



## EVALUATION OF OUTCOME OF RELAPROTOMY IN SURGICAL PATIENTS: A CROSS SECTIONAL STUDY FROM A TERTIARY CARE HOSPITAL

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### Abstract

**Background and Objectives:** Relaparotomy is a significant post-operative complication that necessitates careful consideration by surgeons. It refers to subsequent surgical procedures performed during the hospitalization period that are associated with the initial surgery. The incidence rate of relaparotomy varies between 0.5% and 15%, with a higher occurrence observed in gastrointestinal surgeries. Redo laparotomies can be classified as "on demand" or "planned," depending on the circumstances. The objective of this research was to assess the results of relaparotomies in surgical patients.

**Material and Methods:** A cross-sectional study was done at a tertiary care hospital to evaluate the role and outcomes of patients requiring relaparotomies. The study included patients of both genders, aged 18 years or older, presenting with acute abdomen and undergoing laparotomy, subsequently requiring relaparotomy. Patients who were unwilling to participate or had immunocompromised status and comorbidities such as cardiac or respiratory disease, or organ failure were excluded from the study.

**Results:** A total of 40 patients underwent relaparotomy at the Department of Surgery during the study period. The incidence rate of relaparotomy was found to be higher in males (87.50%) compared to females (12.50%). Among the patients, 60.00% underwent late relaparotomy, while 40.00% underwent early relaparotomy. In the early relaparotomy group, 87.50% of patients showed improvement, while 12.50% experienced mortality. In the late relaparotomy group, 66.67% of patients demonstrated improvement, while 33.33% experienced mortality.

**Conclusion:** This study highlights the significance of early relaparotomy in achieving better outcomes compared to late relaparotomies. The results indicate that early intervention plays a vital role in enhancing patient outcomes.

**Key words:** Laparotomy, Acute Abdomen, Postoperative Complications, Respiration Disorders.

## **INTRODUCTION**

A laparotomy, also known as celiotomy, is a surgical procedure involving a large incision through the abdominal wall to gain access to the abdominal cavity. It is often referred to as opening Pandora's box, as it reveals numerous intriguing aspects within the abdomen. The first successful laparotomy, performed without anesthesia, was conducted by Ephraim McDowell in 1809 in Danville, Kentucky. The term "laparotomy" is derived from the Greek words "lapara," meaning flank, and "tomy," indicating a cut [1].

Relaparotomy is an infrequent but significant post-operative complication that surgeons must consider. It refers to operations performed within the hospitalization period following an initial surgery. Relaparotomy can be classified as early, delayed, late, elective, or targeted, with a definite adaptation syndrome period of 60 days. Surgical procedures performed within this 60-day timeframe are referred to as relaparotomies, while those conducted after this period are considered repeated operations. Redo laparotomies are categorized as on-demand if a repeat procedure is required due to the patient's condition, and as planned if the decision for a second laparotomy is made during the course of the initial surgery, such as in cases of severe intraabdominal sepsis or post-damage limitation surgery [2].

Research studies have indicated that the incidence rate of relaparotomy varies between 0.5% and 15%, with a higher occurrence observed in gastrointestinal surgeries. This may be attributed to complications arising from the antecedent surgery or the presence of severe intraabdominal sepsis. Relaparotomies are performed when abdominal operations need to be redone in conjunction with the initial surgery, while the lowest incidence rates are found in various vascular surgeries. Prachi Srivastava et al. suggested that out of 10 patients requiring relaparotomy, 9 underwent emergency primary surgery, while the remaining patient underwent elective surgery. Hemorrhage was identified as the most common cause among patients requiring relaparotomy [3-6].

Secondary peritonitis is associated with high mortality and morbidity rates despite advancements in surgical procedures and treatments. Recent studies have revealed that approximately three-fourths of patients with secondary peritonitis required on-demand relaparotomy, while one-third required planned relaparotomy. The mortality rate was slightly higher in planned relaparotomy compared to on-demand relaparotomy, although no significant difference was observed in mortality rates between the two groups [7].

