

Early and Late Management of Perforation Peritonitis - A Comparative Study of 50 Cases

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Abstract: Introduction: 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. Peritonitis is an inflammation of the peritoneum, the thin layer that lines the inner wall of the abdomen and covers most of the abdominal organs. Peritonitis may be localised or generalised, and may result from infection (often due to rupture of a hollow organ as may occur in abdominal trauma or typhoid fever) or from a non-infectious process. A diagnosis of peritonitis is based primarily on the clinical manifestations. If peritonitis is strongly suspected, then surgery is performed without further delay for other investigations

Aims and Objectives:. A prospective study of 50 patients of perforation peritonitis was done over a period of last 3 years at surgery ward of Govt. Medical College Amritsar divided into two groups early and delayed with 25 patients in each group.

Results and Conclusion: All cases in our study were of perforation peritonitis presenting at various times in hospital. Those presenting within 24 hours (early) and managed in time showed better outcome as compared to the late presenters. Morbidity is more in late cases as compared to early cases. Mortality rate is high in late presenters.

Keywords: perforation, peritonism, peritonitis.

I. Introduction

Peritonitis is an inflammation of the peritoneum, the thin tissue layer that lines the inner wall of the abdomen and covers most of the abdominal organs. For the gastrointestinal surgeon, the clinically *most* relevant form of peritonitis is secondary bacterial peritonitis. Peritonitis may be localised or generalised, and may result from infection (often due to rupture of a hollow organ as may occur in abdominal trauma or typhoid fever) or from a non-infectious process. The severity of bacterial contamination depends on several factors, including the site of disruption of the intestinal tract, the underlying intestinal pathology and the ability of local host defense mechanism to localize infection. These factors may significantly influence decision making during the process of optimal management of patients with perforation peritonitis(1).

The main manifestations of peritonitis are acute abdominal pain, abdominal tenderness, and abdominal guarding, which are exacerbated by moving the peritoneum e.g., coughing (forced cough may be used as a test), flexing one's hips, or eliciting the Blumberg sign (rebound tenderness) meaning that pressing a hand on the abdomen elicits less pain than releasing the hand abruptly, which will aggravate the pain, as the peritoneum snaps back into place. The presence of these signs in a patient is sometimes referred to as peritonism.

The localization of these manifestations depends on whether peritonitis is localized (e.g., appendicitis or diverticulitis before perforation), or generalized to the whole abdomen. In either case, pain typically starts as a generalized abdominal pain (with involvement of poorly localizing innervation of the visceral peritoneal layer), and may become localized later (with the involvement of the somatically innervated parietal peritoneal layer). Peritonitis is an example of an acute abdomen. A diagnosis of peritonitis is based primarily on the clinical manifestations. Leukocytosis, hypokalemia, hypernatremia, and acidosis may be present, but they are not specific findings. Abdominal X-rays may reveal dilated, edematous intestines, although such X-rays are mainly useful to look for pneumoperitoneum, an indicator of gastrointestinal perforation. The whole-abdomen ultrasound and Computed tomography may be useful in differentiating other causes of abdominal pain. If peritonitis is strongly suspected, then surgery is performed without further delay for other investigations. 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.

In majority of cases, presentation to the hospital is late with well-established generalized peritonitis with purulent/fecal contamination and varying degree of septicaemia.(2).

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(3).It was Finny who strongly recommended surgery as the treatment of perforation. He said "The only rational treatment of perforation is surgical operation and to this there is no contraindication to save the moribund patient.(4)

Perforations of peptic ulcers form the major group among the gastro duodenal perforations. These perforations are usually encountered along the first part of the duodenum anteriorly and in the pylorus of the stomach. The advances in the medical treatment of the peptic ulcer disease have led to a dramatic decrease in the number of elective surgeries performed. However, the number of patients undergoing surgical intervention of complications such as perforation remains relatively unchanged or has increased. Such patients present with the classical signs and symptoms of peritonitis, and need early surgery for a favourable outcome.

A nonspecific aetiology is attributed to small bowel perforations when the perforation cannot be classified on the basis of clinical symptoms, gross examination, serology culture and histopathological examination into any disease state such as enteric fever, tuberculosis or malignancy. These ulcers are usually single and commonly involve terminal ileum.

These small bowel perforations are closely followed by small bowel perforations occurring in intestinal tuberculosis. Most of these (50 - 80%) occur in the ileum usually proximal to the strictures of the bowel. Free tubercular perforations are rare. The mortality rate reported in tubercular perforations is very high, upto 70%.

Depending on the site of the perforation gram positive cocci are predominantly isolated in gastro duodenal perforations; Pseudomonas sp. in small bowel perforation; and E.coli in appendicular and colonic perforations. However, a higher incidence of fungal isolates has also been reported after gastro duodenal perforations(5).

Perforation in ulcers at other sites within the stomach and gastric cancers has been uncommonly reported, and emergency gastrectomy is the treatment of choice(6).

