Pre-operative peritoneal drainage as a part of resuscitation in severe peritonitis

Imamuddin Baloch,[1] Aisha Shaikh,[2] Saira Fatima Shaikh[3]

Abstract

The objective of this prospective observational study was to evaluate the benefits of peritoneal drainage under ultrasonic guidance in cases of severe peritonitis. Fifty cases with peritonitis were included in this study, who were unfit for general anaesthesia, i.e. American Society for Anesthesiologists (ASA) IV plus. The results showed improvement in general condition of the patients in the terms of improved respiration, decreased abdominal distension and circulation. Thus, it was concluded that peritoneal intubation dramatically decreases abdominal distension. Drainage of septic fluid decreases the sepsis, resulting in improvement of organ functions. This procedure has been found to be beneficial and helpful as a supportive procedure in cases where immediate major surgical procedures like laparotomy are not possible due to comorbidities and unstable general condition.

Keywords: Peritonitis, Peritoneal intubation, Septicaemia, Laparotomy.

Introduction

Peritonitis is the most common general surgical emergency all over the world[1] and is a very serious life-threatening condition. Comorbidities further worsen the situation and point towards bad prognosis in spite of a focused management plan.

Peritonitis may be primary or secondary, but general management is the same in both conditions. Majority of the patients present late, with purulent peritonitis and septicaemia.[2] Surgical management of peritonitis is highly demanding and very complex. Combination of improved surgical technique, anti-microbial therapy and intensive care support has improved the outcome of such cases.[3]

Patients and Methods

The study was conducted from March 2006 to September 2009 at Surgical Unit II, Chandka Medical College Hospital, Larkana. Fifty patients were admitted through the emergency department. The inclusion criteria comprised patients with severe purulent peritonitis, moderate to massive intra-abdominal collection, septicaemia, hypotension and comorbidities like uncontrolled diabetes mellitus, bronchial asthma, chronic obstructive airway disease, bronchitis, cardiac problems and renal failure (i.e. American Society for Anesthesiologists [ASA] III plus). Some of these patients were jaundiced and had disturbed liver function tests.

The exclusion criteria comprised patients suffering from peritonitis with stable general condition, and those with ASA II and III.

Dehydration and electrolyte imbalance were corrected — nasogastric tube was passed, and Foley's catheter was retained to monitor urinary output. After detailed history and clinical examination, data was recorded in proformas for analysis. An anaesthetist examined the patients pre-operatively for fitness regarding laparotomy, and declared them unfit for any kind of anaesthesia. Each patient's pulse, temperature, blood pressure, respiratory rate, tidal volume, girth of the abdomen were measured and recorded.

An hourly record of these parameters was kept. Since the patients were unfit for major procedures like laparotomy, it was decided to use a peritoneal tube as a supportive measure to decompress the abdominal distension. A 2cm small transverse incision was made (McBurney's point) at right iliac fossa under local anaesthesia; the peritoneum was approached and opened under vision. Through this, contaminated fluid was suctioned and a tube (Nelaton drain of 28 FR) was positioned in the pelvis for continuous external drainage. The whole procedure was done under ultrasonic guidance. This decision was independently made by the surgeon concerned. After intubation, the patients were watched closely. Their pulse, temperature, blood pressure, respiratory rate and tidal volume were recorded hourly. Assistance was sought for comorbidities from the relevant consultants. After 48 to 72 hours, most of the patients became stable enough to withstand major surgical procedures like laparotomy.

Result

Of the 50 patients, 35 (70%) were over 55 years of age. The age ranged between 25 to 80 years with a mean of 45±15.6 years. 29 (58%) patients were male and 21 (42%) were female. 18 (36%) had peritonitis due to gastric perforation; 15(30%) had ileal perforation (typhoid and tuberculous perforation); 6(12%) had peritonitis due to obstetrical and gynaecological problems; 6(12%) had peritonitis due to perforated

[1]Surgical Unit-II, Ghulam Muhammad Mahar Medical College, Shaheed Mohtarma Benazir Bhutto Medical University, Sukkur, [2]Surgical Unit-I, [3]Surgical Unit-II, Chandka Medical College Hospital, Larkana, Sindh, Pakistan.
Correspondence: Saira Fatima Shaikh. Email: sairafatimashaikh@yahoo.com

appendicitis; and 3(6%) had perforated duodenal ulcer. Only 2(4%) patients had jejunal perforation due to unknown cause.

There was a remarkable decrease in abdominal distension immediately after intubation in all cases. Respiratory rate and tidal volume also improved. Pulse volume increased and pulse rate decreased compared to the pre-intubation state in 40(80%) cases, and blood pressure also became normal in 35(70%) patients. 47(64%) were hyperthermic and 3(6%) were hypothermic before intubation, after which the temperature also started settling down within 24 hours. Most of the patients, (46 out of 50) became haemodynamically stable. Laparotomy was performed in 46(92%) patients under some kind of anaesthesia after 48-72 hours of peritoneal intubation; 6(12%) patients expired after laparotomy and 2(4%) before laparotomy. Overall, the mortality rate was 16%(n=8). One (2%) patient in our series did not require laparotomy and improved after peritoneal intubation and was discharged on 12th post-intubation day. Wound infection was seen in 15(30%) cases after laparotomy; burst abdomen was noted in 3(6%) of cases who required re-closure of abdomen with tension sutures.

Discussion

Surgery is the cornerstone regarding treatment of abdominal sepsis.[4]

The principles of managing peritonitis have not changed for decades. They include elimination of septic focus and removal of necrotic tissue. It is every surgeon's desire to achieve this goal with a single operation, but this is not always possible.[5]

Of the 50 patients in the current study, 58% were male. In a study conducted by Afridi et al there were 68.3% males.[6] Adesunkanmi et al also reported male preponderance with male-to-female ratio being 3:1.[7] Majority of the patients (46%) in our study had proximal gastro-intestinal perforation (gastric, duodenal and jejunal) which is in line with a study by Agarwal et al.[8] The second most common site of gastro-intestinal perforation in our study was ileum (30%), caused by typhoid and tuberculosis. Primary intestinal tuberculosis is uncommon in European and North American countries today.[9] We chose peritoneal intubation under local anaesthesia (a minimal invasive procedure) as first-line surgical intervention for patients who were in very serious condition and could not withstand major surgical trauma. This type of intervention was not found in literature search. Therefore, its result cannot be compared. Overall, the mortality rate in our study was 16%. Perforation peritonitis has a high mortality rate ranging from 6-27%.[10,11]

High mortality also depends upon the site and cause of perforation and associated comorbidities. Veliyev and Merrell reported a death rate of 32.2% from duodenal ulcer perforation and 20.1% from perforated gastric ulcer.[12]

Despite advances in antibiotic therapy and intensive care support, mortality and morbidity remain high.[13] In our study, the mortality rate was comparatively low in spite of the associated comorbidities in the selected cases.

Conclusion

Though less practised in the modern era, peritoneal intubation-drainage dramatically decreases abdominal distension and thus the intra-abdominal pressure. Drainage of septic fluid under ultrasonic guidance decreases the sepsis, resulting in improvement of organ function. The procedure has been found to be quite beneficial as a supportive procedure in cases where immediate major surgical procedures like laparotomy are not possible due to comorbidities and unstable general condition. More work is needed at different centres to know the benefits of this procedure.

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