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Incidence, Risk Factors, And Surgical Outcomes of Parastomal Hernia After Stoma Formation: A 1-Year Retrospective Study

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Abstract: Background. Parastomal hernia is one of the most common long-term complications following stoma formation and remains a significant challenge in colorectal surgery. Despite advances in surgical techniques and perioperative management, its incidence remains high and negatively affects patients' quality of life. Objective. To evaluate the incidence, risk factors, and surgical outcomes of parastomal hernia in patients undergoing stoma formation during a 12-month follow-up period. Methods. A retrospective study was conducted between 2025 and 2026 at the Department of Coloproctology, Multidisciplinary Clinic of the Center for Professional Development of Medical Workers, Tashkent, Uzbekistan. A total of 1,059 patients who underwent colorectal surgical procedures were included in the study. Among them, 196 patients underwent stoma formation. Data regarding surgical approach, type of stoma, prophylactic mesh placement, and postoperative outcomes were analyzed. All patients were followed for 12 months. Results. Parastomal hernia developed in 28 of the 196 patients with stoma formation, resulting in an incidence of 14.3%. The overall incidence among all operated patients was 2.6%. Among patients who developed parastomal hernia, 19 (67.9%) had a colostomy and 9 (32.1%) had an ileostomy. A higher incidence was observed among patients undergoing open surgery and among those who did not receive prophylactic mesh reinforcement. Conclusion. Parastomal hernia remains a significant postoperative complication following stoma formation. The type of stoma, surgical technique, and use of prophylactic mesh play important roles in its development. Preventive strategies should be incorporated into routine surgical practice to reduce incidence and improve long-term outcomes.

Key words: Parastomal hernia, stoma, colostomy, ileostomy, prophylactic mesh, colorectal surgery.

INTRODUCTION

Parastomal hernia is defined as the protrusion of abdominal contents through a fascial defect adjacent to a surgically created stoma. It is one of the most common late complications following stoma formation and may result in pain, cosmetic deformity, impaired stoma function, bowel obstruction, and the need for reoperation.

The reported incidence of parastomal hernia ranges from 30% to 50% depending on follow-up duration, diagnostic criteria, and patient

characteristics. The development of parastomal hernia is multifactorial and influenced by both patient-related and surgical factors.

Major risk factors include obesity, advanced age, diabetes mellitus, smoking, chronic pulmonary disease, malnutrition, increased intra-abdominal pressure, emergency surgery, and technical aspects of stoma construction. Colostomies are generally associated with a higher risk of parastomal hernia compared with ileostomies.

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Several preventive strategies have been proposed, including proper stoma site selection, minimizing the size of the fascial defect, and prophylactic mesh placement. Recent studies have demonstrated promising results with mesh reinforcement in reducing the incidence of parastomal hernia.

The aim of this study was to evaluate the incidence, risk factors, and surgical outcomes of parastomal hernia in patients undergoing stoma formation during a 12-month follow-up period.

METHODS

Study Design and Setting

This retrospective study was conducted between 2025 and 2026 at the Department of Coloproctology, Multidisciplinary Clinic of the Center for Professional Development of Medical Workers, Tashkent, Uzbekistan.

Patient Population

A total of 1,059 patients underwent colorectal surgical procedures during the study period. Among them, 196 patients underwent stoma formation.

Table 1. Baseline Characteristics of Patients with Stoma Formation

Variable	Value
Total patients	196
Male	118 (60.2%)
Female	78 (39.8%)
Mean age	58.4 ± 12.7 years
Colostomy	137 (69.9%)
Ileostomy	59 (30.1%)
Obesity (BMI ≥30 kg/m ²)	46 (23.5%)
Diabetes mellitus	38 (19.4%)
Smoking history	52 (26.5%)
Emergency surgery	61 (31.1%)
Elective surgery	135 (68.9%)

Surgical Procedures

The surgical approaches were distributed as follows:

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- Open surgery: 657 patients (62%)
- Laparoscopic surgery: 402 patients (38%)

Prophylactic Mesh Placement

Prophylactic mesh reinforcement was performed in 43 patients (21.9%), whereas 153 patients (78.1%) underwent stoma formation without mesh placement.

All patients were followed for 12 months. Parastomal hernia was diagnosed through clinical examination and confirmed by radiological imaging when necessary.

Statistical Analysis

Descriptive statistical methods were used to evaluate patient demographics, surgical characteristics, incidence rates, and postoperative outcomes. Chi-square analysis was used to assess associations between risk factors and parastomal hernia development. A p-value <0.05 was considered statistically significant.

RESULTS

During the 12-month follow-up period, parastomal hernia developed in 28 of the 196 patients who underwent stoma formation.

Table 2. Incidence of Parastomal Hernia

Variable	Result
Patients with stoma	196
Parastomal hernia cases	28
Incidence among stoma patients	14.3%
Overall incidence among all operated patients	2.6%

Table 3. Distribution According to Stoma Type

Stoma Type	Total Patients	Hernia Cases
Colostomy	137	19 (67.9%)
Ileostomy	59	9 (32.1%)

Table 4. Association Between Mesh Placement and Parastomal Hernia

Group	Patients	Hernia Cases	Incidence
Mesh	43	2	4.7%

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Group	Patients	Hernia Cases	Incidence
No Mesh	153	26	17.0%

Table 5. Surgical Approach and Parastomal Hernia

Surgical Approach	Patient s	Hernia Cases	Incidence
Open Surgery	657	22	3.3%
Laparoscopic Surgery	402	6	

Table 6. Risk Factors Associated with Parastomal Hernia

Factor	Hernia (+)	Hernia (-)	p-value
Colostomy	19	118	0.03
Ileostomy	9	50	—
Mesh placement	2	41	0.01
No mesh	26	127	—
Open surgery	22	635	0.04
Laparoscopic surgery	6	396	—

