International Journal of Scientific Reports
Abouh AMA et al. Int J Sci Rep. 2025 May;11(5):180-184
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20251042

Original Research Article

Pattern of emergency laparotomy in El Obied Hospital, Western Sudan

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Received: 14 February 2025
Revised: 18 March 2025
Accepted: 19 March 2025

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ABSTRACT

Background: Emergency laparotomy is a common surgical procedure, performed for a wide variety of intra-abdominal pathologies.
Methods: this study is a prospective, descriptive for pattern of emergency laparotomy conducted at El Obeid Hospital during the period of one-year 2021. The data was collected by questionnaire from all patients who were subjected for emergency laparotomy and fulfilled the inclusion criteria.
Results: There were 72 patients, 45 males (62.5%) and 27 (37.5%) females, with male to female ratio 1.7: 1. The majority of the patients were less than 40 years of age (84.8%) and the main age ± standard deviation of 24.65±16.202 years. The common indications are traumatic acute abdomen found in 26 patients (36%), perforated hollow viscous in 26 patients (36%) and acute intestinal obstruction in 20 patients (27.8%). The major cause of perforated hollow viscous was acute appendicitis in 21 patients (81%). Four patients developed surgical site infection and one of them developed a partial burst abdomen. The mortality rate was 1.7%.
Conclusions: The most common indications for emergency laparotomy were abdominal trauma, perforated appendicitis and acute intestinal obstruction. The majority of the patients were discharged in good condition.

Keywords: Abdominal trauma, Emergency laparotomy, Intestinal obstruction, Perforated appendicitis, Surgical outcomes, Western Sudan

INTRODUCTION

The emergency laparotomy is considered a high-risk procedure with significant postoperative morbidity and mortality. Despite being one of the most commonly performed emergency surgical procedures, there is a scarcity of data on the outcomes and postoperative mortality rates of emergency laparotomy.[1] If the patient is clinically stable, the decision to proceed with laparotomy should only be made after doing the necessary investigations, thereby providing a provisional diagnosis.[2] When a patient is diagnosed with hemodynamic instability, haemorrhage-induced hypotension, organ damage or peritonitis after a penetrating injury to the abdomen or diaphragm, emergency laparotomies are commonly performed. The management of blunt trauma injuries can be challenging. It is difficult to identify intra-abdominal injuries with imaging modalities, so careful consideration should be given to the indications of laparotomy.[3] Generally, laparotomies are required in about 25% of abdominal injuries. Peritonitis, hemodynamic instability, evisceration and impalement are most common indications for laparotomies. The non-operative management of hemodynamically stable solid organ injuries is a standard protocol with a failure rate of 2-3%. However, the lack of imaging modalities in developing countries makes non-operative management a major challenge.[4] It is common for emergency laparotomies to result in high mortality rates, postoperative complications and prolonged hospital stays.

There is considerable heterogeneity in patient factors, underlying pathology and surgical procedures, but perforated viscous, intestinal obstruction, bowel ischemia and haemorrhage are common. Patients undergoing emergency laparotomy have a disproportionately high mortality rate compared with other acute surgical emergencies. It is estimated that the mortality rate in octogenarians is about 45% and the complication rate is about 70%. The number of elderly patients undergoing emergency surgery is increasing and initiatives to improve complication-free survival are urgently required.[5] The purpose of this study is to evaluate the patterns of emergency laparotomy in western Sudan.

Objective of the study

The study aimed to evaluate the patterns, indications and outcomes of emergency laparotomies performed at El Obeid Teaching Hospital, Western Sudan. Specifically, it sought to identify the most common causes requiring surgical intervention, analyze patient demographics and assess postoperative morbidity and mortality rates.

METHODS

Study was conducted in El Obeid teaching hospital, El Obeid City, North Kordofan state, Sudan within a period of one year from January to December 2021

This study is a prospective, descriptive analysis involving material from 72 patients who underwent emergency laparotomy at El Obeid Hospital over the one-year period of 2021. Data collection was conducted using a self-structured questionnaire, which contained three sections: personal data, management and postoperative follow-up.

Sampling was non-probability sampling with the following criteria non-probability convenient sampling technique was used to involve all patients who presented to El Obeid Teaching Hospital for emergency laparotomy during the study period and accepted to participate were included, while patients who did not accept were excluded.

Collected data were organized into standardized spreadsheets and input into SPSS software for analysis. The analysis included calculating frequencies, performing cross-tabulations, determining relative risk and conducting a Chi-square test, all with a 95% confidence interval.

Ethical approval

Consent was obtained from the authorities at El Obeid Teaching Hospital and the Ministry of Health, North Kordofan State, Sudan. Verbal and written informed consent were also obtained from all participating patients before enrollment in the study. Confidentiality and anonymity of patient data were ensured throughout the research process.