Rare sites of perforation leading to secondary peritonitis that have also been reported in the literature arise from the biliary tree, uterus, splenic and liver abscesses. Of these, ruptured amoebic liver abscesses are frequently encountered in tropical countries. frequently encountered in tropical countries. These are seen in 3-7% Of cases of intestinal amoebiasis, and up to 22% can rupture to cause peritonitis, which carries a high mortality. The management is by laparotomy and drainage or non-operatively, by means of metronidazol and/or radiologically guided drainage. Rupture of pyogenic liver abscess is rare by comparison(7,8,9)

Small bowel perforation after blunt trauma is frequently associated with other intra-abdominal injuries. Typically, large luminal defects are encountered after blunt trauma that cannot be closed primarily without subsequent luminal compromise, necessitating formal resection with primary anastomosis. The speed of the closure allows for expedient management of associated injuries Without fear of continued enteric spillage. No mesenteric resection or closure is needed, obviating the possibility of internal hernias(10).

The surgical treatment of perforative peritonitis is based on three basic principles viz: (1) To eliminate the source of bacterial contamination by treating the underlying pathologic process. (2) To decrease the degree of bacterial contamination in the peritoneal cavity. (3) To prevent recurrent or residual infection(1).

Patients with perforations should be treated with antibiotics, by fluids and electrolyte replacement and blood transfusion. Surgery is necessary to close the perforated gut and drain the contaminated peritoneum with the minimum surgical interference. Although better conservative management has significantly reduced the mortality of perforation, early limited surgery is most important if good results are to be obtained(11).

II. Aims And Objectives

- To study the advantages and disadvantages of early surgical intervention in peritonitis.
- To study the advantages and disadvantages of conservative/delayed interventions in peritonitis.
- To study complications of peritonitis.

III. Material And Methods

A prospective study of 50 patients of perforation peritonitis was done over a period of last 3 years at surgery ward 6 of GMC Amritsar. Patients admitted with diagnosis of peritonitis were divided into two groups depending upon presentation to the hospital whether early or late. Both early and late groups contained 25 patients each. All cases were found to have peritonitis as a result of perforation of some or the other part of gastrointestinal tract at the time of surgery. In early group those patient were included who presented within 72

hour of onset of symptoms while rest were included in late group. All cases were studied in terms of clinical presentation, radiological investigations done, operative findings and postoperative course. All patients following a clinical diagnosis of perforation peritonitis and adequate resuscitation, underwent exploratory laparotomy. At surgery the source of contamination was searched. The peritoneal cavity was irrigated with 2-3 litres of warm normal saline. The decision to do resection anastomosis or any diversion procedure depend upon the presentation of the patient, number of perforations and condition of surrounding gut and the peritoneal cavity. The drain was put in every patient irrespective of site, number of perforations and operative procedure done. Although all patients received appropriate pre-operative and perioperative broad spectrum antibiotics, the drug regimen was not uniform.

IV. Observations

All cases in our study were of perforation peritonitis presenting at various times in hospital. Those presenting within 24 hours (early) and managed in time showed better outcome as compared to the late presenters. Late cases have deranged parameters like total WBC count, electrolytes and liver function tests. On exploration, more cases in delayed presentation had collection of pus and infected material in peritoneal cavity and bad condition of intestines whereas early cases have comparatively less infected cavity. Post operatively, persistence of fever, wound infection, wound dehiscence rate is more in late cases. Morbidity is more in late cases as compared to early cases. Mortality rate is high in late presenters.

4.1 Regarding Age wise distribution in both groups.

The most common age group presented in our study is between 21 - 30 years (40%) in early group and (40%) in delayed group. While patients in early age group <20yrs presented only in early group(8%).

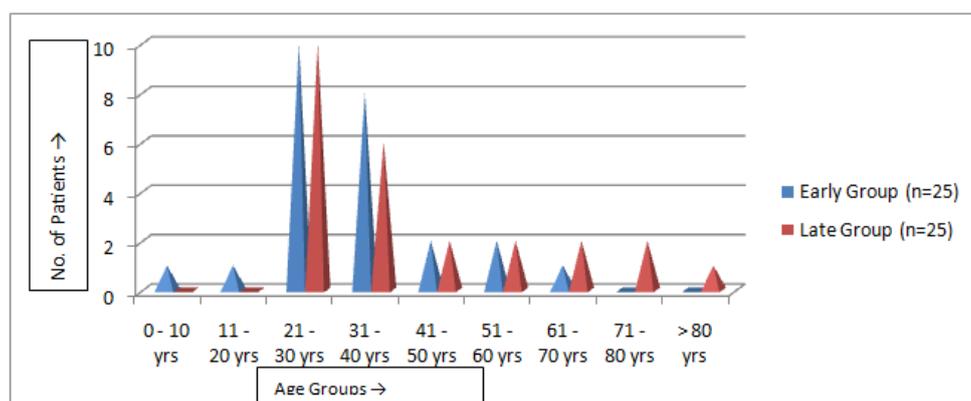


Figure 1 Showing Age Distribution

4.2 Regarding Sex wise distribution in both groups.

In our study out of 25 patients in each group 16 were males and 9 were females in early group whereas 20 were males and 5 were females in Late group. Perforation peritonitis was more common in males in Late group whereas it was more common in females in early group.

