

Management of Peritonitis as Emergency in a Tertiary Care Center

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Abstract

Background: Peritonitis is defined as inflammation of the peritoneal cavity. This study was done to know the various trends of management in peritonitis cases in Amritsar district of Punjab state of India. **Subjects and Methods:** In this study 50 cases of peritonitis were screened on the basis of lab investigations, X-rays (chest and abdomen), ultrasonography and abdominal aspiration whenever required. Majority of perforation peritonitis patients presented to emergency with electrolyte disturbances followed by septicemia. Investigations, X-ray chest showed air under diaphragm. Ultrasound showed free fluid, four quadrant aspiration showed nature of peritoneal fluid of perforation. Patients were initially resuscitated and managed with surgery to correct the underlying pathology. **Results:** Anaemia was present in 12% of cases. 22% of cases presented with septicaemia (TLC > 12000/mm³). Four quadrant aspiration analyses which showed that fecal matter was in the aspirate in 36% cases. Clear fluid was present in 22% cases. Bilioid fluid was present in 12% cases. Haemorrhagic fluid was present in 4% cases, pus was present in 4% cases. No aspiration fluid was seen in 22% of cases. **Conclusion:** The most common site for the perforation is Terminal ileum (48.5%), followed by Stomach (31.4%), Duodenum (14.2%), colon (2.8%), jejunum (2.8%). Fever (90%) is the most common post-operative complication followed by Paralytic ileus (70%) and superficial wound infections (50%). post-operative complications are Anemia/hypoproteinemia (10%), Burst abdomen (2%), Chest infections (10%), and Anastomotic leaks (0%).

Keywords: Peritonitis, management, septicemia.

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Introduction

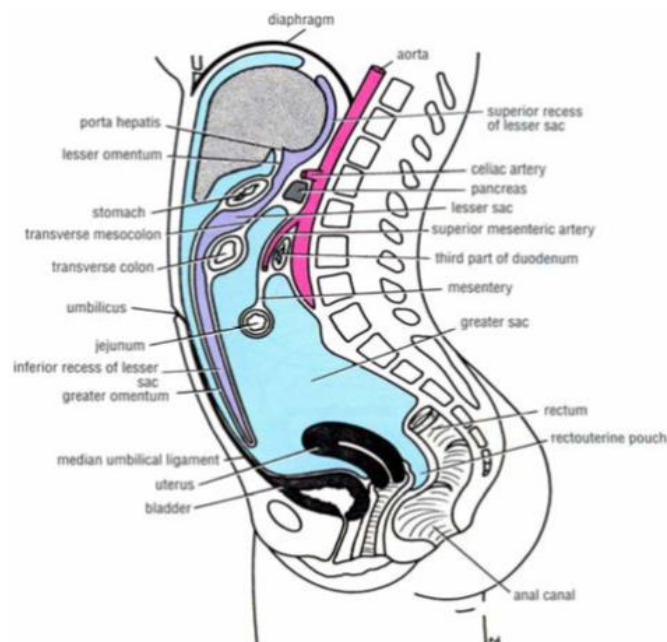


Figure 1: Sagittal section showing arrangement of peritoneum

Peritonitis is defined as inflammation of the peritoneal cavity, peritoneal inflammation caused by loss of integrity of the gastrointestinal tract with consequent leakage of the intestinal contents into the peritoneal cavity. Perforation peritonitis is the most common surgical emergency in India. Despite advances in surgical techniques, antimicrobial therapy and intensive care support, management of peritonitis continues to be highly demanding, difficult and complex. Typhoid fever is the commonest cause of ileal perforation in India. After initial resuscitation with intravenous fluids and correction of electrolyte imbalance, emergency laparotomy is performed to either repair or the resection and anastomosis of the perforated segment or exteriorization of the bowel segment bearing the perforation.

Aims and Objectives

1. To study the aids to diagnosis of peritonitis.
2. To study different methods of management of peritonitis.

Subjects and Methods

Fifty cases with provisional diagnosis of peritonitis came to the surgical emergency of Guru Nanak Dev Hospital/Govt. Medical College, Amritsar (Punjab) were reviewed. Informed consent of the patients was taken.

