

Negative Pressure Wound Therapy

Citation: Paggi B. “Negative pressure wound therapy” (2023) *infermieristica journal* 2(1): 51-54. DOI: 10.36253/if-2142

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Received: April 2, 2023

Revised: April 13, 2023

Just accepted online: April 24, 2023

Published: April 30, 2023

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Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Introduction

Negative Pressure Wound Therapy (NPWT) has ancient origins. The historical summary of the NPWT use to improve wound care is briefly outlined below in Table n.1 and its effects on the wound bed in Figure n.1.

The use of NPWT has been constantly increasing due to the improvement of surgical techniques, the growth of technological potential, and the increased knowledge of the mechanisms of action induced by the mechanical forces of macro- and micro-deformation.

Negative Pressure Wound Therapy in the clinical practice

Currently, there are many areas in which wound care professionals use NPWT to manage wounds whose complexity is linked to factors that often cannot be managed.

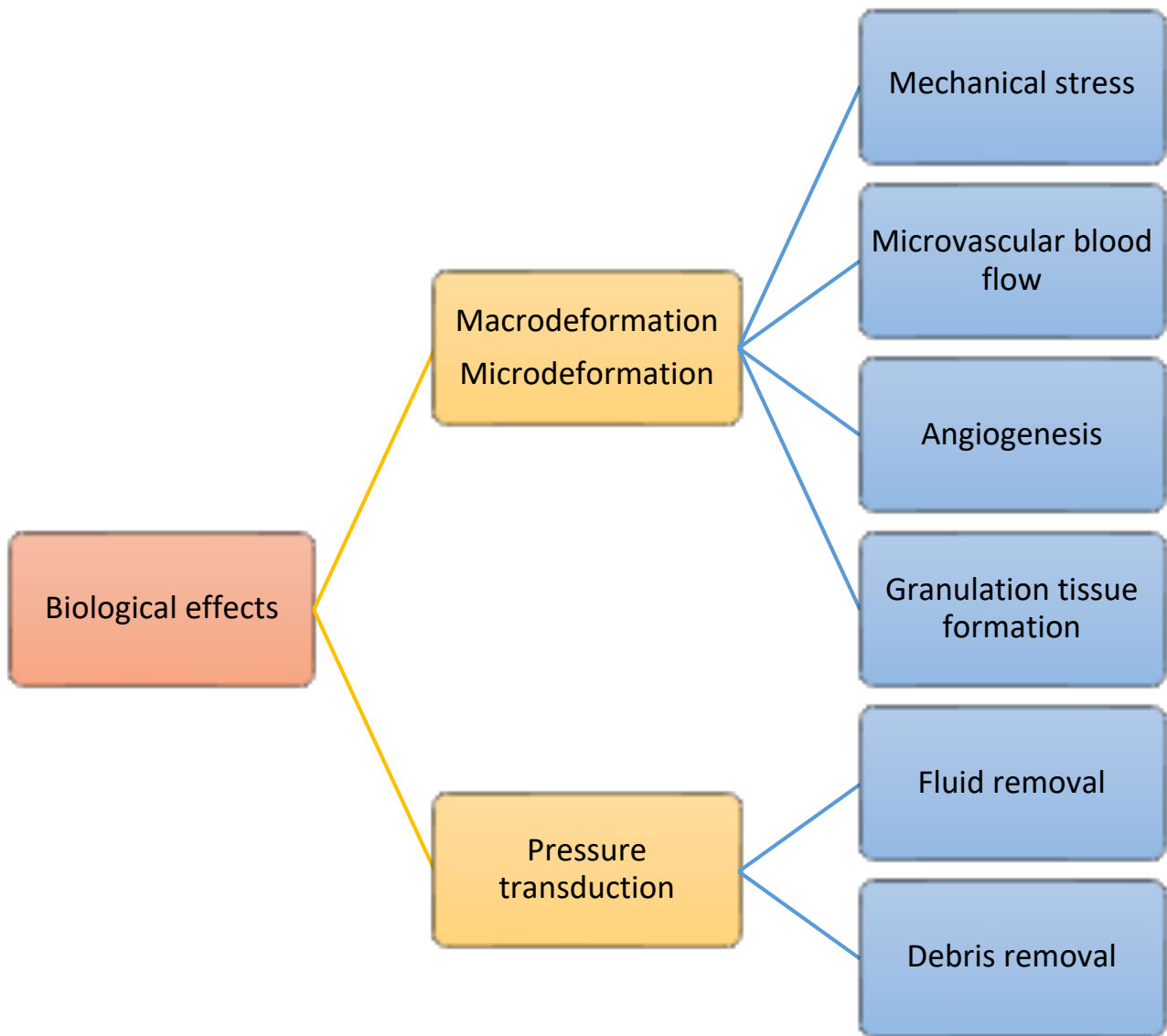
Exudate, size, rooting and other elements are the reasons for choosing a tool that has now become affordable for everyone.

