

Negative Pressure Wound Therapy (Wound VAC) for the Treatment of Chylous Fistula After Neck Dissection: An Effective and Evolving Technique



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Introduction

Chylous fistula is a rare complication of head and neck surgery associated with considerable morbidity. Management strategies vary depending volume of leak, however, minimizing dead space in the neck and reducing the amount of chyle flowing within the thoracic duct are main tenants of controlling chylous fistula. When conservative measures fail or there is a persistent high-volume chyle leak, surgical exploration may be warranted. Treating chylous fistula can be challenging and often results in prolonged hospital stays. Negative pressure wound therapy (NPWT), also known as wound vacuum-assisted closure (wound VAC), has emerged as a highly effective treatment modality for a variety of wounds. We previously reported on our experience with using wound VACs to successfully control chylous fistula at this institution. We have since modified our protocol to simplify VAC set up and increase the efficiency and tolerability of wound VAC changes.

Methods

This is an update to a protocol for wound VAC placement as a part of a previously reported case series on NPWT used in three patients. The wound VAC was placed anteriorly to the sternocleidomastoid (SCM) in Protocol 1. White non-porous foam lined the great vessels of the neck and the remainder of the wound bed was filled with black porous foam (Figure 1). In contrast, Protocol 2 involves VAC placement posterior to the SCM. A piece of black non-porous foam is tucked just deep to the SCM and runs posterolaterally out to the lateral-most portion of the existing incision (Figure 2). The incision is then closed in the typical layered fashion, leaving 1 – 2 inches of the lateral portion open for placement of the wound VAC track pad. The VAC is set continuous suction at 125 mmHg in both protocols and is changed every 72 hours. Protocol 2 has been used in three patients in whom a leak was identified during the index surgery and had their VACs placed prior to closing at the end of the procedure.

Summary of Patient Characteristics

	Patient	Chyle Flow Volume	Conservative treatments	Surgical treatments	VAC Treatment duration	Length of Hospital Stay
Protocol 1						
	Patient 1	High	Octreotide, diet, suction drains	Clipping, fat graft, fibrin glue with omohyoid transposition flap, IR retrograde coiling	20	47
	Patient 2	Low	Octreotide, diet	Clipping, fat graft, fibrin glue, suture plication	7	7
	Patient 3	Low	Octreotide, diet	Clipping, fat graft, fibrin glue, suture plication	6	6
Protocol 2						
	Patient 4	Low	Octreotide, diet, suction drains	Ligation, clipping	9	39
	Patient 5	Low	Octreotide, diet, suction drains	None	8	12
	Patient 6	Low	Octreotide, diet	Ligation, clipping	8	9

Figures 1. and 2.



Results

Many of the patients received altered diets, including nil-per-os (NPO), low or no fat, or enteral feeds, as well as octreotide throughout their hospitalization. Chylous output in Group 1 ceased within 2 to 8 days of placement and in Group 2 ceased within 7 to 8 days. One patient within group 2 was discharged on post-operative day three and had complete resolution of chylous fistula with Wound VAC monotherapy as an outpatient.

Discussion

NPWT has proved to be a highly effective tool for wound care in a variety of settings. Using a Wound VAC to apply sub-atmospheric pressure in continuous or intermittent cycles is thought to hasten the formation of granulation tissue by facilitating micro-deformation of the wound bed in a controlled fashion.¹ In addition, NPWT is also facilitates the removal of excess fluid from the wound bed and has been shown to decrease bacterial counts within wounds.^{1,2} NPWT has been used to successfully treat a variety of wounds, however, there is a dearth of literature reporting on the use of this technology in head and neck surgery wounds.³ Our original case series was the first to report on the use of the commercial Wound VAC device for chylous fistula following neck dissection.⁴

NPWT has since been used to successfully treat chylous fistula following head and neck surgery in numerous patients at our institution. Protocol 2 has now been used on three patients at UNM and two at an outside academic medical center. This set up has also been used in a vascular bypass surgery at an out-of-state facility in recent months. Many of the VAC changes in Protocol 1 required a return to the operating room to safely replace the non-porous white foam along the great vessels of the neck. Simplifying the set up has made VAC changes more efficient and facilitated bedside changes, which have patients have tolerated well. This is primarily due to the fact that the SCM itself, rather than non-porous white foam, is used to protect the great vessels against the theoretical risk of life-threatening hemorrhage. Decreasing the materials used for the new set up is likely also beneficial in terms of cost and minimizing waste of resources. Finally, patients have had good cosmetic outcomes following the use of Protocol 2.

Conclusion

NPWT is a revolutionary treatment option for both high-volume and low-volume chylous fistulas following neck dissection. Modification in wound VAC technique has allowed for greater ease of placement at the bedside and allowed for shorter length of stay in the latter portion of patients in this series. Our experience has demonstrated that NPWT shows potential as a monotherapy cervical chylous fistula on an outpatient basis without the need for adjunctive treatments.

Selected References

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