Indication and Outcome of Abdominal Re Exploration in Pediatric Population. A Single Centre Experience

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ABSTRACT

Objective

Abdominal re exploration (ARE) is an important complication of abdominal surgery and has an effect on morbidity and mortality. The purpose of this study is to know the grounds for performing re-exploration and its effect on outcome.

Methodology

This retrospective observational study was carried out in pediatric surgery unit of Khyber Teaching hospital from May 2017 to May 2019. All patients below 16 years age that underwent redo abdominal exploration within 60 days of the initial procedure were included in the study. Patients who had initial surgery at another hospital were excluded from the study. We reviewed the data regarding demography, indication for first surgery, indication for ARE, interval between first surgery and redo surgery. Collected demographic and clinical data were analyzed using SPSS 20.

Results

A total of 55 re-explorations were done in a duration of 2 years. Age range from 0.06 to 168 months (Mean 41±5.2months) and percentage of male patients was 64%..On initial presentation, 56% cases were emergency cases and 44% were elective. Common indications for re-exploration were intestinal obstruction 29.1%, peritonitis 16.4%, complications of stoma 16.4%, burst abdomen 10.9%. Mean interval from initial surgery was 12.5±3.7 days. Common operative findings of re-exploration were anastomotic disruption, interloop adhesions, burst abdomen, intra-abdominal collection, gangrenous stoma and parastomal herniation. ARE resulted in 14.5% mortality.

Conclusion

Abdominal re-exploration is mainly indicated for intestinal obstruction and peritonitis. Anastomotic disruption and Inter loop adhesions are the common surgical finding during ARE. Mortality rate is high in patients re-explored for peritonitis, fecal fistula, abdominal collection and wound dehiscence.

Key words: Abdominal re-exploration (MeSH), Burst abdomen, (Non-Mesh) Re-laparotomy (Mesh).

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INTRODUCTION

Abdominal exploration when done in connection with initial abdominal surgery is known as abdominal re-exploration (ARE). ARE refers to exploration performed within 60 days following initial surgery[1] Multiple reasons have been defined to perform a re-exploration like fecal fistula, biliary peritonitis, anastomotic leak and burst abdomen.[2] Re-exploration of abdomen can be classified as urgent or elective, planned or unplanned.[3] Urgent or unplanned ARE is also known as " final choice" operation and these surgeries are usually performed due to some complications of the initial surgery, rapidly leading to worsening of patient's condition.[2,4] Elective or planned ARE is to perform re-exploration at an interval already known.[5]

ARE in emergency are very notorious and associated with high rate of morbidity and mortality.[6] The hasty decision of ARE can prove deleterious, especially in children. Due to this, outcome

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measurement is focused and researchers have focused to find out factors affecting outcome. Mortality is used as an important indicator to calculate the outcome of re-explration[7] Recently trends towards laparoscopic approach has resulted in decreased frequency of adhesive obstruction and burst abdomen. However in majority of the centers still open approach is used which is associated with slightly more incidence of complications.[8]

One of the reason to conduct this study is very limited research on re-exploration in Pediatric patients. Importance of this study lie in the fact that it find out factors leading to abdominal re-exploration and mortality related to it.

METHODOLOGY

In this study we retrospectively reviewed 55 patients' record who underwent abdominal re exploration (ARE) from May 2017 to May 2019, in pediatric surgery unit of the Khyber Teaching Hospital. All patients with age below 16 years and redo abdominal exploration done within 60 days of the initial laparotomy were included in the study. Patients with initial laparoscopic surgery or initial surgery done outside our center, were excluded from the study. Patients' data was retrieved regarding age, gender, indication for initial surgery, indication for redo exploration, per-operative findings during re-exploration, interval between initial and re-exploration, mortality associated with ARE. Abdominal re-exploration was done on the grounds of anastomotic leak, intra-abdominal collection, peritonitis, intestinal obstruction not responding to conservative measurements and deteriorating condition of patients.

The collected data was revised, tabulated, coded and put in Excel having statistical analysis program SPSS-20. Data was presented and suitable analysis was carried out according to the type of data. Mean, SD and range for numerical data like age and interval between surgeries were calculated. Categorical data like indication for surgery and re-exploration was expressed in frequency and percentage.

RESULTS

This study included a total of 55 patients who were fulfilling the inclusion criteria. Age range from 0.06 to 168 months (Mean 41±5.2months) and percentage of male patients was 64%.. Gender distribution showed male patients 35 (64%) and female 20 (36%). Analysis of data of the initial presentation of patients showed 24 cases (44%) as elective and 31 (56%) emergency. Decision of re-exploration was made on indications shown in Table 1. The most common indications was intestinal obstruction followed by peritonitis and stoma complications. Per-operative findings in abdominal re-explorations are shown in Table 2. Anastomotic disruption was on top with 23.6% followed by interloop adhesions 21.8% and burst abdomen 10.9%. Interval between initial surgery and re-exploration was 12.5±3.7 days (range from 2 days to 55 days). Outcome analysis showed mortality of 14.5% (Table 3).

