



Case Report

Management of complex open abdominal wounds: Report of two cases

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ABSTRACT

This report discusses the successful management of two complex open abdominal wounds. The wounds were temporarily closed with a silastic sheet. After several dressing changes with vacuum-assisted closure (VAC), bilateral bipedicle advancement flaps were used to close the complex open abdominal wound. Case 1: a 41-year-old man underwent gastric bypass surgery for morbid obesity. Wound dehiscence resulted from a sudden increase in intra-abdominal pressure while weaning from mechanical ventilation. The huge open wound was temporarily covered with a silastic sheet. After serial VAC dressing changes, the wound was progressively reduced. The defect was completely repaired using bilateral bipedicle advancement flaps. The skin defects in the lateral abdominal wall were then covered with a split-thickness skin graft. Case 2: a 65-year-old woman underwent emergency surgery for hypovolemic shock from active upper gastrointestinal bleeding. She had a history of three biliary operations for intrahepatic and common bile duct stones. Hemobilia caused by a ruptured intrahepatic pseudoaneurysm was controlled by intraoperative arterial embolization. To prevent abdominal compartment syndrome, the open wound was initially covered with a silastic sheet. The wound was progressively reduced by serial VAC dressing changes. The midline wound was then successfully closed by bilateral bipedicle advancement flaps. After VAC dressing, the skin defects in the lateral abdominal wall were directly closed 2 weeks later. In our experience, a combination of VAC and bilateral bipedicle advancement flaps is effective for the definitive fascia to fascia closure of huge complex open abdominal wounds.

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1. Introduction

“Open abdomen” is a strategy used to avoid abdominal compartment syndrome [1,2]. It has become a significant intermediate step in the treatment of abdominal emergencies, including severe abdominal trauma, retroperitoneal hemorrhage, pancreatitis, and severe abdominal sepsis. It has proven effective in reducing mortality and immediate postoperative complications, but it remains a challenging surgical problem with increased late morbidity, such as infection, and enterocutaneous or enteroatmospheric fistula. Various strategies have been proposed to close an

open abdomen, including delayed primary fascia closure, planned ventral hernia [3], component separation [4], a Wittmann patch [5,6], abdominal reapproximation anchoring [7,8], and bilateral bipedicle advancement flaps [9,10]. Each of these strategies has various advantages and disadvantages [11,12].

Repeated, tedious abdominal wound dressing changes are usually required to prepare for wound closure before the definitive abdominal wall reconstruction. Negative pressure wound therapy including vacuum pack closure and vacuum-assisted closure (VAC) are currently being used as temporary abdominal closure techniques. These can decrease the frequency of dressing changes and facilitate delayed primary fascia closure [13–15] or enhance secondary fascia closure with a combination of other temporary abdominal closure methods [16–20].

Here, we share our experience in the integration of VAC with bilateral bipedicle advancement flaps to manage two complex open abdominal wounds.

Conflict of interest: none.

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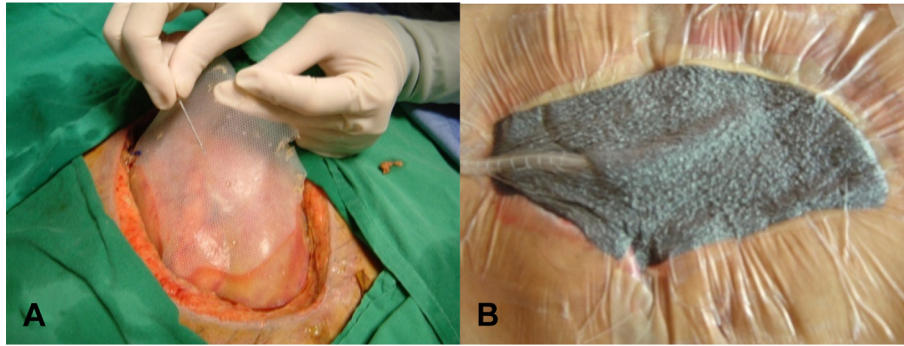


Fig. 1. Case 1: (A) a silo sheath is pierced at multiple sites and used to protect the underlying visceral organs from direct trauma from VAC; (B) the abdominal defect is dressed with a polyurethane sponge and connected to a VAC therapy unit at a negative pressure of approximately 75–125 mmHg. VAC = vacuum-assisted closure.

