EXPERIENCE REPORT

REVISTA ENFERMAGEM ATUAL IN DERME

ULTRAPORTABLE NEGATIVE PRESSURE THERAPY IN THE MANAGEMENT OF POSTMASTECTOMY WOUND DEHISCENCE FOLLOWING RADIOTHERAPY: AN EXPERIENCE REPORT

TERAPIA DE PRESIÓN NEGATIVA ULTRAPORTÁTIL PARA EL MANEJO DE LA DEHISCENCIA DE HERIDAS POSTMASTECTOMÍA TRAS RADIOTERAPIA: INFORME DE EXPERIENCIA

TERAPIA POR PRESSÃO NEGATIVA ULTRAPORTÁTIL NO MANEJO DE DEISCÊNCIA DE FERIDA PÓS-MASTECTOMIA APÓS RADIOTERAPIA: RELATO DE EXPERIÊNCIA

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ABSTRACT
Introduction: Oncology patients who undergo mastectomy followed by adjuvant radiotherapy are at increased risk for wound healing complications, including dehiscence, infection, and tissue necrosis. Ultraportable Negative Pressure Therapy (NPT) has emerged as a promising adjunctive intervention to promote wound healing, manage exudate, and prevent local complications. **Objective:** To report the clinical experience of using ultraportable Negative Pressure Therapy (PICO 7®) in the management of surgical wound dehiscence following mastectomy in a cancer patient who had received adjuvant radiotherapy. **Methods**: This is a descriptive study presented as an experience report, conducted at a hospital in southern Brazil. The case involves a 31-year-old female patient who developed wound dehiscence following mastectomy and adjuvant radiotherapy. After the failure of conventional therapies, the PICO 7® device was implemented. Clinical progression, wound characteristics, and therapeutic response were evaluated. **Results:** The use of ultraportable NPT resulted in rapid granulation tissue formation, effective exudate management, and approximation of wound edges. Progressive wound healing was observed, accompanied by a reduction in infectious complications and early discharge from the wound care outpatient clinic. **Conclusion:** Ultraportable Negative Pressure Therapy proved to be an innovative, safe, and cost-effective intervention for the management of post-mastectomy wound dehiscence in patients who have undergone radiotherapy. Further research is required to validate its effectiveness across diverse oncological contexts.
Keywords: Negative Pressure Therapy; Wound Healing; Mastectomy; Radiotherapy; Breast Oncology.

RESUMEN
Introducción: Los pacientes oncológicos sometidos a mastectomía y radioterapia adyuvante presentan un alto riesgo de complicaciones en la cicatrización, como dehiscencia, infección y necrosis. La Terapia de Presión Negativa (TPN) ultraportátil surge como una estrategia adyuvante eficaz para promover la cicatrización, controlar el exudado y prevenir complicaciones locales. **Objetivo:** Relatar la experiencia del uso de la Terapia de Presión Negativa ultraportátil (PICO 7®) en el tratamiento de la dehiscencia de herida operatoria posterior a mastectomía en una paciente oncológica sometida a radioterapia. **Métodos:** Se trata de un estudio descriptivo del tipo relato de experiencia, realizado en una institución hospitalaria del sur de Brasil. Paciente de 31 años, con dehiscencia de herida posterior a mastectomía y radioterapia, fue tratada con el dispositivo PICO 7® tras el fracaso de terapias convencionales. Se evaluaron la evolución clínica, las características de la lesión y la respuesta a la terapia. **Resultados:** La aplicación de la TPN ultraportátil favoreció la rápida formación de tejido de granulación, el control eficaz del exudado y la aproximación de los bordes de la herida. Se observó una cicatrización progresiva, reducción de complicaciones infecciosas y alta precoz del ambulatorio de heridas. **Conclusión:** La Terapia de Presión Negativa ultraportátil demostró ser una tecnología innovadora, segura y costo-efectiva para el manejo de dehiscencias posteriores a mastectomía en pacientes sometidas a radioterapia. Se destaca la necesidad de más estudios para validar su eficacia en diferentes escenarios oncológicos.
Palabras clave: Terapia de Presión Negativa; Cicatrización de Heridas; Mastectomía; Radioterapia; Oncología Mamaria.

