

## Original Article

# A Non-randomized Retrospective Study of Applicability of Clavien-Dindo Classification of Surgical Complications to Emergency Laparotomies

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**Background :** In developing countries, emergency laparotomy have very high morbidity and mortality rates. The aim of the present study was to evaluate and find out various determinants for safe outcome in emergency laparotomy in terms of decreased morbidity and mortality.

**Materials and Methods :** A non-randomized retrospective study with collected data from 300 patients with emergency laparotomy. Data from various preoperative and operative factors, surgical technique and complications were recorded. The output was measured as better and worse, as per the Clavien–Dindo classification.

**Results :** The study enrolled 300 patients with a male:female ratio of 4.5:1. The majority of patients presented with the history of abdominal pain (98%), abdominal distension (62%) and altered bowel habit (62%). Perforation peritonitis constituted 231 cases followed by intestinal obstruction in 60 cases, rupture liver abscess with peritonitis in 9 cases. Using the Clavien–Dindo classification, 30% patients had no complications 27% had Grade I, 12% had Grade II, 16% had Grade III, 11% had Grade IV and 4% had Grade V complication rates.

**Conclusion :** Postoperative complications increase patient morbidity and mortality and are target for quality improvement programs. Many complications may be prevented by thorough preoperative evaluation preceded by adequate aggressive resuscitation, broad spectrum antibiotics, correction of electrolyte imbalances, early minimum & sound surgical technique and careful follow-up care. The Clavien–Dindo classification can be adapted to assess the severity of postoperative complications following emergency laparotomy.

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**Key words :** Clavien–Dindo Classification, Postoperative Complications, Laparotomy, Bowel Perforation, Intestinal Obstruction.

Laparotomy is a most common surgical procedure done by routine surgical team. Postoperative complication may be defined as any negative outcome as perceived by the surgeon or by the patient. It may occur intraoperatively in the immediate postoperative period, or later on. They are the chief weakness of surgeon's craftsmanship on operation table. Commencing as a seemingly minor disturbance and if allowed to persist they can jeopardize the patient recovery and even result in a fatal outcome. Post operative complication may occur after laparotomy whether elective or emergency. Various factors like

### Editor's Comment :

■ The Clavien–Dindo classification system serves as a valuable tool for assessing postoperative complications in emergency laparotomies. It categorizes outcomes into grades, with Grades I and II denoting minimal problems or none at all and Grades III, IV and V denoting more serious complications. This classification is based on the therapy required to address a specific complication, ensuring an objective and reproducible ranking of complications.

proper resuscitation, meticulous surgical technique, age, any co-morbid condition, anaesthesia technique and postoperative care contribute to final result. More accurately gauging the quality of care may come from adverse occurrences closely linked to the processes of care, like postoperative complications, rather than from death rates or other intermediate outcomes. Therefore, early detection and proper intervention can reduce the morbidity and mortality related with complication<sup>1</sup>.

The assessment of surgical operations has been significantly impacted by the lack of agreement on the definition and grading of unfavourable postoperative complications. Clavien, *et al*<sup>2</sup> 1992 suggested a new classification of complications, which they defined as

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any variation from the ideal postoperative course that is not inherent in the treatment and does not include a failure to cure. A condition that doesn't improve after surgery isn't a result of a problem; rather, it indicates a failure to heal. There was not much guidance provided on how this categorization should be applied to patients experiencing emergency surgery because it was created and verified with patients undergoing elective general surgery.

The current study's objectives are to assess the Clavien-Dindo classification (Table 1) of surgical complications in patients undergoing emergency laparotomies and investigate pre-operative variables for risk assessment that have to be recorded in a surgical complications database<sup>3</sup>.

### MATERIALS AND METHODS

A non-randomized prospective study of postoperative complications in 300 patients who had undergone emergency laparotomy in JLN Medical College and Hospital, Ajmer under various surgical units, during the period of December, 2016 to September, 2018.

