

Abdominal Component Separation in Cases of Wound Dehiscence with Evisceration (Burst Abdomen)

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ABSTRACT

Background: Abdominal wound dehiscence is a mechanical failure of wound healing; The use of component separation in the cases of complex abdominal hernia is a well-established method for closure of large defect. Component separation was described as a novel method in the management of burst abdomen in a small series of case study. **Aim:** To assess the use of component separation as a new concept in cases of burst abdomen. **Material and Method:** Prospective cohort study that included patient presenting with burst abdomen in Cairo university hospitals in the period between 6/2014 to 3/2016. **Results:** The study included 51 patients. The closure was successful in all patients . the rate of complication was low , and included superficial skin flap necrosis (30%), Wound infection (23.5%), and seroma (15.6%). **Conclusion:** This study showed that component separation is a valuable option that can be added to the armamentarium in the treatment of wound dehiscence (burst abdomen).

Keywords: Component separation, burst abdomen, wound dehiscence

INTRODUCTION

Abdominal wound dehiscence is a mechanical failure of wound healing. ⁽¹⁾ It represents a severe and a serious life threatening postoperative condition that requires a rapid and efficient management to close the abdomen and cross with the patient this acute stage, the mortality rates in these cases is reported as high as 45%. ^(2,3)

The use of component separation in the cases of complex abdominal hernia is a well-established method for closure of large defect. Defects up to 22 cm have been successfully approximated using these methods. Component separation in the emergency settings has been used in small series of case presentation. Component separation uses a sliding myofascial flap to provide tension-free closure of large abdominal wounds without implantation of mesh ⁽⁴⁾.

Aim of the study:

To assess the use of component separation as a new concept in the management of cases of burst abdomen (wound dehiscence with evisceration) in which the abdominal closure was associated with increased intra-abdominal pressure or inability to close the abdomen.

MATERIAL AND METHODS

Prospective case series study that included patient presenting with burst abdomen (Figure 1) in Cairo university hospitals in the period between 6/2014 to 3/2016. The abdominal defect was wide enough to prevent primary closure without significant increase in the intra abdominal pressures.



Fig. 1: A case of complete evisceration (burst abdomen)

Patients' demographics including age, gender, and body mass index were recorded. Defect size was measured as width and length in centimeter after dissection of the flaps.

The technique used was as described by Ramirez in 1900⁽⁴⁾. The skin flaps were raised (Figure 2 A, B, C and D). An incision was made at the external oblique 1 cm lateral to the linea semilunaris and the incision was extended from the costal margin above to the inguinal ligament below. A flap is created between both the internal and external oblique muscles. At this level, an attempt to close the abdomen is tried. If still under tension another incision is made 1 cm lateral to the midline at the posterior rectus sheath and extended from the costal margin above to the arcuate line below. In case of burst abdomen associated with stoma, a modified technique was used as described by Maas et al, where at the side of the stoma, the skin was incised 5 cm lateral to the stoma longitudinally and the external oblique was incised from the costal margin to the inguinal ligament (Figure 3). The opposite side was managed as usual.⁽⁶⁾

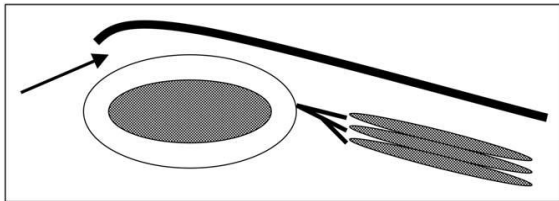


Fig 2A: Raising the skin flaps (Vargo et al., 2004)

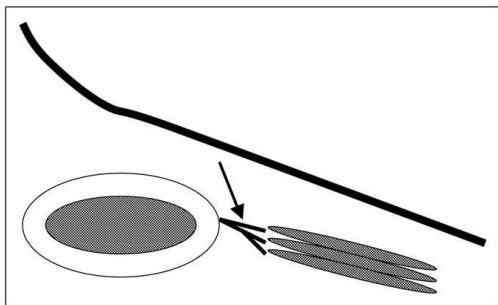


Fig. 2B: An incision was made at the external oblique 1 cm lateral to the linea semilunaris⁽¹⁰⁾

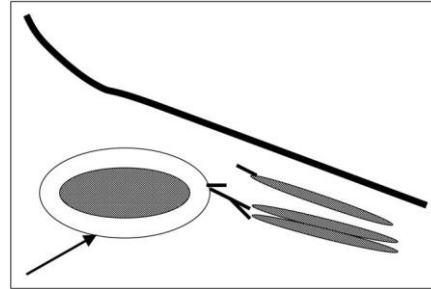


Fig. 2C: Dissection between the plane between the internal and external oblique muscles⁽¹⁰⁾

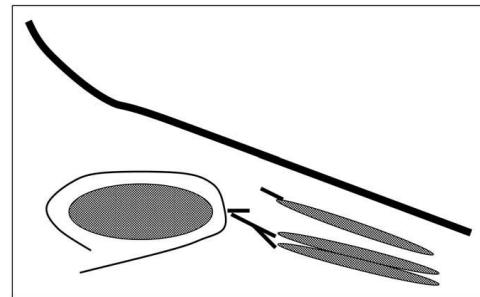


Fig. 2 D: Dissection of the posterior rectus sheath from the rectus muscle⁽¹⁰⁾

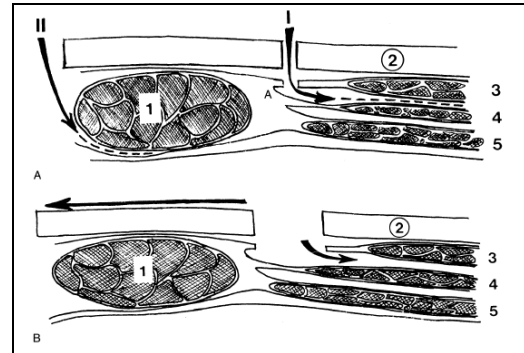


Fig. 3: Technique of component separation in the presence of stoma⁽⁶⁾

After completing the mobilization, the midline was approximated using interrupted 1/0 Vicryl. This was followed by insertion of subcutaneous suction drain and closure of the skin interrupted mattress suture.

