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Research Article

**PERCUTANEOUS DRAINAGE FROM PERITONEAL CAVITY
IN THE TREATMENT OF PERITONITIS: A SINGLE CENTRE
STUDY**¹Rabeea Tahira, ²Maira Larosh, ³Saba Ramzan¹Women Medical Officer, Mayo Hospital, Lahore, Email: rabeeatahira@gmail.com, ²House Officer, Allied Hospital, Faisalabad, Email: mairalarosh21@gmail.com, ³House Officer, DHQ Hospital, Faisalabad, Email: sabaramzan79@gmail.com**Abstract:**

Various factors resulting intestinal perforation including peptic ulcer perforations, ischemic colitis, intestinal obstruction, typhoid or TB infections, cancer, diverticulitis, trauma, and colonoscopy.

Objective: *To determine the efficacy of percutaneous peritoneal drainage under local anesthesia in terms of morbidity and mortality*

Study Design: *Retrospective Study*

Setting: *The study was conducted in department of Surgery, Mayo Hospital, Lahore*

Methodology: *We performed a retrospective analysis of all the cases of acute peritonitis which were subjected to percutaneous peritoneal lavage after being labeled as high risk and unfit for general anesthesia.*

Results: *5/18 [27 %] expired after the drainage [4 of these had multiple organ failure at the time of presentation]. About 27% [n= 5] expired after the definitive surgery so we attribute this mortality to the definitive surgery which is still lesser than the mortality of this procedure.*

Conclusion: *Percutaneous peritoneal drainage initially done on the high risk patients to optimize their pre op condition significantly improves the outcome and has better results than to operate on such patients straightaway*

Keywords: *Peritonitis, Perforation, Percutaneous, Aspiration, Morbidity, Mortality, Surgical Care, Intensive care.*

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INTRODUCTION:

Acute peritonitis is one of the most common emergencies presented to the general surgeons. [1] Despite the recent advances in its definite surgery, medical management, perioperative care and intensive care units, it continues to be one of the most difficult benign diseases to treat.[2] Most of the cases present late to the hospital with well-established generalized peritonitis having gross purulent or fecal contamination and varying degrees of septicemia. The overall mortality rate is 30% and the mortality rate of cases that also have diffuse peritonitis is up to 70%.[3]

Various factors resulting intestinal perforation including peptic ulcer perforations, ischemic colitis, intestinal obstruction, typhoid or TB infections, cancer, diverticulitis, trauma, and colonoscopy. Perforations due to cancer and infection have high mortality rates but iatrogenic perforation during colonoscopy has a low mortality rate.

Conservative treatment have shown a good reduction mortality and morbidity but majority patients still need definitive surgery to get rid of the disease completely. Gold standard management of the peritonitis has been exploratory laparotomy for decades.[4] Immediate laparotomy in high risk patients who have prolonged history or have multiple comorbidities is not advisable as it is associated with morbidity and mortality, besides improved postoperative intensive care. Various alternatives to immediate laparotomy recommended are: percutaneous peritoneal drainage [PPD], laparoscopic sanitation; Taylor's conservative method, laparostomy and planned re-laparotomies.[5, 6] The aim of this case series was to study the morbidity and mortality of percutaneous peritoneal drainage under local anesthesia supported by conservative measures in high risk elderly patients with perforated gut peritonitis when surgery is indicated but carries the high risk of mortality.

MATERIAL AND METHODS:

We performed a retrospective analysis of all the cases of acute peritonitis which were subjected to percutaneous peritoneal lavage after being labeled as high risk and unfit for general anesthesia. This study was performed at the department of Surgery and Emergency, King Edward Medical University, Lahore and all the above patients from January, 2015 to December, 2018 were included. High risk definition: Patients having 20% more risk of mortality were classified as high risk group.[7] Preoperative Diagnosis: Pre op diagnosis was made on the basis of history and obvious abdominal signs and symptoms along with the required investigations I.e CBC, CXR

and AXR and USG abdomen. Free air under diaphragm and free fluid in USG abdomen were the most reliable signs to diagnose perforated intestinal peritonitis. Other investigations included LFT, RFT, S/E, ECG helped to define specific organ disorders. Risk stratification: High risk cases of perforative peritonitis were labeled with the help of Boey's score which is a frequently used scoring system to characterize high risk in these patients. It considered three parameters: Systolic Blood Pressure<100 mm/hg, Presentation to ER >24 hours, major medical co morbid illness.[8]

Patients were given one point for each parameter, additional point for co morbid condition: Long term steroid use, Recent cerebrovascular stroke, patients on cardiac drugs/known ischemic heart disease, smoker with interstitial lung disease like COPD, Alcoholic/known chronic liver disease[9] Non operative regime: After making the diagnosis and assessing their risk, all patients were managed according to the local protocol. They were resuscitated by keeping patient NPO, passing wide bore nasogastric tube in distal greater curvature for decompression and internal drainage, strict input and output monitoring, IV fluids, pain relief, intravenous broad spectrum antibiotic, H2blocker [Ranitidine 50 mg intravenously every 8 h], and hydration.

Accurate tube placement in the distal greater curvature and frequent re-assessment were mandatory in this regimen[10]. Along with these, other medical conditions like hypoxia and hypotension were also treated accordingly. Percutaneous Drainage technique: Under Local anesthesia one cm supra umbilical incision given, subcutaneous tissue split and peritoneal cavity opened. After peritoneal breach a drain was inserted directed towards pelvic cavity. This drain was attached to a continuous infusion of saline. Another incision was given in right iliac fossa lateral to lateral border of rectus abdominis and peritoneal cavity was opened and a wide bore drains 32/F was inserted here; one directed towards the pelvis.

