ORIGINAL PROF-810

LAPAROSTOMY AND ABDOMINAL CONTENT CONTAINMENT

DR. FAISAL BILAL LODHI, FCPS
Assistant Professor Surgery
Punjab Medical College Faisalabad

DR. IFTIKHAR FCPS
Senior Registrar Surgical Unit III
Allied Hospital Faisalabad

DR. TARIQ FAROOQ, FCPS
Assistant Professor Surgery
Punjab Medical College Faisalabad

Prof.Dr.Riaz Hussain FRCS
Professor of Surgery
Punjab Medical College Faisalabad

ABSTRACT... faisalblodhi@hotmail.com **Background:** Alternatives to fascial closure of the abdominal wall are increasingly used in critically ill patients. They pose practical and logistical problems in management of seriously ill patients. **Objectives:** (1) To define the role of laparostomy in intra abdominal sepsis. (2) To highlight the importance of economical method of temporary abdominal content containment using plastic bag. **Setting:** Surgical Unit III Allied Hospital/PMC Faisalabad **Period:** March 2003 to February 2004, **Methods:** Thirteen patient, 08 male and 05 female patients underwent temporary abdominal content containment (t-ACC) following Emergency laparotomies. Indications for t-ACC were severe sepsis requiring reoperation, abdominal wall tissue loss or a combination of these. **Results:** Three patients underwent early definitive abdominal closure within 15 days. Eight patients had a protracted hospital stay (mean 26 days).Two patients died (on 10th and 17th post-op day) due to MODS. **Conclusion:** Plastic bags are cheaper and as effective as polyglactin mesh and other methods of t-ACC. Survivors require a multidisciplinary approach in management, undergo a protracted hospital stay and later need complex incisional hernia repairs.

KEY WORDS: Laparostomy, Abdominal content containment

BACKGROUND

Management of patients with severe intra-abdominal sepsis (IAS) in the past has been difficult as the mortality rates were high in the range of 30-76%[1,2,3,4]. This was due to the fact that, by the time the intra-abdominal sepsis was diagnosed and treated by re-operations, it was too late, as by then, the majority of patients had full-blown sepsis with varying degrees of multi-organ failure. Further operations under these conditions were found to be futile.

This led to the development of aggressive surgical measures like laparostomies and planned re-laparotomies in the 1980s. The early results with laparostomies were promising but it soon became clear that leaving the abdominal wound open was becoming problematic, with increasing complications. The problems with the open wounds were to some extent eliminated by the introduction of temporary abdominal closure devices. They are costly and some times economically unfeasible in our socioeconomic setup. However, in spite of all these developments, the

mortality rate in patients with severe IAS is still around 30%.

MATERIALS & METHODS

The study was conducted in Surgical Unit-III, Allied Hospital, Punjab Medical College, Faisalabad between March 2003 and February 2004. Thirteen patients were included in this study (08 male and 05 female).All patients underwent laparotomy for different indications as shown in table-I. Laparostomy was followed by temporary abdominal content containment (t-ACC) using sterilized plastic drainage bags cut to the required size (Fig 1 &2)

Inclusion criteria:

1 Adult patients
2 Severe sepsis requiring re-operation
3 Abdominal wall tissue loss
4 Combination of sepsis and abdominal tissue loss.

Septic cases were washed daily with normal saline by inserting drip set under one corner of the loosely stitched plastic bag till sepsis settled and wound started granulating. Special attention was paid to early establishment of enteral nutrition in all the patients during their hospital stay.

Table-I

Indication	No of patients (N=13)
Septic abortion	3
Blunt Trauma	3
Typhoid Perforation	2
Penetrating trauma	2
Tuberculous Peritonitis	2
Anastamotic Leakage	1

RESULTS

Three patients underwent early definitive abdominal closure within 15 days. Abdominal wall closure in these patients was done with Prolene No.1 using standard mass closure technique.

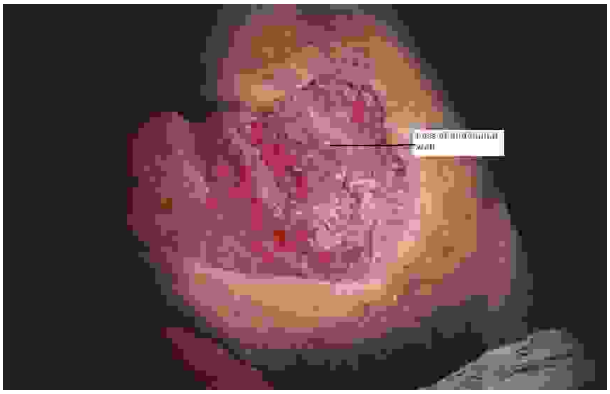

Figure-1

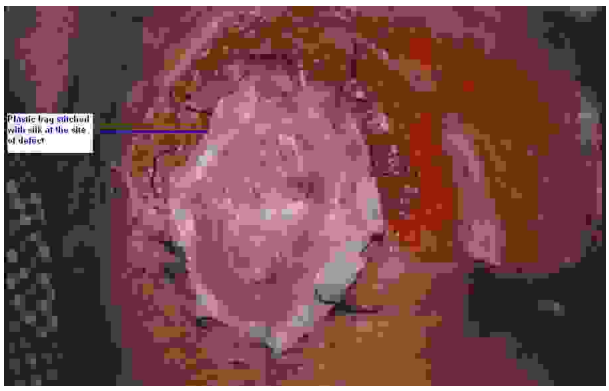

Figure-2

Eight patients had a protracted hospital stay (mean 26 days). Three patients needed abdominal wall closure with tension sutures. In five patients the wound contracted with acceptable secondary healing.(Fig-3-5).