The intraabdominal pressure was measured in mmHg using a catheter connected to sphygmomanometer.

The patients were hospitalized until the return of bowel movement. Follow up was done weekly for the first month then monthly for 5 months. The follow up was to assess the wound and the occurrence of any complication including hernias. By the end of six months, the abdominal wall function was assessed, by asking the patient to perform straight and rotational curl-ups to assess the function of rectus muscles and the internal and external oblique muscles on both sides.

RESULTS

The study included 51 patients, 12 female 39 male (Figure 4). The mean age was 48.6 ranging between 25 to 67 years. The mean Body mass index (BMI) was 39. The width of the defect ranged between 5 to 20 cm in the middle third, and between 3 to 6 cm in the upper and lower

third of the wound. The Length of the defect ranged from 23 to 40 cm.

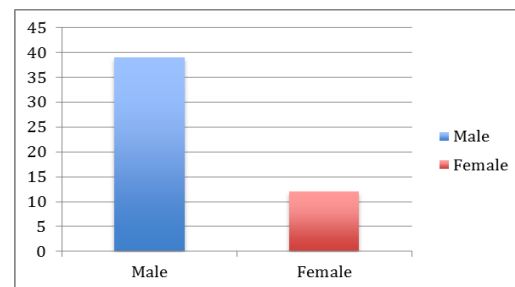


Fig. 4: Gender distribution in the study

Different type of cases were identified in the study, they include posttraumatic cases and post peritonitis (table: 1)

Table (1): Type of cases presented with burst abdomen

Type of cases	Number
Postexploration trauma	16
Post exploration for Intestinal obstruction with resection anastomosis	9
Postexploration for intestinal obstruction with Hartmann's procedure	1
Post perforated duodenal ulcer repair	8
Post pancreatic necrosectomy	5
Post repair of bowel injury	12

The closure was successful in all patients (Figure 5 A and B). The postoperative hospital stay ranged between 7 to 21 days with a median of 15 days. Fifteen cases (30% of cases) developed superficial skin flap necrosis, which was managed conservatively in all cases except two cases that required debridement and closure of skin (figure 6). Wound infection occurred in 12 patients (23.5%), however all the infections were managed conservatively by repeated dressing and antibiotics according to the culture and sensitivity. Eight patients developed postoperative seroma (15.6%), they were managed by repeated aspiration, all of these cases were resolved completely within one month.



Fig. 5A: Closure of burst abdomen in the presence of stoma



Fig. 5B: One month after the closure in the patient with stoma



Fig. 6: Superficial flap necrosis with infection that was managed conservatively

The mean intraabdominal pressure after closure was 14.17 mmHg ranged between 10 to 25 mmHg. There were no cases of recurrent burst abdomen.

During the 6 month of follow up there was incisional hernia in 7 cases (13.7%) that were successfully repaired using mesh. There was no mortality.

By the end of six months all the patients had completely recovered, with full return of their abdominal wall function without any limitation to their activity level

DISCUSSION

Post laparotomy wound dehiscence occurs in 0,25% to 3% of laparotomy patients and immediate operation is required which has a death rate of 20%^(2,5,6).

Different techniques were described to manage these conditions. These techniques include retention sutures, Bogota bag and vacuum assisted closure. Component separation represents a new and efficient way to treat burst abdomen.

In this study, 51 patients with burst abdomen were successfully managed using this technique. Complication rate was relatively low in comparison with other studies

Wound infection was 23.5% which is comparable to the results shown by Vargo who showed an incidence of 26% of wound infection.⁽¹⁰⁾

The overall success rate was 100%. Primary repair was successful in 86.3% of cases, In seven cases (13.7%) they developed incisional hernia which was successfully repaired using mesh hernioplasty. Similar results were shown by Vargo et al where primary closure was successful in 89%.⁽¹⁰⁾

Eight patients, within this study, developed postoperative seroma (15.6%). In another study by Shestak et al.⁽¹¹⁾ the incidence was 1 in 22 (4.5%). The difference in the incidence between both studies might be related to the different types of patients. The cases in Shestak were all large incisional hernia in normal healthy individual. While in this study, they were all complicated cases with burst abdomen and many patients were suffering from low albumin.

When comparing this technique to the other techniques used in abdominal wall closure for complete wound dehiscence (burst abdomen), the component separation is characterized by the use of local tissue without insertion of foreign body. This had lead to decrease incidence of infection, enteric fistula and chronic wound infections. The use of foreign body like in Bogota bag technique showed an incidence of fistula in 8% of cases.⁽¹⁴⁾

The hospital stay in component separation technique was the same as the VAC assisted closure and in vacuum pack. In this study, it ranges between 7 to 21 days with a mediana of 15 days, while in cases managed with vacuum pack, it ranges between 3 to 21 days⁽¹²⁾, and in cases

managed with VAC, and the median hospital stay was 16 days⁽¹³⁾.

The incidence of flap necrosis was higher between component separation technique (30%) and the other technique. In Bogota bag the flap necrosis was 11%⁽¹⁴⁾, this can be explained by the need to elevate a large flap of skin from the abdominal wall to reach the lateral border of rectus muscle. However all the cases were managed conservatively except one case that required debridement.

CONCLUSION

This study showed that component separation is a valuable option that can be added to the armamentarium in the treatment of wound dehiscence (burst abdomen).

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