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CASE REPORT

Effective wound healing with the Vivano Negative Pressure Wound Therapy system: A case-based review

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Objective: This article intends to illustrate the clinical qualification of the Vivano Negative Pressure Wound Therapy system through a detailed case study involving a patient with post-abdominoplasty wound complications.

Methods: A 35-year-old female patient presented with wound dehiscence, necrosis, and infection following cosmetic abdominoplasty performed abroad. After initial conservative management failed, surgical debridement and repeated application of Vivano Negative Pressure Wound Therapy at varying pressure settings led to rapid granulation tissue development, infection control, and successful integration of a split-thickness skin graft. Its role in supporting graft adherence was especially critical, culminating in complete wound closure and recovery within a four-week inpatient period.

Results: The use of Vivano Negative Pressure Wound Therapy contributed considerably to wound stabilization, bacterial clearance, and post-grafting support, leading to complete wound healing and hospital discharge within four weeks of active intervention.

Conclusion: This case underscores the value of Vivano Negative Pressure Wound Therapy in managing complex post-operative wounds, commencement of treatment using this device results in a significantly faster rate of wound healing compared to standard care.

Keywords: Vivano, negative pressure, wound healing

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Introduction

In both inpatient and outpatient care, chronic and complicated wounds, such as diabetic foot ulcers, venous leg ulcers, pressure sores, and post-surgical wound dehiscence, present a major clinical challenge [1]. These wounds frequently exhibit a high risk of recurrence, microbial colonization or infection, excessive exudate, and delayed healing. They have a significant impact on patients and healthcare systems, frequently necessitating specialized treatment modalities, multidisciplinary management, and long-term interventions [1,2]. One of the most effective advancements in modern wound care is Negative Pressure Wound Therapy (NPWT). This technique applies subatmospheric pressure to the wound bed via a sealed dressing connected to a vacuum pump, promoting granulation tissue formation, reducing edema, removing infectious material, and improving local perfusion [2,3]. NPWT has become a widely accepted standard of care for complex wounds, especially when conventional dressings fail to achieve healing [3]. Among the NPWT systems available, the Vivano system, developed by the Hartmann Group, stands out for its versatility, ease of use, and clinical efficacy. Vivano devices are designed to support wound healing across a variety of clinical settings offering customizable pressure settings, intuitive controls, and compatible dressing materials for different wound types. [4].

Overview of NPWT

Negative Pressure Wound Therapy (NPWT), or more commonly, vacuum-assisted closure (VAC), is a complex technique for wound care meant for acute, chronic, and complex wounds [4]. NPWT can be indicated for the following types of wounds: chronic wounds (such as diabetic foot ulcers, pressure ulcers, and venous leg ulcers), acute traumatic wounds (such as physical injuries or cuts/lacerations), surgical wounds (such as dehisced incisions and reconstructive flap donor sites), infected wounds treated with debridement, skin grafts as they improve graft retention and perfusion at the tissue interfaces, burn wounds [5]. While highly effective, NPWT is not suitable for all wound types [6]. Contraindications include: malignancy in the wound bed, untreated osteomyelitis, presence of necrotic tissue with eschar (unless properly debrided first), uninvestigated fistulas, active bleeding or coagulopathy, exposed vital structures without suitable protection [6,7,8].

Vivano System Features

Some of the key advantages include the adaptable pressure settings (-60 to -125 mmHg), the accessible interface with visual and audio alerts, multiple canister sizes and dress-

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ing options, the portable design suitable for inpatient and outpatient care and the efficient sealing system that adapts to body contours [4,9]. Compared to other systems (e.g., V.A.C.® or PICO®), Vivano balances ease of use with advanced therapeutic capabilities, making it ideal for complex surgical cases [5,10]. In this case, Vivano was selected over alternative NPWT systems due to its customizable pressure range, compatibility with skin graft protocols, and the availability of wound dressings suitable for infected and necrotic wound beds.