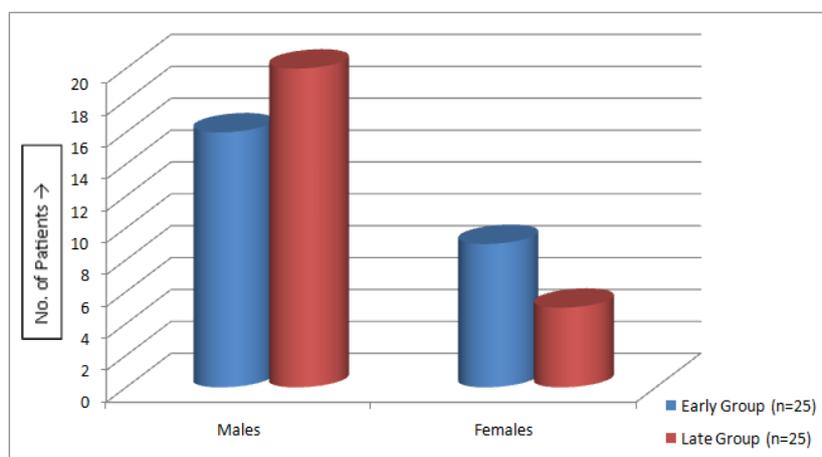


Figure 2 Showing Sex Distribution in both the groups

4.3 Regarding Trauma distribution in both groups.

Perforation peritonitis due to trauma was more (40%) in Early group as compared to Late group (12%). Non traumatic group of patients presented more in delayed group (88%) as compared to early group (60%).

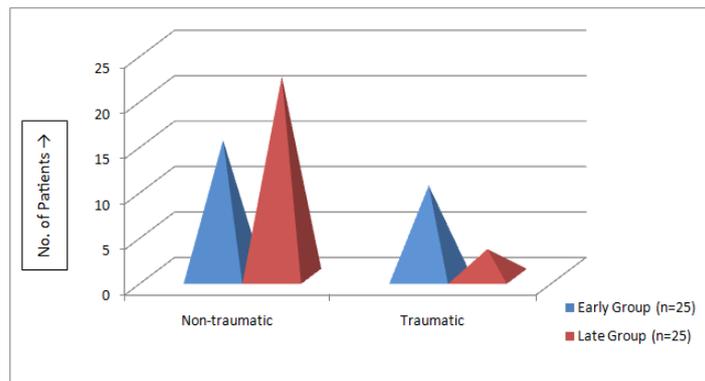


Figure 3 Showing Traumatic vs non traumatic distribution of perforation peritonitis

4.4 Regarding Symptom wise distribution in both groups.

As shown in figure 4. Abdominal Pain was the most common symptom and was present in all patients of both the groups. Fever was present in more patients in late group (100%) as compared to early group (80%). Abdominal distension was present in 100% of patients of Late group as compared to 18(72%) patients in early group. Vomiting was present in 100% of patients in Late group as compared to 16(64%) patients in early group. Constipation was present in all 25(100%) patients in late group as compared to 16(64%) patients in early group.

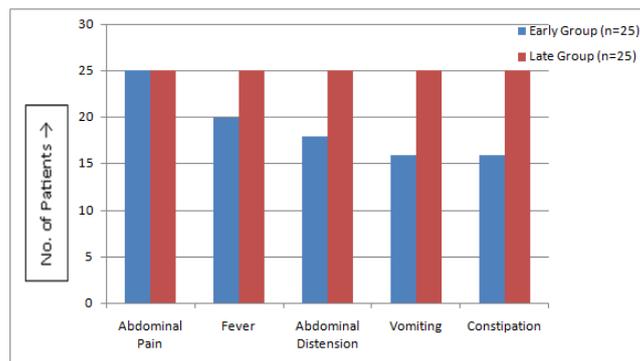


Figure 4 Showing Symptom distribution in both the groups

4.5 Regarding Total Leucocyte Counts in both groups.

Figure 5 shows that Total Leucocytic Count(TLC) < 15000/cmm was present in more patients in early group (72%) as compared to late group (48%). Patients with deranged TLC (>15000) were less in early group(28%) as compared to late group(52%).

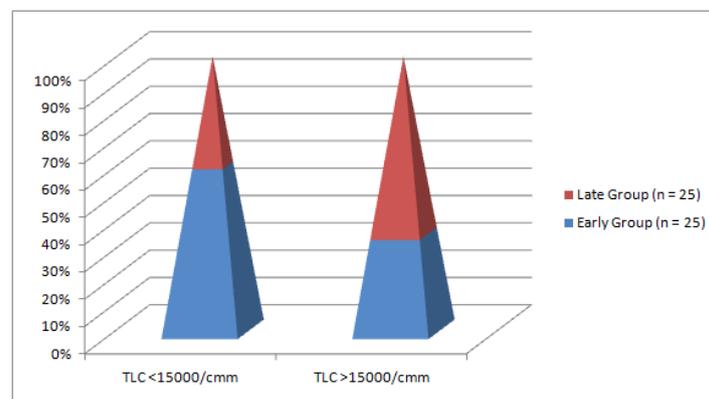


Figure 5 Showing Total Leucocyte Count in Both the groups

4.6 Regarding Renal Function Tests in both groups.

In Figure 6 is shown that Renal Function Tests(RFTs) are more normal in early group (92%) as compared to Late group(52%) and were more deranged in Late group(48%) as compared to early group(8%).