RESUMO
Introdução: Pacientes oncológicos submetidos a mastectomia e radioterapia adjuvante apresentam elevado risco de complicações na cicatrização, como deiscência, infecção e necrose. A Terapia por Pressão Negativa (TPN) ultraportátil surge como estratégia adjuvante eficaz na promoção da cicatrização, controle do exsudato e prevenção de complicações locais. **Objetivo:** Relatar a experiência do uso da Terapia por Pressão Negativa ultraportátil (PICO 7®) no tratamento de deiscência de ferida operatória após mastectomia em paciente oncológica submetida à radioterapia. **Métodos:** Trata-se de um estudo descritivo do tipo relato de experiência, realizado em uma instituição hospitalar do sul do Brasil. Paciente de 31 anos, com deiscência de ferida pós-mastectomia e radioterapia, foi tratada com o dispositivo PICO 7® após insucesso de terapias convencionais. Foram avaliados evolução clínica, características da lesão e resposta à terapêutica. **Resultados:** A aplicação da TPN ultraportátil favoreceu rápida formação de tecido de granulação, controle eficaz do exsudato e aproximação das bordas da ferida. Observou-se cicatrização progressiva, redução de intercorrências infecciosas e alta precoce do ambulatório de feridas. **Conclusão:** A Terapia por Pressão Negativa ultraportátil demonstrou ser uma tecnologia inovadora, segura e custo-efetiva para o manejo de deiscências pós-mastectomia em pacientes submetidas à radioterapia. Destaca-se a necessidade de mais estudos para validar sua eficácia em diferentes cenários oncológicos.
Palavras-chave: Terapia por Pressão Negativa; Cicatrização de Feridas; Mastectomia; Radioterapia; Oncologia Mamária.

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INTRODUCTION

Wound management in oncology patients poses significant challenges due to the complexity of lesions and the adverse effects of adjuvant therapies, such as chemotherapy and radiotherapy, which can impair the healing process. Complications including surgical dehiscence, infection, and tissue necrosis are common following procedures such as mastectomy, negatively impacting patients' quality of life and contributing to increased healthcare costs[1].

Negative Pressure Therapy (NPT) has emerged as a promising adjunctive technology for the management of complex wounds. Through the application of controlled subatmospheric pressure to the wound bed, NPT facilitates granulation tissue formation, reduces edema, manages exudate, and establishes an optimal environment for tissue repair. In the context of breast oncology, NPT has been investigated as a postoperative support strategy, particularly in breast reconstruction procedures[2]. Ultraportable systems, such as Smith & Nephew's PICO 7®, have demonstrated high effectiveness by delivering the therapeutic benefits of NPT in a practical and patient-friendly manner. By promoting wound healing and improving patient comfort, these devices significantly enhance patient outcomes and quality of life.

Negative Pressure Therapy has been shown to reduce local complications, such as skin flap necrosis and infections, in reconstructive surgeries involving implants. One study demonstrated that the prophylactic use of NPT in patients undergoing breast reconstruction with prosthetic implants was associated with lower rates of necrosis and overall postoperative complications[3].

The use of NPT has also yielded positive outcomes in oncologic surgeries of the head and neck—anatomically complex regions with a heightened risk of infection. One study demonstrated that the application of NPT to primary surgical incisions in patients undergoing cervical procedures significantly reduced local complication rates and was found to be both well tolerated and safe[4].

In gynecologic oncology, NPT has been investigated as an alternative strategy for preventing surgical site infections in patients undergoing laparotomies. When applied to closed incisions, NPT has been associated with a significant reduction in infection rates, reinforcing its potential role as a prophylactic measure in major abdominal procedures[5].

Moreover, the benefits of NPT in oncologic breast surgeries include a reduction in complications such as seroma, hematoma, and wound dehiscence. These findings suggest that NPT should be considered for high-risk patients, including those undergoing bilateral mastectomy or presenting with significant clinical comorbidities[6].

In light of these considerations, the present experience report aims to demonstrate that Negative Pressure Therapy, such as Smith &

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Nephew's PICO 7®, represents an innovative and cost-effective technology capable of transforming wound management, particularly in cases of post-mastectomy dehiscence. By promoting faster and more effective healing, reducing complications, and enhancing patients' quality of life, NPT emerges as an essential tool in clinical practice, especially within hospital settings. This study also seeks to encourage further research to explore the potential applications of this technology across a range of oncological contexts.

