



A Study To Find Out The Different Causes of Reexploration of Emergency Exploratory Laparotomy Cases in A Tertiary Care Hospital in Eastern India – A Two Years Experience

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ABSTRACT

Exploratory laparotomy is one of the most common operations performed in our everyday emergency operation theatre. In our institution we had done 1007 exploratory laparotomy between 2009 and 2010, out of which we had to reopen 28 cases. We tried to find out the causes of reexploration in terms of co morbidity of the patients, age of the patients, day of presentation, type of disease and also the experience of the surgeon. We found that experience of the surgeon had a great effect on outcome of the surgery. The rate of reexploration is highest when done by 3rd year junior residents (JR), and lowest when done by residential surgeon. It has also been found that incidence of relaparotomy is also increased with the advancing age of the patient. Highest number of reexploration had to be done in malignant large bowel growth, which is 5(17.86%) in number. We had 4 hypertensive patients (14.29%) and 6 diabetic patients (21.44%) who underwent reexploration and 2 patients (7.14%) were both diabetic and hypertensive underwent reexploration. There were 6 relaparotomy patients (21.43%) who presented before 2 days, 10 relaparotomy patients (35.80%) who presented within 2 – 4 days

KEYWORDS : Exploratory laparotomy; Reexploration; Surgical skill; Experience; Outcome; Causes.

INTRODUCTION:

In our day to day practice we found patients requiring emergency exploratory laparotomy almost every day for various reasons. The spectrum of patients vary from appendicular perforation, peptic perforation, strangulated hernia to solid or hollow viscus injury due to blunt or penetrating abdominal trauma. Patients very often come with poor general condition and with associated co morbidities which are unknown during emergency operation. We try to do the best possible definitive management at the first attempt, but sometimes we have to re explore the patients due to failure of first operation. Here we have tried to analyze the **causes** of re exploration in our institution.

AIMS AND OBJECTIVE:

1. To study different causes of re-laparotomy in patients admitted for emergency laparotomy during the same hospital stay.
2. To find out ways to reduce the number of reexploration.

MATERIALS AND METHOD:

Study period: From 01.01.2009 to 31.12.2010

Study design: Retrospective observational study.

Sample size: During the study period we had 1007 (n = 1007) laparotomies in our emergency (528 in 2010 & 479 in 2009) operation theatre. **We had to reopen 28 out of these 1007 patients.**

METHODOLOGY:

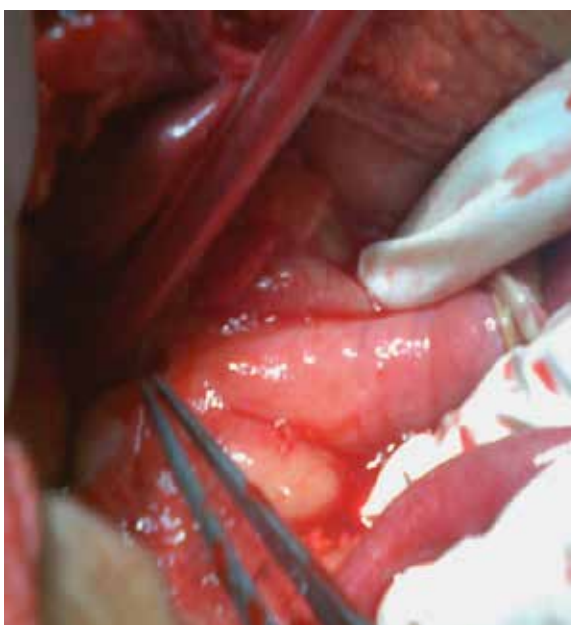
We analyzed the causes of reexploration in terms of age, comorbidity, day of presentation, nature of the disease and experience of the **operating** surgeon and found the percentage of the same. We also found out the rate of reexploration in terms of experience of the surgeon which is calculated by dividing the number of reexploration of cases done by the surgeon by total no of cases done by that surgeon. We also found out the percentage of reopened cases with hypertension, diabetes and both. We found out the percentage of reopened cases in terms of day of presentation. They were taken as presented before 2 days, between 2-4 days and after 4 days. We also distributed the cases according to disease and tried to find out the percentage distribution of relaparotomy cases according to the disease.

RESULTS AND ANALYSIS:

Table1: Disease wise distribution of all laparotomy cases during the study period.

