

## Original Research Article

# Clinical study of relaparotomy after emergency general surgery in a tertiary center of central India: a retrospective study

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### ABSTRACT

**Background:** Relaparotomy after emergency surgery is a catastrophic situation associated with significant morbidity and mortality. Incidence is highly variable depending not only on hospital set up but also on the patient's characteristics as well as on the initial surgery and postoperative care given. This study was thus, planned to identify the indications, procedure, risk factors and outcomes of relaparotomy so that timely intervention can lower incidence and morbidity.

**Methods:** This was a retrospective cohort study conducted in department of general surgery, Gandhi Medical College and associated Hamidia Hospital from January 2018 to December 2019. All patients irrespective of age and sex, who have undergone emergency re-exploration of the abdomen during the period of hospitalization after the first operation and discharge of patients. Data were recorded in pre-validated case record form.

**Results:** 32 cases of relaparotomy were identified. All patients had emergency laparotomy as primary surgery. Majority of patients required relaparotomy for anastomotic site leak in 16 cases (50%) followed by intestinal obstruction in 10 cases (31%), hemorrhage in 4 cases (16%) while the least cause being intra-abdominal sepsis in 2 cases (6.2%). Relaparotomy was associated with increased mortality and morbidity. Out of 32 patients, 4 (12.5%) patients died.

**Conclusions:** Relaparotomy is a rare complication and a lifesaving procedure for patients. Calculative experience guided decision on relaparotomy can decrease the incidence of morbidity and mortality associated with the procedure.

**Keywords:** Burst abdomen, Hemorrhage, Relaparotomy, Sepsis

### INTRODUCTION

Majority of patients develop complications after emergency laparotomy. Many of these need to undergo relaparotomy to correct these underlying complications. Relaparotomy is variously defined and classified, though for practical purpose it refers to operations performed within hospitalization period which is related to initial surgery or to laparotomy performed within 60 days following initial surgery. It is a rare dreaded complication which a surgeon might have to encounter. It is classified as emergency or elective, early or late, radical or

palliative depending upon timing, its goal and need for urgency. There are variety of predisposing factors both patient characteristics as well as conditions of initial surgery along with perioperative care given that predisposes one to surgical complications leading to relaparotomy. Some of the important indications of relaparotomy are anastomotic leakage, septic peritonitis, intestinal obstruction, burst abdomen, intestinal perforation and hemorrhage.<sup>1-3</sup> Measures which should be considered in order to reduce incidence of relaparotomy are, proper preoperative work-up, adequate surgical technique and hemostasis, use of newer antibiotics and

anesthetic techniques, adequate abdominal drainage and perioperative care. Knowledge of various predisposing factors and measures to tackle them can help us to reduce the incidence of relaparotomy. However, there are certain factors like emergency, sepsis, primary suppurating disease, because of which incidence of relaparotomy cannot be brought down further.

Incidence of relaparotomy ranges from 0.5-15% in various reported studies.<sup>1,3</sup> Highest incidence was seen in gastrointestinal surgeries, while lowest in vascular surgeries.<sup>1</sup> Mortality after relaparotomy ranges from 24 to 71%.<sup>1-4</sup> Factors associated with high mortality are elderly patients, peritonitis at the initial surgery and multi organ failure.<sup>1-4</sup>

Majority of patient undergoing relaparotomy should be cared in intensive care unit. Teaching and training institutes are likely to have higher incidence of relaparotomy probably due to deficiencies in the surgical technique in the trainee doctor. Studies have indicated that out of total laparotomies performed 1-1.6% require early relaparotomy after initial surgery.<sup>1</sup>

Considering all these information, primary aim of this study is to study incidence of relaparotomy in emergency settings in Gandhi Medical College and associated Hamidia Hospital, Bhopal. Secondly by this study we also intent to know the various indications of relaparotomy in this study setup and to evaluate mortality and morbidity associated with relaparotomy.