Two patients died (on 10th and 17th post-op day) due to Multiple Organ Dysfunction Syndrome (MODS).

Figure-3

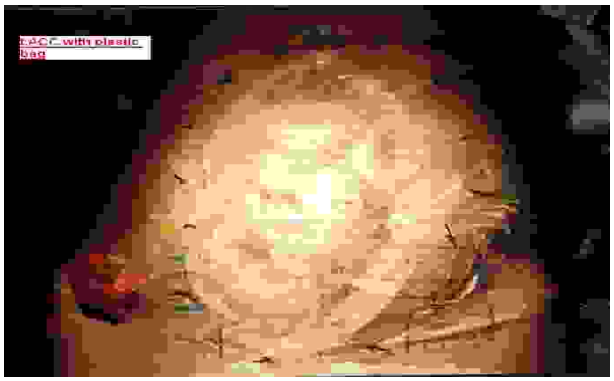

Figure-4

Figure-5

DISCUSSION

Different approaches available to the surgeons in patients with severe Intra abdominal sepsis (IAS) are:

1 **Laparostomies**: The wounds are left open to heal by secondary intention.

2 **Planned re-laparotomies**: Where a conscious decision is made at the time of the primary operation that the patient would be brought back to theatre for a further inspection at a certain time interval. The abdominal wall is closed after each procedure.

3 **On-demand laparotomy:** is dictated by the patient's clinical condition, and is the technique by which most patients are managed, and has a mortality of 30-76 %[5,6]

The main indications for laparostomies are in the management of patients with infected pancreatic necrosis and severe intra-abdominal sepsis. It has also been used either to treat or prevent Abdominal Compartment Syndrome (ACS), especially in patients with intestinal obstruction, gross peritonitis and major abdominal trauma[7].

The principle advantages of leaving the abdominal wound open are :

- It helps re-entry into the abdomen at a further visit.
- It allows effective drainage of the intra-abdominal sepsis.
- It helps in inspecting the abdominal cavity for any new collections and drain them effectively.

It also gives an opportunity to inspect the anastomotic sites for any leaks. By this it aims to eradicate intra-abdominal infection and to minimize or prevent systemic inflammatory response syndrome[8].

Lastly, the risk of abdominal compartment syndrome is virtually eliminated[9].

The disadvantages of laparostomy include:

- Massive fluid losses
- Evisceration of intra-abdominal contents
- Contamination by exogenous organisms

- Fistula formation[10,11]
- Intra-abdominal bleeding
- Post-op abdominal wall hernias

In view of the relatively high complications with the open methods, some modifications were introduced. Temporary abdominal closure devices are used instead of leaving the abdominal wound open. These include:

Meshes (absorbable & Non-absorbable)
Polyglycolic acid (DEXON)
Polytetrafluoroethylene (PTFE)
Polypropylene (MARLEX)
Zippers
Slide fasteners
Adhesive sheets
Plastic bags (3-or 1-litre Urological bags)[12,13]

Different studies show various problems with non-absorbable meshes, when used as temporary closure devices, mainly enteric fistula and persistent infection[14].

Use of Absorbable meshes has also shown to be associated with certain disadvantages as mentioned below:

Cannot be used when further re-explorations are required;
Risk of disintegration.
Complete intestinal evisceration following mesh absorption.

The other common material used for the semi-open method is 1 or 3 litre Urological / Drainage bag[15,16]. This bag, like the meshes, is able to cover the open abdominal wound. Three liter sterile plastic bags were used in this study. They are easily and rapidly fixed. The technique only requires an interrupted or continuous silk suture to fix the bag to the margins of wound. Active sepsis can easily be controlled by liberal lavage with saline using drip set inserted under one corner of plastic bag. When re-explorations are considered, the bag can just be slit in the middle and closed back instead of removing the bag and putting on a new one.

The main advantage of this over the mesh is that it does not stick to the underlying structures. It also prevents heat and fluid losses as it is waterproof. It does not damage the abdominal wall. It is economical as well.

In addition, there would be no risk of wound dehiscence and enteric fistula. We were able to close the abdomen successfully in six out of thirteen patients whereas in five patients the wound contracted with acceptable secondary healing without suturing. In the study by Doyon et al, they were able to close the wound in almost all of their patients when re-exploration was no longer needed[15].

CONCLUSIONS

Laparostomy is an effective method in most patients with severe intra abdominal sepsis. However it has certain major disadvantages which restrict its routine use. If possible use temporary abdominal wall closure devices. Plastic bags are economical, as effective as polyglactin mesh and other methods of t-ACC. Survivors may require a multidisciplinary approach in management, undergo a protracted hospital stay and may later need complex incisional hernia repairs.

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