#### Inclusion Criteria :

All patients (>15 years) presenting at emergency or surgical OPD and had undergone emergency laparotomy.

#### Exclusion Criteria :

- Children < 15 years.
- Patient with history of trauma.
- Redo laparotomy
- Pregnant women

#### Type of Study :

Non randomized prospective Time-Bound Hospital Based study.

#### Method of Collection of Data :

Based on inclusion and exclusion criteria, all abdominal cases admitted to the surgical ward for emergency laparotomy and surgery were assessed using a comprehensive clinical examination, co-morbid conditions and history. All patients underwent routine investigations and based on the provisional diagnosis and the patient's needs, specialized investigations such as CT, USG and X-rays were performed.

Intravenous fluids were used to revive all patients before to surgery and the electrolyte imbalance was addressed. For each patient, urethral catheterization and Ryle's tube aspiration were performed. All patients received wide spectrum antibiotics prior to surgery. Patients with anemia needed blood transfusions. Under general anaesthesia, all patients underwent exploratory

Table 1 — Classification of surgical complication proposed by Clavien –Dindo et al<sup>4</sup>

Grades	Definition
Grade I :	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic and radiological interventions. Allowed therapeutic regimens are: drugs as antiemetic, antipyretics, analgesics, diuretics and electrolytes and physiotherapy. This grade also includes wound infections opened at the bedside.
Grade II :	Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions and total parenteral nutrition are also included.
Grade III :	Requiring surgical, endoscopic or radiological intervention
Grade III-a :	Intervention not under general anaesthesia
Grade III-b :	Intervention under general anaesthesia
Grade IV :	Life-threatening complication (including CNS complications)* requiring IC/ICU-management
Grade IV-a :	Single organ dysfunction (including dialysis)
Grade IV-b :	Multi organ dysfunction
Grade V :	Death of a patient

laparotomy through a midline incision. The entire intestine was examined and the results were recorded concerning the volume and kind of fluid, the pathology of the gut, the area of the gut affected and the state of the intestine next to it.

A number of parameters were recorded, including the surgical technique, intraoperative findings, length of the operation, length of the recovery time, postoperative complications and their management. Postsurgical complications were then assessed and classified using the Clavien-Dindo classification.

Following surgery, all patients were monitored in the ward or Intensive Care Unit (ICU). Each patient's medication regimen was different. The necessity for postoperative blood products, complete parenteral nutrition, ventilator support and complications such as anastomosis leak, wound infection, ruptured abdomen, and respiratory issues were all documented. The complications were graded (Grades I–V), as per the classification proposed by Clavien–Dindo<sup>4</sup>.

- No complications
- Grade I : Wound infection
- Grade II : Respiratory complications
- Grade III : Burst abdomen, anastomosis leak
- Grade IV : Septicaemia
- Grade V : Death

Better (Grades I, II and No problems) and worse (Grades III, IV and V) outcomes were used to gauge the outcome. For the purpose of this study, a predesigned proforma was used to collect and record data. The Statistical Package for the Social Sciences (Version 20.0 for Windows, Developer(s) IBM

Table 2 — Pre-operative Data		
Variable	No of patients	Percentage
<b>Age and sex distribution :</b>		
Age < 60 year	216	72%
Age > 60 year	84	28%
Male	249	83%
Female	51	17%
<b>Clinical sign &amp; symptom :</b>		
Pain abdomen	294	98%
Abdominal distension	186	62%
Altered bowel habit	186	62%
Nausea and vomiting	138	46%
Fever	108	36%
Respiratory distress	84	28%
Shock	72	24%
Diarrhoea	3	1%
Tenderness	288	96%
Guarding	252	84%
Distension	216	72%
Rigidity	210	70%
<b>Positive findings on investigations</b>		
Pneumoperitoneum	216	72%
Air fluid level	69	23%
Increase Total Leucocyte Count	162	54%
Raised serum creatinine	153	51%
Electrolyte imbalance	72	24%
Raised serum total bilirubin	69	23%
Anemia	42	14%
<b>Associated comorbidity</b>		
H/o Tuberculosis	27	9%
DM	21	7%
Hypertension	18	6%
Previous H/O surgery	18	6%
<b>Time for resuscitation</b>		
< 24 hour	147	49%
> 24 hour	153	51%

Corporation, Armonk, New York) was the program used for data analysis. The chi square test and the analysis of variance (ANOVA) test are suitable for data analysis. Every test was used with a 95% significance level.