## METHODS

This is a retrospective study in which 32 relaparotomy cases were reported during the study period of January 2018 to December 2019 were included. For study and clinical purpose all operations in which peritoneum was opened was considered abdominal operation and it included all perforation repairs, formation colostomy and ileostomy, resection and anastomosis and appendectomy. The term relaparotomy is defined as surgery performed in relation to initial surgery within the hospitalization period, irrespective of age and sex. All obstetrical and gynecological surgeries were excluded.

### Statistical analysis

Data was collected in pre-validated form with recording of patient's age, sex, preoperative and intraoperative findings, surgery performed, cause of relaparotomy and its outcome. Details of morbidity and mortality were recorded. SPSS software and Microsoft excel was used to analyze data with respect to above relevant clinical information.

## RESULTS

A total of 936 laparotomies were performed in the department of general surgery, Gandhi Medical College,

Bhopal in the specified unit during the study period January 2018 to December 2019. Out of 936 laparotomies, 32 patients underwent a total of 33 relaparotomy out of which one patient undergone laparotomy for three times. All the patients had emergency laparotomy as the primary or 1st surgery. In the relaparotomy cases, 4 patients had planned relaparotomy while 28 patients had emergency relaparotomy.

**Table 1: Sex wise distribution.**

Sex	Cases (%)
Male	24 (75)
Female	8 (25)

**Table 2: Age wise distribution.**

Age (in years)	N (%)
14-30	3 (1.2)
31-40	10 (3.9)
41-50	7 (2.7)
51-60	6 (2.4)
61-70	4 (1.6)
>70	2 (0.8)

**Table 3: Causes of relaparotomy.**

Causes	N (%)
Anastomotic leak	16 (50)
Intestinal obstruction	10 (31)
Hemorrhage	4 (16)
Intrabdominal sepsis	2 (6.2)

**Table 4: Type of wound.**

Type	Number of relaparotomy	%	Number of laparotomy
Clean	0	0	4
Clean contaminated	7	4.3	160
Contaminated	10	10	76
Dirty	15	15	80

In the present study of relaparotomy 24 patients (75%) were male while 8 cases (25%) females with male to female ratio of 3:1. Youngest patient in this study was 19 years old female operated for obstruction due to Koch's abdomen as compared to oldest patient being 84 years old operated for sigmoid volvulus causing intestinal obstruction. Incidence was highest in 31-40 years age group with 10 patients (3.9%) followed by 41-50 years age group. Incidence was lowest in age group greater than 70 years with only 2 patients (0.8%). Most common indication for first laparotomy was small intestinal perforation 20 cases (62.5%) followed by gastric perforation and large bowel perforation. Out of total 32 relaparotomy performed major indication for

relaparotomy was leak from anastomotic site in 16 cases (50%) followed by obstruction in 10 cases (31%) and hemorrhage in 4 cases (16%) and intra-abdominal sepsis in 2 cases (6.2%). Majority of cases (16) were operated after 6<sup>th</sup>-10<sup>th</sup> days of laparotomy, 9 cases were operated within 2-4<sup>th</sup> days of first surgery or laparotomy, 4 cases within first two days of 1<sup>st</sup> laparotomy due to hemorrhage and 3 cases after 10 days of first surgery. Overall mortality rate was 12.5% in this study. Maximum mortality was seen in 51-60 years age group with 3 cases while lowest in 14-30 years age group with only 1 mortality. Most common cause of death was septicemia followed by multiorgan dysfunction syndrome. 1 patient died from planned relaparotomy group while 3 died in emergency relaparotomy group. Two patients died within 7 days of relaparotomy while 1 died within 2 days and remaining 1 died after 10 days of relaparotomy. Mean ICU stay was of 5.12 days which required close monitoring while mean days of hospitalization was 18.75 days.

