Cogitare Enfermagem

EXPERIENCE REPORT

Impact of low-power laser therapy on peristomal lesions of urinary stomas: case reports

HIGHLIGHTS

1. The use of laser therapy promotes effective healing of peristomal lesions.
2. The procedure is safe, painless, and well accepted by patients.
3. Clinical evolution indicated a progressive reduction of treated lesions.
4. Laser therapy promotes well-being and continuity of care.

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ABSTRACT

Objective: To report on the experience of using low-power laser therapy for the treatment of peristomal lesions in patients with urinary ostomies. **Method:** Report of two cases treated at a stoma therapy service in southern Brazil in 2025. **Result:** Low-power laser therapy was applied weekly by a trained stoma therapist nurse, with individualized doses and complementary use of photodynamic therapy. The treatment was well accepted, non-invasive, painless, and associated with conventional care. A progressive reduction in lesions was observed, with improved skin integrity and satisfactory patient adherence. **Conclusion:** Low-level laser therapy has proven to be an effective and safe approach to managing peristomal lesions, promoting healing, symptom relief, and improved quality of life. The importance of professional training and continuous monitoring is reinforced.

DESCRIPTORS: Nursing Care; Low-Level Light Therapy; Ostomy; Enterostomal Therapy; Wound Healing.

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INTRODUCTION

Urinary ostomies are surgical procedures indicated for treating urinary tract tumors, anatomical anomalies, and severe dysfunctions, and are classified according to their location. One of the most common complications is peristomal skin lesions, especially allergic or irritant contact dermatitis, usually caused by improper use of collection equipment and skin contact with effluents[1,2].

A study conducted in Brazil showed that, among people with urinary and intestinal ostomies, 30.2% had already developed some type of complication. The most frequent complications were dermatitis (28.9%), prolapse (20.2%), peristomal hernia (18.5%), and stoma retraction (17.9%)[3]. In addition, individuals with urostomies often experience difficulties related to self-care, especially with regard to changing and cleaning the collection equipment, emptying the bag, caring for the peristomal skin, trimming the adhesive base, using adjuvants, and properly securing the device. These limitations can lead to complications in both the stoma and the surrounding skin, reinforcing the importance of educational actions that promote self-care in its multiple dimensions - not only biological, but also emotional, social, and cultural[4].

The proper management of these lesions is the responsibility of the stoma therapist nurse, who must prescribe collection equipment, adjuvants, and specific topical treatments. Low-level laser therapy (LLLT) has been integrated into clinical practice due to its beneficial anti-inflammatory, healing, analgesic, and antimicrobial effects. The application of LLLT requires specific technical knowledge and is regulated by the Brazilian Federal Nursing Council (COFEN) as an activity exclusive to trained nurses[7]. LLLT modulates cellular activity, considering parameters such as wavelength, power, and application time[8,9].

In this context, Photobiomodulation (PBM), especially with low-power lasers, stands out as an effective adjuvant therapy in the treatment of skin wounds. The emission of light stimulates cells, promoting tissue regeneration, cell proliferation, and accelerated healing. In addition, it contributes to the formation of new blood vessels, nerve regeneration, and reduction of edema[10,11].

PBM and Photodynamic Therapy (PDT) showed promising results in the treatment of skin lesions and onychomycosis, demonstrating efficacy in healing and reducing the use of antimicrobials[12-14]. To ensure the safety and efficacy of treatment, it is essential that the application technique is constantly updated and improved. This involves mastering parameters such as power (W or mW), pulse frequency (Hz), pulse duration (ns), emission mode (continuous or pulsed), wavelength (λ), as well as the correct calibration of the equipment and choice of the appropriate tip. It is also essential to consider the exposure time (s), energy density (J/cm²), power per area (W/cm²), total area to be treated (cm² or mm²), number of application points, energy per point (J), and total joules applied, according to specific clinical protocols adapted to the patient's condition[15].

The pathophysiology of LLLT is not yet fully understood, which reinforces the importance of studies investigating its mechanisms and clinical applications. Given this, this study is justified as it contributes to evidence-based practice and the development of care protocols, with the aim of reporting on the experience of using low-power laser therapy for the treatment of peristomal lesions in patients with urinary ostomies.

METHOD

This is a report of two cases, prepared based on the guidelines of the CAse REport (CARE) tool, from the Enhancing the Quality and Transparency of Health Research (EQUATOR) network, conducted between April and June 2025, during the follow-up of patients at a Reference Center for Stoma Therapy in the Southern Region of Brazil.

Data collection took place during consultations with the patients, with an average duration of 60 minutes each, including clinical observations, lesion assessments, photographic records, and follow-up of progress. The sample consisted of two patients with significant peristomal dermatitis. Both were informed about the study objectives and their rights as participants, signed the Free and Informed Consent Term (FICT), and authorized the use of images through a specific document.