Relaparotomy may prove beneficial for patients developing intraperitoneal sepsis following abdominal procedures. Early identification of intraperitoneal sepsis and prompt performance of relaparotomy after the initial abdominal surgery might reduce the incidence of multi-organ failure prior to relaparotomy and improve survival rates thereafter. The aim of this study was to identify the indications, procedures, risk factors, and outcomes associated with relaparotomy [8].

## **MATERIAL & METHODS**

This observational study included 40 cases of relaparotomy reported between May 2008 and September 2010 at department of General Surgery of Smt. B. K. Shah Medical Institute & Research Centre, Vadodara, Gujarat. The study was approved by the HRRP (Human Research and Review Panel) of the said institute.

The study defined abdominal operation as a procedure involving the opening of the peritoneum, which encompassed surgeries such as appendectomy, open cholecystectomy, colostomy, and colostomy closure. The term "relaparotomy" referred to surgeries performed within the hospitalization period in conjunction with the initial surgery.

The inclusion criteria for this study involved individuals of both genders who were above 18 years of age. The study included all patients who visited the outpatient department and were referred to or admitted under the department of general surgery due to acute abdomen. These patients underwent laparotomy initially and subsequently required relaparotomy. On the other hand, the exclusion criteria consisted of patients who expressed unwillingness to participate in the study. Additionally, patients with immunocompromised status and other comorbidities such as cardiac or respiratory diseases, as well as organ failure, were excluded from the study population.

Data were collected using a pre-validated case record form, which captured patient characteristics, preoperative and intraoperative findings, details of the surgical procedure, and complications during and after surgery. The interval between the initial operation and relaparotomy, as well as the outcomes of relaparotomy, were documented. Morbidity and other relevant factors were also assessed.

**RESULTS**

The results from Table 1 indicate the age and gender distribution of the study population. In the male group, the highest number of individuals was observed in the age group of 41-45 years, accounting for 45.71% of the total male population. Among the female group, the highest number of individuals was observed in the age group of 41-45 years, accounting for 40.00% of the total female population.

**Table 1: Age and Gender distribution of study population**

Age Group	Male	%	Female	%
30-35	2	5.71%	0	0.00%
36-40	2	5.71%	1	20.00%
41-45	16	45.71%	2	40.00%
46-50	8	22.86%	1	20.00%
51-55	4	11.43%	1	20.00%
56-60	3	8.57%	0	0.00%
<b>Total</b>	<b>35</b>	<b>100.00%</b>	<b>5</b>	<b>100.00%</b>

In the male group, the most common diagnosis was intestinal obstruction, followed by malignancy, fecal fistula, hemorrhage, adhesions, anastomotic failure, bowel gangrene, abscess, and other findings. In the female group, the most common diagnosis was also intestinal obstruction, followed by malignancy, fecal fistula, adhesions, and anastomotic failure (Table 2).

**Table 2: Age and Gender wise diagnoses in study population**

Diagnosis	Male	%	Female	%	p value
Intestinal Obstruction	20	57.14%	1	20.00%	0.5173
Malignancy	4	11.43%	1	20.00%	
Fecal Fistula	2	5.71%	1	20.00%	
Haemorrhage	3	8.57%	0	0.00%	
Adhesions	2	5.71%	1	20.00%	
Anastomotic Failure	1	2.86%	1	20.00%	
Bowel Gangrene	1	2.86%	0	0.00%	
Abscess	1	2.86%	0	0.00%	
Other Findings	1	2.86%	0	0.00%	
<b>Total</b>	<b>35</b>	<b>100.00%</b>	<b>5</b>	<b>100.00%</b>	

The provided data indicates the presence of specific signs and symptoms in the study population. These include a tensed abdomen, palpable lump, guarding rigidity, and organomegaly.