## RESULTS

From this study two peaks in age distribution were found in emergency laparotomies. First in age group 20-40 years patients and second in age group 40-60 years. The oldest patient was eighty-six years old, and the youngest was eighteen. The ratio of men to women was 4.5:1.

The majority of patients (98%), Abdominal Distension (62%), Abnormal Bowel Habits (62%), Nausea or Vomiting (46%), Fever (36%) and Shock (24%), caused by Septicaemia and Dehydration, were among the symptoms that they reported having experienced in the past. The majority of patients (96%) reported having abdominal pain, which was followed by Guarding (84%), Distension (72%) and Stiffness (70%).

In our study patients present within 3 days of onset of symptom were 153 and after 3 day were 147 patients.

In all patient flat plate abdomen X-ray was done and found gas under diaphragm in 216(72%), dilated bowel loop with air fluid level 69(23%), rest of patients X-ray were normal. Gas under diaphragm was present in 216 patients of perforation out of 231 patients of perforation (93.5%). Pre-operative investigative data included increase Total Leucocyte Count (>10000) in 54%, raised creatinine (>1.2 mg/dl) in 51%, electrolyte imbalance in 24%, raised serum total bilirubin (>1.2mg/dl) level in 23% and Anaemia (Hb<10gm/dl) in 14%.

In 48% of the cases, the time needed for resuscitation, diagnosis, and patient optimization for surgery was less than 24 hours, while in 52% of the cases, it was more than 24 hours.

Table 3 — Operative Data		
Variable	No of patients	Percentage
<b>Indication of Laparotomy :</b>		
<b>Perforation Peritonitis</b>		
Gastroduodenal perforation	165	55%
Small bowel perforation	54	18%
Large bowel perforation	6	2%
Appendicular perforation	3	1%
Gall bladder perforation	3	1%
<b>Intestinal obstruction</b>		
Band adhesion	27	9%
Malignancy	15	5%
Sigmoid volvulus	9	3%
Stricture	6	2%
Tuberculosis	3	1%
Rupture liver abscess	9	3%
<b>Peritoneal fluid :</b>		
<1000 ml	153	51%
>1000 ml	138	46%
Nil	9	3%
Bilious	171	57%
Feceal	54	18%
Serous	45	15%
Purulent	21	7%
<b>Surgical procedure :</b>		
<b>Gastroduodenal perforation</b>		
Omentopexy	144	48%
Figure of eight	21	7%
<b>Small bowel perforation</b>		
Primary repair with omental patch	36	12%
Resection anastomosis	12	4%
Resection anastomosis with ileostomy	6	2%
Appendisectomy	3	1%
Cholecystectomy	3	1%
<b>Large bowel perforation</b>		
Resection anastomosis with ileostomy	6	2%
Intestinal obstruction		
Release of band with adhesiolysis	27	9%
Resection anastomosis	15	5%
Resection anastomosis with ileostomy	9	3%
Right hemicolectomy with ileostomy	6	2%
Left hemicolectomy with ileostomy	3	1%
Peritoneal toileting	9	3%
<b>Duration of surgery :</b>		
< 2 hour	159	53%
> 2 hour	141	47%

Most cases involved acute abdomen/peritonitis. There were 231 cases of perforation peritonitis, 60 cases of intestinal obstruction and 9 cases of ruptured liver abscess with peritonitis. On exploration 171 patients have bilious peritoneal fluid, faecal containing peritoneal fluid in 54 cases, serous peritoneal fluid in 45 cases, purulent fluid in 21 cases and no peritoneal fluid in 9 cases. In 153 patients amount of peritoneal fluid >1000ml, in 138 patients amount of peritoneal fluid were ≤1000ml and 9 patients have no free fluid in peritoneal cavity.