## DISCUSSION

Incidence rate of relaparotomy is highly variable in various studies under different clinical scenario. Studies have found incidence rate to vary from as low as 0.34% to as high as 4.4%.<sup>1,5-8</sup> Incidence rate in this study was 3.41%. The incidence is a bit towards higher side for being the study is done in a tertiary teaching institute with first surgery done as laparotomy in emergency settings by the trainee residents. Some Indian studies have incidence of relaparotomy in tertiary care setup as low as 0.34 to 0.76%.<sup>7,8</sup> These variable incidences depend not only on patient characteristics but also on indications of primary surgery and postoperative care given. Mean duration between first laparotomy and relaparotomy was 6.21 days in this study which was comparable to other studies where it was variable from 5 days to 6.95 days.<sup>1,6</sup> Duration depends upon patient's factors like anemia, malnutrition, time of referral to higher center, comorbid conditions, surgical technique used in first surgery, postoperative care given and presence of an experienced surgeon in operation theatre at first surgery. Although there is no sufficient direct evidence to show relation between initial surgery and relaparotomy to patient's prognosis. However, to be on a safer side and to improve outcome of relaparotomy patients should not be hastily planned for relaparotomy. In such scenario patient's optimization and control infective part are the factors that should be taken care off before proceeding further. Despite of the availability and delivery of best possible intensive care mortality rate in this study was 12.5% which is less compared to other studies in which mortality rate was in between 26.7% to 37.3%.<sup>1,9,10</sup> Most common indications for relaparotomy in this study was anastomotic leak followed by obstruction, hemorrhage and sepsis. Obstruction being a common pathology due to intestinal tuberculosis, volvulus and adhesions after previous surgery. This is being similar to other studies were major indication for relaparotomy was leak.<sup>1</sup> In this

study a higher proportion male underwent relaparotomy compared to females. Relaparotomy were performed equally in both genders in one of the studies, which might be due to different setup and different patient profile of that particular study.<sup>9</sup> All the patients in this study underwent initial surgery as emergency laparotomy. Planned relaparotomy was done in 4 patients (12.5%) while remaining had relaparotomy in emergency settings (87.5%). This is comparison to an extent with a similar study where a total of 57 (70.37%) underwent emergency relaparotomy and 24 (29.63%) underwent planned relaparotomy.<sup>1</sup> Thus emergency surgery is a major risk factor for relaparotomy.

High mortality in relaparotomy is not always the surgeon's fault, there are several other factors like general condition of the patient, availability of experienced surgeon and better ICU facility, indication of previous surgery and relaparotomy, associated infections and its severity and presence of other co morbid conditions are the decisive factors before taking up a patient for relaparotomy. Relaparotomy if essential should always be done by experienced and skilled surgeons or at least in his presence in a teaching institute.

Morbidity was taken in to account by considering number days in an intensive care unit and average number of days of hospitalization in this study mean ICU stay was of 5.21 days and average hospital stay was 18.75 days which was quite lower to other similar study (27 days).<sup>1</sup>

A wise calculated decision along with improving certain factors like timely referral, optimization of general conditions of patient, controlling infective part might help us reduce the morbidity and mortality associated with relaparotomy.

This present study was conducted to identify factors associated with morbidity and mortality and indications of relaparotomy in a limited setup with a smaller number of cases. Many factors directly or indirectly responsible for morbidity and mortality like nutritional status, anemia, hypoproteinemia, calculation of various prognostic scores like SOFA and several other comorbid conditions like diabetes mellitus, obesity etc., were not considered in this study due to logistic and practical considerations.

A broad prospective study with sufficient number of cases is required to formulate protocols and guidelines to guide us, surgeons so that the dreaded complications of relaparotomy can be dealt with utmost care and expertise.

## CONCLUSION

Although relaparotomy as a surgical procedure has its own morbidity and mortality but it is lifesaving procedure for the patients which is the last resort at times in many patients. Taking proper aseptic precautions, achieving adequate hemostasis, proper surgical technique and a

wise calculative experience guided decision can all help us reduce morbidity and mortality associated with relaparotomy.

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