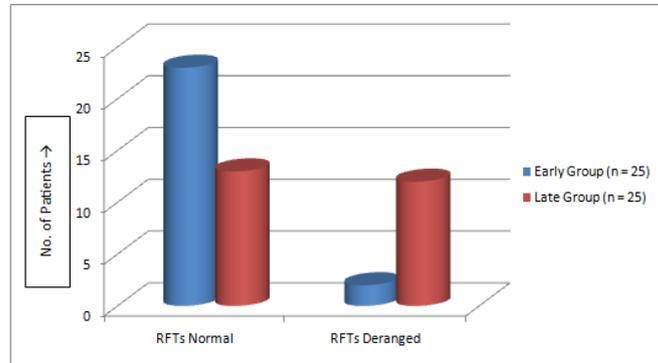


Figure 6 Showing variation of Renal Function in both the groups

4.7 Regarding Renal Function Tests in both groups.

Figure 7 shows that more patients(88%) in early group had normal Liver Function Tests (LFTs) as compared to 64% patients in late group who had normal LFTs. 36% patients in late group had deranged LFTs as compared to 12% patients in early group.

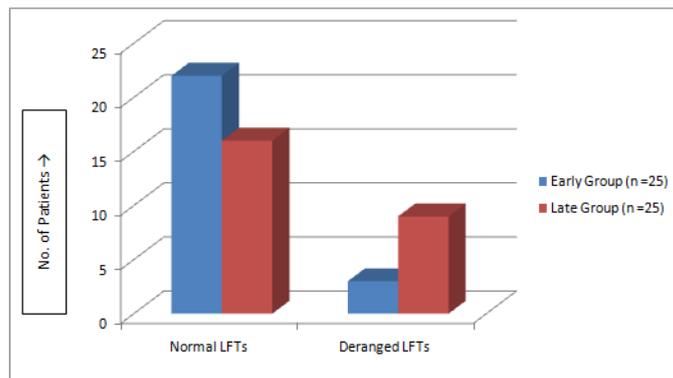


Figure 7 Showing variation of Liver Function Tests in both the groups

4.8 Regarding Changes in S Electrolytes (Na+, K+, Ca+) in both groups.

Figure 8 shows that 92% patients had normal electrolytes and 8% patients had deranged electrolytes in early group as compared to late group in which 52% of patients had normal serum electrolytes and the electrolytes were deranged in 48% patients.

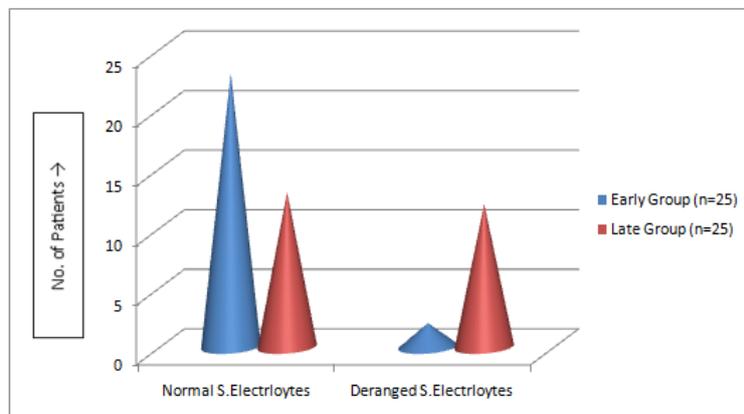


Figure 8 showing variation in S.Electrolytes in both the groups

4.9 Regarding preoperative Blood Transfusion in both groups.

Figure 9 shows that more patients(60%) in early group needed blood transfusion preoperatively as compared to 36% patients of late group.

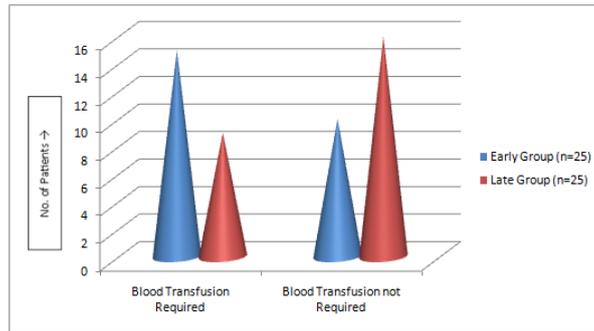


Figure 9 Showing need for blood Transfusion in both groups

4.10 Regarding Exploratory Laparotomy in both groups.

Figure 10 shows that exploratory laparotomy was performed in more patients(96%) of early group as compared to 84% patients in late group.