Indication for Re-exploration	Frequency	Percent
Peritonitis	9	16.4
Entero-cutaneous Fistula	4	7.3
Intestinal Obstruction	17	30.9
Burst Abdomen	6	10.9
Complications of stoma	9	16.4
Intra-abdominal collection	5	9.1
Foreign body	3	5.5
Persistent bile leak	2	3.6
Total	**55**	**100.0**

Table 1: Indications for Re-exploration

Per Operative findings	Frequency	Percentage
Gut Perforation	3	5.5
Anastomosis Disruption	13	23.6
Interloop Adhesion	12	21.8
Anastomotic Stenosis	2	3.6
Burst Abdomen	6	10.9
Intra-abdominal collection	5	9.1
Gangrenous Stoma	5	9.1
Phytobezoar in distal ileum	1	1.8
CBD injury	2	3.6
Intra-abdominal bleeding	1	1.8
Parastomal herniation	3	5.5
Gossypiboma	2	3.6
Total	**55**	**100.0**

Table 2: Operative findings in Re-exploration

Indication of Re-exploration	Outcome	
	Expired	Improved and further follow up
Peritonitis	3	6
Enterocutaneous Fistula	2	2
Intestinal Obstruction	1	15
Burst Abdomen	1	5
Complications of stoma	0	9
Intra-abdominal collection	1	4
Foreign body	0	4
Persistent bile leak	0	2
Total	**08**	**47**

Table 3: Outcome of abdominal re-exploration

DISCUSSION

Abdominal re-exploration in pediatric patients is the main reason for morbidity and can lead to increase in mortality rate. ARE can be classified as early and late, based on the interval after the initial surgery. Reported frequency of ARE is 1.7% to 15%.[9] This has been regarded as rescue procedure to combat complications encountered due to initial laparotomy. Different studies have

been conducted to find out factors and parameters for immediate re-exploration. Identification of candidates liable to re-explore is always challenging.[10] Clinical observations and certain investigations were used to point out cases who will get benefit as a result of re-exploration.[1]

Research has focused on indication and outcome of ARE. The current study had the same objective to clarify the issue further and share our experience. Current study includes 55 patients who underwent abdominal exploration within 60 days of 1st laparotomy. Mean age of patient in current study was 41 months and male patient percentage is 64. Negussie *et al.* reported similar results with a mean age of 37 months and male patient percentage of 54%.[11] Another study endorsed our finding with a high percentage of re-exploration for male patients.[12] Whether male gender is more prone to post-op complication warrants further studies.

ARE has been reported to be performed for both elective and emergency case.[13] Literature review showed high percentage of re-exploration for emergency cases with a percentage of 55 to 61%.[14,15] Unstable condition of patients and less experience of operating surgeon in emergency are the factors responsible for high level of ARE in this study.

Among indications intestinal obstruction was the most common indication to re-explore the patients and inter loop adhesions was the most common culprit for it. A scoring system has been reported to ease decision of re-exploration in peritonitis patients [16], however in current study patients re-exploration decisions were taken on clinical grounds. In a study conducted at Mexico revealed that intra-abdominal collection is the top most reason for re-exploration, followed by evisceration, anastomosis dehiscence, bleeding and stoma complications.[15] ARE has been reported for Hirschsprung's disease due to obstructive symptoms and current study has similar cases which were re-explored for intestinal obstruction.[17] Another study showed anastomotic leak and post-operative collection as most common reasons leading to re-exploration.[11] In a study conducted in India, fecal fistula was most important reason to re-explore the patient and intestinal obstruction was on bottom in the list, which is in contradiction to the current study.[12]

Current study has analyzed the operative findings in re-exploration, with findings of anastomotic disruption, inter-loop adhesions and intra-abdominal collection on top of the list. Literature review showed similar results however frequency reported is different from center to center. Some centers have reported anastomotic leak as most common cause of re-exploration while others found intra-abdominal collection to be the top most culprit.[18]

Initial Surgery, developing complication and then re-exploration will definitely have effect on the outcome. Variability of reports exists on the mortality rate related to re-exploration. Reported rate in different studies with a percentage of 6% to 30%.[1,19] Most of the mortalities have been associated with initial surgery done as emergency. Current study has mortality rate of 14.5%. Cross tabulation revealed that mortality was high in fecal fistula (50%) and peritonitis (33.3%) patients. Timely intervention to combat the deleterious effects of complicated initial surgery, would have reduced number of mortalities.[18] Sepsis and multi organ failure were the main reasons for mortality.[7]

As far as the limitations of this study are concerned, observational study design and single center experience can affect the result to be generalized. Multicenter experience and prospective study is recommended to further clarify the factors on this issue.

CONCLUSION

Abdominal re-exploration can lead to significant morbidity and mortality. Analysis of factors leading to re-exploration showed Intestinal obstruction, peritonitis, stoma complications and burst abdomen as leading reasons for re-exploration. Re-exploration for emergency cases is on top and mortality rate has strong association with re-exploration done for peritonitis, fecal fistula, wound dehiscence.

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