Original Research Article

Clinical study of relaparotomy after emergency general surgery in a tertiary center

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Abstract

Background: The term "Relaparotomy" (RL) refers to operations performed within 60 days in association with the initial surgery. Re-laparotomy is associated with augmented morbidity and mortality. It is important to understand which patients may be at high risk for repeat surgery and allow for optimal resource utilization to reduce morbidity and mortality of re-exploration. Present study was aimed to study relaparotomy surgeries done after emergency general surgery at a tertiary center. **Material and Methods:** Present study was retrospective, case record based study, conducted patients irrespective of age and sex, undergone re-exploration of the abdomen after emergency general surgery, during the period of hospitalization after the first operation (Index operation) and discharge (readmission for re-exploration) within 60 days of primary operation. **Results:** During study period among 758 emergency general surgery, 46 cases required relaparotomy, incidence of relaparotomy was 6.07 %. Majority of patients were from 60-70 years age group (30.43 %) followed by from 50-59 years age group (19.57 %). Mean age of study patients was 56.43 ± 11.69 years. Male predominance was observed (71.74 %) and male:female ratio was 2.54 :1. Common indications of re-laparotomy in present study were burst abdomen (30.43 %), anastomotic leak (17.39 %), abscess or intraabdominal collections (15.22 %), bile leak following primary repair of hepatobiliary surgeries or feeding jejunostomy (10.87 %) and intestinal obstruction (8.70 %). While systemic post-operative complications noted were acute kidney injury (AKI) (15.22 %), Septicaemia (10.87 %), disseminated intravascular coagulopathy (DIC) (8.7 %), pneumonia (8.7 %), respiratory failure (2.17 %) and arrhythmia (2.17 %). Mortality was noted in 7 patients (15.22 %), while 82.61 % patients were discharged. **Conclusion:** Relaparotomy is associated with increased morbidity and mortality, common causes are burst abdomen, anastomotic leak and abscess or intraabdominal collections.

Keywords: Relaparotomy, burst abdomen, anastomotic leak, postoperative care.

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INTRODUCTION

The term 'emergency laparotomy' describes an exploratory procedure for which the clinical presentation, underlying pathology, anatomical site of surgery, and perioperative management vary considerably. The risk for bowel injuries also increases with each consecutive laparotomy and can be as high as 50 %.[1] The term "Relaparotomy" (RL) refers to operations performed within 60 days in association with the initial surgery.[2] Re-laparotomy is associated with augmented morbidity and mortality.[3] Whenever re-laparotomy is essential, mortality increases to as high as 22% to 51%.[4] The causes for re-explorations following emergency or elective laparotomy are obstruction, wound dehiscence, fistula, anastomotic leak, hemorrhage, post-op peritonitis, perforation, circumscribed and diffuse peritonitis without perforation and suture line insufficiency due to necrosis of pancreas and biliary peritonitis.[5,6] Factors which influence outcomes of patients who underwent RL includes patient's sociodemographic characteristics, the indication for the first operation, the urgency of the first operation, the duration between first operation and RL, etc.[3,7] It is

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important to understand which patients may be at high risk for repeat surgery and allow for optimal resource utilization to reduce morbidity and mortality of re-exploration. Present study was aimed to study relaparotomy surgeries done after emergency general surgery at a tertiary center.

MATERIAL AND METHODS

Present study was retrospective, case record based study, conducted in Department of General Surgery, Jawaharlal Nehru Medical College, Wardha, India. Study approval was obtained from institutional ethical committee. Case records of patients irrespective of age and sex, undergone re-exploration of the abdomen after emergency general surgery, during the period of hospitalization after the first operation (Index operation) and discharge (readmission for re-exploration) within 60 days of primary operation, from January 2021 to December 2021 (1 year) were considered for study.

Patients' demographic details, history, examination, investigations, management and complications were collected from indoor case sheets retrieved from case record section of the institute. Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

RESULTS

During study period among 758 emergency general surgery, 46 cases required relaparotomy, incidence of relaparotomy was 6.07 %. Majority of patients were from 60-70 years age group (30.43 %) followed by from 50-59 years age group (19.57 %). Mean age of study patients was 56.43 ± 11.69 years. Male predominance was observed (71.74 %) and male:female ratio was 2.54 :1.

Table 1: General characteristics

Characteristics	No. of patients	Percentage
Age groups (in years)		
<30	4	8.70%
30-39	5	10.87%
40-49	7	15.22%
50-59	9	19.57%
60-70	14	30.43%
>70	7	15.22%
Mean age (mean ± SD)	56.43 ± 11.69	
Gender		
Male	33	71.74%
Female	13	28.26%

Common indications of re-laparotomy in present study were burst abdomen (30.43 %), anastomotic leak (17.39 %), abscess or intraabdominal collections (15.22 %), bile leak following primary repair of hepatobiliary surgeries or feeding jejunostomy (10.87 %) and intestinal obstruction (8.70 %).

Table 2: Indications of re-laparotomy.

Indications	No. of patients	Percentage
Burst abdomen	14	30.43%
Anastomotic leak	8	17.39%
Abscess or intraabdominal collections	7	15.22%
Bile leak following primary repair of hepatobiliary surgeries or feeding jejunostomy	5	10.87%
Intestinal obstruction	4	8.70%
Retraction of stoma	2	4.35%
Hollow viscus perforation	2	4.35%
Enterocutaneous fistula	2	4.35%
Bowel necrosis	1	2.17%
Stump blow out	1	2.17%

Local post-operative complications noted were wound infection (17.39 %), stomal site infection (4.35 %), peri stomal/peri fj excoriation (4.35 %), burst abdomen (2.17 %) and stoma prolapse (2.17 %). While systemic post-operative complications noted were acute kidney injury (AKI) (15.22 %), Septicaemia (10.87 %), disseminated intravascular coagulopathy (DIC) (8.7 %), pneumonia (8.7 %), respiratory failure (2.17 %) and arrhythmia (2.17 %).