Disease	No of patients (n = 1007)	%
Duodenal perforation	459	45.58

Ileal perforation due to typhoid fever	61	6.06
Appendicular perforation	68	6.75
Traumatic duodenal injury	4	0.40
Traumatic jejunal tear	27	2.68
Traumatic ileal tear	19	1.89
Traumatic tranverse colon injury	14	1.39
Sigmoid volvulus	32	3.18
Strangulated hernia	58	5.76
Obstructing large bowel growth	84	8.34
Acute pancreatitis	10	9.93
Splenectomy	14	13.90
Ruptured liver abscess	8	7.94
Intestinal obstruction due to benign cause	149	14.80



Duodenal perforation

Table2: Disease wise distribution of relaparotomy patients.

Disease	No of patients (n = 28)	%	p value
Duodenal perforation	4	14.29	
Ileal perforation due to typhoid fever	4	14.29	
Appendicular perforation	1	3.57	
Traumatic duodenal injury	1	3.57	
Traumatic jejunal tear	2	7.14	
Traumatic ileal tear	2	7.14	
Traumatic transeverse colon injury	2	7.14	
Sigmoid volvulus	2	7.14	
Strangulated hernia	4	14.29	
Obstructing large bowel growth	5	17.86	
Acute pancreatitis	1	3.57	

Table 3: Age wise distribution of the patients.

Age group	No of patients underwent laparotomy(n =1007)	No of patients underwent relaparotomy (N= 28)	% of relaparotomy as compared with total no of relaparotomy cases	p value
10 – 20 years	76	2	7.14	1.0000
20 – 30 years	135	1	3.57	0.1606
30 – 40 years	243	2	7.14	0.0408(sig-nificant)
40 – 50 years	327	3	10.71	0.0127 (sig-nificant)
50 – 60 years	102	7	24.99	0.0176(sig-nificant)
60 – 70 years	59	6	21.42	0.0070(sig-nificant)
>70 years	65	7	24.99	0.0014 (sig-nificant)

It is evident from the above table that advancing age has definitely affected the outcome of the operation, as the rate of reexploration is significant with the advancing age of the patient.

Table 4: Distribution of total number of exploratory laparotomy cases according to the experience of the operating surgeon.

Operating surgeon	No (n = 1007)	%
2 nd year Junior Resident (JR)	193	19.17
3 rd year Junior Resident (JR)	214	21.25
Senior resident (SR)	276	27.41
Residential surgeon	324	32.17

Table 5: Percentage distribution of relaparotomy cases as compared with total no of cases done by the surgeon.

Operating surgeon	No of cases of reexploration/No of cases of laparotomy (n/N)	%
2 nd year Junior Resident (JR)	9/193	4.66
3 rd year Junior Resident (JR)	11/214	5.14
Senior resident (SR)	5/276	1.81
Residential surgeon	3/324	0.93

Table 6: Distribution of relaparotomy cases according to the experience of operating surgeon.

Operating surgeon	No (n = 28)	%	p value
2 nd year Junior Resident (JR)	9	32.14	0.0453 (signifi-cant)
3 rd year Junior Resident (JR)	11	39.28	0.0129 (signifi-cant)
Senior resident (SR)	5	17.87	0.2904
Residential surgeon	3	10.71	0.0128 (signifi-cant)

From the above table it is seen that reexploration rates are significant when the 1st operation is done by junior residents as well as residential surgeon.

Table 7: Comorbidities of the patients in relaparotomy cases.

Comorbidity	Total no of patients underwent laparotomy (n = 248)	Total no of patients underwent relaparotomy (n = 12)	p value
Hypertension (HTN) only	139	4	1.0000
Diabetes Mellitus (DM)only	93	6	0.0374 (sig-nificant)
Both DM & HTN	13	2	0.0481(sig-nificant)

It is quite evident that when the patient is diabetic, and both diabetic and hypertensive chances of reexploration is more.

Table 8: Distribution of relaparotomy cases according the day of presentation at emergency.

Day of pres-entation	No of explo-ration (n = 1007)	No of reex-ploration (n = 28)	%	p value
<2 days	357	6	21.43	0.1596
2– 4 days	491	10	35.80	0.1826
>4 days	159	12	42.87	0.0005(sig-nificant)

So we had to do relaparotomy more often when the patient presented after 4 days .

Discussion: Relaparotomy is as we understand, repeated laparotomy after a presumably successful initial laparotomy. This term has a Greek origin and it has three parts in it RE-repeated, LAPARA-abdominal , TOMIE-cut up, i.e. a repeated exploratory operation of the abdominal cavity. The term "Relaparotomy" (RL) refers to operations performed within 60 days in association with the initial surgery. RL is categorized as early or late; radical or palliative; urgent or elective; and, planned or unplanned depending on the performed period, its purpose, urgency. Mamich V. I. offers the definition for a relaparotomy to consist in the time of same hospital admission – "an interference, which accomplish in the time of hospitality in a surgical ward, after the first operation" [1].

