Redo-laparotomies: reasons, morbidity and outcome

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ABSTRACT

A large number of patients undergo various operative procedures every day and laparotomy forms a large proportion. At times, laparotomies have to be redone due to complications like biliary peritonitis, faecal fistula, burst abdomen or anastomotic leak. Our objectives were to determine the causes of Redo-laparotomy evaluate morbidity associated with it and analyze its outcome. A prospective study of patients in BP Koirala Institute of Health Sciences (BPKIHS) from 1. 1. 2009 to 31. 12. 2009 was done. Institutional ethical clearance was taken. The Statistical analyses were done using SPSS version 11.5. Redo-laparotomy was performed in 40(1.99%) cases. The mean age was 31.99±21.49 years with a M: F ratio of 4:3. The indications of Redo-laparotomy were: burst abdomen (n=9; 22.5%), followed by intra-abdominal collection and abscess (n=7; 17.5%), fecal (n=6; 15%), and biliary peritonitis (n=5; 12.5%). The mean duration between first laparotomy and Redo was 9.42±7.56 days and the mean duration of hospitalization was 26.98±12.50 days. Lower gastrointestinal surgeries usually lead to a Redo. The mortality in our study was 30% and 21/40 patients had to be managed in the intensive care unit. Clinical acumen formed the basis (87.5%) to decide for Redo-laparotomy in the majority. Redo-laparotomies that are performed following complicated abdominal surgeries have high morbidity and mortality rates. Multiple factors may lead to a Redo-laparotomy which is beyond the hands of a clinician yet a vigilant and vigorous management could help reduce the rate of Redo-laparotomies.

Keywords: Redo-laparotomy, relaparotomy, complications.

INTRODUCTION

At times abdominal laparotomies' have to be redone. This may be due to complications in the antecedent surgey or because of severe intrabdominal sepsis already present. Abdominal operations that have to be redone in association with the initial surgery are called relaparotomies. The term "Relaparotomy" (RL) refers to operations performed within 60 days in association with the initial surgery. Because of increased morbidity and mortality associated they are often called the final choice operations.[1-3] Redo laparotomies are called on demand if the laparatomy has to be redone because of patients condition and are called planned if the second laparotomy is decided upon during the course of the first surgery itself like in case of severe intraabdominal sepsis or post damage limitation surgery.

This is a prospective observational study to determine the causes of on demand Redo-laparotomy, evaluate morbidity associated with it and analyze its outcome.

MATERIALS AND METHODS

This was a prospective observational study conducted at BP Koirala Institute of Health Sciences (BPKIHS) a tertiary care academic institute in Dharan, Nepal. Ethical clearance was obtained. Patients who underwent abdominal surgeries between 1. 1. 2009 to 31. 12. 2009 were analyzed. Forty (out of 2010 laprotomies) which had undergone relaprotomies were selected.

Patients with initial laprostomy, damage control surgery, only flank drain placement or other minimally invasive procedure like ultrasound guided drainage procedures were excluded. Cases with an initial laproscopic procedure and planned laparotomies or laparotomies during colostomy or ileostomy closure were also excluded from the study.

Data was entered and was analyzed for their age, sex, initial diagnosis, procedure performed and post-operative complications requiring relaprotomies. The interval between laprotomies and morbidity and mortality associated were also analyzed.

Clinical parameters, hematological and radiological investigation formed the basis for the decision to undergo relaprotomy.

All the operations were performed/ supervised by qualified surgeons (senior residents or consultants). All post-operative patients received 3rd generation cephalosporins and anerobic coverage post operatively. Further antibiotics received depended upon culture sensitivity reports and patient condition.

Table-1: Basic patient characteristics

Total laparotomies	2010
Total relaparotomies	40(1.99%)
Age	31.99±21.49
Sex M:F	4:3
Duration between 1st and 2nd laparotomy	9.4 ± 7.6 (1- 30) days
Number of 2nd relaparotomy	5
Duration between 1st and 2nd relaparotomy	12.2 ± 7.2 (6- 24) days
Co- morbid conditions	14 (35%)
Mortality	12 (30%)
Left against medical advice(LAMA)	2 (5%)

Chi square test and fisher exact test was done using SPSS 11.5 software by a statistician who was blinded to the study. A p value of < 0.05 was considered significant.

