Case study

# Care coordination and adjuvant therapies in complex wounds: a case report in oncology


## ABSTRACT

**Introduction** Care coordination is essential in the management of complex wounds, requiring structured coordination and communication among services and professionals to adequately meet patient needs. This multidisciplinary approach is associated with morbidity, treatment costs and length of hospital stay.

**Method:** This is a descriptive case report conducted at a Cancer Center in São Paulo, Brazil.

**Case report** A 45-year-old male patient with no known comorbidities was diagnosed with rectal adenocarcinoma. He underwent robotic sphincter-preserving low anterior resection of the rectum with total mesorectal excision on 20 December 2022, followed by ileostomy closure on 18 April 2023. On 29 November 2023, he was readmitted with severe sepsis secondary to pelvic collection, low colorectal anastomotic dehiscence and necrotising fasciitis extending to the left lower limb. He underwent nine surgical debridements, negative pressure wound therapy, skin grafting, antimicrobial dressings, topical management of hypergranulation tissue and adjunctive low-level laser therapy. Care was coordinated by surgical, infectious disease, palliative care, nutrition, physiotherapy, psychology and the stomal therapy nursing team.

**Conclusion:** This case highlights the relevance of structured care coordination, specialist stomal therapy nursing involvement and individualised use of adjunctive wound therapies in the management of extensive complex wounds in oncology.



**Keywords** wound infection, oncology nursing, multidisciplinary team.

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## INTRODUCTION

Care coordination is a fundamental component of contemporary health systems, involving the deliberate organisation of care activities and information exchange among professionals, services and levels of care to ensure comprehensive, safe, patient-centered care.[1,2] In complex clinical situations, this process requires structured communication, collaborative decision-making and active participation of both the healthcare team and the patient. Horizontal integration, defined as the coordination of providers or services operating at the same or similar level of care, supports alignment of clinical actions, communication and treatment planning.[3] This approach was relevant in the present case because the patient required simultaneous interventions from different hospital-based teams to optimise safety, continuity and quality of care.

In complex and hard-to-heal wound management, care coordination is particularly important because these wounds have multifactorial causes and substantial clinical, functional and economic implications. They require continuous reassessment, individualised therapeutic planning, advanced wound care technologies and interprofessional collaboration. Complex wounds are associated with morbidity, prolonged treatment, increased costs, repeated or extended hospitalisations and impaired quality of life, including limitations in mobility, self-image, autonomy and psychological well-being.[4,5]

Stomal therapy nursing is traditionally focused on the care of people with stomas and, depending on the country and local scope of practice, may also include wound and continence care.[6] In Brazil, stomal therapy nurses commonly contribute to the management of stomas, complex wounds, fistulas, continence-related conditions and patient education. In this case, the stomal therapy nurse was involved in stoma management, structured wound assessment using the TIMERS framework, selection and monitoring of adjunctive therapies,


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and communication with the surgical and multidisciplinary teams. These therapies included negative pressure wound therapy (NPWT) and low-level laser therapy (LLLT). NPWT applies controlled subatmospheric pressure through a sealed dressing system to remove exudate, reduce edema, improve perfusion, stimulate granulation tissue and prepare the wound bed for grafting or reconstruction.[7] LLLT was used as adjunctive photobiomodulation therapy with red and infrared wavelengths, 660nm and 808nm, respectively, to modulate inflammation, reduce pain, stimulate angiogenesis and support collagen synthesis.[8]

This case report describes care coordination in the management of extensive complex wounds affecting the sacral region, thigh and left leg in a critically ill patient treated at a Cancer Center, emphasising stomal therapy nursing, interdisciplinary collaboration and adjunctive therapies to optimise wound healing and clinical recovery.

## CASE REPORT

A 45-year-old male patient, with no known comorbidities, was diagnosed with mid/high rectal adenocarcinoma. On 20 December 2022, he underwent robotic sphincter-preserving low anterior resection of the rectum with total mesorectal excision, reconstruction through an internal stapled low colorectal anastomosis and creation of a temporary protective loop ileostomy. No immediate postoperative complications were documented, and he was discharged on 28 December 2022. On 18 April 2023, he underwent ileostomy closure, with no immediate postoperative complications recorded.

On 29 November 2023, he presented to the emergency department with severe sepsis secondary to an extensive pelvic collection associated with dehiscence of the previous low colorectal anastomosis, spreading through the ischial foramen to the entire left lower limb and resulting in necrotising fasciitis. Initial goals were sepsis and source control, prompt surgical debridement, preservation of viable tissue and limb function, pain and exudate management and wound bed preparation for subsequent reconstruction. An exploratory laparotomy was performed with creation of a proximal transverse colostomy. Low colorectal anastomotic dehiscence was identified, with perineal induration and infectious extension to the left gluteal region and ipsilateral proximal thigh, crepitus to the pretibial area and extrusion of feculent material.

