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Range and Outcome of Perforation Peritonitis at a Tertiary Care Center- A Prospective Study

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Abstract
Introduction: *Acute peritonitis by perforation is the most common type and almost 80% cases results from necrosis of digestive conduit, such as typhoid fever, duodenal ulcer perforation, tubercular perforation and mesenteric ischemia secondary to the intestinal obstruction. So it is very important to seek urgent evaluation and treatment that can prevent fatal complications. This prospective study was conducted at tertiary care center to know the range of perforation in terms of etiology, presentation ,site of perforation, treatment options, postoperative complications and mortality so that we can improve its outcome in this region.*
Methods: *This was a prospective study conducted by the department of general surgery from September 2017 to March 2018. 39 consecutive patients of perforation peritonitis admitted to surgical emergency were included in this study. All patients were resuscitated and underwent emergency exploratory laparotomy. On laparotomy, cause of perforation was identified and managed accordingly.*
Results: *The mean age of patients was 34.9 years (range 15-75 years).The majority of patients were male (76%). Perforated duodenal ulcer due to acid-peptic disease and small bowel perforation due to typhoid were the most common cause of perforation peritonitis. Tubercular perforation was second most common cause of small bowel perforation. Post- operative complications included wound infection (31%), anastomotic leak (8%),burst abdomen (13%) ,Pneumonia(25%),septicemia (8%),Acute renal failure (6%) and abdominal collection in (9%) .*
Conclusion: *Peritonitis due to perforation is still a terrible and alarming condition encounter to general surgeon in emergency. Early arrival of patients to hospital and adequate Resuscitation before surgery improves outcome of disease. Avoidance of extensive emergency surgery contributes to low mortality.*
Keywords: *Perforation peritonitis, Exploratory laparotomy, outcome.*

Introduction

Peritonitis is an inflammatory process of the peritoneum caused by any irritant/agent, such as bacteria, fungi, virus, talc, drugs, granulomas and foreign bodies. If left untreated peritonitis can rapidly spread into the blood and to the other organ and leads to death. Perforation causes secondary peritonitis results from an inflammation or mechanical break of the integrity of intestine, thus exposing the peritoneal cavity to the resident flora of gastrointestinal tract. Acute peritonitis by perforation is the most common type and almost 80% cases results from necrosis of digestive conduit[1-4], such as typhoid fever, duodenal ulcer perforation, tubercular perforation and mesenteric ischemia secondary to the intestinal obstruction. So it is very important to seek urgent evaluation and treatment that can prevent fatal complications. This prospective study was conducted at tertiary care center to know the outcome of perforation in our region in view of etiology, presentation, site of perforation, surgical treatment and post -operative complications.

Material and Methods

This study was done on consecutive 39 cases of perforation peritonitis, which were admitted in department of general surgery from August 2017 to March 2018.

Inclusion criteria- It included all cases aged between 15yers to 75 years having peritonitis due to perforation of any part of gastrointestinal tract .

Exclusion criteria- Those cases with either primary peritonitis or that due to anastomotic leak were excluded.

Patients aged less than 15 years were excluded.

All cases were studied in terms of clinical presentation, radiological finding, operative finding, cause of perforation, post- operative complications and mortality data was collected from indoor patient records, and outpatient department follow up cases.

All patients with clinical diagnosis of perforation peritonitis undergone hematological, biochemical and radiological investigation like x-ray abdomen standing view and ultrasonography. All patients were taken for urgent exploratory laparotomy after adequate resuscitation and written informed consent. The surgical approach is the best via a midline incision for adequate exploration of abdominal cavity. Adequate hemostasis and suctioning of peritoneal fluid was done. If colonic perforation was found, the proximal segment was exteriorized with colostomy and a mucous fistula was made on the distal segment. In case of small bowel perforation, resection is followed by primary anastomosis whenever possible. In case where severe peritoneal contamination and viability of the bowel is doubtful, a stoma was made. In gastro-duodenal perforation, primary closure with omentopexy was done. The peritoneal cavity was irrigated with 4-5 litres of warm normal saline until clear return was obtained. Two drain was placed in abdominal cavity, one in right paracolic gutter and other in pelvic cavity. Mass closure of abdomen was done with continuous, non absorbable, double loop nylon no.1. All patients received perioperative broad spectrum antibiotic with anaerobic coverage. The regimen was not same for all the patients. Antitubercular drugs was also started postoperatively in case of abdominal Koch's.

