LAPAROSTOMY USING URINE BAGS AS A CONTAINER, CASE SERIES STUDY IN SULAIMANI EMERGENCY AND SULAIMANI TEACHING HOSPITALS

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ABSTRACT

Background

Laparotomy wound is usually closed at the end of the operation. However, in certain occasions, it is undesirable, difficult or even imapossible to do so. The abdomen may be left open for a while; a situation called (contained laparostomy).

Objectives

The aim of this paper is to describe a simple and cheap method of temporary abdominal closure.

Patients and Methods

Over a 7-year period (2008-2015), 11 patients underwent emergency laparotomy for trauma, abdominal sepsis or intra-abdominal compartment syndrome in Sulaimani, Iraq, after which the abdomen was temporarily, closed using a sterile urine bag. Daily change of dressing and irrigation of the wound with saline was performed until the time of definite closure of skin and fascia.

Results

There were nine males (82%). Age ranged from 21 to 72 years with a mean of 43±15 year. Six patients (55%) had penetrating trauma, 4 (36.4%) had abdominal sepsis and one (9.1%) had abdominal compartment syndrome. The urine bag was kept for 7 days in 8 patients (72%), 12 days in 2 patients (18.2%) and 32 days in one patient (9.1%). Two patients (18.2%) had disruption of bag to skin sutures and another two (18.2%) had superficial wound infection. Two patients (18.2%) died due to multiple organ failure and pulmonary embolism.

Conclusion

Laparostomy management using a urine bag is cheap, simple, effective and easy to perform with minimal morbidity.

Keywords: *Laparostomy, Open abdomen, Urine bag, Bogota Bag, Damage control surgery.*

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INTRODUCTION

The usual routine after each laparotomy is to close the abdominal wound primarily and definitely in a standard full-thickness technique. However, there are occasions in which exceptions to this rule do exist such as the damage control surgery, abdominal sepsis and abdominal compartmental syndrome, [1] in which early and complete laparotomy wound closure may be undesirable, difficult or impossible.

The idea of leaving the abdomen open dates back to the 1970 s, when patients with septic abdomens were treated with laparostomy, in analogy to incision and drainage of an abscess and leaving it to heal by secondary intention [1, 2]. By definition, laparostomy is a surgical procedure in which the peritoneal cavity is deliberately left open anteriorly, hence often called 'open abdomen'. The abdominal contents are protected with a temporary coverage. The term does not include full-thickness abdominal wall defects resulting from partial excision of a tumor or necrotizing infection [3].

There are different tools used to achieve a temporary abdominal closure [4-6]. Bogota bag, described for the first time by Oswaldo Borraez in 1979 when he was a resident in Colombia is the cheapest. It is made of a sterile 3-liter IV fluid bag sewn to the skin or abdominal fascia of the anterior abdominal wall [7, 8].

In this study, we describe a very cheap method to temporarily close the abdominal cavity after an emergent laparotomy using a sterile urine bag as a container instate of IV fluid bag. The outcome and complications of the procedure are discussed in view of the relevant literature.

PATIENTS AND METHODS

This case series study conducted in Sulaimani Teaching and Sulaimani Emergency Hospitals (STH and SEH) from October 2008 until October 2015). Approval of the ethical committee of college of medicine and from both hospitals were obtained in advance. consent has been taken from all patients.

All the patients underwent laparostomy with urine bag used as a container and operation performed and followed up in the above two hospitals were included, other patients with laparostomy using mesh or adhesive materials or any material other than urine bag as a container were excluded from this study.

During the above 7-year period 11 patients (9 males and 2 females) were admitted to (STH and SEH) for laparotomy had their abdomen left open at the end of the operation and temporarily covered with a sterile urine bag (contained laparostomy). This series of patients was prospectively and retrospectively analyzed.

