

Retrospective Study on Indication and Outcome of Emergency Exploratory Laparotomy in a Peripheral Medical College of West Bengal

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Abstract: ***Background:** Exploratory laparotomy is a surgical procedure performed in a patient who requires surgery when the actual cause and nature of the disease is not certain. Emergency exploratory laparotomy (EEL) is usually carried out as an emergency procedure in patients who are acutely ill and require urgent operation for control and stabilization of their condition. Objective: Aim of this study is to evaluate indications and post operative outcomes and complication in patients undergone EEL. Methodology: It is a retrospective 6 - month study from March to September of 2023, among general surgery patients undergone EEL. Patient's age, sex, diagnosis, intraoperative findings, operative procedure, and outcomes were extracted and analysed. Results: A total 716 surgical operations, 83 EEL were performed. (11.59% of total surgery) during this period. 20 - 60 yrs. age being most common 67.46%, <20 yrs. 14.45%. >60 yrs. = 36.14%. Ratio being <20: 20 - 60: >60 = 1: 4.9: 2.4. Peak ages were 21 - 30 years and 31 - 40 years. M: F = 63: 20 (3.15: 1). Performative peritonitis being the most common cause (22.89%) 2nd most common BTA (20.48%) followed by large bowel malignancy (16.86%) Appendicular perforation (9.63%), Volvulus (8.93%), ileoileal intussusception, trauma by sharp instrument, obstruction due to post operative adhesion, obstructed hernia, tichozebezoar etc. were other causes. A total of 10 patients undergone complication: 12.04%, Mortality rate 3.61%. All the mortality were subjected to late presentation, as they arrived after atleast 5 days of their acute symptoms. Each of them developed sepsis and multiple organ dysfunction before death. Conclusion: EEL is still very relevant in general surgery practice. It is commonly advocated in conditions when there is rapid deterioration of patient's condition, or the patient cannot be stabilized for a possible diagnosis to be made. Performative peritonitis being the most common cause. Post operative complications and mortality rate was 12.04% and 3.61% respectively.*

Keyword: Laparotomy, indication, complication, mortality

1. Introduction

The term laparotomy is derived from two Greek words: 'lapara' (meaning the soft anterior part of the trunk between the ribs and the pelvic bone) and 'otomy' (meaning making a surgical incision). Surgically, laparotomy is a procedure involving making a large incision through the abdominal wall to gain access into the abdominal cavity for diagnostic or therapeutic reasons.

Exploratory laparotomy is a surgical operation performed on a patient who requires surgery, but the actual cause and nature of the disease is not known. On the other hand, therapeutic laparotomy is done for a known disease which requires operation for its treatment. Exploratory laparotomy is usually conducted as an emergency procedure in patients who are acutely ill and require urgent operation for control and stabilization of their disease condition.

The indications for exploratory laparotomy are wide and varied. It is usually performed for cases of acute abdomen which have not responded to conservative measures or have shown rapid deterioration in patient's clinical condition. Indications may include blunt and penetrating abdominal traumas with associated haemodynamic instability, bowel perforations, complicated inflammation of some intra - abdominal viscera, small and large bowel obstructions, mesenteric ischaemia etc. Earlier before the advent and widespread use of current advanced imaging techniques, most patients presenting with acute abdominal conditions underwent emergency surgical exploration.

However, with the improvement in the use of modern imaging techniques and with the current use of laparoscopy, the need for exploratory laparotomy is dwindling.

Nonetheless, the importance and place of exploratory laparotomy as a rapid and cost - effective diagnostic and therapeutic tool in the management of some cases of acute abdomen are still very apt.

The objective of this study is to appraise the common indication for exploratory laparotomy in a General Surgery unit as well as to assess the post operative outcome and complications.

2. Methodology

This is a 6 - month retrospective study extending from March to September 2023. The study was carried out at MIDNAPORE MEDICAL COLLEGE AND HOSPITAL, WEST BENGAL. The hospital is a tertiary health care hospital, located at Paschim Medinipur district, West Bengal. All the consecutive patients in General Surgery unit who had exploratory laparotomy within the study period were recruited into the study.