The various methods of management affecting the outcome were studied. Provisional diagnoses were made from the history and clinical examination of the patients. To clinch the final diagnosis, various investigations were undertaken such as routine investigations like Hb, BT, CT, TLC, DLC, ESR, Urine complete examination. Blood urea, blood sugar, serum creatinine.

Microscopic examination and culture sensitivity of the fluid taken by doing paracentesis. Radiological investigations: X-ray chest (PA view) standing including both domes of diaphragm. X-ray abdomen standing position, including both domes of diaphragm, Ultrasound abdomen, CT Scan Abdomen (whenever indicated) and then respective treatment.

Results

Total of 50 patients with provisional diagnosis of peritonitis were taken up for the study. Most common causes of peritonitis were perforation(35 cases).

Table 1: Showing aetiology of peritonitis

Site	No. of cases	Percentage (%)
Perforation	35	70
Intestinal obstruction	11	22
Appendicitis	4	8
Total	50	100

Table 2: Showing Type of Surgical Procedure

Aetiology	Suturing	Omental patching	Resection & anastomosis	Appendicectomy	Cecopexy	Ileostomy	Adhesiolysis	Peritoneum lavage with drain
Gastic perforation	11	11	0	0	0	0	0	11
Duodenal perforation	5	5	0	0	0	0	0	5
Jejunal perforation	1	0	0	0	0	0	0	1
Colon perforation	1	0	0	0	0	0	0	1
Appendicular	0	0	0	4	0	0	0	0
Ileal perforation	13	0	4	0	0	6	0	17
Identified Obstructions	0	0	4	0	2	1	2	9
Not Identified obstructions	0	0	0	0	0	0	0	2
TOTAL	31	16	8	4	2	7	2	46

Anaemia was present in 12% of cases. 22% of cases presented with septicaemia(TLC>12000/mm³). Electrolyte imbalance was seen in 40%cases. Four quadrant aspiration analyses which showed that fecal matter was in the aspirate in 36% cases. Clear fluid was present in 22% cases. Bilious fluid was present in 12% cases. Haemorrhagic fluid was present in 4% cases, pus was present in 4% cases. No aspiration fluid was seen in 22% of cases.[Figure 2]

Suturing of the perforation was the most common (31 cases) surgical procedure done, omental patching with suturing in 16 cases, resection and anastomosis in 8 cases. appendicectomy was done in 4 cases, ileostomy was done in 7 cases and adhesiolysis was done in 2 cases. Cecopexy was done in 2 cases with provisional diagnosis of peritonitis. In 2 cases only peritoneal lavage was done and drains were inserted in not identified or sealed perforation.

The most common anatomical site of perforation was terminal ileum(17 cases). The next common site was stomach(11 cases) followed by duodenum(5 cases), jejunum(1 case) and colon(1 case).[Figure 1]

