap)	Manual colorectal
Primary access	Totally laparoscopic	Midline laparotomy

Results

Colonoscopic detorsion as an initial step was technically successful in most patients and allowed for a more controlled treatment regimen. This paved the way for radical resection after decompression and correction of fluid and electrolyte imbalances.

The average operative time was 160±22 minutes in the laparoscopic group and 112±25 minutes in the open group. The increased operative time reflected the technical complexity of the intracorporeal stage but was not accompanied by a deterioration in short-term clinical outcomes. Conversion to laparotomy was required in 2 patients (4.87%) due to severe adhesions or localized necrosis of the sigmoid colon.

In the early postoperative period, the laparoscopic approach demonstrated faster recovery of intestinal motility and better tolerability of the procedure. The length of hospital stay was significantly shorter, and the complication rate was almost 2.4 times lower compared to open surgery. In the study group, only grades I–II complications were recorded, while in the control

group, grades IIIa–IIIb complications were observed, requiring invasive correction or reoperation.

The benefits of laparoscopic treatment persisted in the late postoperative period. After six months, a feeling of incomplete evacuation persisted in 9.7% of patients in the study group versus 30.0% in the control group. Pain and episodes of abdominal distension were also less common. No recurrences of volvulus or clinically significant anastomotic stenosis were observed during the observation period.

Table2. Main perioperative outcomes

Indicator	Laparoscopy	Open surgery	p
Surgery duration, minutes	160±22	112±25	0.001
Hospital stay, days	6.1±1.7	9.4±2.1	<0.001
Peristalsis recovery, days	1.7±0.6	2.8±0.8	<0.01
Enteral nutrition initiation, days	1.3±0.4	2.5±0.7	<0.001
Common complications, %	22.0	52.5	0.004
Stomatous formation, %	4.8	18.3	≈0.03
Conversion rate, %	4.87	—	—

Длительность госпитализации

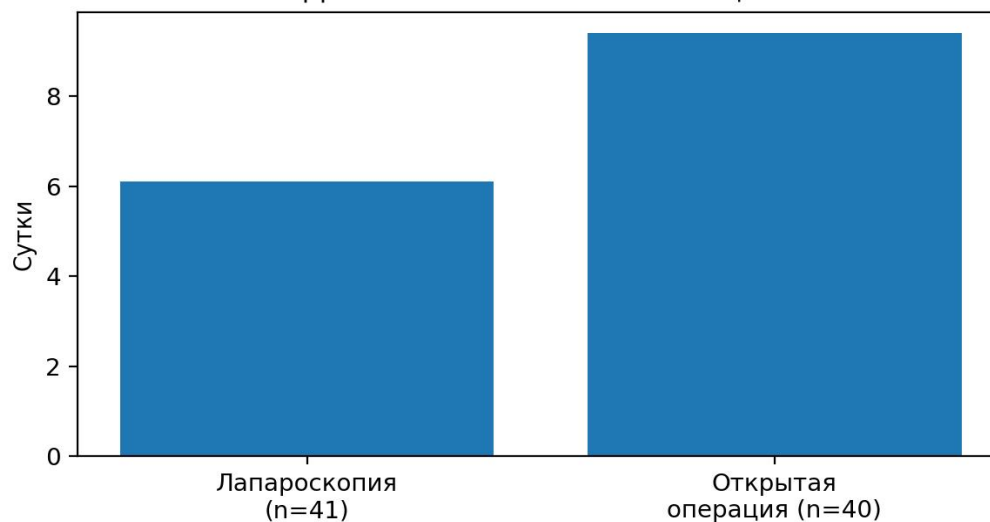


Figure 1. Comparison of length of hospital stay.

