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Case Report
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Abdominal Wound with Exposed Mesh Successfully Treated with Vacuum Assisted Closure Therapy and Hatchet Flap - A Case Report

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Introduction

Complex abdominal wall wound complicated with mesh exposure poses a clinical dilemma to plastic surgeons. The mesh is often removed and the defect closed with a more sophisticated reconstruction with autogenous tissue [1]. On the contrary, conservative management by retaining the mesh in the open wound will often invite intractable infection because of the presence of foreign body. We report a case of Prolene mesh exposure in a full-thickness abdominal wound that was successfully managed with vaccum-Assisted Closure (VAC) therapy and a hatchet flap.

Case Report

A 66-year-old gentleman, chronic smoker, with past history of left renal cell carcinoma which was removed by open partial nephrectomy *via* a left flank incision in 2016. He was diagnosed left lower chest wall liposarcoma and underwent left chest wall resection (3cm skin margin) including the left 7th and 8th ribs in April 2021. Histopathology diagnosis was well-differentiated liposarcoma with involved inferior margin. He declined adjuvant radiotherapy. Five years later, local recurrence developed at two sites (4x6cm left chest wall and 6x6cm left upper abdominal wall) and he underwent composite resection of left chest wall (including 3 ribs) and left upper abdominal wall. The left chest wall defect was reconstructed with a dual mesh (BARD Ventralight ™ CT) covered by a transposition left internal mammary perforator flap (9x14cm). The donor site defect was covered by split-thickness skin graft. The full-thickness abdominal wall defect (9x8cm) was reconstructed by the same mesh with primary skin closure. Postoperatively, the left chest wall wound healed uneventfully. However, the left upper abdominal wound dehisced and the mesh was exposed on day 12. There was redness of the wound edge but frank pus discharge was absent. No microorganism was grown from the abdominal wound.

Given the unfavorable skin status and undue tension, the abdominal wound was managed with VAC device at continuous pressure of 100mmHg without mesh removal. Granulation tissue gradually formed in the porous space of the mesh which adhered to underlying tissue on day 24 after vacuum treatment (Figure 1). Eventually, the abdominal wound was closed with a 7x4cm hatchet flap on day 35 after VAC treatment (day 47 postoperatively) (Figure 2 and 3). The wound healed smoothly without further dehiscence or mesh exposure. There was no incisional hernia 4 months following salvage surgery (Figure 4). No VAC-related complication occurred.

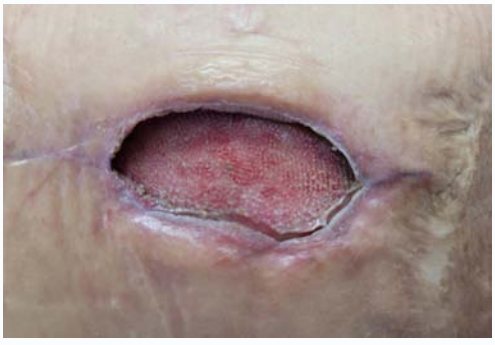


Figure 1: Granulation tissue filling the mesh interstices.

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Figure 2: Design of hatchet flap.



Figure 3: Inset of hatchet flap.



Figure 4: Stable wound without mesh exposure 4 months after operation.

Discussion

VAC is gaining popularity for the management of complex or contaminated wounds. The basic mechanism of VAC is edema alleviation, enhancing local perfusion and tissue nourishment, and hastening wound healing [2]. Because of these advantages, VAC is potentially an attractive solution to the besetting problem of open wound with mesh exposure.

In 2009, Tamhankar *et al.,* [3] reported 4 patients with mesh infection following abdominal wall hernia repair (3 had positive bacterial growth while 1 negative growth) and were managed with VAC therapy. Complete and partial mesh preservation was achieved in 3 and 1 patients respectively. They proposed VAC as the low-risk first-line intervention for post-hernia repair mesh infection if harnessed judiciously.

In the series reported by Berrevoet *et al.,* [4]., VAC was employed in 63 patients with porous mesh infection after ventral hernia surgery: 54 retromuscular and 9 open intraperitoneal cases. All 54 retromuscular meshes were salvaged after 2-9 dressing changes. For the 9 open intraperitoneal meshes, 3 required complete or partial mesh excision. The overall mean duration to complete wound closure was 44 days. Authors concluded that VAC is a useful adjunct for salvaging deep infected porous meshes.

A prospective study [5] comparing VAC (Group 1, N=12) *vs.* conventional wound care (Group 2, N=12) for mesh exposure after ventral hernia repair was conducted in a 3-year period. Mesh salvaged rate was significantly higher in Group 1 than Group 2: 91.7% *vs.* 41.7%. Authors declared that VAC therapy has excellent and promising outcomes in the preservation of infected prosthesis.

In the above 3 series, no flap reconstruction is required in addition to VAC therapy for wound closure. We speculate the wound dehiscence of our reported case is ascribed to wound closure under tension. Therefore, hatchet flap elevation apart from VAC alone was employed to ensure tension-free wound closure [6]. Hatchet flap is a simple but reliable, versatile local flap that could be applied in various body parts. Actually, prolonged exposure (4 months) of implantable central venous access device in the arm salvaged by a local transposition flap had been reported [7]. So, for difficult cases of mesh exposure with skin loss, local flaps should be considered in addition to VAC for optimal wound healing and mesh safeguarding.

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