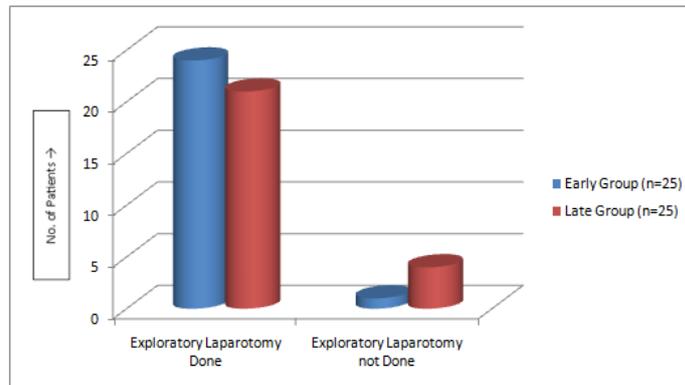


Figure 10 showing No. of patient undergoing Exploratory Laparotomy

4.11 Regarding Status of peritoneal cavity in both the groups

Figure 11 shows that on exploratory laparotomy pus was present in equal number of patients(48%) in both groups. Blood in the peritoneal cavity was present more(32%) in early group as compared to 4% in late group. Faecal contamination of peritoneal cavity was more(32%) in late group as compared to 8% in early group. Bile contamination was seen 8% of patients only in early group.

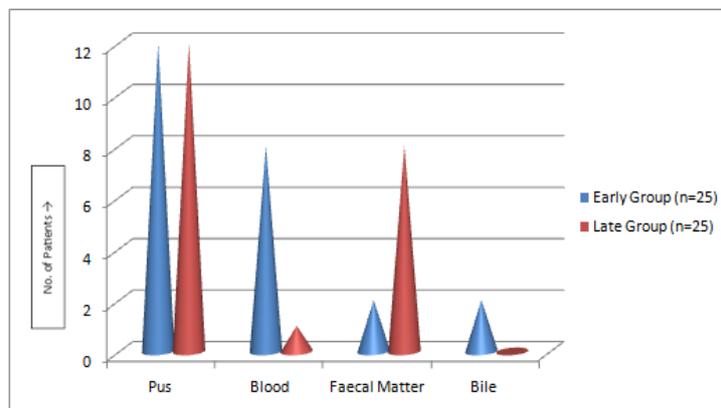


Figure 11 showing peroperative status of peritoneal cavity

4.12 Regarding Location of Perforations in both the groups

Figure 12 shows ileum was common site of perforation in both early(56%) and (40%) late groups. Duodenal perforations were more common(16%) in late group as compared to 4% in early group. Jejunal perforations were seen equally(4%) in both the groups. Perforations in other part of intestine were more common in early group(32%) as compared to late group(24%).

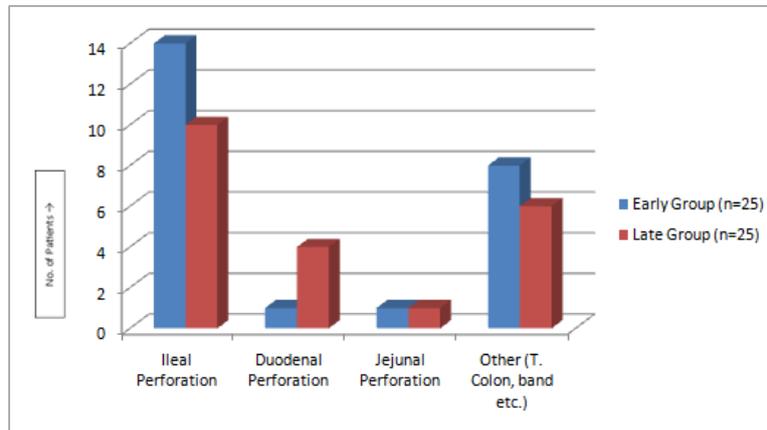


Figure 12 Showing location of perforation in both the groups

4.13 Regarding Etiology of Perforation in both the groups.

Figure 13 shows that widal test was POSITIVE in more patients 18(72%) in late group as compared to early group 15(60%). Widal negative patients were more (40%) in early group than in late group(28%).

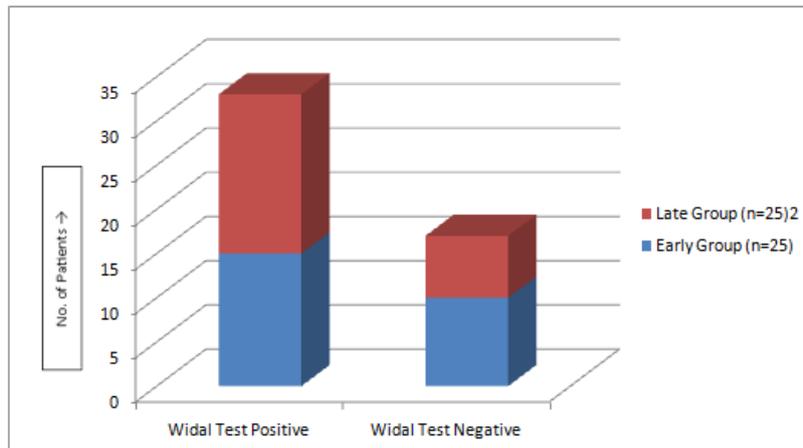


Figure 13 Showing etiology of perforation

4.14 Regarding procedure done in both groups

Figure 14 shows that simple closure of perforation was more commonly performed in early group in 13(52%) of the patients as compared to late group in which simple closure was performed in 8(32%) patients. Closure and diversion procedure was more commonly done in 11(44%) patients in early group and in 8(32%) patients in late group . Resection and anastomosis with diversion procedure in 5(20%) cases in late group. Drains were put in only 1(4%) patient in early group as compared to 4(16%) patients in late group.