Case Presentation

The patient, a 35-year-old female without comorbidities and without chronic medication, had previously undergone an abdominoplasty procedure abroad and presented dehiscent surgical wounds, necrosis, and signs of infection in the lower abdominal region, 10 days after the procedure (Figure 1.)

She first presented to the Emergency Unit at Emergency Clinical County Hospital Târgu Mureș 3 weeks after the surgery presenting persistent purulent drainage from the right iliac crest area, accompanied by erythema, edema, and localized pain. A CT scan was promptly conducted to exclude deeper fascial or visceral extension, and although the clinical team initially opted for conservative management as the patient initially refused surgery, this approach failed to yield significant improvement. A wound culture revealed *Pseudomonas aeruginosa* sensitive to amikacin, prompting the initiation of targeted antibiotic therapy. Despite this approach, there was no significant clinical improvement, and the patient returned 4 weeks postoperative with a fever of 38.2°C and increased wound drainage, at which point she agreed to surgical intervention.

The first surgical procedure, performed two days after her readmission, revealed extensive necrosis in the suprapubic region, with cleavage planes and subcutaneous separation extending from the umbilicus to both iliac crests, and a soft tissue defect measuring approximately 10–20 cm. During the surgery, the team carried out chemical debridement and thorough irrigation with antiseptic solutions, followed by complete excision of necrotic tissue and the initial application of the Vivano NPWT system set at 90/50 mmHg (Figure 2.).

Microbiological analysis identified *Pseudomonas aeruginosa* and *Serratia marcescens* in low colony counts, leading to an adjustment in antimicrobial therapy to amikozit 500 mg IV, administered twice daily.

Two weeks post-readmission, the patient underwent a second surgical intervention that involved additional debridement of the wound edges, hemostasis and flap ap-

Fig. 1. The patient 10 days after the abdominoplasty

Fig. 2. The surgical wound after complete excision of necrotic tissue and the initial application of the Vivano NPWT system using atrauman wound dressing and the VivanoMed Foam Kit

proximation using three buried sutures to support closure of the superior abdominal wall, after which Vivano NPWT was reapplied at a reduced setting of 70/40 mmHg. By the third week, the patient reported discomfort in the left flank, and subsequent imaging revealed postoperative edema and a subcutaneous hematoma. As a result, a third procedure was carried out, involving further debridement, harvesting of a split-thickness skin graft from the left anterolateral thigh, and graft fixation using individual sutures, with final NPWT application in continuous mode at 75 mmHg.

By the end of the month, the patient's clinical evolution was favorable, with a clean, granulating wound bed and a pink, viable skin graft that showed no signs of necrosis or infection (Figure 3.), while systemic signs of infection had resolved. At discharge, she was prescribed anticoagulation with Clexane 40 mg, analgesia, gastroprotection, and scheduled follow-ups.

Throughout the treatment process, the Vivano NPWT system played a pivotal role by maintaining a sterile and balanced wound environment, reducing exudate and microbial load, encouraging strong granulation tissue formation, and supporting secure graft adherence while preventing complications such as hematoma or seroma. The managed reduction in pressure settings—from 90/50 mmHg to a final continuous 75 mmHg—demonstrates the adaptability of the system to different wound healing phases.

