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Case Series

Surgery Section

Prevalence and Outcomes of Relaparotomy: A Case Series from Tertiary Care Hospital, Mumbai, Maharashtra, India

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ABSTRACT

Relaparotomy is usually performed in certain cases of postoperative complications. Depending on the hospital setting, the incidence of relaparotomy differs. Postoperative care for the patient after the primary surgery also affects the incidence of postoperative sepsis. The purpose of the present study is to identify the indications for relaparotomies so that, in the future, the factors causing these complications can be modified to reduce their incidence. The present study comprises 3,127 primary laparotomies, out of which 135 relaparotomies were performed on 132 patients. The most common age group affected was 31 to 40 years (3.22%), with an average age of 39.25 years. Leakage was the most common indication for relaparotomy, accounting for 77 patients; this includes leaks from anastomosis and perforation. The mean duration between primary laparotomy and relaparotomy was 6.85 days. The mortality rate was 45 (34%) patients. The mean number of days spent in the Intensive Care Unit (ICU) for patients who required continuous monitoring was 4.45 days, while the mean duration of hospitalisation was 26.4 days. Relaparotomy is a lifesaving procedure. The incidence of relaparotomy is influenced by the primary surgical skill, appropriate surgical technique and postoperative infection control. Relaparotomy is most commonly indicated due to leakage from the anastomotic site.

Keywords: Anastomotic leak, Intestinal obstruction, Laparotomy, Postoperative, Sepsis

INTRODUCTION

After an emergency or planned laparotomy, many individuals experience complications. To address these issues, a relaparotomy may be required for some of these patients. Relaparotomy refers to procedures performed in connection with the initial surgery while the patient is hospitalised. Depending on the timing, purpose and degree of urgency, relaparotomy can be categorised as either early or late, drastic or palliative, planned or unexpected [1].

Several predisposing factors are crucial in the development of surgical complications that necessitate relaparotomy. Significant indicators for relaparotomy include anastomotic leaks, septic peritonitis, intestinal obstruction, ruptured abdomen, intestinal perforation and haemorrhage [1-3]. To reduce the incidence of relaparotomy, appropriate preoperative work-ups, the use of modern anaesthetic techniques, contemporary antibiotics, sufficient antiseptics and improved postoperative fluid and electrolyte management should all be implemented. Following a relaparotomy, mortality rates can vary from 24% to 71% [1-3]. Factors associated with a high mortality rate include multiorgan failure, peritonitis following the initial surgery and older patient age [1-5].

In light of the above, the primary goal of the present study was to determine the prevalence of relaparotomy in the General Surgery Division of D.Y. Patil Hospital in Navi Mumbai, India. Secondary objectives included identifying the various indications for relaparotomy in the study setting and assessing the mortality and morbidity associated with the procedure.

CASE SERIES

The present case series comprised 135 relaparotomy instances between August 2018 and December 2022. It included any patient, regardless of age or gender, who underwent a second abdominal exploration while in the hospital following their initial procedure and before being discharged from care. However, all obstetrical and gynaecological laparotomies were excluded from this series.

During the research period, the General Surgery department performed a total of 3,127 laparotomies. Out of these, 132 patients required a total of 135 laparotomies due to various complications. Relaparotomies were necessary for three patients who underwent two relaparotomies each. Thus, the prevalence of relaparotomy in the Institute was 4.22%.

Of the 132 patients who required a repeat laparotomy, 36 had a planned laparotomy as their first procedure, while 96 had an emergency laparotomy. Among the 36 patients who had an initial scheduled laparotomy, 20 underwent planned relaparotomies and 16 underwent emergency relaparotomies. One patient underwent three surgeries: two relaparotomies and one initial procedure. Among the 96 patients who had undergone emergency laparotomy, 18 patients had planned relaparotomies and 78 patients had emergency relaparotomies.

In the present analysis of relaparotomy instances, there were 35 female patients and 97 male patients, resulting in a male-to-female ratio of approximately 2.7 to 1. The youngest patient in the study was a six-month-old baby, while the oldest was 75 years old and had undergone a relaparotomy. The age group of 31-40 years had the highest incidence of relaparotomy at 3.22%, followed closely by the 41-50 age group at 3.16%, the 51-60 age group at 2.80% and the over 70 years age group at 2.63% [Table/Fig-1].

Age group (in years)	No. of relaparotomies	Incidence (%)
31 to 40	32	3.22
41 to 50	32	3.16
51 to 60	28	2.80
61 to 70	13	1.34
>70	27	2.63

[Table/Fig-1]: Incidence of relaparotomy in different age groups.