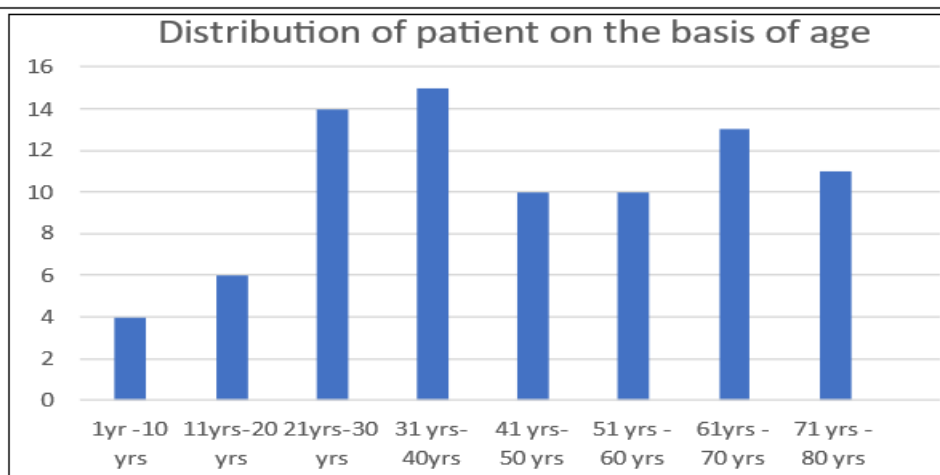
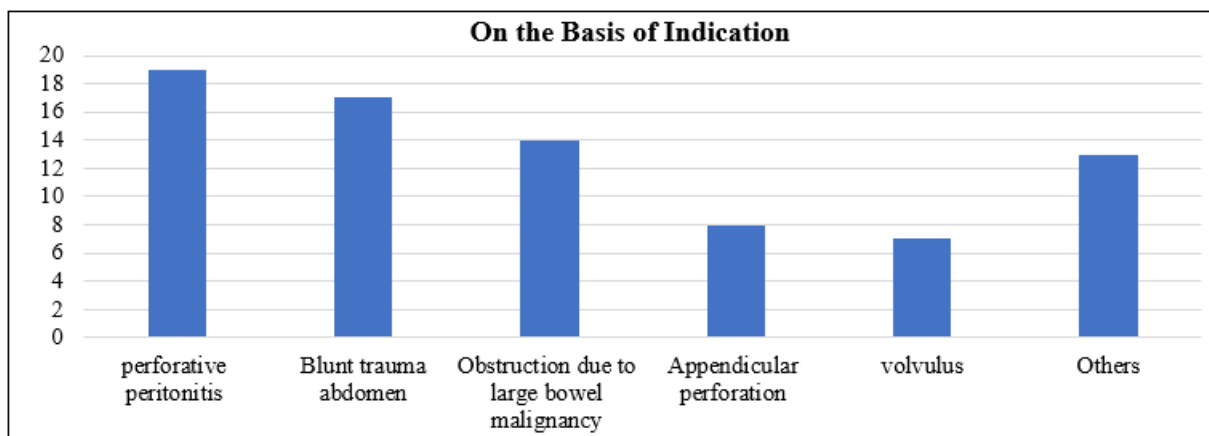
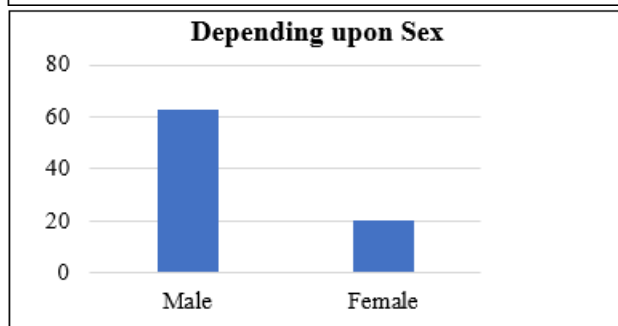
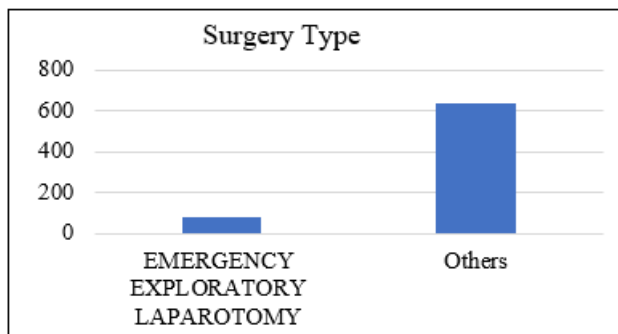
The patient's identification numbers were obtained from the theatre records and the case notes retrieved from the records department. Their demographics include age, sex, intraoperative findings, operative procedures, complications, and outcomes were extracted and analysed.

