

Research Article

Efficacy of Abdominal Drains Placement Under Local Anaesthesia in High Risk Patients (ASA-4) with Generalized Peritonitis.

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Abstract

Background: The surgical management of patients with peritonitis is complex and demanding. The patients are prone to have high morbidity and mortality. The surgical procedure under general anesthesia may worsen the outcome.

Objective: To determine the efficacy of two drains placement under local anaesthesia in patients with the diagnosis of peritonitis requiring exploratory laparotomy.

Methodology: This was a study on 84 patients from January 2013 to July 2019 with generalized peritonitis. The patients required surgical intervention but were unfit having ASA 4. After making the diagnosis, two drains were placed in the abdominal cavity under local anaesthesia. First drain was placed in the lumbar area anteriorly while the second drain was placed in between the umbilicus and the symphysis pubis. Other treatment measures were done as per standard protocol. Post-procedure outcome included cure of the patients, improvement and fitness for general anesthesia, deterioration of the condition or death.

Results: Out of all patients, 55 (65.47%) were male while 29 (34.53%) were female. In all patients, there was a remarkable decrease in abdominal distension immediately after drain placement. The 69 (82.14%) patients showed improvement in clinical and biochemical parameters within 24 hours. Nineteen (22.62%) patients were cured and did not require laparotomy. Fifty-one (60.71%) improved and underwent laparotomy. The mortality occurred in 14 (16.66%) patients.

Conclusion: Peritoneal drainage and lavage by using two drains under local anesthesia and lavage is safe and effective in unfit patients with peritonitis.

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Key Words: Peritonitis, Local Anaesthesia, Laparotomy, Abdominal Drains

Introduction

Peritonitis is caused by introduction of infection from endogenous or exogenous sources. One of the most common sources is perforation of part of the gastrointestinal tract.¹ Treatment of the peritonitis includes supportive measures, systemic antibiotics and the surgical intervention after resuscitation.² The

aim of supportive therapy is to minimize or prevent secondary complications due to sepsis which may lead to organ system failure.³ The type of surgical procedure depends on the nature of the underlying disease and the severity of intra-abdominal and systemic sepsis. The operative management includes

source control, peritoneal toilet and resection/reconstructive procedure. Source control can be achieved by various surgical procedures at laparotomy or by laparoscopic methods in selected cases.⁴ The success of treatment can be defined as patient recovery after adequate source control with resolution of sepsis and clearance of all residual intra-abdominal infection.⁵

Surgical procedures usually have excellent results but may be associated with morbidity and mortality. In unfit patients, definitive surgery carries high risk of mortality.⁶ The type of surgical procedure, comorbid factors and competency of surgeon determines the risk. Patients who are hemodynamically unstable, preoperative optimization and stabilization is needed.⁷ In unstable patients with peritonitis, percutaneous drain placement under local anaesthesia offers an immediate and minimally invasive solution to a life-threatening condition. This often results in restoration of hemodynamic stability within 24 to 48 hours.⁸ Post procedure peritoneal lavage and exploratory laparotomy for definitive surgical management is the aim of this procedure. This procedure promotes maximal elimination of infective material and allows time for resuscitation by improving respiratory, cardiovascular and renal functions. In intra-abdominal sepsis, upto 92% success rate can be achieved for haemodynamic stability by percutaneous drain placement for peritoneal lavage.⁹

The purpose of this study was to see the benefits of usage of peritoneal drainage in unfit patients with severe peritonitis. As general anaesthesia may worsen the outcome of surgery, this procedure can safely be performed under local anaesthesia. Significant decrease in septic load by peritoneal drainage and resuscitative measures restore hemodynamic stability for definitive surgical procedure, which was the rationale of this study.

Methods

This was Quasi experimental study of 84 patients from January 2013 to June 2019. The consecutive sampling technique was applied. Sample was calculated by using

$$n = \frac{(Z_{1-\alpha/2})^2 [P_1(1-P_1) + P_2(1-P_2)]}{d^2}$$

These patients with severe peritonitis presented to the surgical emergency Mayo Hospital, Lahore. The patients of both genders of more than 12 years were included. They were admitted through emergency or referred from other units and periphery. The enrolled patients required surgical intervention and were high risk. They were assessed by anesthetist and labelled as ASA 4, so unfit for surgery under general anaesthesia. The diagnosis was made on basis of clinical assessment and radiological investigations including abdominal and chest X-rays, Ultrasonography/ CT scan of abdomen. Complete blood examination, blood sugar, blood urea & serum creatinine, electrolytes, liver function tests, viral markers, ECG were also done. After aseptic measures in operation theatre, two drains were placed under local anaesthesia, 2% Xylocaine, in the abdominal cavity. First drain was put in the lumbar region anteriorly and second one in between the umbilicus and pubis. Initial reveal of drains was noted in terms of amount and nature. The peritoneal cavity was thoroughly irrigated with normal saline. Other treatment measures included nasogastric tube, intravenous fluids and electrolytes, antibiotics (ceftriaxone, metronidazole, and amoxicillin) analgesics /antipyretics, urinary cauterization etc. Post procedure outcome were seen in term of cure, improvement and fitness for anesthesia or deterioration of the condition and death. This was done on the basis of clinical assessment, drain reveal and repeat ultrasound. The drains were removed after completion of treatment. The patients who improved but still revealed gut contents and pus, underwent exploratory laparotomy as per routine. For data analysis, SPSS version 20 was used and t-test was applied. P-value of 0.05 was considered as significant.