Complications from emergency abdominal surgery may necessitate reoperation and can be associated with significant morbidity and mortality. The incidence of urgent relaparotomy-requiring complications has been reported as 1–4.4% in patients who underwent abdominal cavity/organ-related surgeries [2] RL-requiring complications can be categorized into 5 groups: (i) hemorrhage into intestinal canal or abdominal cavity (ii) peritonitis that occurs in the absence or presence of a perforation (iii) mechanical or paralytical postoperative ileus (iv) eventration or evisceration (v) miscellaneous complications[2]. Indications for reopening includes bleeding, infection, anastomotic leakage, wound dehiscence, necrotizing pancreatitis, bowel necrosis, bowel obstruction and miscellaneous indications. Relaparotomy for dehiscence and obstruction carried minimal risk; for bleeding and infection entailed moderate risks; and for anastomotic leak had the highest mortality

rate. The mortality rate increased in older age groups, multiple system and organ failure and multiple relaparotomies. Reintervention had brought to evidence technical errors, which could be corrected, and resulted in patient salvage in some cases. Timely relaparotomy is valuable in the identification and treatment of complications following abdominal surgery [2].

Healing in the GI tract is rapid when free of complications: Unlike cutaneous healing, in which progress can be observed on a daily basis and intervention instituted early if necessary, healing of the intestinal anastomosis is anatomically obscured from inspection, allowing the surgeon only the patient's parameters of general well-being to judge the success of the operation. For the same reason, complications usually require re-operation, with the associated morbidity of a laparotomy and additional general anesthetic. This places a great responsibility on the surgeon to be cognizant of all the preoperative, intraoperative, and postoperative factors relating to anastomotic healing that might compromise the healing process. Bearing these in mind along with, attention to technical detail, complications should be limited to an acceptable level. Patients most at risk are those who perioperatively develop physiologic problems that lead to shock, hypoxia, and resultant anastomotic ischemia, those with radiation-induced tissue injury, sepsis, preoperative bowel obstruction. Malnourishment, malignancy, diabetes, steroids, and age also influence outcome to varying degrees [3].

The cause of the leakage may be multifactorial, including contribution from faulty technique, ischemia of the intestine at the suture line, excessive tension across anastomosis and mesentery, the presence of local sepsis, presence of obstruction distal to the anastomosis. The old patient (>80 years), anaemic, malnourished with several coexisting diseases, receiving high doses steroids, after chemo-radiotherapy is more prone to develop the anastomotic leakage [4].

The technique for performing the anastomosis remains at the discretion of the surgeon and largely depends on experience, patient characteristics and the operative setting, rather than there being any clear evidence for one technique over another. New techniques and devices that overcome drawbacks in current practice are consistently being developed and tested, making further risk reduction in gastrointestinal anastomosis of great future promise even in the emergency setting [5].

Kumar. K et al showed that age greater than 60 years, haemoglobin level less than 10 g/dl, size of perforation greater than 5 mm were identified as risk factors for leak. Serum albumin, hemoglobin and size of perforation were independent risk factors for prediction of leak after repair of peptic perforation [6].

Typhoid ileal perforation is one of the most serious complications of typhoid fever causing high morbidity and mortality. Surgery is the preferred method of treatment, with survivors having high rates of infective postoperative complications that are life-threatening. The most common postoperative complications were wound infection, wound dehiscence and enterocutaneous fistulae. Relaparotomy in these cases is required almost every time and the outcome is poor [7].

Everywhere in the world, emergency surgeons have to face situations where reopening of abdomen is needed for different reasons. Relaparotomy performed soon after surgery is associated with a high mortality rate. Thus, to decrease both the relaparotomy and mortality rates, complicated surgery should ideally be performed by experienced surgeons in fully equipped facilities [8]. In conclusion, we suggest that the most efficient way of reducing reexploration and mortality rates is actually "avoiding the possible complications during the first surgery". On the other hand, the success of the surgeon would be proportionate to his correct responses to such questions as "to whom, when, under what conditions, why and how the surgery should be conducted" when RL is required [2].

CONCLUSION:

Advancing age of the patient, comorbidity and experience of the operating surgeon are contributing factors for the reexploration after emergency exploratory laparotomy. Though our study has shown that chances of reexploration is also quite significant with the residential

surgeon, but that may be due to the fact that residential surgeons are doing the more difficult cases or when the juniors are in trouble.

Later the presentation, more is the chance of relaparotomy.

Malignancy and typhoid ulcer perforation increase the risk of reoperation.

Relaparotomy can be prevented by proper resuscitation of the patient and also by doing the operation by an experienced **surgeon** with proper surgical technique.

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