For the treatment of skin lesions in the peristomal area, LLLT was used weekly, using a device with a wavelength of 808 nm ±10 nm in the Infrared (IR) and 660 nm ±10 nm in the red (R), both with a useful power of 100 mW ±20%, with 1J of energy covering the entire injured area, with a distance of 1 cm between application points and an application time of 10 seconds per point. A non-lubricated condom was used to protect the device tip. In cases suggestive of fungal infection, PDT was also used.

Additionally, skin care products were used: cleanser, protective powder, spray, and barrier paste. The patients described in the study were already using different topical adjuvants during treatment, but without a satisfactory clinical response. After the addition of low-power laser therapy, a progressive improvement in the lesion was observed, with a gradual reduction in the affected area and recovery of the integrity of the peristomal skin.

The assessment of the injury included photographic records, measurements with a ruler, and notes in the electronic medical record, detailing the number of stitches applied, which decreased with clinical improvement.

Additional information was obtained from the electronic medical record. The research was approved by the institution's Research Ethics Committee (REC), under Opinion No. 7,465,676.

RESULTS

Treatment adherence was satisfactory, with patients attending laser sessions. The following are the case reports that form the basis of this study.

Case reports

Case 1. Male patient, 80 years old, hypertensive and a smoker in abstinence for 40 years. Allergic to Acetylsalicylic Acid (ASA). He presented a weight loss of approximately two kilograms and performs physical activity regularly. He underwent prostatectomy in 2021, and in 2022, a lesion was identified in the bladder. He underwent eight cycles of chemotherapy and radical cystectomy with urostomy on 09/29/2023. Examination revealed a stoma in the lower right abdominal quadrant, measuring 20 mm, slightly protruding, with significant peristomal hyperemia, using convex collection equipment and protective barrier paste. He began LLLT in April 2025, with 18 application points (1J red and 1J infrared), weekly. The number of points was reduced as he improved

clinically. At the eighth consultation, complete recovery of the peristomal skin was observed. Figures 1 and 2 illustrate this evolution.

Figure 1. Photo of the stoma and peristomal skin before the first session of LLLT. Porto Alegre, RS, Brazil, 2025

Source: Authors' collection (2025).

Figure 2. Photo of the stoma and peristomal skin at the 8th consultation. Porto Alegre, RS, Brazil, 2025

Source: Authors' collection (2025).

Case 2. Male patient, 77 years old, hypertensive, with dyslipidemia, and a smoker in abstinence for 50 years. In January 2022, he was diagnosed with urothelial carcinoma *in situ* and underwent radical cystectomy with lymphadenectomy and neoadjuvant chemotherapy. He presented with peristomal dermatitis in August 2023 and sought medical attention for evaluation. On examination, the patient had a flat stoma measuring 22 mm, and peristomal skin with dermatitis, with exudate and odor characteristic of a fungal lesion, and was referred for medical evaluation. He began oral treatment and continued home ostomy care. He returned in April 2025 with an extensive peristomal lesion, hyperemia, and two points with loss of skin integrity. He started weekly LLLT with 20 points (1 infrared J and 1 red J), dressing with paraffin mesh, barrier spray, alcohol-free paste, and convex cut-to-fit collector equipment. In May, there was worsening with exudate and fungal odor, and PDT was initiated with 32 points, progressively reduced. After six sessions, complete healing was observed, as illustrated in Figures 3 and 4.

Figure 3. Photo of stoma and peristomal skin before starting photodynamic therapy. Porto Alegre, RS, Brazil, 2025

Source: Authors' collection (2025).

Figure 4. Photo of the stoma and peristomal skin after the sixth application of photodynamic therapy. Porto Alegre, RS, Brazil, 2025

Source: Authors' collection (2025).

DISCUSION

Depending on their location, urinary ostomies can be classified as: nephrostomy or pyelostomy, when they originate from the kidneys; ureterostomy, when they externalized a ureter; cystostomy or urostomy, when they derive from the bladder; and vesicostomy, when the bladder mucosa is sutured directly to the skin, above the pubic symphysis[1]. Both patients in the cases presented underwent radical cystectomy, which resulted in urostomies, highlighting the importance of specialized follow-up for the prevention and treatment of peristomal complications.

The most common skin changes are dermatitis, mainly allergic contact dermatitis, triggered by collection equipment or products that weaken the skin and trigger an inflammatory process, as observed in Case 1, with peristomal hyperemia associated with the use of a convex pouch and protective barrier paste; and irritant contact dermatitis, usually caused by leakage of effluents and the irritating action of enzymes present[1].