Among the 132 relaparotomy patients, the initial reasons for laparotomy included intestinal obstruction (35 cases), peptic perforation (28 cases) and ileal perforation (23 cases). There were also eight appendectomies, twelve cases of liver trauma and twenty-six additional disorders, which included 10 cases of necrotising

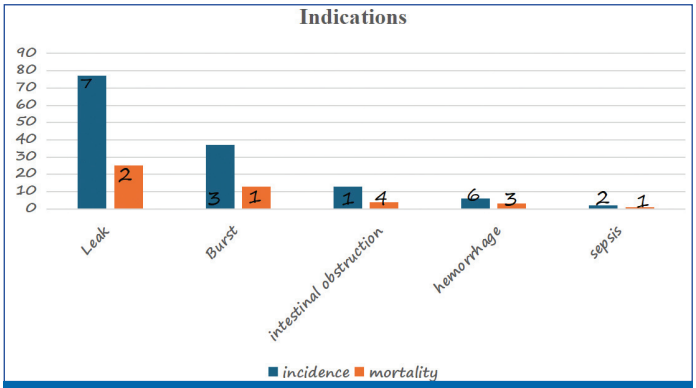
pancreatitis, six of carcinoma of the rectum, six colostomy closures and four pseudocysts of the pancreas. The incidence of relaparotomy based on wound categorisation at the time of the initial operation is shown in [Table/Fig-2].

Type of wound in 1st laparotomy	No. of laparotomy (3127)	No. of relaparotomy (132)	Incidence of relaparotomy
Clean	17	1	5.8%
Clean contaminated	991	32	3.22%
Contaminated	995	47	4.72%
Dirty	1124	52	4.62%

[Table/Fig-2]: Incidence of relaparotomy based on wound categorisation.

Leak from the anastomotic site was the primary indication for 77 of the 135 relaparotomies performed overall. Burst abdomen (n=37) was the second most prevalent cause, followed by intestinal obstruction (n=13), haemorrhage (n=6) and intra-abdominal infection (n=2). The largest number of cases (70 instances) underwent surgery within 5-10 days of the initial laparotomy, followed by 37 cases within 2-4 days, 21 cases after more than 10 days and seven cases on the same day.

A total of 45 cases out of 132 relaparotomies resulted in death, reflecting an overall mortality rate of 34%. Among the relaparotomies that led to mortality, 77% were due to leaks at the anastomotic site, 37% were due to burst abdomen and 13% were due to intestinal obstruction. Of the three patients who underwent two relaparotomy operations, two did not survive, while one was discharged after full recovery. A diagrammatic representation of mortality based on relaparotomy indications is provided in [Table/Fig-3].



[Table/Fig-3]: Incidence and mortality for relaparotomy.

The age group of 51-60 years had the highest mortality (n=16), while the 41-50 age group had the lowest (n=5). Mortality rates were as follows: 31-40 years (n=6), 61-70 years (n=8) and above 70 years (n=10). Septicaemia accounted for the highest mortality rate; two patients died suddenly, possibly from myocardial infarction or pulmonary embolism, while others died from cardiorespiratory arrest.

Out of the total, 13 individuals passed away between two and four days after relaparotomy, 11 died between four and six days post-procedure, nine died within two days, seven within six to eight days and five after more than ten days. Of the 36 scheduled relaparotomies, 11 patients did not survive, compared to 34 patients who did not survive out of 96 emergency relaparotomies. The mean duration of ICU stay or close observation for patients was 4.45±1.54 days, while the mean hospital stay was 26.4±4.64 days.

DISCUSSION

In the present study, the incidence of relaparotomy was 4.31%. The incidence of relaparotomy in tertiary care settings has been reported in some Indian studies to be as low as 0.34% to 0.76% [Table/Fig-4] [1,3,6-9]. The distinct nature of the Obstetrics and Gynaecology department where these studies were conducted may explain the extremely low incidence rates. The General Surgery department has different patient characteristics and reasons for relaparotomy.

Author name	Place/year	Incidence rate of relaparotomy
Haluk RU et al., [1]	Izmir Ataturk Training and Research Hospital, Izmir, Turkey/2006	1.8%
Koirala R et al., [3]	Sir Ganga Ram Hospital, New Delhi, India/2015	2.5%
Hutchins RR [6]	Imperial College of Science, Technology and Medicine, London, UK/2004	4.4%
Sridhar M and Susmitha C [7]	Shadan Institute of Medical Sciences and Research Centre, Telangana, India/2016	0.76%
Thombarapu U [8]	Sumandeep Nursing College, Vadodara, Gujarat, India/2015	0.34%
Wain MO and Sykes PA [9]	Park Hospital and Altrincham General Hospital in the Trafford District of Manchester/1987	1.7%

[Table/Fig-4]: Incidence of relaparotomy in different studies [1,3,6-9].

