Vacuum-assisted closure for postcardiac surgery mediastinitis in a patient on hemodialysis

Sakashi Noji, MD · Atsushi Yuda, MD
Takayuki Tatebayashi, MD · Masayoshi Kuroda, MD

Abstract
A 66-year-old man on hemodialysis underwent off-pump coronary artery bypass grafting. He was discharged in good condition on postoperative day (POD) 16. A high-grade fever and a purulent discharge emerged on POD 30. Methicillin-resistant Staphylococcus aureus was identified by culturing material from the wound. On admission, vacuum-assisted closure (VAC) therapy was applied for 80 days. Finally, good wound healing allowed us to perform simple wound closure without using muscle flaps or omentoplasty. VAC therapy is a useful and safe procedure for postcardiac surgery mediastinitis.

Key words Vacuum-assisted closure (VAC) · Mediastinitis

Introduction
Postcardiac surgery mediastinitis, commonly called a deep sternal wound infection, is one of the most feared complications in patients undergoing cardiac operations. At the present time, there is no general consensus about the appropriate surgical approach to mediastinitis after cardiac surgery. Vacuum-assisted closure (VAC) is a novel treatment with an ingenious mechanism, and recent reports have demonstrated encouraging clinical results.1 We herein describe a case of postcardiac surgery mediastinitis treated by VAC therapy.

Case
The patient was a 66-year-old man on hemodialysis who underwent off-pump coronary artery bypass grafting (CABG). He had diabetes mellitus and was on insulin therapy. Preoperative data showed hemoglobin A1c (HbA1c) of 6.0% and a blood glucose level of 120 mg/dl. Off-pump CABG was performed for three-vessel disease.

After a median full sternotomy, the left internal thoracic artery (LITA) and the right internal thoracic artery (RITA) were harvested by a skeletonization technique. The saphenous vein (SVG) was harvested from the left lower leg. Graft configuration was as follows. The RITA was brought across the midline to the left anterior descending coronary artery. The LITA was anastomosed to the posterolateral branch of the circumflex coronary artery. The SVG was anastomosed to the posterolateral branch of the circumflex coronary artery. The SVG was anastomosed to the atrioventricular branch of the right coronary artery. Proximal anastomosis was done by the Enclose II device (Novare Surgical System, Cupertino, CA, USA). During and immediately after surgery, we treated the blood glucose level of 110–130 mg/dl with increased insulin therapy.

His postoperative course was uneventful, and he was discharged in good condition on postoperative day (POD) 16. There was no sign of infection at discharge with the C-reactive protein (CRP) level at 0.35 mg/dl and the white blood cell (WBC) count of 4150/μl. However, on POD 30 a high-grade fever and a purulent discharge from the median sternotomy wound emerged.
Methicillin-resistant *Staphylococcus aureus* (MRSA) was identified by culturing material from the wound.

On operation, the necrotic tissue was removed (Fig. 1A), VAC therapy was applied, and suction was initiated. Over the course of treatment, the wounds with persistent areas of necrosis were further débrided and the VAC reapplied. Application of VAC therapy involved porous polyurethane foam to fill the wound. Within the foam was embedded a noncollapsible evacuation tube to which a negative pressure vacuum was applied. A transparent adhesive drape covered the wound and foam; and pressure was initiated at $-100$ mmHg, subsequently increased, and maintained either continuously or with intermittent cycling. The VAC dressings were exchanged every 2–3 days. Wound assessment and care were consistently managed by our hospital wound care team, which includes plastic surgeons. We employed VAC therapy for 80 days until the wound became smaller and granulation tissue proliferated, in addition to the administration of antibiotics including vancomycin (Fig. 1B,C). The wound was finally closed without any surgical revisions at 14 days after the discontinuation of VAC.