Gastroduodenal Perforations (165) were treated with omentopexy in 144 patients and figure of eight repair in 21 patients. Small bowel perforations (54) were managed according the condition of the gut primary repair of perforation with omental patch (36), resection anastomosis (12) and resection anastomosis with stoma (6). Large bowel perforation (6) patients were managed by resection anastomosis with stoma (6). Intestinal obstruction (60) was managed by release of band and adhesion-lysis (27), resection anastomosis (15), resection anastomosis with ileostomy (9), right hemicolectomy with ileostomy (6), extended left hemicolectomy with ileostomy (3). In 6 patients of rupture liver abscess simple peritoneal lavage with drain was done. Right hemicolectomy with ileostomy and peritoneal lavage was done in 3 patients. Three patients of appendicular perforation were managed by appendicectomy. Three cases of GB perforation were treated by cholecystectomy.

Postoperative complications recorded were wound infection 81(27%), respiratory complications 36(12%), septicaemia 33(11%), burst abdomen 30(10%),

anastomosis leak/faecal fistula 18(6%) and Death in 12(4%). A total of 300 patients (30%) had no issues, 81 patients (27%) had Grade I complications, 36 patients (12%), 48 patients (16%) had Grade III complications, 33 patients (11%) had Grade IV complications, and 12 patients (4%), had Grade V complications. These data were based on the Clavien-Dindo classification.

## DISCUSSION

Emergency laparotomy is one of the most commonly performed major surgical procedures in emergency. It becomes imperative to assess the risk of morbidity and mortality in each of such patients undergoing emergency laparotomy, as these patients are often brought to the hospital in morbid conditions. Risk assessment prior to surgical procedure not only allows proper allocation of resources and psychological preparedness about outcome among relatives but also helps surgeons in medico legal suits. In our study, Median age of patient was 45 year, 72% patients were below the age of 60 years. This is consistent with other studies as reported by Jignesh A Gandhi, *et al*<sup>5</sup>. In our study majority of patients were males (249 males and 51 females) and the male-to-female ratio was 4.5:1. Another study done by A. Singh, *et al*<sup>6</sup> reported male to female ratios of 3.95:1 also showed that there were more male patients going for emergency laparotomy.

Patients' clinical presentations differed depending on the pathogenic state and location. Individuals who experienced a perforation of the duodenum typically had a brief history of upper abdominal or epigastric pain. Most patients with ileocecal pathology had a

Table 4 — Various Surgical Procedures according to Pathology and Outcome in Relation to Clavien-Dindo Classification

Pathology	No of patients	Percentage	Surgical procedure	n(%)	Better outcome	Worse outcome
Perforation peritonitis						
Gastroduodenal perforation	165	55%	Omentopexy	144(87.27%)	111(77.08%)	33(22.92%)
			Figure of eight	21(12.73%)	18(85.71%)	3(14.29%)
Small bowel perforation	54	18%	Primary repair with omental patch	36(66.67%)	27(75%)	9(25%)
			Resection anastomosis	12(22.22%)	6(50%)	6(50%)
			Resection anastomosis with ileostomy	6(11.11%)	3(50%)	3(50%)
Large bowel perforation	6	2%	Resection anastomosis with ileostomy	6(100%)	0(0%)	6(100%)
Appendicular perforation	3	1%	Appendicectomy	3(100%)	3(100%)	0(0%)
Gall bladder perforation	3	1%	Cholecystectomy	3(100%)	0(0%)	3(100%)
<b>Intestinal obstruction</b>						
Band adhesion	27	9%	Release of band and adhesionolysis	27(100%)	21(77.77%)	6(22.23%)
Malignancy	15	5%	Resection anastomosis	6(40%)	3(50%)	3(50%)
			Right hemicolectomy with ileostomy	6(40%)	3(50%)	3(50%)
			Extended left hemicolectomy with ileostomy	3(20%)	0(0%)	3(100%)
Sigmoid volvulus	9	3%	Resection anastomosis with ileostomy	9(100%)	6(66.67%)	3(33.33%)
Stricture	6	2%	Resection anastomosis	6(100%)	3(50%)	3(50%)
Tuberculosis	3	1%	Resection anastomosis	3(100%)	0(0%)	3(100%)
Rupture liver abscess	9	3%	Peritoneal lavage	6(66.67%)	3(50%)	3(50%)
			Right hemicolectomy with ileostomy	3(33.33%)	0(0%)	3(100%)