3. Results

A total of 83 exploratory laparotomy were performed out of 716 surgical operations conducted within the study period (11.59% of total surgery). The age range was 6 - 79 year. The peak ages were 21 - 30 years and 31 - 40 years. (Figure1)

Out of 83 patients underwent exploratory laparotomy, 63 were male and 20 were female, giving a ratio of 3.15: 1.

The commonest indication for exploratory laparotomy was peptic perforation constituting 19 out of 83 patients (22.89%), Blunt trauma abdomen 17 patients accounting to 20.48%. Obstruction due to large bowel malignancy was among 14 patients (16.86%). Complicated appendicitis (ruptured appendix and appendicular abscess) occurred in 8 patients out of 83 patients (9.63%). Volvulus accounting 8.43%, 7 out of 83 patients. Ileoileal intussusception 4 patients. Spontaneous ileal perforation seen in 5 of our patients. While obstruction due to post operative band adhesion, ileal stricture, penetrating trauma to abdomen, diverticular perforation, jejunal perforation, gangrenous Meckel's diverticulum were other causes for explorative laparotomy. Out of 19 peptic perforation 16 were male (84.21%) mostly in the age group of 31 - 40 years, 12 patients belong to this age group (63.15%). Among the 17 patients from blunt trauma abdomen male patient 14 (82.35%), most common in the age group of 21 - 30 years. 12 patients among 17 patients (70.58%). Out of 14 patients of acute intestinal obstruction 5 were male (35.71%) and most prevalent age group is 61 - 70 years (57.14%). Out of complicated appendicitis 71 - 80 years age of patient pt were more common, 4 out of 8 (50%), 5 was male and 3 female.



Indication	Male	Female	Total
Peptic perforation	16	3	19
Obstruction due to large bowel malignancy	5	9	14
Blunt trauma abdomen	14	3	17
Complicated appendix	5	3	8
Volvulus	6	1	7
Others	17	1	18

Among the 83 patients 10 patients undergone complications, giving a percentage of 12.04%. Among these subjects, 7 subjects suffered from Surgical site infection (SSI), wound dehiscence in 3 subjects. 1 patient undergone 7 episodes of haemodialysis for post operative AKI., following which the patient recovered. Patient suffered from SSI recovered on dressing and antibiotics according to wound swab report and secondary suturing done in the patient undergone wound dehiscence.

Surgical site infection	7
Wound dehiscence	3
Post operative AKI	1

3 patients succumbed to death among these 83 patients, accounting to 3.61%. Among these 3 patients 2 have perforated peptic ulcer and 1 have large bowel obstruction. All the mortalities were probably due to late presentation as they arrived more than five days from onset of their abdominal symptoms. Each of them developed sepsis and multiple organ dysfunction before death.

4. Discussion

Exploratory laparotomy is a very common procedure in general surgical practice. It is commonly performed as an emergency procedure in conditions when there is rapid deterioration of patient's condition, or the patient cannot be stabilized for a possible definitive diagnosis to be made.

Exploratory laparotomy is also carried out in cases where the need for an operation is certain, but a definitive diagnosis cannot be achieved until the abdomen is opened up. This is more so in limited resource environment where the capacity for modern imaging procedures is lacking or suboptimal.

Exploratory laparotomy has been found to be a lifesaving procedure especially in cases of trauma associated with severe haemodynamic instability which cannot be corrected by resuscitation alone.^{1, 2, 4} However, active resuscitation with intravenous fluids to correct fluid and electrolyte imbalance, blood transfusion to replenish significant blood losses and nasogastric decompression should be pursued aggressively before surgery.^{1, 2, 10, 11}

Peri - operative antibiotic required in most of the patients especially those with peritonitis from bowel perforation or obstruction¹¹. These will help to improve the patient's physiological status and reduce peri - operative and post - operative morbidity and mortality.^{1, 2, 10, 11}

Whenever possible, active efforts should be made to arrive at a definitive or a provisional diagnosis as this will help the

surgeon to plan for the surgery ahead of time and also to isolate cases that can be managed conservatively.¹