Technological evolution has allowed the introduction on the market of ever smaller, stationary and disposable devices, available in advanced care centres as well as at the patient's own home. We can consider this element as the real breakthrough that has made the difference in NPWT treatment. However, this breakthrough was achieved thanks to the steps taken by the clinical practice combined with research. We need just to think about how much the application times have evolved, and the evaluation of the effects on the tissues has reduced the need for extremely lengthy treatments, favouring

Tab.n.1 NPWT historical references

NPWT History
<ul style="list-style-type: none">• Primitive\Ancient Civilized people• Romane empire• Abu All Ibn Sina author of early medical encyclopedia• Cupping Technique mentioned in 1580-1588• End of 18th Century “Suction Syringe” developed• Also in 18th Rubber Ball used to produce negative pressure• 1933 Scientist attempted to get invention certificate for negative pressure chamber• 1969 Finally got approved as a medical device
<ul style="list-style-type: none">• 1986 Kremlin Papers
<ul style="list-style-type: none">• 1989 (1984) Chariter and Jeter develop a new technique with gauze
<ul style="list-style-type: none">• 1997 Argenta and Morykwas published: "Vacuum-assisted closure: a new method for wound control and treatment: clinical experience"

Fig.n.1 NPWT mechanisms of action



the choice towards reconstructive surgical treatments that are aimed at a more rapid resolution of tissue damage. The choice of dressing materials, foam or gauze, and its use in instillation form have favoured better control of tissue growth, cellular and microbial loads. The availability of disposable systems has become an important resource in the management of surgical wounds at risk of complication, and an equally important resource in the management of lower limb ulcers with exudate that is difficult to control (see Tab. 3). These management methods have in fact changed clinicians' choices and in particular the patient's quality of life.

Negative Pressure Therapy in the Guidelines

As NPWT technologies evolved and clinical applications has grown, the scientific community has increased its work to produce new and solid evidences to convey into clinical practice guidelines.

NPWT has showed to be effective NPWT is in reconstructive surgery, abdominal surgery in the presence of hypertension, dehiscence surgery, orthopaedic trauma surgery, cardiology, and the management of chronic wounds.

In table 2 are reported some good clinical practice recommendations to follow when using NPWT

Tab.n.2 Examples of good practice recommendations to follow when using NPWT

NPWT in Plastic and Reconstructive Surgery enhances the quality of tissue, as well as facilitating stabilisation of the tissue ¹ .
The combined regular cleansing and application of NPWTi-d are likely of greatest benefit in critically colonised or infected wounds ² .
Dressing selection for NPWTi-d therapy is dependent on wound characteristics of size, depth, tunnelling and undermining ² .
NPWTi-d does not replace debridement of the acutely infected, chronically infected or contaminated wound, and appropriate antibiotic therapy ³
Some important outcomes for NPWT are: reduction of exudate from the open abdomen, early fascial closure, shorter length of hospital stay, lower mortality, lower rate of secondary procedures to reconstruct the abdominal wall and improvement in patients' quality of life ⁴ .
Open fracture-induced soft tissue wounds and the closure of the dermatofasciotomy wound were the first reported indications for NPWT ⁵
All complicated wounds, especially those larger than 50 cm ² , with proven or high risk of infection, with soft tissue defect and exposed neuro-vascular elements, bony structures (including fractures and osteotomies) and osteosynthesis, after hemostasis, surgical treatment and debridement wounds ⁶

Legend: NPWTi-d - Negative pressure wound therapy with instillation and dwell time

Conclusions

NPWT will certainly continue to be an undisputed therapeutic choice. The future will certainly hold surprises in terms of technology, supply and demand, Healthcare professional have the responsibility to maintain their knowledge well updated to deliver the best care for patients needing to recover from wounds as soon as possible, reducing the rate of potential complications.

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