Discussion

The defining feature of this case is the complete healing of a complex, infected surgical wound within just one month following Vivano NPWT. The patient, who presented with post-abdominoplasty wound dehiscence, necrosis, and bacterial colonization, showed limited improvement with conservative management. Once Vivano NPWT was initiated in conjunction with surgical debridement and antimicrobial therapy, wound progression was rapid and sustained. The integration of the Vivano NPWT system into the treatment plan contributed to wound healing in several essential ways. The patient's wound, initially colonized by Pseudomonas aeruginosa and subsequently by Serratia marcescens, NPWT helped limit the local spread of infection by maintaining a closed, sterile environment, while reducing bacterial load through exudate management and promoting tissue perfusion. Multiple surgical interventions with aggressive debridement and necrectomy were followed by the use of Vivano at different pressure settings (90/50 mmHg, 70/40 mmHg, and finally 75 mmHg continuous). This allowed the wound bed to develop healthy granulation tissue, creating an optimal substrate for skin grafting. Without this intervention, graft adherence and healing might have been compromised. NPWT was used postoperatively to stabilize the skin graft, minimizing dead space, seroma formation, and movement at the wound site—factors known to influence graft take. At discharge, the graft was reported to be pink, viable, and well-integrated, with no signs of necrosis. The rapid and complete healing of this case's complex surgical wound within one month using the Vivano NPWT system is notably faster than outcomes reported in recent clinical studies. For instance, a 2023 randomized controlled trial by Wang et al. [11] analyzed eight RCTs involving 564 patients and found that NPWT with instillation (NPWTi) led to improved outcomes compared to standard NPWT, but the average healing times extended beyond four weeks [11]. Similarly, a 2023 study by Zhang et al. [1] compared NPWT to alginate dressings in diabetic foot ulcers and reported that NPWT significantly reduced the time to readiness for skin grafting, yet the overall healing process still spanned several weeks [1]. In a 2021 study by Kirsner et al. [12], a single-use NPWT system demonstrated higher wound closure rates over a 12-week period compared to traditional NPWT in diabetic lower extremity ulcers. While these findings highlight the effectiveness of NPWT systems, the healing durations reported are longer than the one-month recovery observed in this case [13]. The Vivano system's customizable pressure settings, simple application, and effective exudate management likely contributed to the accelerated healing

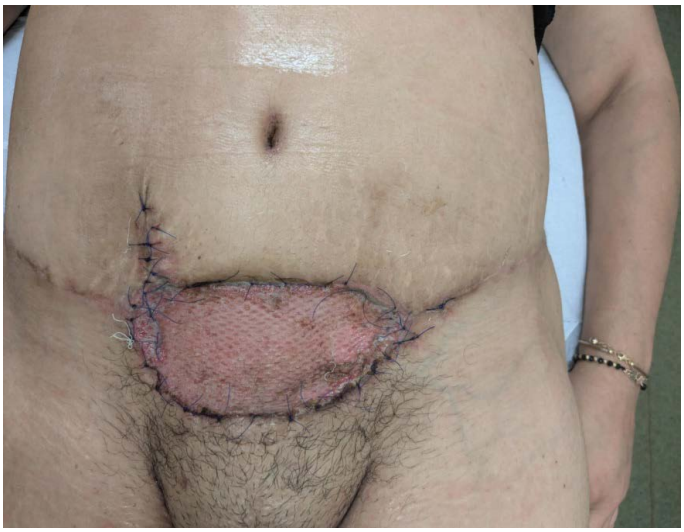

Fig. 3. The viable skin graft

in this patient. This case underscores the potential of the Vivano NPWT system to expedite wound healing, even in complex cases, aligning with and potentially surpassing outcomes reported in recent literature.

Conclusion

This case highlights the therapeutic value of Negative Pressure Wound Therapy (NPWT) using the Vivano system in the management of a severe post-abdominoplasty complication. The patient presented with extensive wound dehiscence, necrosis, and multidrug-sensitive infection that proved unresponsive to initial conservative measures. A structured treatment plan involving surgical debridement, targeted antimicrobial therapy, and staged application of NPWT at customized pressure settings facilitated a favorable clinical trajectory. Notably, the initiation of NPWT marked a clear inflection point in the healing process, with rapid and sustained improvement observed shortly after device placement. The Vivano system significantly accelerated wound stabilization by optimizing exudate control, containing infection, and promoting granulation tissue formation. Its role in supporting graft adherence was especially critical, culminating in complete wound closure and recovery within a four-week inpatient period. This case reinforces the clinical relevance of NPWT as a frontline adjunct in complex wound management and underscores the Vivano system's adaptability in high-risk surgical scenarios.

Author Contributions

SI: Conceptualization, Writing, Project administration;
SB: Writing – review & editing Supervision Visualization;
DD: Validation, Visualization, Supervision;
CG: Data curation, Resources, Methodology

Ethical Statement

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of our university. Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest

None to declare.

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