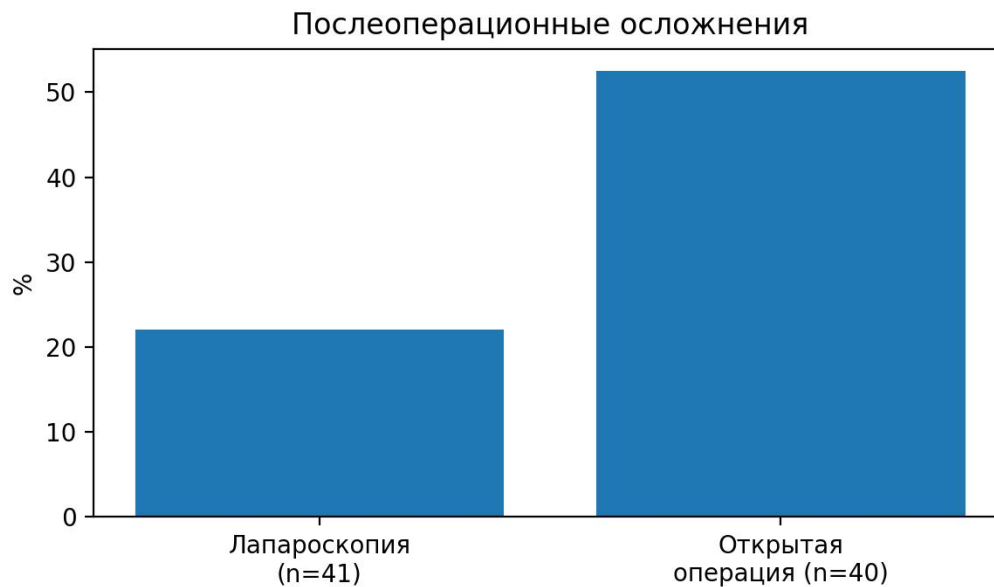
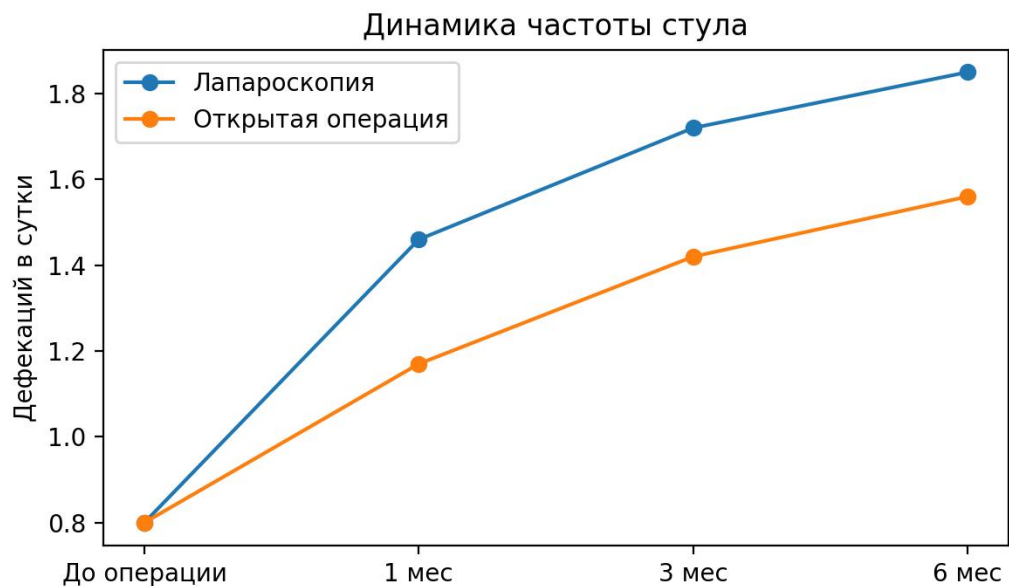


Figure 2. Comparison of the overall incidence of postoperative



complications.

Figure 3. Dynamics of bowel movement frequency in the long term.

Table 3. Structure of postoperative complications according to Clavien–Dindo

Degree of complication	Laparoscopy, %	Open surgery, %
I	14,6	27,5
II	7,3	17,5
IIIa	0	5,0
IIIb	0	2,5

Degree of complication	Laparoscopy, %	Open surgery, %
Итого	22,0	52,5

Discussion

These results confirm that laparoscopic sigmoidectomy in selected patients with dolichosigmoid colon and sigmoid volvulus provides benefits in terms of key clinical outcomes. Although the procedure takes longer, this is offset by reduced surgical trauma, faster recovery of intestinal motility, and a reduced incidence of infectious, inflammatory, and functional complications.

