ORIGINAL RESEARCH PAPER

Volume-8 | Issue-1 | January-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ROLE OF NEGATIVE PRESSURE DRESSINGS IN SPLIT -THICKNESS SKIN GRAFTS

General Surgery

Dr. D. Lokanadham Professor,Department of General Surgery, Alluri Sitarama Raju Academy of Medical Sciences , Eluru

Dr. A. Viswanadh* Assistant professor, Department of General surgery, Alluri Sitarama Raju Academy of Medical Sciences , Eluru*Corresponding author

Dr. K.Sidhardha Post graduate, Department of General Surgery, Alluri Sitarama Raju Academy of Medical Sciences , Eluru

Dr.G.Govind Post graduate, Department of General Surgery, Alluri Sitarama Raju Academy of Medical Sciences , Eluru

ABSTRACT

Background

The use of negative pressure in the dressing of split thickness skin grafts has been shown to promote healing by a variety of mechanisms, including a decrease in interstitial edema, an increase in perfusion, and a decrease in bacterial colonization.

Methods

An observational study was performed on 20 patients at Department of General Surgery, Alluri Sitarama Raju Academy of Medical Sciences, Eluru, undergoing split-thickness skin grafting for acute wounds after trauma and for chronic wounds, such as pressure ulcers and diabetic wounds.

Results

In 18 patients, there was a 95% take of the graft, with 5% of partial loss and in 2 patients there was complete loss of graft.

Conclusions

Negative pressure wound therapy is an innovative and commercially successful concept for the management of wounds of nearly every etiology, and the technique is an alternative to commercially available negative pressure dressings.

KEYWORDS

negative pressure skin graft, wound closure

INTRODUCTION

Acute and chronic wounds affect at least 1% of the population. Regardless of etiology, wounds are difficult to treat if coexisting factors such as infection or diabetes mellitus prevent regular wound healing.

Modern wound-healing concepts include different types of moist dressings and topical agents, although only a few of these treatments have convincingly been shown to give higher wound closure rates compared with traditional wound dressings.

Over the past 50 years, clinicians have described how certain wounds respond to sub-atmospheric pressure used within a closed dynamic delivery system.

The vacuum-assisted closure device has revolutionized wound care since its first introduction in 1997.

This relatively new technique, developed by Argenta and Morykwas to expedite wound healing by secondary intention, is based on the principle of application of controlled negative pressure wound therapy (NPWT), often called topical negative pressure (TNP).

It is effective for treating acute, chronic, and infected wounds, to prepare a wound for skin grafting, and to promote subsequent graft adherence.

It has been reported to increase local vascularity and the rate of formation of granulation tissue, and a reduction in interstitial edema and bacterial contamination, ensuring intimate contact between foam dressing, graft, and recipient wound bed.

However, such techniques require surgical skill and experience to make the skin graft adhere securely to the grafting site, and it does not always provide satisfactory results in some difficult body areas, with poor skin graft taking as an outcome.

MATERIALS AND METHODS

Between 1st November 2017 and 31st October 2018 at the Department of general surgery, Alluri sitarama raju academy of medical sciences, Eluru 20 patients received wound management with NPWT after a split-thickness skin graft. Their medical records were evaluated and efficacy was assessed using the following primary outcome measures: wound-healing time, granulation rate, change in wound surface and volume (calculated with the Xakellis and Frantz method), pain, bacterial clearance, total costs, and time of nursing staff involvement. Secondary outcome measures included adverse effects and comfort.

Exclusion criteria

use of steroid drugs, deep fistulas, sepsis, underlying osteomyelitis, active bleeding, patients younger than 18 years, and psychiatric patients. All patients gave written informed consent.

PROCEDURE

Skin grafts were managed with the use of a soft polyurethane sponge as a compressive tool and a staple fixation technique for skin grafts. This had several advantages over a traditional tie-over dressing including quick application, good adaptation, and the ability to more evenly distribute pressure across the wound.

A paraffin gauze was individually trimmed and shaped to make close contact with all wound surfaces and placed over the wound or skin graft, then a sterile foam sponge dressing was applied.

The drainage tube was inserted into the foam using a trocar; all drainage holes were positioned to lie within the foam . The wound was then covered with a semi occlusive dressing.

The drainage tubing was placed over a gauze swab and within the semi occlusive dressing to ensure a good seal and to avoid ischemic necrosis of the skin.

Any hair at the wound site was shaved to facilitate subsequent removal of the dressing.

A continuous negative pressure of 50-100 mmHg was applied . It is important that an air tight peripheral seal be maintained. Small leaks may be patched with further semi occlusive dressing.

RESULTS

Twenty patients (12males and 8 females), mean age 42 years, were

managed with this method after a skin graft. In the 18 patients with traumatic defects and with diabetic wounds, the skin grafts survived completely with no troubles.

There were no cases of infection or hematoma. One disadvantage of this method was the increased difficulty of flap monitoring when the flap was completely covered by the NPWT device.