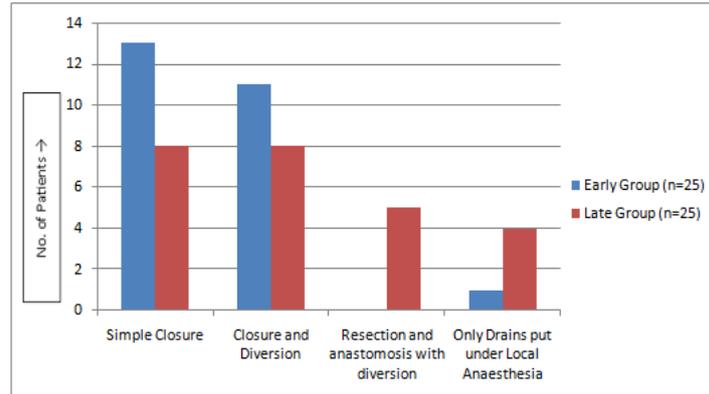


Figure 14 Showing various procedures done in both the groups

4.15 Regarding post operative stay in both groups

Figure 15 shows that more patients(88%) in early group were shifted to ward as compared to 80% patients in late group. Among those shifted to ICU more patients(20%) were from late group and 12% were from early group.

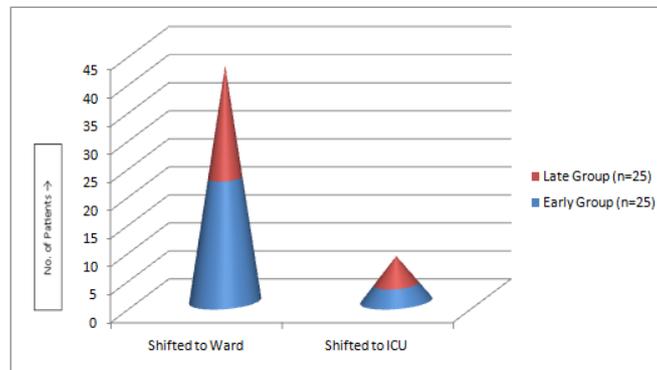


Figure 15 Showing Post operative shifting to Ward and ICU

4.16 Regarding post operative complications in both the groups

Figure 16 shows that post operative complications like fever was more common(80%) in late group as compared to early group(32%). Wound discharge was seen in 12(48%) patients in late group while only 20% in early group. Wound dehiscence was more(24%) in late group as compared to early group(4%). Resuturing was done in 6(24%) patients in late group while only in 1(4%) patient in early group.

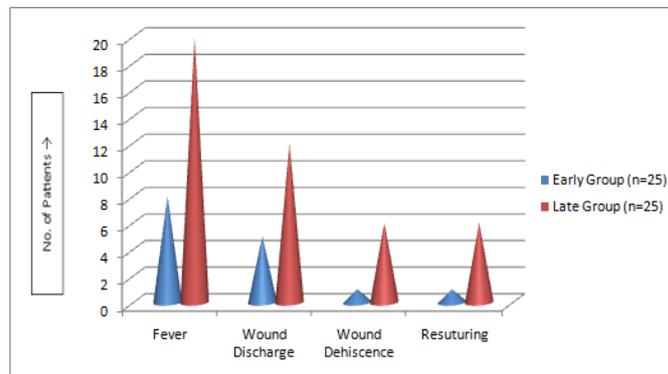


Figure 16 Showing post operative complications in both groups

4.17 Regarding Mortality in both groups

Figure 17 shows that there was more mortality(24%) in late group while only 8% mortality was there in early group.

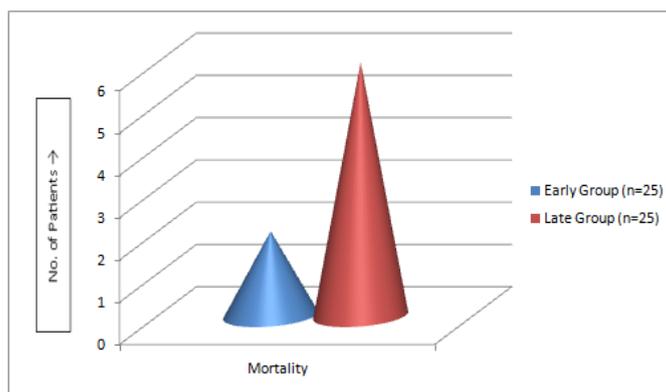


Figure 17 Showing Mortality in both the groups

V. Discussion

In This study, all the patients in early and late groups presented with abdominal pain, tenderness, rigidity and guarding. Distension was more in late group(100%) as compared to early group. Vomiting was more common in late group(100%) as compared to early group(64%). Constipation was more common in late group(100%) as compared to 64% in early group. This study is comparable with the study of Hittunen et al(12) in which early group had constipation in 76%, vomiting in 69%, distension in 76% while these symptoms were present in all patients of delayed group whereas Dickson et al(13), early group had constipation in 70% vomiting in 63% distension in 72% while these symptoms were present in all the patients of delayed group. In the present study there were more widal positive patients in late group(72%) as compared to early group(60%), while widal negative patients were more in early group(40%) as compared to late group(28%). Dickson et al(13) also reported widal positive patients presenting more in delayed group(80%) as compared to early group(66%).