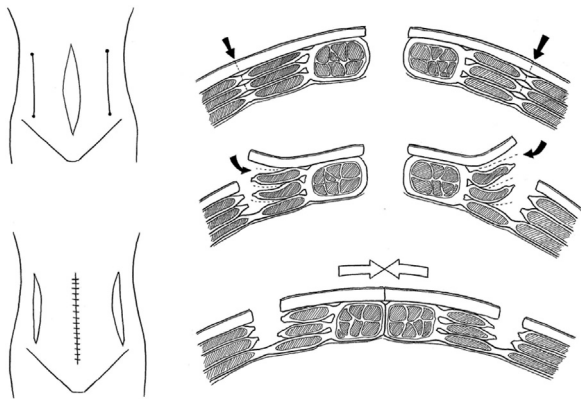


Fig. 2. Illustration of the technique used for bilateral bipedicle advancement flaps to close a midline defect.

2. Case Reports

2.1. Case 1

A 41-year-old man with a body mass index of 53.8 underwent a gastric bypass for morbid obesity. Unfortunately, wound dehiscence and bowel evisceration resulted from a sudden increase in intra-abdominal pressure while weaning from mechanical ventilation. As evisceration and marked swelling of the small bowel hindered primary closure of the abdominal wound, it was initially covered with a silastic sheet and treated with VAC (Fig. 1). VAC dressings were changed twice a week. After 4 weeks of VAC, the abdominal wound was well covered with granulation tissue. Although the defect decreased to $26 \times 16 \text{ cm}^2$, frozen abdomen developed and delayed primary fascia closure could not be achieved by VAC alone. The midline wound was then successfully closed fascia to fascia using bilateral bipedicle advancement flaps (Fig. 2). The skin defects in the bilateral abdominal wall were closed using split-thickness skin grafts (STSGs) (Fig. 3).

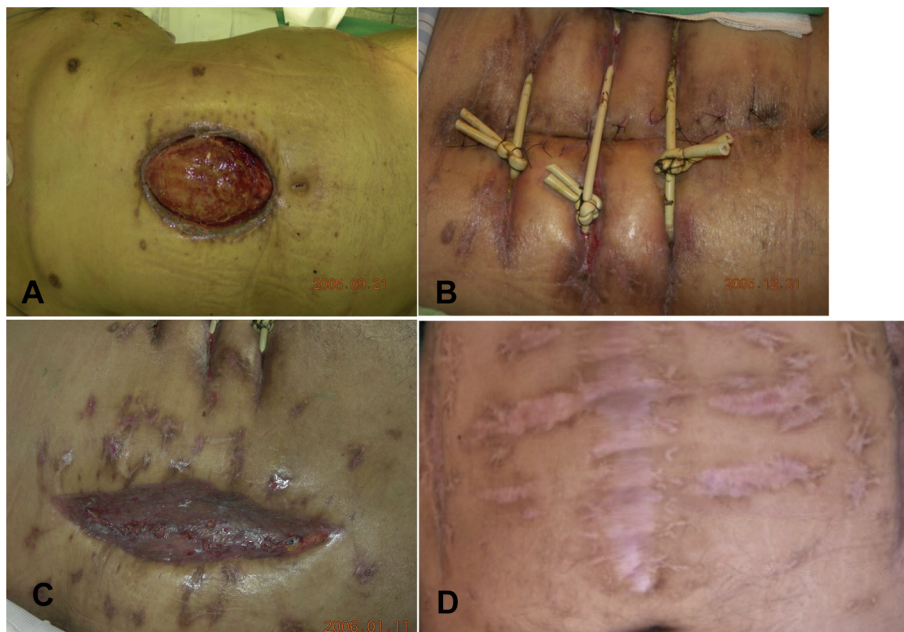


Fig. 3. Case 1: (A) after 4 weeks of VAC, the abdominal defect is covered with granulation tissue; (B) using bilateral bipedicle advancement flaps, the abdominal defect is closed fascia to fascia with silicon Foley catheter retention sutures; (C) the lateral abdominal wound is repaired using STSGs; (D) after the integration of VAC and bilateral bipedicle advancement flaps, the complex open abdominal wound has completely healed 3 months later. STSGs = split-thickness skin grafts; VAC = vacuum-assisted closure.

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