METHODOLOGY

Study Type

This exploratory descriptive study is presented as an experience report on the use of ultraportable Negative Pressure Therapy (Smith & Nephew PICO 7®) in the healing of post-mastectomy surgical wound dehiscence following radiotherapy.

Study Setting

The study was conducted at a hospital in southern Brazil, which serves as a reference center for oncologic reconstructive plastic surgery procedures.

Ethical Considerations

Since this is an experience report, the study did not require approval from a Research Ethics Committee. However, verbal consent was obtained from the patient for the disclosure of data and images related to the proposed treatment.

Type of Therapy Used

In this report, the Negative Pressure Therapy (NPT) device PICO 7, manufactured by Smith & Nephew, was utilized. This device is characterized by its ultraportable design and a 10 x 20 cm dressing. The system comprises a pressure-generating unit and an integrated sterile dressing. The PICO 7 delivers a continuous negative pressure of 80 mmHg (nominal value) directly to the wound surface, thereby creating an optimal environment for healing.

Exudate management is achieved through a combined system involving absorption by the dressing and moisture evaporation through its semi-permeable outer layer. Designed for patients with low to moderately exudating wounds, the PICO 7 promotes accelerated granulation tissue formation and reduces the risk of infection. It is particularly well-suited for clinical contexts requiring outpatient or home-based wound care.

RESULTS

This experience report outlines the patient's clinical history, wound characteristics, the therapeutic approach implemented, and the clinical progression observed during the use of the PICO 7 device.

Patient and Wound Clinical History

A 31-year-old female patient with a prior history of breast cancer underwent a right

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mastectomy with breast implant placement on November 1, 2024. She subsequently initiated adjuvant radiotherapy on November 27, 2024, completing 15 conventional sessions followed by 5 boost sessions, with the treatment concluding on December 24, 2024.

At the conclusion of the radiotherapy protocol, the patient developed grade IV radiodermatitis, which progressed to an ulcerated lesion in the right breast region. She began follow-up care with a specialized wound care team at an outpatient clinic, initially receiving dressings with Aquacel® in combination with Safgel®. Despite these interventions, the wound condition progressively deteriorated, leading to complete surgical wound dehiscence and exposure of the breast implant.

On February 18, 2025, the patient began follow-up with a specialist nurse, who performed a detailed wound assessment and recommended the initiation of Negative Pressure Therapy. Following approval by the health insurance provider and coordination of hospital logistics, the PICO 7 device was applied on March 17, 2025. At that time, debridement of nonviable tissue was performed, followed by primary intention approximation of the wound edges and application of the negative pressure system.

The first dressing change was performed on March 20, 2025, to assess the wound bed. The sutures were maintained for 15 days, while the PICO 7 dressing remained in place, ensuring an optimal environment for healing through effective exudate control and a reduced risk of infection.

Figure 1 - Wound on December 24, 2024.

Source: Research Data.

During the patient's follow-up and the final therapeutic phase using the PICO 7 device, dressing changes and periodic reassessments were conducted by the multidisciplinary team

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involved in her care. At each stage, clinical management was adapted based on the wound's progression. Table 1 presents a summary of the interventions performed throughout the course of treatment.

Table 1 - Summary of Interventions Performed Throughout the Treatment

Period	Therapy Used	Dressing Change Frequency	Remarks
12/24/2024 to 02/18/2025	Aquacel + Safgel	Every 72 hours	Initial treatment at the wound care outpatient clinic
02/18/2025 to 03/17/2025	Biatain Silicone Ag	Every 96 hours	Chosen for comfort and exudate management
03/17/2025 to 03/24/2025	Negative Pressure Therapy with PICO 7	Single change during the period	Applied after debridement and suturing
03/24/2025 to 03/31/2025	Gauze for suture protection	As needed	Final healing phase

Source: Research Data.

Figures 2, 3, 4, 5, 6, and 7 illustrate the clinical progression of the wound throughout the treatment, highlighting the various stages of the healing process. The photographs are presented in chronological order based on the date of each record, providing a sequential and comparative view of the progress achieved with the implemented therapeutic approach.