In this study, exploratory laparotomy was quite common constituting 11.59% of the total number of surgeries. The peak age was between 21 - 40 years, and this compares favourably with the peak age of 31 - 40 years reported by Suresh Patil et al² and 21 - 50 years by Kapoor et al³ in similar studies elsewhere. There is male preponderance in our series with a male to female ratio of 3.15: 1. This finding is higher than 2.57: 1 documented by Kapoor et al³ and contrasts to 1: 1 ratio obtained by Suresh Patil et al.²

The Indications for exploratory laparotomy in general surgery are numerous and varied in their frequencies. In the current review, peptic perforation was the commonest reason for exploratory laparotomy, constituting 22.89% of the total number of cases (Table 1). This finding is in similarity as hollow viscus perforation reported as the commonest indication for exploratory laparotomy in studies by Suresh Patil et al² and Kapoor et al³.

The finding of peptic perforation as the commonest cause for exploratory laparotomy in our setting may be due to late presentation. Patients with peptic perforation in were compromised clinically. This did not give room for more detailed investigations. Intestinal obstruction from large bowel malignancy was the third commonest indication for exploratory laparotomy constituting 16.86% of the cases. This together with peptic perforation made up 46.98% of the reasons for laparotomy in this review.

The second commonest cause for exploratory in this report was blunt trauma abdomen which accounted for 20.48% of the total number of patients. This value is quite high and indicates high incident of road traffic accident. This is much higher than the values of 10% and 8.29% recorded by Kapoor et al³ and Suresh Patil et al² respectively in their series. Most of the cases of trauma had significant splenic injury resulting in splenectomy, 8 of the 17 cases of trauma. (47.05%). This is consistent with findings in the literature where splenic injuries were reported as one of the commonest indications for exploratory laparotomy especially following blunt abdominal trauma^{12, 13}. Other intra - abdominal organs commonly involved in abdominal injuries are the liver and the intestine because of their large sizes and wider distribution in the abdomen¹³. Some other less common reasons for laparotomy following trauma include injury to the diaphragm, mesentery, traumatic abdominal wall hernia etc^{14 - 18}.

The fourth commonest indication for exploratory laparotomy in our study was complication from appendicitis (ruptured appendix and appendicular abscess) which accounted for 9.63% of the total number of patients. This value is slightly lower than the values of 12% and 12.7% recorded by Kapoor et al³ and Suresh Patil et al² respectively. The male to female ratio for complicated appendicitis in this study was 1.6: 1. This gender difference corresponds to the general predominance of male patients with appendicitis in most reports.^{19 - 21}.

However, this finding contrasts with equal gender distribution of appendix abscess observed by Suresh Patil et al². The peak age group for appendicitis - related cases in this study was 21

- 30 years. This corresponds to second and third decades documented by Kotiso in 2006²⁰. Abdominal injury in the current survey showed an overwhelming male predominance with a male to female ratio of 15: 1. This could be explained by the fact that males are more adventurous than females and are therefore more likely to be involved in cases of trauma. Also, cases of Peptic Perforation showed very significant male preponderance with a male to female ratio of 5.33: 1. This correlates with similar male predominance in a ratio of 4: 1 in a report by Agboola¹⁹.

A total of 10 patients had various complications following surgery, giving a complication rate of 12.04%. Generally, abdominal surgeries are sometimes marked by wound complications ranging from 2.8% - 40% depending on various factors as indication, duration before presentation, extent of disease etc.^{3, 22-23}. The current survey recorded a mortality rate of 3.61%. The causes of death in this review were perforated peptic ulcer disease in 66.66% and intestinal obstruction in remaining 33.33%. The mortality figure in this study was lower than 6.4%, 10.0% and 14.0% recorded by Hagos, Alagoa and Kotiso respectively after surgery for acute abdomen^{20, 24, 25}. All the cases of mortality in our report presented more than five days after onset of symptoms. Each developed sepsis and multiple organ dysfunction before death. This suggests that late presentation greatly enhanced the risk for mortality.

5. Conclusion

Exploratory laparotomy is still very relevant in general surgery practice particularly for those patients with acute abdominal conditions who would require urgent intervention in order to save the patient's life or prevent further deterioration in their clinical condition. Peptic perforation was the commonest indication. Late presentation was associated with significant mortality.

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