RESULTS

On demand Relaparotomy was performed in 40 patients (1.99%) out of the 2010. The mean age was 31.99±21.49 years with a M: F ratio of 4:3. Thirty two of these patients (82%) had relaparotomy during the index admission. Five (12.5%) out of 40 patients required 2 or more relaprotomies. Twentynine (62.5%) of these patients were operated in the emergency and 14 (35%) had comorbid conditions (Table-1).

Lower gastrointestineal tract was the most common site of redolaparotomy 23 (57.5%) (Table-2). Resection and anastomosis (15, 37.5%) and closure of perforation (7, 17.5%) were the most common initial operation performed (Table-3). Burst abdomen (9, 22.5%) was the most common cause of relaprotomy. During surgery five were found to have intra-abdominal abscess, 3 had contained leak and no apparent cause could be found in one. Intra-abdominal collection (7, 17.5%) and fecal peritonitis (6, 15%) were other common indication for redo's (Table-4). Tension suturing and fashioning of an ostomy were the most commonly performed procedure in 9 (22.5%) patients each (Fig. 3). The average duration between 1st and 2nd laparotomy was 9.4+ 7.6 (1-30) days and between the 2nd and the 3rd was 12.2 ± 7.6 (6-24) days. Twenty one (52.5%) patients required postoperative ICU care and the average stay was 8.62 (1-30) days.

The overall mortality was 30% (12/40) with 65 %(26/40) patients improving. Two patients left against medical advice. Mortality in redo's for upper GI surgeries was higher 6/12 (50%) vs lower GI surgeries 4/23 (17.39%) and this was significant (p value of 0.048) (Table-2). Mortality in the extremes of age was higher (Table-5) but this was not statistically significant. Mortality rates in patients who needed a second relaparotomy were higher but it did not reach statistical significance probably because only 5 patients needed a 2nd relaparotomy in our series.

Sepsis and multi organ failure was the most common cause of mortality with 8/12 patients succumbing to it. Similarly respiratory failure was determined as the cause of death in 2 patients. DIC and hypovolemia with dyselectrolytemia were the cause of death in 1 patient each. The last patient had a large duodenal perforation with omental necrosis patient developed an immediate post-operative leak which could not be controlled despite a relaprotomy and pyloric exclusion.