RESULTS

This study examined a group of 72 patients underwent emergency laparotomy, whose ages ranged from one to 71 years, with a mean age of 24.65 years. Among the 72 patients, 45 (62.5%) were males and the remaining 27 (37.5%) were females, resulting in a male-to-female ratio of 1.67:1.00.

The majority of patients, specifically those between the ages of 16 and 25 years, followed by the age groups of 15 years and less and 36 years and more, comprising 36.1%, 27.8% and 20.8%, respectively, out of a total of 72 patients. While the age distribution for males was similar to the whole population, females appeared to have a substantially younger age profile. Nearly 64% of the participants in the study resided in North Kordofan State, as stated in Table 1 And Figure 1.

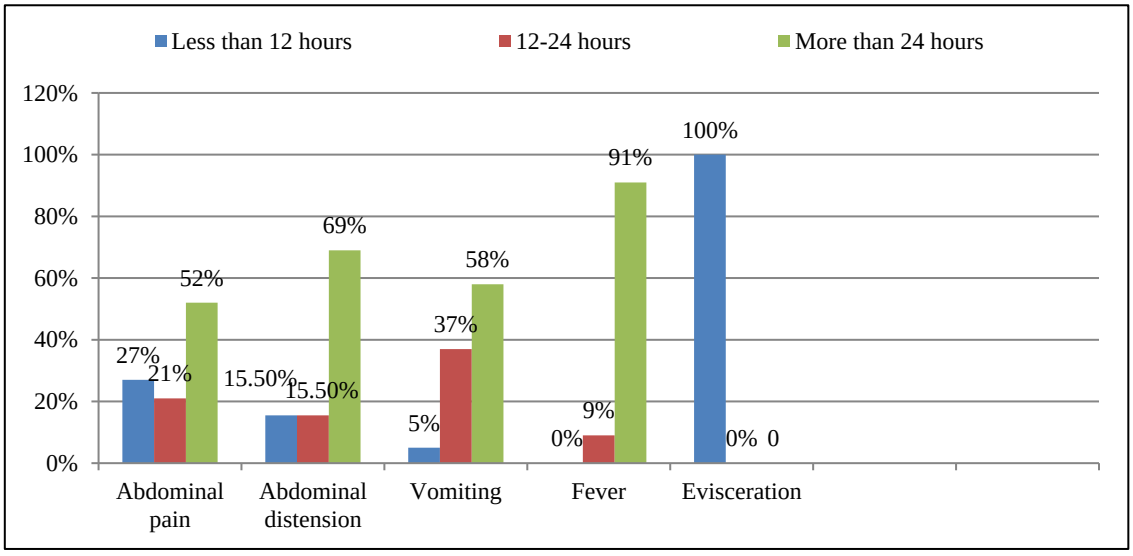

Figure 1: Description of the surgeons by age, sex and residence.

Table 1: Distribution of study participants by sex, age and residence.

Variable	Male	Female	Total
Age group (in years)			
≤15	15	5	20
16-25	16	10	26
26-35	4	7	11
≥36	10	5	15
Total	45	27	72
Residence			
North Kordofan State	28	18	46
South Kordofan State	10	5	15
West Kordofan State	7	4	11
Total	45	27	72

Table 2: Distribution of study patients by symptoms and duration of symptoms.

Variable	Less than 12 hours	12-24 hours	More than 24 hours	Total
Abdominal pain				
Yes	17	13	32	62
No	5	4	1	10
Abdominal distension				
Yes	4	4	18	26
No	18	13	15	46
Vomiting				
Yes	1	7	11	19
No	21	10	22	53
Fever				
Yes	0	2	20	22
No	22	15	13	50
Evisceration				
Yes	1	0	0	1
No	21	17	33	71

Table 3: Distribution of diagnosis of participants.

Variable	Traumatic acute abdomen	Complicated appendicitis	Intestinal obstruction	Perforated hollow viscous	Total
Perforated appendicitis	-	21	-	-	21
Penetrating stab	13	-	-	-	13
Penetrating gunshot	4	-	-	-	4
Blunt abdominal trauma	9	-	-	-	9
Intussusception	-	-	10	-	10
Adhesive I O	-	-	5	-	5
Sigmoid volvulus	-	-	3	-	3
Strangulated hernia	-	-	2	-	2
Perforated du	-	-	-	3	3
Perforated typhoid ulcer	-	-	-	1	1
Perforated terminal ilium	-	-	-	1	1
Total	26	21	20	5	72

Table 2 show the distribution of study patient's symptoms and duration of symptoms. 62/72 of patients (86%) reported abdominal pain, including 17/62 (27%) duration of symptoms is less than 12 hours, 13/62 (21%) duration of symptoms is 12 to 24 hours and 32/62 (52%) duration of symptoms is more than 24 hours. 26/72 of patients (36%) reported abdominal distention, including 4/26 (15.5%) duration of symptoms is less than 12 hours, 4/26 (15.5%) duration of symptoms is 12 to 24 hours and 18/26 (69%) duration of symptoms is more than 24 hours.