In 2 patients there was failure of graft uptake . This was due to various factors like uncontrolled blood sugars, decreased patient compliance, inadequate blood supply, malnutrition etc.

DISCUSSION:

During the past decade, NPWT has become a common treatment of acute and chronic wounds. The granulation tissue formed with this technique is high quality, rich in capillaries, and totally suitable to manage a skin graft. In the authors' opinion, it should be noted that NPWT may have striking benefits in the treatment of some diseases (ie, complex reconstructions in plastic surgery), for which it may be impossible to conduct other treatments. Moreover, NPWT is an innovative and commercially successful concept for the management of difficult-to-treat wounds of nearly every etiology. The most important reasons for the success of NPWT are its assumed safety and the facilitation of wound care. In experience NPWT has yielded significantly lower nursing staff costs and less time involvement, patients are more comfortable, and there is less risk of cross-infection than treatment with modern wound dressings. In addition, the techinique used in this case series is based on the same principles as the expensive, commercially available vaccuum-assisted closure systems.

CONCLUSION

This technique represents a major advance in wound care and recommend its use, although more research is needed to confirm results since there are contrasting opinions in the literature. The disadvantage of this system is that it can only be used for hospitalized patients, and it should, therefore, be reserved for patients confined to the hospital for reasons other than wound treatment alone.

In summary, this study of 20 patients with different kinds of wounds showed that NPWT technique is an efficient alternative to the commercially available, branded systems and, as already demonstrated in the literature, is safe, efficient, and more convenient-to-use than conventional treatments for healing split thickness skin grafting.

REFERENCES

1. Whitney JD. Overview: acute and chronic wounds. Nurs Clin North Am. 2005;40(2):191-205.
2. Brem H, Sheehan P, Rosenberg HJ, Schnieder JS, Boulton AJ. Evidence-based protocol for diabetic foot ulcers. Plast Reconstr Surg. 2006;117(7 Suppl):193S–207S.
3. Bonham PA. Assessment and management of patients with venous, arterial, and diabetic/neuropathic lower extremity wounds. AACN Clin Issues. 2003;14(4):442-456.
4. Gottrup F. Trends in surgical wound healing. Scand J Surg. 2008;97(3):220-226.
5. Jacobs S, Simhaee DA, Marsano A, Fomovsky GM, Niedt G, Wu JK. Efficacy and mechanisms of vacuum-assisted closure (VAC) therapy in promoting wound healing: a rodent model. J Plast Reconstr Aesthet Surg. 2009;62(10):1331-1338.
6. Morykwas MJ, Argenta LC, Shelton-Brown EI, McGuirt W. Vacuum- assisted closure: a new method for wound control and treatment: animal studies and basic foundation. Ann Plast Surg. 1997;38(6):553-562.
7. Argenta LC, Morykwas MJ. Vacuum-assisted closure: a new method for wound control and treatment: clinical experience. Ann Plast Surg. 1997;38:563-576.
8. Saxena V, Hwang CW, Huang S, Eichbaum Q, Ingber D, Orgill DP. Vacuum-assisted closure: microdeformations of wounds and cell proliferation. Plast Reconstr Surg. 2004;114(5):1086.
9. KCI. V.A.C. Therapy Clinical Guidelines:A Reference Source for Clinicians. http://www.kci1.com/KCI1/vactherapyformsandbrochures. Updated December 2012. Accessed October 23, 2013.
10. Thompson G. An overview of negative pressure wound therapy (NPWT). Br J Community Nurs. 2008;13(6):S23-S30.
11. Mouës CM, van den Bemd GJ, Meerding WJ, Hovius SE. An economic evaluation of the use of TNP on full-thickness wounds. J Wound Care. 2005;14(5):224-227.
12. Wanner MB, Schwarzl F, Strub B, Zaech GA, Pierer G. Vacuum assisted wound closure for cheaper and more comfortable healing of pressure sores: a prospective study. Scand J Plast Reconstr Surg Hand Surg. 2003;37(1):28-33.
13. Braakenburg A, Obdeijn MC, Feitz R, van Rooij IA, van Griethuysen AJ, Klinkenbijl JH. The clinical efficacy and cost effectiveness of the vacuum-assisted closure technique in the management of acute and chronic wounds: a randomized controlled trial. Plast Reconstr Surg. 2006;118(2):390-400
14. Armstrong DG, Lavery LA; Diabetic Foot Study Consortium. Negative pressure wound therapy after partial diabetic foot amputation: a multicentre, randomized controlled trial. Lancet. 2005;366(9498):1704-1710.
15. Preston G. An overview of topical negative pressure therapy in wound care. Nurs Stand. 2008;23(7):62-64, 66, 68.
16. Morykwas MJ, Faler BJ, Pearce DJ, Argenta LC. Effects of varying levels of subatmospheric pressure on the rate of granulation tissue formation in experimental wounds in swine.