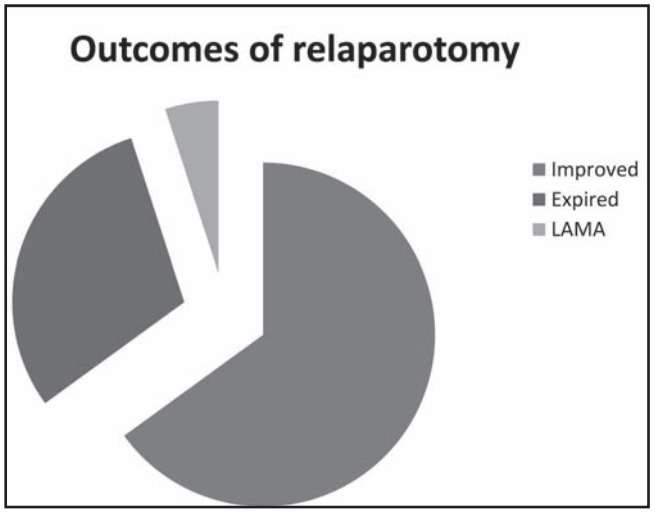

Fig. 1. Out comes after relaparotomies

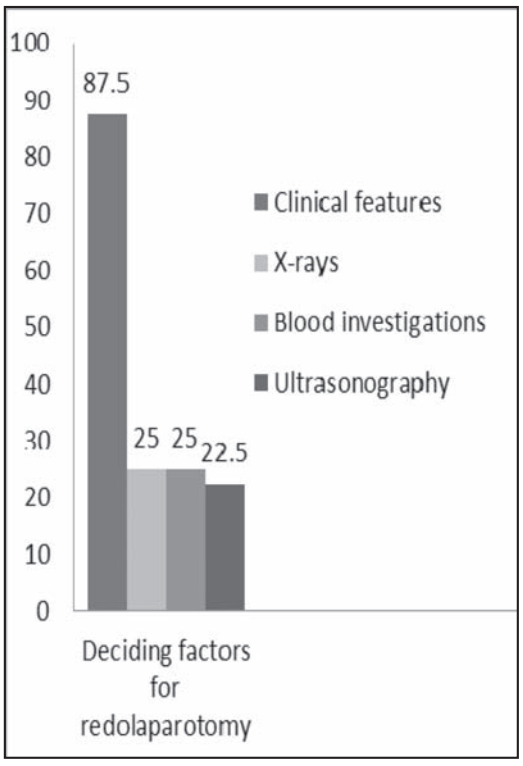

Fig. 2. Deciding factors for relaparotomies

Table-2: Site of first laparotomy

Site of first laparotomy	n. (%)	Survived	Died	LAMA
Upper GI surgery	**12 (30)**	**5**	**6 (50%)**	**1**
Stomach	4 (33)	2	2	0
Duodenum	4 (33)	0	3	1
Gallbladder	3 (25)	3	0	0
Pancreas	1 (9)	0	1	0
Lower GI surgery	**23 (57.5)**	**18**		**1**
Small bowel	10 (43.5)	8	2	0
Appendix	3 (13.0)	3	0	0
Colon	6 (26.1)	4	1	1
Rectosigmoid	4 (17.4)	3	1	0
Multiple sites involved	**3 (7.5)**	**2**	**2**	**0**
Gynaecology	**2 (5)**	**2**	**0**	**0**

DISCUSSION

There is some controversy regarding whether urgent relaparotomies should be on demand basis or should be planned. Most studies have failed to show any benefit.so except for damage limiting surgeries we as an institute do not follow planned relaparotomies so those were excluded from the study design itself.[2-4] The incidence of urgent redo-laparotomies are disease and procedure dependent. The rate of redolaparotomies in postoperative patients in our study was 1.99% this is consistent with rates of between 1-4.4% reported in literature.[4-7]

Indications requiring Redolaprotomies are similar everywhere and our indications concurred with numerous other studies.[2-5,7] Parameters that formed the basis for decision to undergo relaprotomies were broadly categorized as : i) hemorrhage unresponsive to conservative measures ii) peritonitis generalized, local or intra-abdominal abscess not amenable to treatment by percutaneous methods iii) mechanical or paralytic postoperative ileus iv) clinically significant post-operative leak or fistulas v) worsening patient condition vi) burst-abdomen(evisceration/eventration).[3,8,9] Burst abdomen was in contrast to other studies more common in our study. This could be attributable to the general nutritional status of our population and the lack finances for total parenteral nutrition. The fact that a significant portion of burst abdomen had controlled intra-abdominal leak suggests that these patients could have been managed by interventional radiology alone where interventional radiology is available.

Whatever may be the indication urgent relaparotomies are associated with a high mortality. Even the advances in surgical technique, critical care and interventional radiology have not made relaparotomies safer. Mortality following relaparotomies range from15.5% to 53 %.[3,6,10] We had a mortality rate of 35% which is comparable. Multiple redos are generally associated with increased mortality. In our study 20% (10/40) patients died after first relaparotomy and the mortality after 2nd relaparotomy was 40% (2/5). This is comparable to other studies which found mortality of 30.6% for a single laparotomy and 66.5% for multiple relaparotomies.[8-10] This was however not significant as the number of patients undergoing a 2nd relaparotomy was very small in our study.

The site of index surgery affects mortality rates. Studies have shown a higher mortality following GIsurgeries that need urgent relaparotomies. Like our study mortality rates following fistulas and anastomotic leaks was high while rexplorations for obstruction and wound dehiscence had low mortalities.[3,11] However our data didn't reach statistical significance.