In the present study management was mainly surgical. In our study pus was present equally(48%) in both the groups. Blood in peritoneal cavity was present in 32% cases in early group as compared to 4% in late group. Faecal contamination of peritoneal cavity was more(32%) in late group as compared to 8% in early group. Bile contamination was seen in 8% cases of early group only. This is comparable to Sweetman et al(14) and Aston et al(15) where pus in the peritoneal cavity was present in 52% case in delayed group as compared to 46% in early group.

In enteric perforation, simple closure of perforation was done. As an alternative procedure like resection and ileo-ileal anastomosis were also done in some cases where there were multiple perforations and distal gut was not healthy. Also in some such cases ileostomy or exteriorisation of the gut was done. Drainage of peritoneal cavity is essential to drain out the residual pus and was done in all cases. Dickson et al(13) have recommended simple closure if it is possible. Gupta et al(16) also recommended the primary closure of traumatic perforations. Kim et al(17) recommended resection of small bowel in multiple perforations of terminal ileum. He also recommended ileostomy in very sick patients.

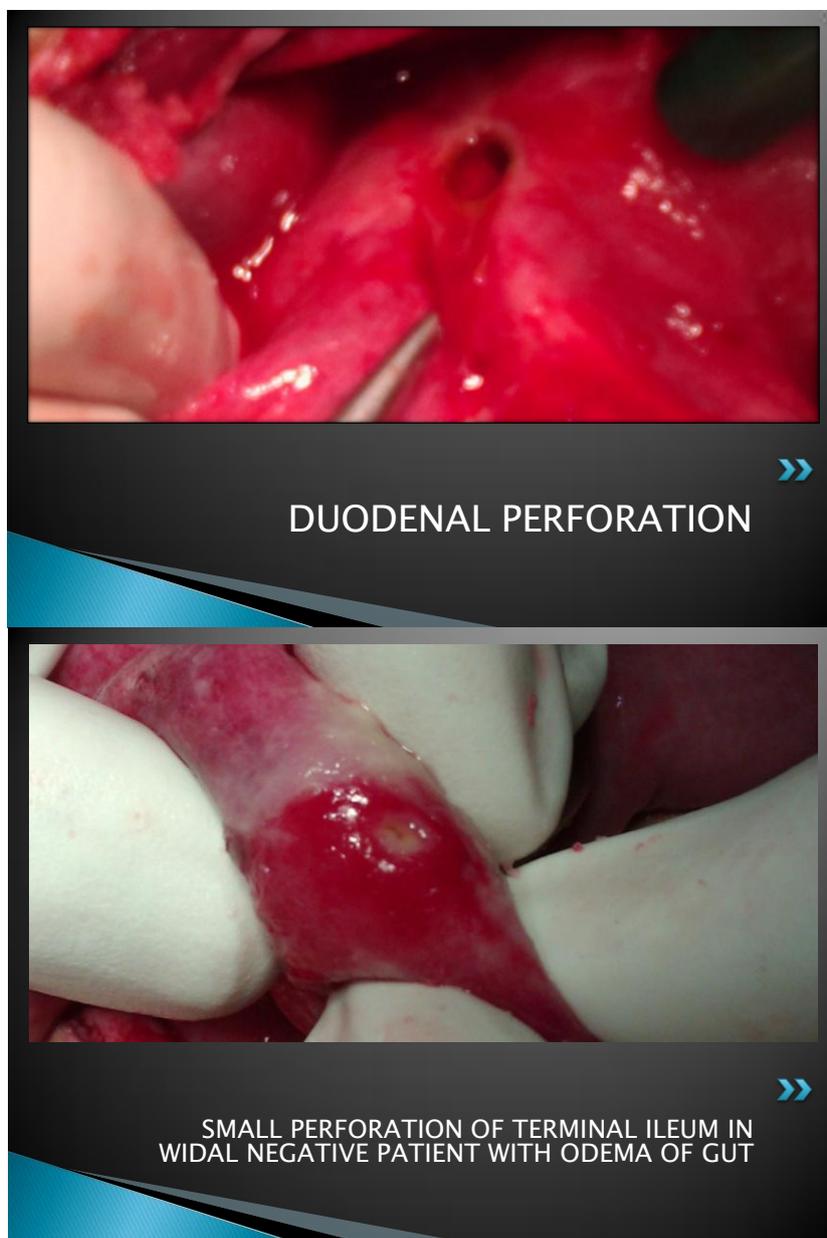
In our study we had fever as most common post operative complication. it was present in 80% of patients in late group and 32% patients in early group. Wound discharge was seen in 48% cases in late group as compared to 20% in early group. Wound dehiscence was seen in 24% in late group and 4% in early group. Resuturing was done in 24% in late group and 4% in early group. Gupta et al(16) in their study also had fever as most common complication. He had it in 84% case in delayed and 40% cases in early group. In his study wound discharge was seen in 14.4% in delayed group as compared to 22% in early group. Wound dehiscence was seen in 18% in delayed group and 3% in early group. Resuturing was seen in 20% in delayed and in 1% in early group. All these findings were comparable with our study.