history of nausea or vomiting, changed bowel habits, abdominal pain and distension. Individuals who had suffered a small bowel typhoid perforation also had a history of fever, which was followed by an abrupt start of abdominal pain. Patient of intestinal obstruction were present with abdominal distension, colicky pain, frequent vomiting and altered bowel habit. Patient of rupture liver abscess present with pain initially in right hypochondrium followed by generalised pain abdomen and vomiting.

In our study, the commonest sign was abdominal tenderness (96%) followed by abdominal guarding (84%), distension (72%) and rigidity (70%). In a study done by Jain R, *et al*<sup>7</sup> the commonest sign is abdominal tenderness (99.9%) followed by abdominal guarding/rigidity (61.2%).

Plain abdominal radiography remains an important diagnostic tool if it is restricted to certain surgical conditions, especially those pertaining to intestinal obstruction and hollow viscus perforation<sup>8</sup>. In our study Plain X-ray abdomen was done in all patient and found gas under diaphragm in 216 patients of perforation peritonitis with diagnostic sensitivity 93.5% and specificity 100%, these findings were contradictory to study done by Sarah L Gans, *et al*<sup>9</sup> show sensitivity 60%. When intestinal obstruction is suspected in a patient, imaging should reveal the location, reason, and severity of the obstruction<sup>10</sup>. As a standard diagnostic modality, plain abdominal radiography is recommended for the identification of intestinal obstruction<sup>11,12</sup>. In our study 69 patients showed dilated bowel loop and multiple air fluid level in plain X-ray abdomen out of which 54 had intestinal obstruction, 6 patients of intestinal obstruction have normal X-ray abdomen with sensitivity 78% and specificity 90%.

Gastroduodenal perforations are a frequent surgical complication that can result from gastric cancer<sup>13</sup>, NSAID usage, or Peptic Ulcer Disease (PUD). Our analysis shows that 57% of the patients have a history of using NSAIDs. Perforation makes up fewer than 1% of the complications associated with gastric cancer. Our study found that simple closure of the perforation using an omentopexy, adequate antibiotic treatment, and adequate hydration all greatly reduced the death rate, which was 77.08% in the better result group. Omental patching has also been advised in cases of gastroduodenal perforations by Singh A, *et al*<sup>6</sup>. Alternative therapies for perforated peptic ulcers, such figure of eight repair, have demonstrated very positive and satisfactory outcomes. In our study, figure of eight repair was performed on 21 patients, with 18 (85.71%) of those patients in the better outcome group<sup>14</sup>. A study by Singh A, *et al*<sup>15</sup> also produced results that were

similar. Billroth I, Billroth II, truncal vagotomy and drainage procedures are the remaining treatment options for perforated peptic ulcers; however, definitive acid reduction and bypass surgery were not feasible for these patients because of their compromised physiological status and septicaemia, which seems to increase the risk of death and morbidity without significantly improving the long-term outcome<sup>16</sup>. Laparoscopic repair of the perforated gastroduodenal ulcer by running suture with or without omental patch is an option for stable physiological state and early presentation of case<sup>17</sup>.