The urine bag was fixed to the skin using No. 0 interrupted polypropylene sutures while the rectus sheath was left un- sewed (Fig. 1), Then 3-4 packs left on the top of the urine bag and a sterile towel used to support the abdominal wall which replaced by bandages after the first dressing change and supported by an abdominal belt. All patients were admitted to the intensive care unit, with close monitoring and supportive measures. The packs were changed after 24 hours from the operation and every 24 hours until the day of the laparostomy closure. Warm normal saline was used to mechanically wash the applied urine bag from outside and a transfusion set connected to the normal saline bottle used to wash the bag from inside and to irrigate the wound from between the sutures to remove any discharge bellow the bag.

The abdominal contents were inspected through the bag once a day for bowel leak, peristalsis, distension or any other abnormalities and more frequently if the patient developed abdominal pain, fever or extensive discharge. When the general condition of the patient improved and the abdominal distension decreased with less bulging of the abdominal viscera and the edge of the wound appeared easier to be approximated, the abdominal bag was removed and the abdominal wall was closed in layers 6-8 days' latter. Any short-term complication of the procedure was observed and managed accordingly.

SPSS version (23) software was used to analyze the results.

Figure 1. Contained Laparostomy Wound Using a Urine Bag.

RESULTS

There were 11 patients (9, 82% males; and 2, 18% females; with Male: Female ratio of 4.5:1) with an age range from 21 to 72 years and a mean of 43±15 year. The indications of laparostomy are shown in Table 1.

All patients were operated in (SHE) except two who were operated upon one in Ranya hospital and the other one in Kalar hospitals before being referred to us. The urine bag was kept for 6 days in 8 patients (72.7%), 12 days in 2 patients (18.2%) and 32 days in one patient (9.1%). Two patients died in this series (18.2%); one due to multiple organ failure and one due to pulmonary embolism 3 and 41 days postoperatively respectively. The methods of definite abdominal closure are shown in Table 2.

Table 3 displays the complications encountered in this series.

Table 1. Indications of laparostomy

Indication	Number of Patients	Percentage
Damage control surgery	6	55.5
Gun shot	4	36.4
Shrapnel	2	18.2
Intra-abdominal abscess	4	36.4
Acute pancreatitis	2	18.2
Fecal peritonitis	1	9.1
Bile peritonitis	1	9.1
Intra-abdominal compartment syndrome *	1	9.1
Total	11	100

***** The initial pathology in this patient was an obstructed huge incisional hernia. The patient developed intra-abdominal compartment syndrome 20 hours after hernia repair.

Table 2. Method of abdominal closure.

Method	Number of Patients	Percentage
Fascia and skin	8	72.7
Skin only	1	9.1
Pedicled TRAM flap	1	9.1
No closure *	1	9.1
Total	11	100

***** The patient died on 3rd postoperative day.

Table 3. Complications.

Complication	Number	Percentage
Disruption of bag from the skin sutures following intestinal obstruction *	3	27.3
Superficial wound infection	2	18.2

***** The urine bag was replaced twice in one patient and once in another patient. As distended bowel loop resulted in suture disruption.

Figure 2. Direct abdominal wall closure not possible.

Figure 3. Closure of abdominal wall with Pedicled TRAM flap.