Results

Eighty four patients were included, out of which 55(65.47%) were male and 29(34.53%) female. The age of the patients ranged from 17 - 62 years with the mean of 42.02 (SD ± 11.54). All the patients in the study were with ASA 4. Abdominal girth decreased in all the patients after drains insertion. The blood pressure, pulse, respiratory rate and temperature started to improve after the procedure at 12 to 24 hours (Table No.1). Similarly, urine output were significantly after replacement of fluid and electro-

lytes in 24 hours. All the 84 patients (100%) improved during initial 12 hours but afterwards this improvement was either slow or static. Some of them deteriorated. Table 2 shows improvement in biochemical parameters including arterial blood gases, leucocyte count and serum electrolytes. In all subjects there was a slight but significant improvement in PH immediately after 6 hour (baseline 7.2 ± 0.029 after; 7.41 ± 0.065). The mean PCO₂ at baseline was 48.10 ± 5.23 , while after 6hr PCO₂ was significantly improved after surgery as 35.26 ± 2.16 mmHg. The mean PO₂ mmHg at baseline was 86.44 ± 10.20 ,

while after 6hr it was significantly improved as 93.44 ± 5.08 . Similarly, the Na, K, HCO₃ and Cl improved after the procedure and replacement. Total leukocyte count was significantly decreased from 15.03 ± 2.5 to 10.03 ± 2.6 . The outcome of the drains placement in these patients is shown in Figure 1. Out of all, 19(22.62%) patients were cured and did not require surgical intervention at all. Fifty one (60.71%) patients improved, became fit for laparotomy and were operated. Overall mortality occurred in 14 (16.66%) patients.

Table- 1: Clinical Parameters of the Patients

Clinical Parameters	Baseline	After 6hr	After 12hr	After 18hr	After 24hr
Blood Pressure (systolic) mmHg	90±6.94	99±6.56	99±6.56	110±6.94	112±6.94
Blood Pressure (diastolic) mmHg	60±6.78	66±6.90	69±6.90	70±6.78	70±6.78
Respiratory Rate (per minute)	30±5.77	27±5.87	24±4.98	22±4.98	18±4.98
Temperature (C)	38.2±1.5	37.3±1.3	37.4±1.4	37.4±1.4	37.4±1.5
Pulse rate (per minute)	112±10.6	108±10.6	108±10.6	107±10.6	102±10.6
Pulse volume (systolic – diastolic) mm Hg	30±3.5	33±3.4	30±3.3	40±3.3	42±3.3
Urine output(ml/hour)	30.19±12.3	32.19±12.3	34.19±12.3	36.19±12.3	40.19±12.3
Drain output ml/hour	2000±500	1200±300	900±250	650±150	400±100
Abdominal Girth(in cm)	95±12	90±12	86±12	86±12	86±12

Table-2: Biochemical Changes after Drain Placement.

Biomedical Parameter	Base line	6 hours	24 hours
PH	7.2±0.029	7.40±0.075	7.41±0.065
PCO ₂ mmHg	48.10±5.23	37.26±4.16	35.26±2.16
PO ₂ mmHg	86.44±10.20	92.44±5.08	93.44±5.08
HCO ₃ meq/l	18.44±6.48	25.7±2.13	24.7±2.13
Total Leukocyte Counted	15.03±2.5	12.03±2.5	10.03±2.6
Sodium(Na ⁺) meq/l	133.30±4.24	137.43±4.2	139.43±4.2
Potassium(K ⁺) meq/l	2.9±1.68	3.4815±1.46	3.59±0.46

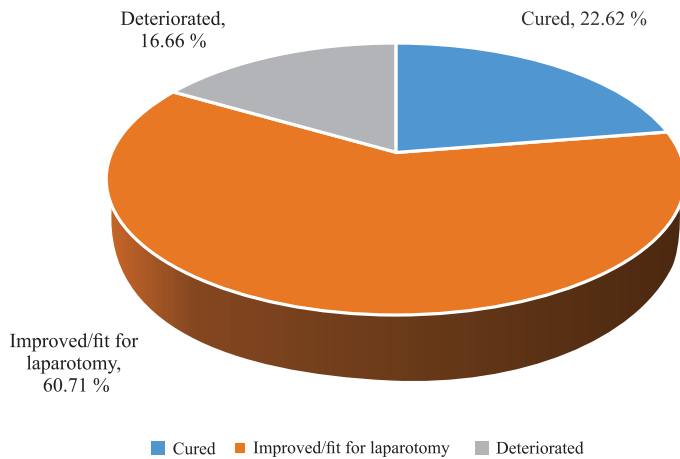


Figure 1: Outcome of the Drains Placement

Discussion:

The effectiveness of the drains placement in peritoneal cavity for treating peritonitis is not much studied. It is an important and lifesaving procedure. Most of the patients either improve or become cured completely. Peritoneal cavity is complex and closed cavity and covers the abdominal viscera.¹⁰ Peritonitis is inflammation of the membrane that lines the abdominal cavity and the viscera. It can be localized or generalized.¹¹ The common reason of peritonitis is perforation of portion of the gastrointestinal region. It is exemplified by perforation of the hollow viscera like duodenum/stomach (peptic ulcer), typhoid enteric perforation, perforated appendix. It is also associated with pancreatitis, pelvic inflammatory disease, abdominal trauma.^{12,13} According to the pathogenesis, the disease may be classified as primary or secondary peritonitis. Secondary peritonitis is by far the most common form of peritonitis encountered in clinical practice.¹³

The mainstay of treatment of peritonitis is surgery. However, patients with peritonitis are at great risk for general anesthesia.¹⁴ In many cases with peritonitis patient have other comorbid condition or peritonitis itself can cause perioperative morbidity and mortality.¹⁵ So it is always prudent to resuscitate and optimize the patient before exploratory laparotomy.¹⁶ The procedure of placement of two drains under local anaesthesia avoids all the risks and complications of general anaesthesia while treating or at least stabilizing the patients. In our study, patients had generalised peritonitis but declared unfit

for surgery under general anesthesia. Intraperitoneal double drain and lavage removes the septic material. It decreases the abdominal distension, improves the respiratory, cardiovascular and biochemical parameters of the patients.

The study shows that patients undergoing peritoneal drainage were of middle to old age (42.02 ± 11.15 years). Baloch et al demonstrated that primary peritoneal drainage was more commonly done in older patients (55 ± 10) years.¹⁷ The dissimilar results regarding age may be due to different sample size or may be incidental finding. While considering gender, our results (56 male% vs. 44% female). are comparable to the study by Baloch et al (58% vs. 42%), which established that male to female ratio for the procedure is similar.

We observed post procedure significant decrease in abdominal distension after drain placement in all patients. Moreover there was improvement in clinical parameters like respiratory rate, pulse volume, pulse rate blood pressure, temperature, urine output in these patients. Baloch et al study also showed similar results. They have also shown that laparotomy was performed in 79.2% patients under anesthesia while present study showed that laparotomy was performed in 60.71%. Due to different clinical conditions and co morbidity, present study showed dissimilar results.¹⁷

Present study also demonstrated the mortality rate of 16.66% in the patients undergoing the procedure. Baloch et al has reported almost similar hospital mortality rate in the patients undergoing peritoneal drainage and lavage. After optimizing, some of the patients were operated by them under anaesthesia. They mentioned that 2 (4%) patients expired before laparotomy. and 6(12%) patients after the laparotomy. Overall mortality in their patients has been 16%.¹⁷

Thirumanikandan PL et al conducted a study on high risk patients with perforated peptic ulcer. They concluded that management with percutaneous peritoneal drain under local anesthesia for high risk patients is more effective combined with conservative management than the conventional surgery under

general anaesthesia, which is associated with high mortality. The overall mortality in their patients was 20% which is a bit higher than our patients. Two of the nine patients died, both of them didn't improve hemodynamically went in shock and multiple organ failure. Three patients improved hemodynamically and were operated for laparotomy due to continuous drain of gut contents. Rest of them improved and the drains were removed at appropriate time after doing ultrasound abdomen to check for residual collection and return of bowel motility.¹⁸

Study by A. Saber et al on patients with peritonitis due to peptic ulcer perforation showed that, an initial period of non-operative treatment with careful observation is beneficial in some cases, and this supports the results of our study.¹⁹ Percutaneous drain placement under local anesthesia supported by the conservative measures in high risk elderly patients with perforated duodenal ulcer seems effective even when surgery is indicated. In high risk patients, with established peritonitis because of perforated duodenal ulcer, pus should be drained with the least invasive procedure and without general anaesthesia. Transnasogastric placement of a drainage catheter through the perforated ulcer can be effective and successful as definitive therapy.¹⁸ The high risk patients can be managed by putting in an intra-abdominal drain supported by conservative treatment with (12.2%) deaths and (87.8%) patients improved satisfactorily.¹⁹ As has been shown in some studies, some of these patients recovered completely without major surgery while others were subjected to exploratory laparotomy. Some of our patients left against medical advice during the treatment, which was the limitation of study.

Conclusion:

We concluded that in patients with peritonitis requiring exploratory laparotomy but are unfit for general anesthesia, outcome improves with the drain placement. In patients where major surgical procedures like laparotomy under general anaesthesia may worsen the condition, this procedure can be recommended for the management of peritonitis in unfit patients.

Ethical Approval: Given

Conflict of Interest: The authors declare no conflict of interest

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