The overall mortality in present study in late group is 24% and 8% in early group. Mortality is also comparable with following studies:

Study By	Delayed Group	Early Group
Dunkerly (18)	20%	6%
Kim et al(17)	26%	8%
Sharma et al(19)	18%	5%
Noguren et al(20)	28%	4%
Gupta et al(16)	22%	6%
Aggarwal et al(21)	21%	5%
Jain et al(22)	20%	4%

VI. Summary And Conclusion

Peritonitis is a surgical emergency. Patients of peritonitis should be explored as early as possible. Surgical exploration is the cornerstone of the management of peritonitis. Delay in procedure leads onto further complications and increased mortality rate. Early exploration saves the patient from localized abscess and septicemia. Early exploration can be a life saving procedure in some complicated cases.



Reference

- [1]. Vagholkar KR. Therapeutic option in perforation peritonitis. *Hospital Today* 2011;6(5):277-81.
- [2]. Jhobta RJ, Attri AK, Kaushik R, Rajeev Sharma and Aupam Jhobta. Spectrum of perforation peritonitis in India review of 504 consecutive cases. *World journal of Emergency Surgery* 2006;1:26.
- [3]. Kumar S, Gupta A, Chaudhary S, Agrawal N. Validation of the use of POSSUM score in enteric perforation peritonitis -results of a prospective study. *Pan Afric Med J* 2011;9:22.
- [4]. Finney JMT. On surgery treatment of perforating typhoid ulcer. Quoted by Karnmarkar SR, *IJS* 1972. *Johs Hopkins Hosp Rep* 1900;8: 155-177.
- [5]. Gupta S, Kaushik R. Peritonitis -the Eastern experience. *World J Emerg Surg* 2006;1:13.
- [6]. Adachi Y, Mori M, Meahara V, Matsumata T, Okudaira Y Sugimachi K Surgical results of perforated gastric
- [7]. Carcinoma: an analysis of 155 Japanese patients. *Am JGastroenterol* 1997;92:516-8.
- [8]. Sarda AK, Bal S, Sharma AK, Kapur MM, Intra peritoneal rupture of amoebic liver abscess. *Sr J Surg* 1989;76:202-03.
- [9]. Eggleston FC, Verghese M, Handa AK. Amoebic perforation of bowel: experiences with 26 cases. *BR J Surg* 1978;65:748-51.
- [10]. Natrajan A, D Souza RE, Lahoti NG, Candrakala SR. Ruptured liver abscess with fulminant amoebic colitis: case report with review. *Trop Gastroenterol* 2000;21:210-13.

- [11]. Townsend MC, Peliass ME. A technique for rapid closure of traumatic small intestine perforations without resection. *AmJSurg* 1992; 164(2):171-2.
- [12]. Chouhan MK, Pand SK. Typhoid enteric perforation. *Br JSurg* 1992; 69:173-5.
- [13]. Hittunen R, Kairaluoma MI, Mokka REM, Larmi TKI. Non-traumatic perforations of small bowel. *Surg* 1977;184-188.
- [14]. Dickson JAS and Cole GJ. Perforation of terminal ileum: A review of 38 cases. *BJS* 1964;12:893-7.
- [15]. Sweetman WR and Wise RA. Acute perforated tuberculous enteritis: Surgical treatment. *Ann Surg* 1959;149:143-48.
- [16]. Aston NO, De Costa AM. Tuberculous perforation of the small bowel. *Postgrad Med J* 1985;61:251-52.
- [17]. Gupta SK, Gupta R, Singh G, Gupta S. Perforation Peritonitis: A Two Year Experience. *JK Science* 2010;12(3):141-44. www.jkscience.org
- [18]. Kim JP, Oh SK, Jerrett F. Management of ileal perforation due to typhoid fever. *Ann Surg* 1975;181:88-91.
- [19]. Dunkerley GE. Perforation of ileum in enteric fever. *BMJ* 1946;2:454-7
- [20]. Sharma L, Gupta S, Soin AS, Sikora S, Kapoor V. Generalized peritonitis in India-the tropical spectrum. *Jpn JSurg* 1991; 21 (3): 272-7.
- [21]. Nogueira C, Silva AS, Santosh IN, Silva AG, Ferreira L, Matos E et al. Perforated peptic ulcer: main factors of morbidity and mortality. *World JSurg* 2003;27(7):782-7.
- [22]. Agarwal N, Saha S, Srivastava A, Chumber S, Dhar A, Garg S. Peritonitis: 10 years' experience in a single surgical unit. *Tropical Gastro* 2008, pp. 1-6.
- [23]. Jain BK, Arora H, Srivastava UK, Mohanty D, Garg PK. Insight into the management of non-traumatic perforation of the small intestine. *J Infect Dev Ctries* 2010;4(10):650-54.