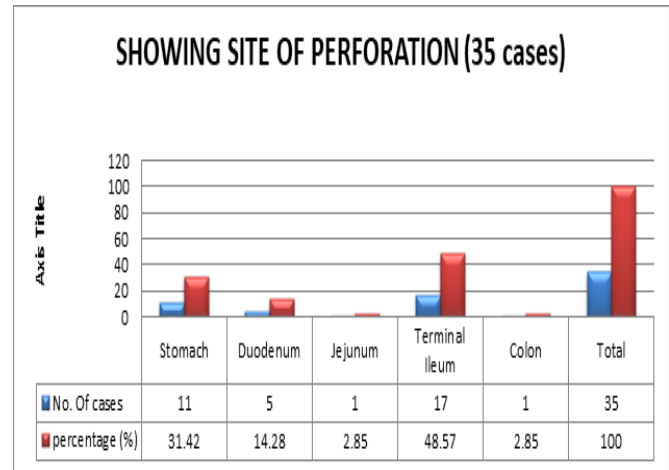


Figure 1: common anatomical site of perforation

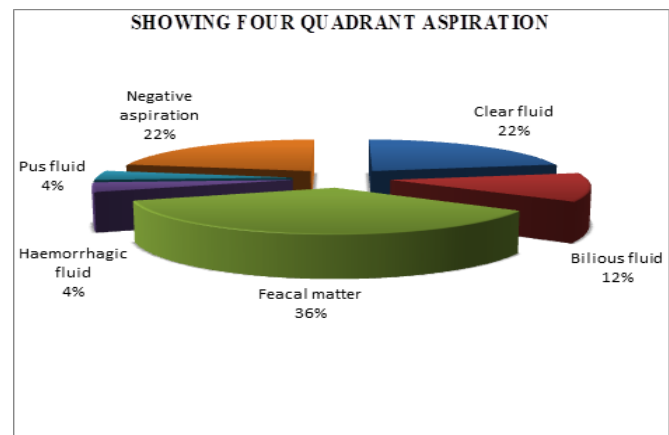


Figure 2: Four quadrant aspiration

Fever was the most common post-operative complication(90%),the next most common post-operative complication was paralytic ileus(70%) and superficial wound infection was present in 50% cases. Other post-operative complications were anaemia/hypoproteinemia(20%),burst abdomen(2%) and chest infection(10%). Overall mortality was 12% in this study. Mortality in ileal perforation was 17.6%.[Figure 3&4].

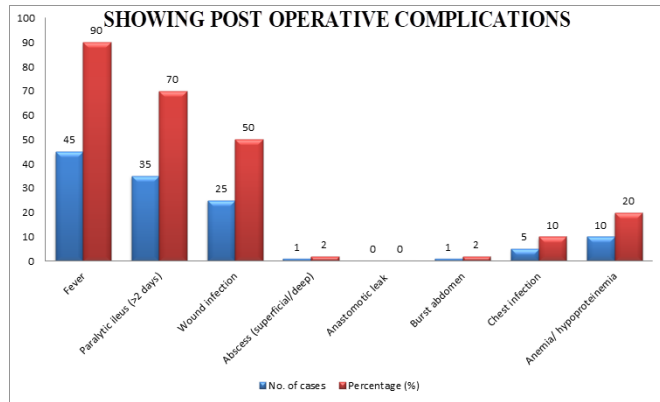


Figure 3: post-operative complications

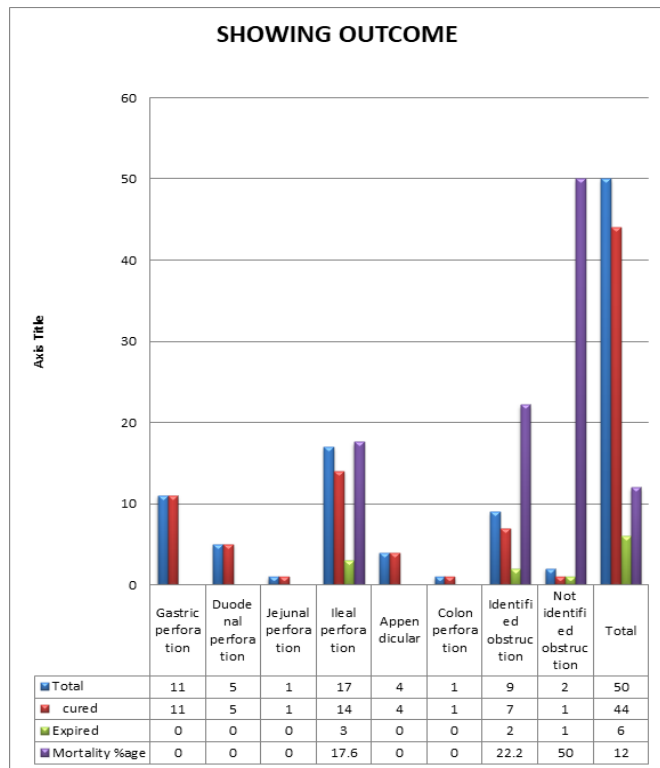


Figure 4: showing outcome

Discussion

Peritonitis is a frequently encountered surgical emergency in any Hospital with high morbidity and mortality, which continues to be a matter of great concern to the surgeons, particularly in a tropical Country like India. At the time of presentation, general condition of the patient is usually very much deteriorated and deserves skillful emergency surgical management.

The present study was undertaken to study the aids to diagnosis and management of peritonitis. In this study the most common cause of peritonitis is perforation peritonitis, various studies favour that perforation is the main cause of peritonitis.