Other complications may also occur, such as pyoderma gangrenosum, erythema, ulceration, candidiasis, folliculitis, varicose veins, pseudoverrucous lesions, psoriasis, and granuloma formation[2]. In Case 2, the progression of dermatitis, with the presence of exudate and a characteristic odor, indicated a fungal infection, with loss of peristomal skin integrity, demonstrating the complexity of these complications and the need for specific therapeutic interventions.

Several factors contribute to peristomal skin complications, such as improper removal and frequent reapplication of the collection equipment, presence of moisture, flaws in the stoma demarcation, skin contact with effluents, infections, allergic reactions, improper use of topical products, excessive hygiene, incorrect handling of equipment, and inaccurate cuts in the adhesive base[2]. These factors may have contributed to the condition presented in Case 2, which worsened after home care, requiring reassessment and modification of the therapeutic approach.

The stoma therapist nurse is the professional responsible for prescribing collection equipment, adjuvant products, and topical treatments, such as creams or barrier paste, hydrocolloid protective plates, hydrocolloid powder for moisture absorption, and adhesive removers[14,16]. In both cases, adjuvant products such as barrier paste and protective spray were used, according to the individual needs of each patient.

The treatment of dermatitis in the cases presented consisted of LLLT, which corresponds to the application of light with a therapeutic effect, promoting cell modulation (activation or inhibition) in a dose-dependent manner[8]. Parameters such as wavelength, power, type of light, energy density, and application time are adjusted. Efficacy also depends on the patient's physiological state, location, and nature of the lesion[9]. In Case 1, LLLT was started at 18 points and adjusted according to healing, resulting in complete recovery of the peristomal skin after eight sessions.

COFEN Resolution No. 567/2018 established that the development of protocols, evaluation, and use of technologies in wound care are the exclusive responsibilities of nurses[6,7]. The application of laser therapy requires technical knowledge and must be performed by trained nurses, integrating the systematization of care[5]. In both cases, the nurse's role was fundamental in the evaluation and conduct of laser treatment, respecting technical and clinical parameters.

Laser therapy has applicability in infection control, notable for its ability to destroy bacteria and fungi via electron transfer, as demonstrated in Case 2. This mechanism generates free radicals by transferring energy to oxygen, forming singlet oxygen, a highly

reactive molecule. This free radical acts directly in the elimination of microorganisms, its effect being enhanced when associated with PDT photodynamic therapy.[8,16-17].–

PDT consists of applying a photosensitizer, a non-toxic dye, combined with laser therapy directed at a target lesion, such as fungi and bacteria, to induce localized oxidative photolesion. The laser, by activating the photosensitizers, transfers energy to molecular oxygen, generating reactive species that result in the immediate destruction of microorganisms[6,7] In Case 2, the initial application at 32 points was progressively reduced as clinical improvement occurred, with complete healing after the sixth session.

PDT in the treatment of fungal infections, such as onychomycosis, has shown promising results. Some studies investigating the use of lasers show significant clinical improvement, including healthy nail growth and reduction of dystrophies caused by infection[14]. The efficacy of antimicrobial PDT depends on parameters such as light, power, and exposure time, in addition to the type of infection. It stands out for being a specific therapy with no relevant side effects and no reports of bacterial resistance, using methylene blue as a photosensitizer[18]. The positive experience in Case 2 reinforces its potential as a complementary therapeutic resource in the management of infected peristomal lesions.

The limitations of the study include the small number of cases, which restricts the generalization of the results, the absence of a control group, and the variability in the periods of lesion evolution prior to treatment. There is also a scarcity of publications specifically addressing the use of low-power laser therapy in peristomal lesions of urinary ostomies, which reinforces the relevance and originality of this research. Despite the promising results obtained with the use of LLLT and PDT, new comprehensive and standardized studies are needed to validate the efficacy and safety of this approach.

FINAL CONSIDERATIONS

The use of LLLT has proven to be an effective and safe approach in the treatment of skin lesions, including peristomal lesions. It is a promising alternative for the management of these lesions, with the potential to improve patients' quality of life and optimize care in clinical practice. The treatment of peristomal dermatitis with low-power laser can promote significant improvement in symptoms, accelerate healing, and improve patients' quality of life. However, its application requires professional training, adaptation to individual needs, and continuous monitoring of results.

Despite the promising results presented in this study, relevant questions remain that deserve further investigation. It is necessary to reflect on the feasibility of using laser therapy in all health services, especially those with fewer resources, as well as on the balance between costs and benefits when compared to conventional treatment. These considerations reinforce the importance of new research to evaluate its applicability, effectiveness, and impact in different clinical practice contexts.

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Rieth ALL, Paczek RS, Silveira CS, Carreiro PE, Martins LM, Micheletti VCD.** Drafting the work or revising it critically for important intellectual content - **Rieth ALL, Paczek RS, Silveira CS, Carreiro PE, Martins LM, Micheletti VCD.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Paczek RS.** All authors approved the final version of the text.

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