Figure 2 - Wound on February 1, 2025.

Source: Research Data.

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Figure 3 - Wound on February 18, 2025.

Source: Research Data.

Figure 4: Wound on March 17, 2025, prior to NPT application.

Source: Research Data.

Figure 5 - Wound on March 17, 2025, after NPT application.

Source: Research Data.

Figure 6: Wound on March 25, 2025, after NPT removal.

Source: Research Data.

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Figure 7 - Wound on April 9, 2025, after completion of treatment.

Source: Research Data.

DISCUSSION

This experience report reinforces the role of Negative Pressure Therapy (NPT) in the management of complex wounds, particularly among oncology patients undergoing adjuvant radiotherapy. The use of the ultraportable PICO 7® device was found to facilitate wound healing by ensuring effective exudate control and promoting approximation of wound edges—outcomes that align with findings reported in recent literature.

A study demonstrated[8] that the use of NPT in prosthetic breast reconstructions significantly reduced rates of flap necrosis and infectious complications, suggesting that the subatmospheric environment enhances vascularization and reduces tension on newly reconstructed tissues. These benefits were also observed in the present report, which documented rapid granulation tissue formation and the absence of new infectious complications.

Furthermore, a systematic review and meta-analysis[9] demonstrated a significant reduction in the incidence of seroma, hematoma, and wound dehiscence in oncologic breast surgeries when prophylactic NPT was applied to closed incisions. These findings further support the indication of this method for high-risk patients, such as those who have undergone radiotherapy, as illustrated by the case presented in this report.

Another noteworthy aspect was the reduced need for frequent dressing changes, underscoring the capacity of ultraportable NPT to maintain an optimal moist environment for healing while minimizing wound manipulation and patient discomfort[10].

Despite the favorable outcomes, it is important to recognize that the benefits of NPT are not universally observed. One reviewed study reported no statistically significant differences in complication rates among patients

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undergoing mastectomy with flap fixation, suggesting that the effectiveness of NPT may vary depending on the type of surgery and the application protocol utilized[11]. Therefore, the positive results described in this report may be attributed, in part, to appropriate patient selection and the careful implementation of the technology.

Moreover, the use of NPT in outpatient and home care settings, as demonstrated in this case, has been reported as both safe and effective. This supports its application in high-risk cervical incisions and reinforces the safety and feasibility of the method beyond the traditional hospital environment[12].

Another important aspect is the cost-effectiveness of NPT. The prophylactic use of NPT in oncologic abdominal surgeries has been associated with a significant reduction in surgical site infection rates, leading to decreased hospital costs, shorter lengths of stay, and reduced need for antibiotic therapy[13]. In the present case, the favorable clinical progression facilitated early discharge from the specialized outpatient clinic and minimized the need for additional surgical interventions.

Therefore, the findings presented in this report are consistent with the current literature, indicating that ultraportable Negative Pressure Therapy is a safe, effective, and cost-efficient approach for managing post-mastectomy wound dehiscence in patients who have undergone radiotherapy.

Study Limitations

Since this is an experience report, the observations described are based on a single patient, which limits the generalizability of the results. Additionally, the absence of a control group precludes direct comparisons with other therapeutic modalities. Further studies employing robust methodological designs and larger sample sizes are necessary to validate these findings and establish more precise clinical guidelines.

Contributions to the Health Field

The implementation of NPT, particularly through ultraportable devices such as the PICO 7®, represents a significant innovation in the management of complex wounds in oncology patients. Its applicability in outpatient and home care settings broadens access to advanced therapeutic options, thereby promoting equity in care. Furthermore, the reduction in complications and the acceleration of the healing process may contribute to decreased healthcare costs and improved clinical outcomes.

CONCLUSIONS

The reported experience highlights NPT as an effective tool in the management of post-mastectomy wound dehiscence in patients who have undergone radiotherapy. The use of the PICO 7® device provided an optimal environment for healing, ensuring adequate exudate control and infection prevention. Despite the inherent limitations of the study, the

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outcomes observed are promising and underscore the need for further research to support the incorporation of NPT as a standard practice in the treatment of complex oncologic wounds.

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