In this study the most common (48.57%) site of perforation was terminal ileum (up to 30 cms proximal to ileocaecal junction) present in 17 cases out of 35 cases; next most common (31.42%) site was stomach (11 cases out of 35 cases), other sites were 1st part of duodenum (5 cases), jejunum (1 case) , colon (1 case). This study matches with the study of Agrawal N et al8 (most common site of perforation was ileum followed by duodenum).

X-ray chest PA view including both domes of diaphragm in upright position is a very useful investigation to diagnose the perforation of abdominal hollow viscus by detecting pneumoperitoneum.

Table 3: Showing X-Ray Chest (Pa View) (35 Cases)

Findings	No. of cases	Percentage (%)
Air under right / both domes of diaphragm	35	100
Total	35	100

In this present study X-ray abdomen was done in 50 cases, pneumoperitoneum was detected in all cases of perforation peritonitis (35 cases out of 50 cases) and multiple air-fluid levels with pneumoperitoneum was the finding in 2 cases. This study is well comparable with the study of SO Fic A et al1(X ray abdomen showed free air in the abdominal cavity in 80% cases of gastrointestinal perforation), Whereas Dickson JAS et al2 had observed air under diaphragm in 40% of abdominal X ray films in patients of terminal ileum perforation and Aston NO et al3 reported free peritoneal gas in 25 % of abdominal X ray films in patients of perforation.

Table 4: Showing X-Ray Abdomen (35 Cases)

Findings	No. of cases	Percentage (%)
Air under right / both domes of diaphragm	35	100
Multiple air fluid level	2	5.71

In this study USG Abdomen was done in 50 cases. The most common ultrasonographic findings were free fluid in the peritoneal cavity(70%) and dilated gut loops with sluggish or absent peristalsis (22% cases).

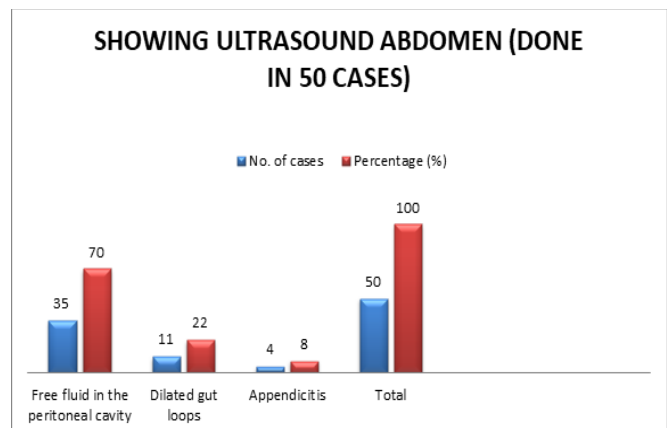


Figure 5: Ultrasound abdomen

Findings of ultrasonography in this study are well supported by the studies of SO Fic et al,^[1] (free fluid was detected in 80% cases).

In our study CECT of the abdomen was done only in two cases. SO Fic et al,^[1] had observed that CT was more sensitive to the combination of liquid and minimal amount of free air, which was undetectable with ultrasound and X-ray.

In the present study management was mainly surgical. Exploratory Laparotomy was done in all cases after 3 to 4 hours of initial resuscitation.

Pre-operative Resuscitation included I.V. fluids with electrolytes, Ryle's tube aspiration and Foley's catheterization, Maintenance of input -output balance, Blood transfusion, I.V antibiotics against gram positive, gram negative and anaerobes, Monitoring of temperature, pulse and blood pressure regularly, Pre-operative intra peritoneal abdominal drain was inserted in two cases who were severely toxic and abdomen was over distended causing respiratory distress.

Pneumoperitoneum and signs of peritonitis were observed in all the cases of perforation.

Foul smelling clear fluid with or without flakes in the peritoneal cavity was observed in 11 cases; foul smelling bilious fluid with or without flakes was observed in 6 cases; foul smelling fecal matter with or without flakes was observed in 18 cases; hemorrhagic fluid was observed in 2 cases and pus was observed in 2 cases.

In 17 cases, terminal ileal perforation (up to 30 cms proximal to the ileocaecal junction on anti-mesenteric border) was observed, In 11 cases gastric perforation was observed. In all the cases of gastric perforation it was single and present either in the pyloric region or on the anterior surface of the stomach; in 5 cases perforation was observed on the anterior wall of the first part of the duodenum; in 1 case perforation was observed on the anti-mesenteric border of the jejunum; colon perforation was observed in one case only.