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Figure 1. Flowchart of patient selection and study design

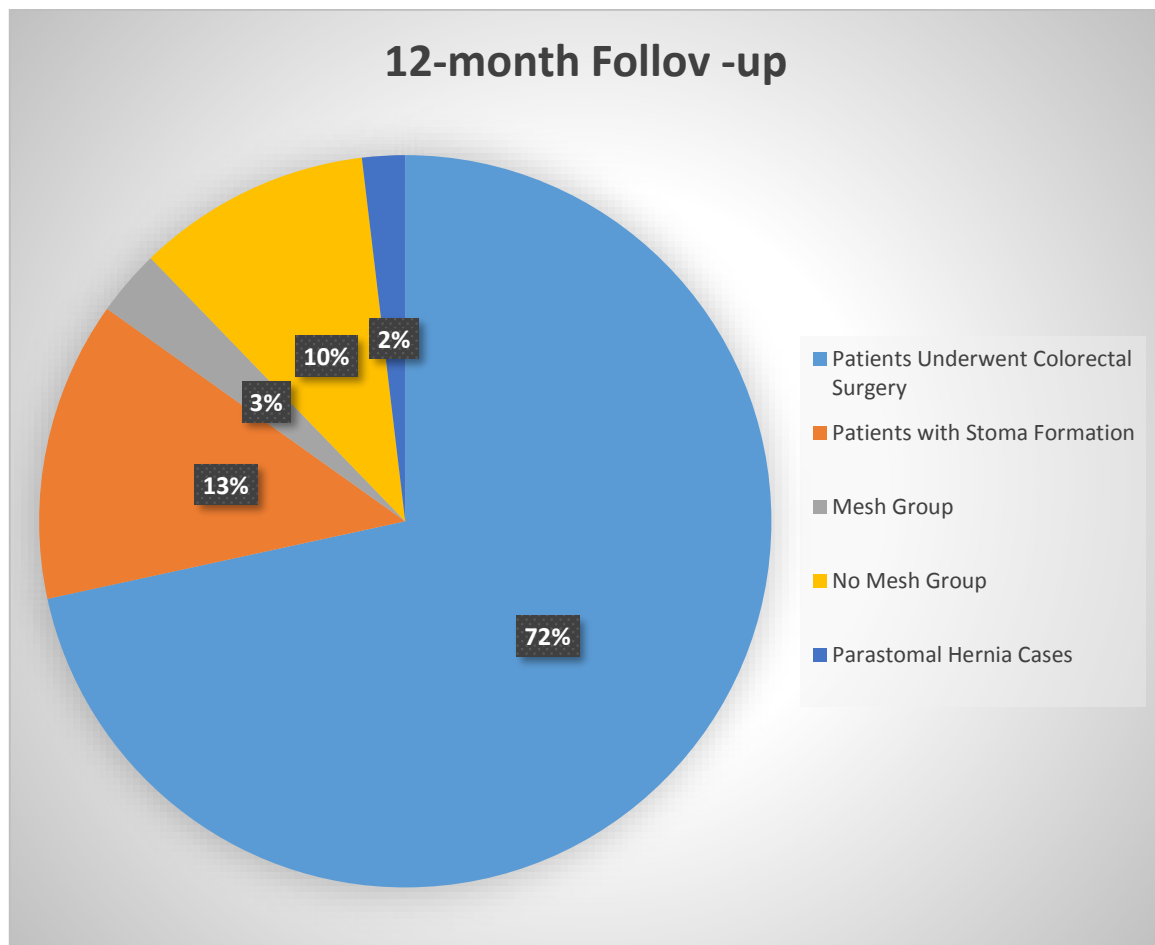


Figure 2. Preoperative clinical photograph demonstrating a giant parastomal hernia associated with colostomy.



DISCUSSION

The incidence of parastomal hernia observed in this study was 14.3%, which is lower than the

30–50% incidence reported in many previous studies. This difference may be attributed to the relatively short follow-up period and the selective use of prophylactic mesh.

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Our findings demonstrated a higher incidence of parastomal hernia among patients with colostomies compared with those with ileostomies. These findings are consistent with numerous international studies and may be explained by anatomical and physiological differences associated with colostomy formation.

Open surgical procedures were associated with a greater risk of hernia development compared with laparoscopic approaches. Minimally invasive surgery may reduce tissue trauma, preserve abdominal wall integrity, and decrease postoperative complications.

The use of prophylactic mesh appeared to provide a protective effect. Patients who received mesh reinforcement demonstrated lower rates of parastomal hernia, supporting previous evidence suggesting that prophylactic mesh placement may be beneficial, particularly in high-risk patients.

This study has several limitations. First, its retrospective design may introduce selection bias and limit the ability to establish causal relationships. Second, the study was conducted at a single center, which may reduce the generalizability of the findings. Third, the follow-up period was limited to 12 months, whereas parastomal hernias may continue to develop several years after stoma creation. Therefore, the true incidence of parastomal hernia may be underestimated.

Future multicenter prospective studies with larger sample sizes and longer follow-up periods are required to validate these findings.

CONCLUSION

Parastomal hernia remains one of the most important long-term complications following stoma formation. In the present study, the incidence among patients with stoma formation was 14.3%.

Patients with colostomies demonstrated a higher risk of developing parastomal hernia compared with those with ileostomies. Open surgical procedures were associated with a greater risk than laparoscopic approaches. The use of prophylactic mesh demonstrated a

protective effect and was associated with reduced rates of hernia formation.

Appropriate stoma site selection, minimization of the fascial defect, utilization of modern surgical techniques, and prophylactic mesh placement in high-risk patients may contribute to reducing the incidence of parastomal hernia and improving long-term surgical outcomes.

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