Results

Total 39 patients were included in this study. 76% being male (29 patients) with male to female ratio of 3.1:1.Mean age of presentation was 34.9years with minimum age was 15 years and maximum age was 75 years. Maximum numbers of patient (29.6) were in age group of 36-45 years.

The majority of patients presented with history of pain in abdomen (93.4%), distention of abdomen (71.9%), altered bowel habit in (53.7%).nausea and vomiting in (49.9%), fever in (36%)and shock in (26.8%). Presentation of patients depend upon site and cause of perforation. Patients with duodenal ulcer perforation had history of pain in epigastric area or upper abdomen about 7.4% patients gave history of NSAID intake since long time and 26% patients were chronic alcoholic.

Patients with iliocecal tuberculosis presented with vague abdominal pain with distension of abdomen, altered bowel habit nausea or vomiting and loss of appetite and weight. Patients presented with small bowel typhoid perforation had history of abdominal pain with prolonged high grade fever. Patients with appendicular perforation presented as pain in periumblical region shifting to right iliac fossa or originating directly in the right iliac fossa then spreading all over abdomen.

Table I: Presenting sign and symptoms

S.No.	Clinical presentation	No .of cases in % (n=39)
1	Abdominal pain	36(93.4%)
2	Abdominal distention	28(71.9%)
3	Altered bowel habit	21(53.7%)
4	Nausea/vomiting	19(49.9%)
5	Fever	14(36%)
6	Septicemia	10(26.8%)
7	Positive history of NSAIDs	3(7.4%)

77% patient had pneumoperitoneum on erect x-ray abdomen.11.6% had multiple air-fluid level, hypokalemia in 49%,Hyponatremia in 38%,and increased urea and creatinine in 29%.

Table II: Findings on investigations

S.No.	Findings on investigations	No. of cases in %(n=39)
1	Pneumoperitoneum	30(77%)
2	Air- fluid level	4(11.6%)
3	Hypokalemia	19(49%)
4	Hyponatremia	15(38%)
5	Increased blood urea and creatinine	11(29%)

The time taken by the patients between onset of symptoms and reaches to the hospital was less than 24 hours in 14 case (36%) and more than 24 hours in 25 cases (64%).

Most common site of perforation was found in duodenum (46%) followed by small bowel (24%), pre-pyloric (gastric) (18%), appendicular (9%) and colon (3%).

Table III: Site of perforation

S.No.	Site of perforation	No. of cases(n=39)
1	Duodenal	18(46%)
2	Pre-pyloric(Gastric)	7(18%)
3	Small bowel	9(24%)
4	Appendicular	4(9%)
5	Colon	1(3%)

Duodenal ulcer perforation due to acid peptic disease and small bowel perforation due to typhoid fever were the most common cause of perforation peritonitis noticed in 57% and 14% each. Appendicular (11%), traumatic (8%) and tuberculosis (7%) were the other causes of small bowel perforation Total number of perforation in colon (3%) was due to malignancy.

Table IV: Etiology of perforation peritonitis

S.No.	Etiology of perforation peritonitis	No. of cases(n=39)
1	Acid peptic disease	22(57%)
2	Enteric	6(14%)
3	Appendicular	4(11%)
4	Traumatic	3(8%)
5	Tubercular	3(7%)
6	Colonic malignancy	1(3%)

The definitive surgical procedure were varied according to site ,size of perforation and severity of contamination and inflammation of gut.63% cases were managed by primary closure of perforation with omentopexy while resection and anastomosis of bowel was done in 14% patients. In 12% cases, ressection was done without anastomosis and stoma was formed. Appendicectomy was done in 9% of patients with appendicular perforation.