Table 3: Post-re-laparotomy complications

Post-operative complications	No. of patients	Percentage
Local complications		
Wound infection	8	17.39%
Stomal site infection	2	4.35%
Peri stomal/peri FJ excoriation	2	4.35%
Burst abdomen	1	2.17%
Stoma prolapse	1	2.17%
Systemic complications		
Acute kidney injury (AKI)	7	15.22%
Septicaemia	5	10.87%
Disseminated intravascular coagulopathy (DIC)	4	8.70%
Pneumonia	4	8.70%
Respiratory Failure	1	2.17%
Arrhythmia	1	2.17%

Mortality was noted in 7 patients (15.22 %), while 82.61 % patients were discharged.

Table 4: Outcome

Outcome	No. of patients	Percentage
Discharged	38	82.61%
Mortality	7	15.22%
Against medical advice	1	2.17%

DISCUSSION

Despite the development in surgical techniques, anaesthesia, intensive care monitoring and antibiotic therapy re-laparotomies continue to be a problem in general surgery.[8] Urgent redo-laparotomies can be subdivided into 'on-demand surgery' where the patient's condition necessitates re-exploration and 'planned' wherein a relaparotomy is performed every 36 to 48 h for inspection, drainage and peritoneal lavage of the abdominal cavity until findings are negative for ongoing peritonitis.[9] The basic steps of laparotomy is to give a peritoneal lavage to drain abscesses or fluid collections, debride necrotic tissues and address the primary issue and close the abdomen or leave it open as laparostomy or bring a diversion like stoma. In study by Shukla A *et al.*,[10] 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. Zala JN *et al.*,[11] studied 50 cases of re-exploratory laparotomy, majority (56%) were seen in the 21-50 age group; males (37) more than females (13) with 3:1 ratio. Mean duration between 2 laparotomies was 8 days with range of 3-20 days. It is also observed that mean duration of hospital stay among the discharged patients is 30 days with range of 15-60 days. In this study, mortality was 16% (n=8), out of which 5 patients were having co-morbidity. Out of 50 patients 34 (68%) developed local or systemic post-operative complications. J Vaishnavi *et al.*,[12] noted that the incidence of revision laparotomy was 7% and the incidence of second revision laparotomy was 1%. The indications for relaparotomy were anastamotic leak 2/7 (20%), burst abdomen 2/7 (20%), pancreatic injury 1/7 (10%), bladder injury 1/7 (10%), negative laparotomy 1/7 (10%). The variables with significant p-value are systemic hypertension, COPD, CAD, intra-op and post-op inotoropic support, wound infection, wound dehiscence and intra-abdominal abscess. Shashiranjan S *et al.*,[13] noted male patient (83%) predominance, bowel obstruction (40%) was most common indication for laparotomy. Fecal fistula (27%) had highest indication for relaparotomy followed by failure of primary closure (23%). Incidence of relaparotomy is highest in 18 -35 years age group (30%). In relaparotomy, 50 % underwent resection and anastomosis with proximal diversion as operative procedure. Most of patient underwent early relaparotomy (i.e 73.3%) than late relaparotomy (26.7%). Early relaparotomy (81.8%) has better outcome than late relaparotomy (75%). Among co-morbidity, relaparotomy patients with diabetic mellitus (i.e 33.3%) were in highest number .Among mortality ,46-50 years age group were in highest number (i.e 33.3%). Kirubel A *et al.*,[14] studied 2146 laparotomies, 6.9% (149) needed re-laparotomy and 129 patients were analyzed. Most (123,95.3%) had on-demand re-laparotomy. Patients operated on emergency made 70.5% (91) of the cases making the ratio of emergency to elective surgery 2.4:1. The three most common surgeries that needed re-laparotomy were, Perforated appendicitis (35,27.1%), bowel obstructions (28,21.7%), and trauma (20,13.4%). The most common indications for relaparotomy were intra-abdominal abscess (57,44.23%), wound dehiscence

(17,13.2%) and anastomotic leak (15 ,11.6%). Surgical site infection (128,100%) and malnutrition (58,45%) were the leading complications. The overall mortality rate was 12.8 % (19). There was no statically significant difference in mortality rate between on-demand and planned re-laparotomy (P=0.388), urgency of the primary surgery (P=0.891) and the number of relaparotomy (p=0.629). Re-laparotomy for anastomotic leak (p=0.001) and patients above fifty years of age (P=0.015) had significant associations with mortality. Incidence of relaparotomy can be decreased by proper understanding of predisposing factors and by taking appropriate measures. Emergency initial surgery, sepsis and primary suppurative diseases are some of the risk factors for relaparotomy. To improve the quality of care for high risk surgical patients like emergency laparotomy understanding of the nature, type and incidence of post-operative complications is needed.[15] For this different care bundles are prepared which consist of early identification of high risk patients, consultant led surgery and anesthesia, early antibiotic, early surgery has been established to improve outcomes and show up to 53% reduction in mortality and morbidity after emergency laparotomy.[16,17] With the advent of additional methods of diagnosis of post op complications the fatality after re laparotomy can be reduced. CT proved to be accurate in detecting postop inflammatory lesion and percutaneous drainage can be done if needed.

CONCLUSION

Relaparotomy is associated with increased morbidity and mortality, common causes are burst abdomen, anastomotic leak and abscess or intraabdominal collections. Relaparotomy can be prevented by careful planning first laparotomy, building of patient's general status, early re-exploration with proper surgical techniques and thorough postoperative care.

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