As would be expected redolaparotomies are associated with a high rate of complications and our results were no different. Wound infection and dehiscence. Pulmonary

Table-3: Operative procedure done in the first laparotomy

	Frequency (%)
Resection and end to end anastomosis	15 (37.5)
Primary closure of perforation	10 (25.0)
Gastric resection	3 (7.5)
Open cholecystectomy	3 (7.5)
Appendectomy	3 (7.5)
Total abdominal hysterectomy	2 (5.0)
Others	4 (10.0)

Table-4: Findings at relaparotomy

	Number of cases	Number of Mortality (%)
Biliary peritonitis	5	2 (40%)
Bleeding	4 (LAMA 1)	1 (25%)
Burst abdomen	9	2 (22%)
Fecal fistula	1	0 (0%)
Fecal peritonitis	6	2 (33%)
Obstruction	5	3 (60%)
Intra-abdominal collection	7(LAMA 1)	2 (29%)
others	3	0 (0%)

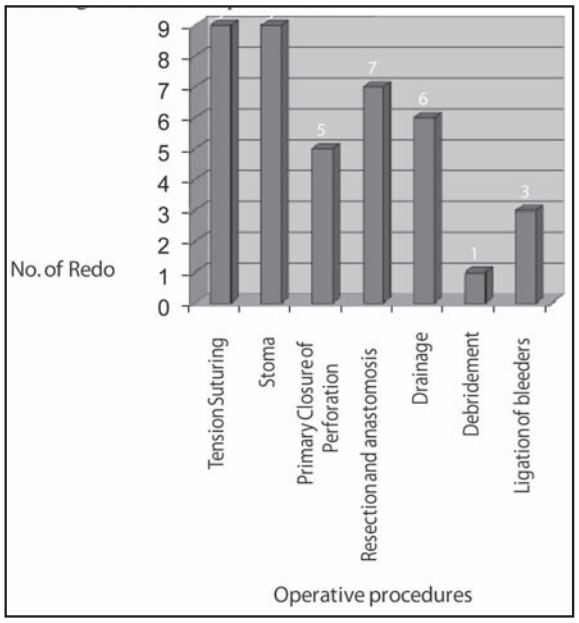

Fig. 3. Operative procedures for redolaparotomy

complications were the next most common complication this underscores the need for vigilancy in wound management and pulmonary care (Table-6).

Surgery in intrabdominal sepsis improves survival. Studies suggest early intervention impacts mortality.[12-14] As shown by Hutchins and colleagues this could be due to reduction in multiorgan failure rates by early intervention.[15] The presence or absence of co-morbid conditions did not impact survival in our patients while this is surprising it could be explained by the fact that the reasons for the patient requiring relaparotomy often outweigh impact of co-morbid conditions. Intra-abdominal sepsis is difficult to treat with as much as 41% reporting residual abcessess.[9] Multiorgan failure due to sepsis was the cause of death in two thirds of our patients (8/12). Most studies report a similar outcome.[3,4,16]

Urgent redo-laparotomies are associated with very high mortality and morbidity rates. Redolaparotomies for upper GI surgeries carry a higher mortality. Multiple factors may lead to a Redo-laparotomy which is beyond the hands of a clinician yet a vigilant and vigorous management could help reduce the rate of Redo-laparotomies. However when how and what remains the individual surgeons dilemma.

Table-5: Age vs outcome in relaparotomy

	Survived	Died	Total	Mortality (%)
<15 years	5	4	9	44.5
ears	19	7	26	26.9
>60 years	2	1 (+ 2 LAMA)	5	33.3
	26	12	40	33.6

Table-6: Complications

	n. (%)
Wound infection	13 (32.5)
Wound Dehisence	7 (17.5)
Pulmonary complications	10 (25.0)
Septicaemia	4 (10.0)
Dyselectrolytemia	4 (10.0)
Cardio vascular complications	6 (15.0)
Intrabdominal collections	4 (10.0)
Decubitus ulcers	4 (10.0)
others	15 (37.5)

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