**Table 3:** Signs and symptoms distribution in study population

Sign & Symptoms	N	%
Tensed Abdomen	37	37.00%
Palpable Lump	32	32.00%
Gaurding Rigidity	30	30.00%
Organomegaly	25	25.00%

Table 4 provides information on the surgical procedures performed in the study population and their associated mortality rates. Among the operative procedures, tension suturing and stoma creation had no recorded mortality. Primary closure of perforation had a mortality rate of 7.50%, while resection and anastomosis had a mortality rate of 10.00%.

**Table 4:** Surgical procedures done in study population

Operative Procedures	Mortality	%
Tension Suturing	0	0.00%
Stoma	0	0.00%
Primary Closure of Perforation	3	7.50%
Resection & Anastomosis	4	10.00%
Controlling of Bleeder	1	2.50%
Drainage	1	2.50%
Fistula Repair	1	2.50%
<b>Total</b>	<b>10</b>	<b>25.00%</b>

Table 5 displays the mortality rates according to postoperative complications in the study population. Out of the recorded complications, haemorrhage was associated with a mortality rate of 5.00%. Surgical site infection, burst abdomen, septicemia, and complications of stoma each had a mortality rate of 2.50%. On the other hand, electrolyte imbalance, adhesion, and malnutrition did not result in any recorded mortality. The total mortality rate for all postoperative complications was 12.50%, with a total of 5 deaths recorded.

**Table 5:** Mortality according to Post-Operative Complication

Post Op Complication	N	%
Haemorrhage	2	5.00%
Surgical Site Infection	1	2.50%
Burst Abdomen	1	2.50%
Septicemia	5	12.50%
Electrolyte Imbalance	0	0.00%
Adhesion	0	0.00%
Malnutrition	0	0.00%
Complication of Stoma	1	2.50%

## DISCUSSION

The current study revealed a significant gender disparity in the incidence of relaparotomy, with males having a notably higher occurrence. The male-to-female ratio of 7:1 observed in this study indicates a substantial predominance of males requiring relaparotomy. These findings align with previous studies [9], supporting the notion of a male predominance in relaparotomy cases.

Regarding the diagnoses leading to relaparotomy in the present study, intestinal obstruction was found to be the most common diagnosis, followed by malignancy, fecal fistula, hemorrhage, adhesion, anastomotic failure, bowel gangrene, and abscess in descending order. Unfortunately, no comparable studies were identified for further discussion. The distribution of surgical procedures performed during relaparotomy in the present study revealed that 27.50% of patients underwent primary closure

of perforation, 25.00% underwent resection and anastomosis, 12.50% underwent tension suturing, stoma creation, and drainage, and 5.00% underwent controlling of bleeders and fistula repair. A study conducted by R. Koirala et al. [10] reported different proportions for these procedures, including 17.50% undergoing resection and anastomosis, 22.50% undergoing tension suturing and stoma creation, 15.00% undergoing drainage, and 7.50% undergoing controlling of bleeders and fistula repair.

In terms of the timing of relaparotomy, 60.00% of patients underwent late relaparotomy, while 40.00% underwent early relaparotomy. Among the 10 patients who died during the study, 4 had comorbidities. Of those, 5.00% had diabetes, and 2.50% had cardiac disease and renal failure, respectively. These findings are consistent with previous studies [11-15].

However, it is important to acknowledge certain limitations of the study. The sample size may have been relatively small, limiting the generalizability of the findings to a broader population. Additionally, the sample selection process might have introduced bias, such as convenience sampling or a specific demographic representation. These factors should be considered when interpreting the results and applying them to a wider context. Future studies with larger sample sizes and more diverse populations could provide further insights into the incidence and outcomes of relaparotomy.

## CONCLUSION

Relaparotomy serves as a life-saving procedure for patients. The incidence of relaparotomy is influenced by the expertise in primary surgery, adherence to proper surgical techniques, and prevention of post-operative infections. The most frequent indication for relaparotomy is the presence of anastomotic site leaks.

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