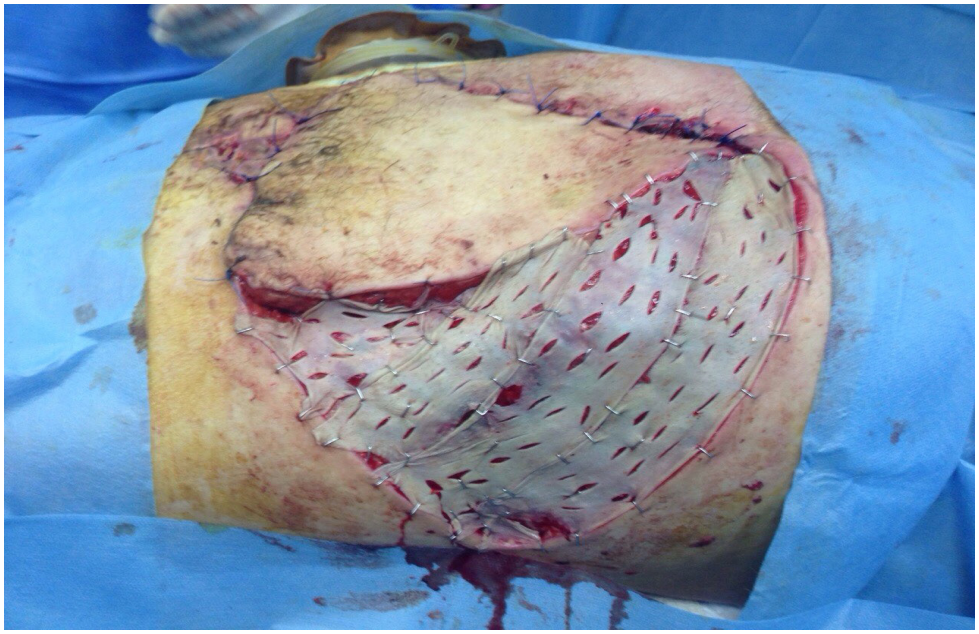

Figure 4. The raw area closed by skin graft.

Figure 5. After flap and the graft healing.

DISCUSSION

In this study, a small number of patients with contained laparostomy using a urine bag following emergency laparotomy for different reasons are presented.

Temporary abdominal closure techniques are used to postpone definite closure until predisposing factors causing pathologic elevation of intra abdominal pressure or abdominal sepsis are resolved [8]. These temporary abdominal closure techniques are most commonly used in cases of abdominal compartment syndrome in which decompressive laparotomy is necessary to reduce intra abdominal pressure to restore systemic perfusion, and prevent associated complications [8].

There are different methods to cover the abdominal viscera during the early period, some are expensive such as negative pressure dressing, Velcro-like patch or zipper-type synthetic materials, others are less expensive like synthetic meshes and Bogota bag [4, 6].

In properly selected patients, laparostomy has many advantages over primary abdominal closure, as it improves ventilation, allows better visceral perfusion, inspection of the abdominal cavity through the transparent bag and better drainage [3, 9]. Unlike frequent closure and opening of the abdominal wall, this procedure keeps the abdominal wall fresh for final closure and permits faster weaning from ventilator and earlier enteric feeding [3, 9-12]. The disadvantages of this procedure are temperature and fluid loss, (entero-Environmental) fistula, weakness of the abdominal wall due to lateral fascial retraction, which leaves abdominal viscera unprotected with the development of huge incisional hernia later on [5, 6, 8, 13-14].

In comparison to the other materials used to contain the abdominal viscera Urine bag has the advantages of being cheap, readily available in all operating rooms, already sterile thus; no time is needed for its sterilization particularly in damage control surgery in which time factor is critical. It is transparent allowing easy inspection of the abdominal contents. Drainage is possible from the edges of the wound Moreover, the procedure is rapidly mastered by junior doctors and minimal learning curve is required [9].

However, urine bag is weak compared to mesh and methods and can tear apart when abdominal distension occurs. This would require placing more sutures or replacing the urine bag [8].

In this series, we have sutured the bag to the skin rather than to the fascia to keep the latter fresh for future closure. Polypropylene No. 0 interrupted sutures mounted on round needle were used to allow good drainage and avoids disruption of the bag when the abdomen distends.

We advocate early definite closure of laparostomy wounds preferably around 7 days due to technical ease as the adhesion of the viscera to the abdominal wall is not tough. It is also advisable to keep the opening in the abdominal wall as close to the center as possible so that closure would be technically easier. We could close both fascia and skin in most cases. However, in one patient it was only possible to close the skin while the fascia was not sutured because of lateral displacement of the rectus sheath resulting in a big incisional hernia that would need subsequent repair.

Conclusion

Despite the small number of patients in this series, the technique of using a urine bag to manage the open abdomen seems to be simple and effective. It is very cheap compared with other tools and easy to be performed. The morbidity is minimal while the deaths were not related to the procedure but to the underlying pathology.

Conflict of Interests

None to be declared.

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