Male patients represented a larger proportion of relaparotomy cases, which is consistent with similar research (Haluk RU et al., reported that 74.37% of relaparotomy cases involved males) [1]. One researcher found that relaparotomies were performed equally on both genders, which may have been influenced by the unique setting and patient population in that study [9]. Out of the 132 relaparotomies performed in the present study, 96 (72.7%) were emergency surgeries, while the remaining 36 (27.2%) were planned surgeries. Among the 96 emergency relaparotomies, two patients underwent relaparotomy twice. Of the 36 patients who had planned relaparotomy, one patient also had a relaparotomy twice.

In the present analysis, the most common reasons for relaparotomy were leakage from the anastomotic site or perforation, followed by burst abdomen, intestinal obstruction, haemorrhage and sepsis. The indications for relaparotomy in previous studies are essentially the same as those in our study [Table/Fig-5], with the only distinction being the incidence rates [1-4].

Studies	Place/year	Indications for relaparotomy	
Haluk RU et al., [1]	Izmir Ataturk Training and Research Hospital, Izmir, Turkey, 2006	Leakage in intestinal anastomosis (n:34) (41.97%); haemorrhage (n:15) (18.51%); intestinal perforation (n:8) (9.87%); intraabdominal infection or abscess (n:8) (9.87%); progressive intestinal necrosis (n:7) (8.64%); stomal complications (n:5) (6.17%); and postoperative ileus (n:4) (4.93%). Two or more Urgent abdominal re-explorations were performed in 18 cases (22.22%), and overall mortality was seen in 30 cases (34.97%)	
Krivitskii DI et al., [2]	Surgical Association of Mobile, Alabama/1990	Diffuse and circumscribed peritonitis (78 patients), ileus (46), eventration (11), haemorrhage (12), others (5)	
Koirala R et al., [3]	Sir Ganga Ram Hospital, New Delhi, India/2015	Faecal fistula without evidence of anastomotic failure	27 (14%)
		Anastomotic failure	13 (6.7%)
		Abscess/collection	57 (29.6%)
		Haemorrhage	66 (34.2%)
		Biliary fistula	6 (3.1%)
		Intestinal obstruction	13 (6.7%)
		Abdominal dehiscence	4 (2.1%)
		Bowel gangrene	7 (3.6%)
Ching SS et al., [4]	Ysbyty Gwynedd, Bangor, Gwynedd, UK/2003	Bleeding (n:15), infection (n:9), anastomotic leakage (n:6), wound dehiscence (n:6), necrotising pancreatitis (n:5), bowel necrosis (n:3), bowel obstruction (n:2) and miscellaneous indications (n:2)	

[Table/Fig-5]: Indications for relaparotomy in other studies [1-4].

The average time between the initial laparotomy and the subsequent one in the present study was 6.95 days. In one study, the average time between two laparotomies was five days, while in another, it was also 6.95 days [1,6]. The present study institute's mortality rate for

relaparotomy was as high as 34%, even with the best postoperative care available; this is roughly comparable to previous studies where the mortality rate ranged from 26.7% to 37.3% [1,9,10].

The authors considered the number of days spent in the Intensive Care Unit (ICU) or in the hospital requiring careful observation when calculating morbidity. The average length of hospitalisation in the present study was 23.45 days, which is comparable to the study conducted by Haluk-RU et al., (27 days) [1].

CONCLUSION(S)

Relaparotomy, though a critical and often life-saving procedure, is associated with significant morbidity and mortality. The present study, conducted in a tertiary care setting, found a relaparotomy incidence of 4.22%, primarily driven by anastomotic leaks, burst abdomen and intestinal obstructions. The findings highlight the substantial risks posed by relaparotomy, with a mortality rate of 34%, despite the availability of advanced postoperative care. The results underline the importance of meticulous surgical technique and vigilant postoperative management to minimise the need for relaparotomy. Furthermore, the high mortality associated with relaparotomy calls for continued efforts to improve surgical outcomes through the early identification of complications and prompt intervention. Future research should focus on refining the factors contributing to these complications, aiming to reduce the incidence of relaparotomy and improve patient outcomes.

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