The key element of the presented approach is not only the minimally invasive approach itself, but also the staged treatment. Endoscopic detorsion, decompression, and brief preoperative preparation eliminate the need for surgery on severely dilated, edematous, and hemodynamically unfavorable bowels. Under these conditions, the frequency of primary anastomoses increases, and the need for stoma formation decreases.

Intracorporeal overlap anastomosis offers a number of technical advantages: a wide opening, no significant tension, reduced risk of stricture, and the ability to complete the procedure laparoscopically. Using a linear stapler and a reproducible mobilization sequence, this anastomotic option has proven reliable and convenient for emergency colorectal surgery.

The practical value of the study lies in the fact that the proposed algorithm is adapted to the conditions of emergency surgery in Uzbekistan and can be implemented in clinics with basic endoscopic and laparoscopic infrastructure. This is especially important for centers that require a transition from reactive emergency laparotomy tactics to a more standardized and organ-preserving patient pathway.

Conclusion

Study Limitations

The study was retrospective and single-center, limiting the generalizability of the results to all categories of patients with sigmoid volvulus. The analysis excluded patients with generalized peritonitis and severe intestinal ischemia, so the findings apply primarily to hemodynamically stable patients after successful decompression or with the potential for organ-preserving strategies.

An additional limitation is the lack of long-term follow-up beyond 6 months and an in-depth economic evaluation. Nevertheless, even with the current design, the study demonstrates a consistent advantage of the laparoscopic approach for clinically significant outcomes and may serve as a basis for further prospective studies.

Comparison with literature data

The results of this study are consistent with current literature on emergency colorectal surgery. The international WSES guidelines consider endoscopic detorsion as the first stage of treatment in the absence of ischemia and perforation and recommend performing radical resection during the same hospitalization. Recent studies have emphasized that the laparoscopic

approach ensures earlier recovery and a lower risk of wound complications compared to open surgery.

A comparison with published series shows that our own data on conversion rates, complications, and hospital stays are within the range typical for specialized centers. Particularly noteworthy is the reduced incidence of stoma formation in the study group, reflecting the advantages of a staged patient pathway: decompression, stabilization, and then radical surgery under more favorable conditions.

Table4. Comparison of our own results with literature data

Source	Key Finding	Practical significance
WSES 2023	Decompression and subsequent resection during the same hospitalization	Confirms the step-by-step algorithm
Atamanalp, 2024	NOSE and laparoscopic resection are associated with low mortality	Supports a minimally invasive strategy
Lee et al., 2020	Postoperative morbidity remains lower in selected patients after minimally invasive treatment	Consistent with a reduction in complications
This study	Complications 22.0% vs. 52.5%; hospitalization 6.1 vs. 9.4 days	Confirms the clinical advantage of laparoscopy

Laparoscopic sigmoid colon resection with intracorporeal overlap anastomosis in patients with dolichosigmoid colon complicated by sigmoid volvulus demonstrates clinical advantages over open surgery. This method reduces hospitalization and rehabilitation time, lowers the overall complication rate, and improves functional outcomes with an acceptable conversion rate.

A two-stage approach appears optimal: endoscopic detorsion and decompression, followed by delayed radical laparoscopic resection during the same hospitalization. This approach may be considered preferable in hemodynamically stable patients without signs of generalized peritonitis or intestinal necrosis.

Practical recommendations

- In the absence of perforation, ischemia, or diffuse peritonitis, endoscopic detorsion and decompression should be considered as the initial stage.
- Radical resection of the sigmoid colon is appropriately performed after short-term patient stabilization during the same hospitalization.
- Intracorporeal side-to-side overlap anastomosis can be recommended as a reproducible technique with sufficient experience in laparoscopic colorectal surgery.
- The Clavien-Dindo classification and standardized functional scales are recommended for assessing treatment outcomes and data comparability.

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