Same procedure was repeated on left side and drain of 32 Fr was placed in upward direction. These drains were attached to free drainage bottles. Serial examinations were performed to check the continuous drainage and contents in the bottles until the definitive surgical procedure. We recorded vitals and I/O and observed their stability for undergoing the definitive surgery. Demographics: We studied 18 cases which were high risk and were unable to undergo surgery under G/A at the presentation. Their diagnosis of perforated ulcer peritonitis was confirmed on the basis

of abdominal signs and specific investigations [CXR and abdominal scan. Their ages ranged between 55-75 years. All of them were males. On the basis of Boey's score, they were designated as high risk i.e score equal to or more than 3. Most of these patients had pulmonary comorbidities and were smoker [15/18]. Other common comorbidities were IHD and previous CVA [14 out of 18]. Our aim was to reduce the septic load by the help of drainage of gut contents through a non-invasive method, irritating the peritoneum so that we can perform definitive surgery once the patients are hemodynamically stable. Management post drainage:

After drainage, patients who got haemodynamically stable and had significant output, were taken for the definitive surgery. All the definitive procedures were done in open manner and by the same team of

surgeons. Patients who were operated were 13 ; 10 of these had DU perforation and 3 had Enteric perforation.

RESULTS:

Out of 18 patients , 5[27 %] expired after the drainage [4 of these had multiple organ failure at the time of presentation]. About 27% [n= 5] expired after the definitive surgery so we attribute this mortality to the definitive surgery which is still lesser than the mortality of this procedure i.e 43%.[11] There was a significant number of patients who were made stable with the help of drainage and underwent successful laparotomies to seal their perforations i.e 8/18 [44 %]. Hence the overall mortality in the high risk patients in which we performed PPD was 10/18 [55%].

Table no. 1: showing risk stratification according to the scoring defined in the text

Score	SBP<90mm Hg	Presentation >24 hr	Comorbidities	Number
2	Yes	Yes	No	3
3	Yes	Yes	Yes	8
4	Yes	Yes	Yes [more than 1]	7

DISCUSSION:

Emergency laparotomy refers to the abdominal surgical procedure in which the initial presentation, site and nature of pathology and operative management is not known and they all differ very much from patient to patient. Almost 400 and above definitive surgical procedures can be attributed to this specific term[12].

So all the required preoperative preparation and optimization to deal with the pathology and improve the morbidity and mortality in short period of time is not easy and thus a challenge for the surgeon. Thus emergency exploratory laparotomy is most of the times a high risk surgery.

Table no. 2: showing percentage of various co-morbidities among patients included in the study

Patients	Comorbidities
12	IHD
6	CVA
15	Smoker
14	COPD

Although there is not a single factor which can be attributed with poor outcomes of the patients presenting with peritonitis but old age, comorbidities and medical illnesses, delay in the presentation and diagnosis are the most important ones. Of all such factors, ones which can be modified are those that help reducing the morbidity and mortality[13]. Moller et al concluded in their study that besides the preoperative optimization and post operative care, extent of the septic shock in the patients of perforative peritonitis at presentation predicted their true outcome[14]. In abdominal infections like peritonitis, exploratory laparotomy is the definitive and treatment of choice[15].

Elimination of the septic source and removal of purulent/fecal material are the core principles of exploratory laparotomy. The principles of managing peritonitis like elimination of septic focus and removal of necrotic tissue have not changed till today. All of this may not be achieved in a single surgery[16]. Primary peritoneal drainage was introduced as a mode of close management of perforative peritonitis as it could wash away the septic load off a patient that helped in self healing. This modality of treating peritonitis in premature neonates due to NEC has been studied on a large scale and its results are comparable with the laparotomy [17, 18].

Primary peritoneal drainage as a modality of treatment depended on same concept of self-healing and expected recovery in patient's status if sepsis causing peritoneal collection is drained away. Also in adults the results are very promising as the studies have proved and they play important parts in improving outcomes in high risk patients with perforative peritonitis, an initial conservative treatment with serial resuscitation and observation may be safely allowed in certain situations to allow their general condition to get better and undergo a definitive surgery with improved morbidity and mortality[19, 20].

The aim of our study was to observe the success of percutaneous peritoneal drainage in making high risk patients i.e reducing the septic load of these patients by a noninvasive procedure so that they can be operated upon once they are stable and fit for general anesthesia. In our retrospective study we included 18 patients and assigned them high risk according to their disease and sepsis. Out of these 18 patients 15 had score 3 or above due their comorbidities. The overall mortality was 55 % [n=10] but we were able to make 13/18 patients fit enough to undergo general anesthesia who were initially not fit for surgery by reducing their septic load under local anesthesia. Although the overall post operative mortality in elderly high risk patients is 41.8 % [21], our study showed the post operative mortality to be 27 % which is significantly lower and shows better outcome once the patient underwent surgery after initial reduction of his septic load.

Those among who survived after laparotomy 44 % [8/18] were shifted to ward and were managed with standard post operative care. None of them showed 15 day mortality and average hospital stay was around 6.8 days. In short they had a smooth post op recovery phase. Although other post op complications like surgical site infection and chest infection occurred and were treated according to the local protocols. So this study of previous cases and literature concluded that if high risk patients were to be taken for percutaneous peritoneal drainage before they undergo laparotomy, they had better outcome and prognosis. Therefore improving patient's hydration along with addressing medical comorbidities and draining the septic load significantly improved the outcome and prognosis in high risk elderly cases[22].

CONCLUSION:

Percutaneous peritoneal drainage initially done on the high risk patients to optimize their pre op condition significantly improves the outcome and has better results than to operate on such patients straightaway.

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