19/72 of patients (26%) reported vomiting, including 1/19 (5%) duration of symptoms is less than 12 hours, 7/19 (37%) duration of symptoms is 12 to 24 hours and 11/19(58%) duration of symptoms is more than 24 hours. 22/72 of patients (31%) reported abdominal pain, including, 2/22 (9%) duration of symptoms is 12 to 24 hours and 20/22 (91%) duration of symptoms is more than 24 hours. Only one of patients (1.4%) reported evisceration, presented more than 24 hours.

Table 3 show the distribution of diagnosis of patients. 26/72 patients (36%) diagnosed as traumatic acute abdomen, including 13/26 (50%) penetrating stab abdomen, 9/26 (35%), blunt abdominal trauma and 4/27 (15%) diagnosed as gunshot abdomen. About 21 (29%), reported perforated appendicitis. 20 (28%) participants reported intestinal obstruction, including 10/20 (50%) intussusception, 25% adhesive intestinal obstruction, 15% sigmoid volvulus and 10% strangulated hernia. Around 5/72 (7%) patients reported perforated hollow viscous, including 3 (60%) perforated duodenal ulcer, 20% perforated typhoid ulcer and 20% perforated terminal ilium.

DISCUSSION

This study analyzed the patterns of emergency laparotomy at El Obeid Hospital over one year, involving 72 patients. The predominance of male patients (62.5%) aligns with findings from similar studies in the region.[6] The mean age of patients was 24.65 years and the majority were younger individuals, reflecting trends observed in other research where younger male patients were more commonly affected by acute abdominal conditions requiring emergency surgery.[7,8]

Abdominal pain was the most frequently reported symptom (86%), followed by fever (31%) and vomiting (26%). This finding supports previous studies that identified abdominal pain as a primary symptom driving emergency surgical intervention.[7,8] Delayed presentation was a significant concern in our cohort, with 52% of patients experiencing symptoms for more than 24 hours before seeking medical attention. This delay in seeking care increases the risk of complications, higher morbidity and extended hospital stays, as seen in other studies.[9,10]

The most common indication for emergency laparotomy was perforated appendicitis (29%), followed by traumatic acute abdomen (36%) and intestinal obstruction (28%). These results are consistent with reports indicating that perforated appendicitis remains a leading cause of emergency laparotomy worldwide, particularly in resource-limited settings.[9] Our study further supports the findings of Ogbuanya et al, who reported that peritonitis, particularly from perforated hollow viscera, was a major indication for emergency surgery in Sub-Saharan Africa.[10] Additionally, the proportion of patients with traumatic abdominal injuries (penetrating and blunt trauma) in our study is similar to findings from Ethiopia, where approximately 25% of laparotomies were trauma-related.[4]

The postoperative mortality rate in this study was relatively low (14.2%), aligning with results from Jansson et al, who reported similar mortality outcomes after emergency laparotomies in Sweden.[11] However, mortality remains disproportionately high among elderly patients, with previous research estimating mortality rates in octogenarians to be as high as 45%.[5] Our study reinforces the urgent need for improved preoperative risk stratification and postoperative care to enhance patient outcomes.

Overall, our findings are consistent with international trends while highlighting challenges unique to resource-limited settings, such as delays in seeking care, the burden of trauma-related laparotomies and the limited availability of imaging modalities for diagnosing intra-abdominal injuries[3,4] Future studies should explore strategies to optimize patient outcomes, including early intervention, enhanced surgical training and improved postoperative monitoring to reduce morbidity and mortality.

This study has several limitations. The small sample size (72 patients) may limit the generalizability of the findings. Additionally, the study was conducted in a single region (North Kordofan State), which may not reflect patterns in other areas. The reliance on retrospective data may introduce recall bias, and variations in clinical presentation or management approaches were not extensively analyzed. Lastly, the study did not assess long-term patient outcomes, which could provide further insight into prognosis and treatment effectiveness.

CONCLUSION

Emergency laparotomy was most common in young males, with abdominal pain as the leading symptom, often persisting for over 24 hours. Traumatic acute abdomen, perforated appendicitis and intestinal obstruction were the primary diagnoses. Delayed presentation was frequent, highlighting the need for earlier recognition and intervention to improve outcomes.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Abouh AMA, Koko MBA, Doumi EBA. Pattern of emergency laparotomy in El Obied Hospital, Western Sudan. Int J Sci Rep 2025;11(5):180-4.