REVIEW ARTICLE

The History of Negative Pressure Wound Therapy (NPWT): From “Lip Service” to the Modern Vacuum System

Christine Miller, DPM, CWS, FACCWS*

Temple University School of Podiatric Medicine, 148 North 8th Street, Philadelphia, PA 19107, USA

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Abstract Negative pressure wound therapy (NPWT) is a commonly used modality to facilitate tissue granulation and thus hasten the healing process. While the modern vacuum systems are quite sophisticated, their historic origins can be traced to ancient times. This is a historic review of the precursors to the current negative pressure wound therapy.

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Negative pressure wound therapy (NPWT) in its most current form has been used steadily to heal complex wounds since its initial development in the early 1990's.¹ This therapeutic modality aids in formation of granulation tissue to facilitate wound healing. Recently the use of negative pressure wound therapy (NPWT) has been advocated in traumatic injuries like those sustained in combat situations.²

While this technology seems relatively recent to modern medicine, its roots go back to the earliest civilizations. The use of the human mouth predated the sponge, sealant, and tubing used today. These rudimentary applications are explored in this journey back through the history of NPWT. Modern medicine should not forget its past, and the knowledge gained from our predecessors. This historic review highlights the development of NPWT from ancient times to the modern era.

During the Roman era, medical personnel were attached to the various armies throughout the vast empire.³ Deep wounds sustained in battle and possible “poisonous wounds” plagued those who cared for the injured. Individuals who were thought to have hereditary powers of healing were assigned to give direct suction by mouth to the

wound.³ This treatment proved so successful that they were considered indispensable to the Roman army, and even Cato had a group of these sucking healers in his African campaign. The historian Suetonius wrote that one of these healers was ordered to suck the wound of Cleopatra to attempt to revive her from the bite of the asp.³ As history proves this was not a successful venture.

Along with direct mouth suction, the use of “cupping glasses” were utilized to draw fluid out of an open wound. These dome shaped cupping glasses were applied over the wound site and left in place for at least an hour to draw out fluid. To activate the suction, heat was applied on the inside of the glass and placed against the patient's flesh, as cooling occurred the suction increased.³ If these glass vessels were not readily available then the good old standby, oral suction was performed.

By the 18th century, this “lip service” approach to wound healing was seen as disgusting, but still effective. Dominique Anel, a French Surgeon, noted men attached to his regiment known as the “wound suckers” would successfully clear blood clots and foreign bodies from the injured soldiers wounds.⁴

This gruesome and risky act of “wound sucking” inspired Dr. Anel to invent a suction syringe with a triangular tip and wide cannula to replace the need for

* Corresponding author. Tel.: +1 267 978 7527.

E-mail address: Miller12@temple.edu

direct mouth contact.⁵ This tool was then used to drain abscesses and hematomas. The syringe was a welcome alternative to the lip service normally paid in this era.

Cupping remained a predominate form of negative pressure therapy throughout the 19th century. In 1821 Dr. Francis Fox, a British physician, invented the "Glass Leech" which was a suction apparatus with a wide neck cup and clung to the skin affectively much like that of a leech.⁶ Later in 1890, Dr. Gustav Bier developed a cupping system with glass cups in a variety of shapes and sizes along with tubing and a bulb.⁶ This allowed for wound secretions to be extracted from various parts of the body.

In the 20th century, the Russians were innovators in the area of negative pressure treatments. The Soviet-Afghanistan War drove this need for advancements in both surgical technique and wound care.⁷ Dr. Nail Bagaoutdinov, a Soviet Surgeon, began using a negative pressure unit with foam dressings to treat infected wounds in 1985.⁷ The modern NPWT systems came into being in the 1990's with the use of polyurethane foam and a mechanical vacuum pioneered by Drs. Louis Argenta and Michael Morykwas of Wake Forest University School of Medicine.⁸

In the current era, NPWT continues to be advantageous in the healing of complex wounds. It is of interest

that NPWT may at first glance appear to be a new development, but is actually steeped in history. The various benefits of this therapy will continue to be explored in the future.

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