Typhoid and TB were the causes of small intestinal perforations that we observed in our investigation. Even in healthy, young patients, it can be lethal. In underdeveloped nations, the most terrible consequence of enteric fever is intestinal perforation, which can result in widespread peritonitis<sup>18</sup>. It is more prevalent in young boys who are in their economically productive years to have the condition and its sequelae. The number of perforations, the patient's overall health and the state of the gut all affect how tubercular ileal perforations are managed. Ileocecal tuberculosis was managed by right hemicolectomy with or without stoma, perforation along with multiple stricture with strictureplasty or resection anastomosis, and a covering stoma or only stoma<sup>19,20</sup>. Typhoid enteric perforations were managed by simple primary double layer repair, primary double layer repair with free omental sheet graft, primary double layer repair with stoma, primary double layer repair with Ile transverse anastomosis, and depending on the condition of the gut with multiple perforations, it was also managed by resection and anastomosis with and without stoma. Primary double layer repair with free omental sheet graft of the typhoid perforation is a safe and effective treatment; as seen in our study, 36 patients of ileal perforation were managed by primary repair with free omental sheet graft, 27(75%) were in the better outcome group and 9(25%) in worse outcome group. An alternative procedure like resection and anastomosis were done in 12 patients where there were multiple perforations, 6(50%) patients in better outcome and 6(50%) were in worse outcome group. In 6 patients of enteric perforation where the gut was not healthy enough or with multiple perforations or there was excessive soiling, exteriorization of gut was done, in better outcome group were 6(100%) and in worse outcome group was 0.

A rare cause of perforation peritonitis, observed in 2% of patients, is colorectal perforation. In our setup, malignancy is an uncommon cause of perforation peritonitis; compared to its western counterpart<sup>21</sup>, only



1% of cases had peritonitis as a result of malignancy. Treatment choices for rectal perforations are determined by the surgeon's experience level, the patient's age, general health and the severity of peritonitis. Rectal perforations have a significant morbidity and fatality rate. When treating acute left-sided colon perforation without faecal peritonitis<sup>22</sup>, primary anastomosis and protective ileostomy are better to the Hartman method. In our study, 6 patients have large bowel perforation were managed with resection anastomosis and ileostomy, 6(100%) patients were in worse outcome group. Study done by Singh, *et al*<sup>15</sup> shows similar result. Appendicular and GB perforation were managed with appendicectomy and cholecystectomy respectively.

Intestinal obstruction was another common surgical emergency that was associated with a high mortality if the diagnosis was delayed or managed inappropriately. In our study small bowel obstruction constitutes about 70% of all intestinal obstructions, bands and adhesions being the most common cause. Study done by Jaiswal NK, *et al*<sup>23</sup> also show band adhesion was the most common cause of intestinal obstruction. An intestinal blockage that was strangulated required immediate surgical attention. The administration of analgesics, intestinal decompression, intravenous antibiotics, fluids and electrolytes, and, if necessary, surgery<sup>24</sup>, are the fundamentals of managing intestinal obstruction. Conservative therapy is effective in up to 75% of patients with adhesive small intestinal obstruction; hence, it was initially tried in all patients who did not exhibit obvious indications of strangling. If, after 48-72 hours of conservative therapy, the obstruction in the small intestine does not clear up on its own without surgery, this is an uncommon occurrence.

In our study, 60 patients presented with intestinal obstruction, which on laparotomy was found to be most commonly due to bands and adhesions in 27(45%) patients. Release of bands and adhesiolysis was done in all case, 21(77.77%) patients belong to the better outcome group and 6(33.33%) patients in worse outcome group. Patients presenting with gangrenous small bowel obstruction were subjected to resection and anastomosis. On exploration growth were found in 15 patients' resection of growth with anastomosis were done in 6 patients, right hemicolectomy with ileostomy were done in 6 patient and extended left