The aims of surgical intervention are two fold: to drain the pus and bowel contents from peritoneal cavity and to prevent further contamination.

Minimum required operative procedure was performed. In all the cases of peptic perforation, the edges were excised and margins freshened and perforation was closed in two layers by applying at least one layer with non-absorbable suture. Pedicled omental patch was also applied in almost all the cases. Meticulous peritoneal toileting was done with normal saline. Abdominal drain was inserted in pelvic cavity and paracolic gutter.

In enteric perforation, simple closure of perforation was done with atraumatic needle in two layers/single layer. As the patients were poor surgical risk and they tolerated minimum anaesthesia, simple closure has the advantage of being quick and easy. An alternative procedure like resection and ileo-ileal anastomosis were also done in some cases.

In some cases of enteric perforation where the gut was not healthy enough or with multiple perforations or there was excessive soiling exteriorization of gut was done (ileostomy). Postoperatively patients were given I/V fluids, Ryle's tube aspiration, blood transfusions, antibiotics such as 3rd generation cephalosporin and metronidazole for anaerobic organisms. This treatment is recommended by most of the

previous authors.

Gupta S et al,^[4] and other authors have also recommended the omental patching in gastro duodenal perforations.

KIM JP et al,^[9] recommended resection of small bowel in multiple typhoid perforations of the terminal ileum; he also recommended exteriorization of the small bowel in very sick patients.

Sweetman R et al,^[5] Aston NO et al,^[3] had also recommended resection of the segment of ileum as the treatment of choice in case of tubercular perforations.

Gupta SK et al,^[6] had also recommended the primary closure of the traumatic perforations. Town send MC et al¹⁰ had also recommended the primary colure of the traumatic perforations.

In this study fever was the most common post-operative complication which was presented in 90% of the patients. 2nd most common post-operative complication was paralytic ileus (for >2 days) which was presented in 70% of the patients. Other post-operative complications were superficial wound infections (50%), anemia/hypoproteinemia (20%), burst abdomen (2%), chest infections (10%) and anastomotic leaks (0%).

Whereas in the study of Gupta SK et al 6common morbidity encountered were chest infection (39 cases), wound infection (12 cases), biliary leak (8 cases), intra-abdominal abscesses(6 cases), burst abdomen (6 cases), renal failure (2 cases), DIC (4 cases), jaundice and upper gastro intestinal bleeding (1 case each).

In the study of Agrawal N et al,^[8] incidence of major complications was 25% (burst-11%, leak-5%, intra-abdominal abscess 5% and multi-organ failure-6.5%). In the study of Jain BK et al,^[15] superficial wound infection (46.8%) was the most frequent post-operative complication followed by wound dehiscence (31.3%) and entero-cutaneous fistula/leak (11.5%).

The overall mortality in the present study is 12%. The causes of mortality in the present series are very poor general condition of the patient at the time of admission, anaemia, toxemia, dehydration and patients reported late after the perforation.

Conclusion

The most common site for the perforation is Terminal ileum (48.5%), followed by Stomach (31.4%), Duodenum (14.2%), colon (2.8%), jejunum (2.8%).

Diagnosis is made by clinical examination and confirmed by the detection of pneumoperitoneum on X-ray chest/ abdomen, ultrasonography of the abdomen and often by the four quadrant aspiration.

Laparotomy and closure of the perforation is still the commonest surgical procedure done in the ileal and jejunal perforations. Omental patching is the commonest surgical procedure done in the peptic perforations.

Peritoneal toilet and lavage with normal saline is the essential component of all the surgical procedures in perforation peritonitis. Resection & Anastomosis and Ileostomy are the surgical procedures done in case of multiple ileal perforations and/ or in case of unhealthy, oedematous bowel wall.

Fever (90%) is the most common post-operative complication followed by Paralytic ileus (70%) and superficial wound infections (50%). other post-operative complications are Anemia/ hypoproteinemia (10%), Burst abdomen (2%), Chest infections (10%), and Anastomotic leaks (0%). Overall mortality in perforation peritonitis is 12%.

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