Table V: Definitive procedures

S.No.	Definitive procedures performed	No.of cases (n=39)
1	Primary closure with omentopexy	25(63%)
2	Ressection and anastomosis	5(14%)
3	Ressection with stoma formation	5(12%)
4	Appendectomy	4(9%)

In postoperative period, complications included wound infection (31%) anastomotic leak (6%), burst abdomen (13%), pneumonia (25%), septicemia (8%), acute renal failure (6%) and intra-abdominal collection (3%)). Overall mortality was 6%. Late presentation and associated medical illness were major factor contributing to the mortality. These postoperative complications were seen in patients with intestinal perforation (61%) than in patients with gastroduodenal perforation (39%).

Table VI: Post-operative complications

S.No.	Post-operative complications	No. of cases (n=39)
1	Wound infection	12(31%)
2	Anastomotic leak	3(6%)
3	Burst abdomen	5(13%)
4	Pneumonia	10(25%)
5	Septicemia	3(8%)
6	Acute renal failure	3(6%)
7	Intra abdominal collection	9(3%)
8	Mortality	2(6%)

Discussion

Perforation peritonitis is the common surgical emergencies faced by general surgeon. The majority of patients in our country are the younger age group as compared to the western countries[5], where it is more commonly seen in people of 45-60years of age. As noticed in our study, the mean age was 34.9years with male female ratio of 3.1:1. In a study by Adesunkamni et al, they found that M: F ratio was 3:1 with the overall mean age of 27.6+/-18.3 years[6]. perforation of the proximal part of the gastrointestinal tract was more common[7], which is in contrast to the studies from western countries where perforation are common in distal part[8]. Duodenal ulcer perforation due to acid peptic disease and small bowel perforation due to typhoid fever were the most common causes of perforation peritonitis noticed in 57% and 14% respectively in our study. Another study conducted by Gupta and Kaushik shows the same results[9].On the other hand Noon et al[10] from Texas reported as series of 430 cases, in which penetrating trauma was the commonest causes perforation (210) cases, followed by appendicitis (92 cases) and peptic ulcer (68 cases).It is noticed in our study that proper fluid resuscitation ,broad spectrum antibiotic coverage and simple closure of perforation using omentopexy significantly decrease mortality rate. Another study like Siu WT et al also supported this finding[11]. There are other treatment options for perforated peptic ulcer such as Billroth I, Billroth II and Truncal vagotomy drainage procedure [12,13]. Laparoscopic repair of perforated gastroduodenal ulcer by running suture is an option[14]. Patients with long term history of NSAID intake, otherwise it is rare for a gastric ulcer to perforate[15]. As seen in our study, 7.4% patients gave positive history of NSAIDs. Small bowel tuberculosis present mainly with features of obstruction due to the narrowing of gut caused by hyperplastic tuberculosis and strictures. Multiple ilealperforation are seen in ulcerative type of tuberculosis[16]. The most common site of extrapulmonary tuberculosis is the ileocecal region and terminal ileum[17]. In our study, causes of ileal perforation was typhoid and tuberculosis. Management of ileal perforation due to tuberculosis was depend on general condition of the patients, condition of gut and the number of perforation. In this case right limited hemicolectomy with or without stoma was made. Patient may have associated multiple non passable strictures which needs stricturoplasty at the same time. Typhoid perforation were managed by either primary repair or only stoma, depend upon condition of patient and gut. Primary repair of typhoid perforation is a safe and effective treatment[18] as seen in our study, 14 % patients were managed by primary repair. Colorectal perforation is a rare cause of perforation peritonitis seen in 3% which were managed by resection with stoma formation. Perforation peritonitis has high mortality rate. The overall mortality rate ranges between 6-27% [9,19], where as those associated with gastric perforation were 36% (20 cases),enteric perforation were 17.7% (21 cases) and colorectal perforation were 17.5 % (22 cases). In this study, mortality rate was comparatively less (6%) than other study, may be due to primary closure with omentopexy in all patients with gastroduodenal perforation due to peptic disease and also formation of stoma in ill patients in emergency.

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