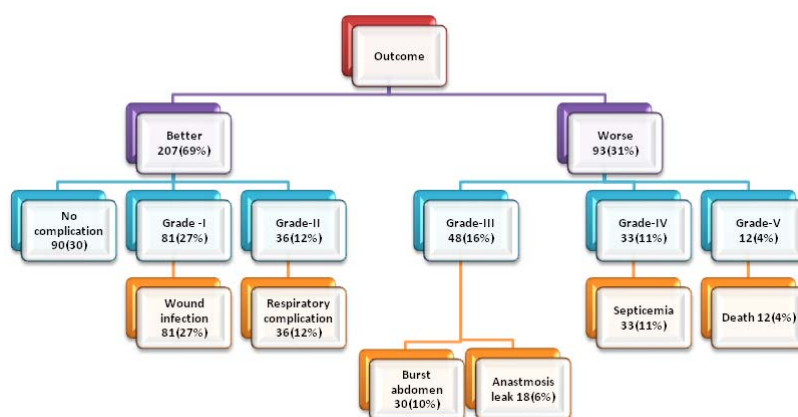


Fig 1 — Postoperative outcome according to Clavien- Dindo classification

hemicolectomy with ileostomy was done in 3 patients, belonging to better outcome group were 3(50%), 3(50%), 0(0%) respectively and 3(50%), 3(50%), 3(100%) respectively in worse outcome group. Six patients presented with intestinal stricture, in which resection anastomosis were done, 3(50%) in better and 3(50%) in worse outcome group. Sigmoid volvulus were present in 9 patients for which resection anastomosis with ileostomy performed, in better outcome group 6(66.67%) and in worse outcome group 3(33.33%).

Rupture liver abscess with peritonitis were present in 9 patients, in 6 patient exploratory laparotomies with peritoneal lavage done, 3 (50%) in better outcome group and 3(50%) patients in worse outcome group. Three patients of rupture liver abscess present with slough out caecum and ascending colon for which right hemicolectomy with ileostomy was performed and it belong to worse outcome group 3(100%).

Postoperative complications recorded in our study were wound infection 81(27%), respiratory complications 36(12%), septicaemia 11(11%), burst abdomen 30(10%), anastomosis leak/faecal fistula 18(6%) and Death in 12(4%). Using the Clavien–Dindo classification complication were graded, 90 out of 300 (30%) patients had no complications, 81(27%) had Grade I complication, 36(12%) had Grade II complications, 48 (16%) had Grade III complications, 33 (11%) had Grade IV complications, and 12(4%) had Grade V complication rates. Singh A, *et al*<sup>15</sup> found similar result of complication 38.28% patients had no complications, 18% had Grade I complication, 16.57% had Grade II complications, 9.14% had Grade III complications, 7.14% had Grade IV complications, and 10.85% had Grade V complication rates.

Despite waiting longer to seek treatment, the mortality rate in our study was 4%; however, the global

literature on the subject indicates that the mortality rate following emergency laparotomies surgery ranges from 6% to 27%<sup>25</sup>. The existence of septicaemia was one of the major factors in our study that contributed to mortality. As a result, contamination plays a major role in perforation peritonitis patients, and infection is linked to death. For optimal results that minimize morbidity and mortality<sup>26</sup>, adequate preoperative resuscitation, correction of electrolyte imbalances and an early surgical intervention to remove the source of infection and limit future contamination are essential.

### CONCLUSION

This study shows that explorative laparotomy has to be done most commonly as an emergency procedure in case of hollow viscous perforation. Peptic ulcer perforation is the most common cause of perforation peritonitis. Intestinal obstruction was the next most common cause for emergency exploratory laparotomy. **“Postoperative complications increase patient morbidity and mortality and are a target for quality improvement programs.”** Many complications may be prevented by thorough preoperative evaluation preceded by adequate aggressive resuscitation, broad spectrum antibiotics, correction of electrolyte, imbalances early minimum & sound surgical technique and careful follow-up care. **“The Clavien–Dindo classification can be adapted to assess the severity of postoperative complications in emergency surgeries in view of easy understanding and applicability and assessment of different surgical therapies.”**

**Conflicts of Interest :** All authors have no conflicts of interest.

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