Between 8 December 2023 and 28 January 2024, the patient underwent nine sequential surgical debridements performed by colorectal and reconstructive surgery teams. Wound assessment and therapeutic planning were based on the TIMERS framework, which guides evaluation of tissue, infection/inflammation, moisture balance, wound edge, regeneration/repair, and social factors.[5] The sacral wound showed deep dehiscence, exposure of sacral bone and adjacent muscular structures, necrotic tissue and abundant purulent exudate. The left lower limb wound showed exposed muscle groups, friable and detached edges, necrotic tissue and abundant seropurulent exudate. The initial wound presentation is shown in Figure 1.

NPWT was initiated to control exudate and local infection, reduce dressing manipulation and stimulate viable granulation tissue. Dressing changes were performed in the operating room under general anesthesia every 4 to 5 days until 9 February 2024. Initially, four NPWT devices were used on the sacral region, thigh and left leg. A non-adherent mesh dressing (Adaptic) was applied as the primary contact layer, followed by polyurethane foam connected to the devices. Continuous pressure was set at 140mmHg during the first four weeks and 120mmHg subsequently. Sealing was challenging due to wound extent and exudate volume, requiring five nurses and one surgical technician for proper application. Adhesive film detachment and loss-of-seal alarms were frequent.

After formation of viable granulation tissue in the thigh wounds, the patient underwent two skin grafts on 2 and 14 February 2024. NPWT was reinstated over the grafts with a non-adherent silicone film interface and pressure of 120 mmHg. On 23 January 2024, clinical improvement and adequate pain control under palliative care supervision allowed transfer from the intensive care unit to the inpatient ward. Care was then coordinated among colorectal surgery, reconstructive surgery, infectious disease, nutrition, physiotherapy, psychology and stomal therapy nursing.

On 1 March 2024, NPWT was discontinued in the grafted areas and throughout the leg because of satisfactory healing progression. Satisfactory graft take, reduced exudate and hypergranulation in non-grafted areas were observed. Antimicrobial silver foam dressings (Mepilex Ag) were applied to help control local bioburden and exudate, allowing dressing changes every two days.

To modulate inflammation, reduce pain and support tissue repair, LLLT, also referred to as photobiomodulation therapy, was instituted. A dual-wavelength, low-intensity semiconductor diode laser delivered visible red light at 660nm and near-infrared light at 808nm. The protocol consisted of 4J per point every 48 hours, totaling eight sessions by 18 March 2024. LLLT was discontinued after clinical reassessment showed reduced inflammation, satisfactory pain control using the verbal 0–10 Numerical Rating Scale,[9] and progression to epithelialisation, indicating achievement of treatment goals and avoiding excessive proliferative stimulation.

Non-grafted leg wounds showed hypergranulation in approximately 70% of the wound bed, treated with topical 50% trichloroacetic acid (TCA) to control excessive tissue growth. Eight sessions were carefully administered using a cotton swab, avoiding adjacent viable tissue. The evolution of the left lower limb wound during photobiomodulation and hypergranulation management is shown in Figure 2.

For the sacral wound, NPWT was maintained until 30 March 2024, with bedside dressing changes after shared decision-making with the patient and medical team and prior rescue

opioid medication. Progressive granulation tissue formation and reduced wound depth allowed transition to conventional occlusive dressings. Sacral wound progression is shown in Figure 3.

The patient was discharged on 17 April 2024 after clinical stabilisation and satisfactory wound healing progression. Outpatient follow-up continued in the specialised wound care unit, conducted by stomal therapy nurses. Initially, visits were weekly and included wound reassessment, monitoring of healing, and guidance on wound care and dressing changes. Dressing changes were performed by the home healthcare team according to outpatient recommendations and maintained in areas with remaining hypergranulation tissue. Follow-up was coordinated by surgery and stomal therapy teams, focusing on healing, complication prevention, functional rehabilitation, return to daily activities and recovery of autonomy.

The institution has a stable in-house medical team and a dedicated stomal therapy nursing team, facilitating continuity of care. Interdisciplinary planning and weekly meetings supported communication and therapeutic alignment. The patient's participation in treatment decisions, whenever clinically possible, promoted adherence and contributed to a collaborative, patient-centered approach.

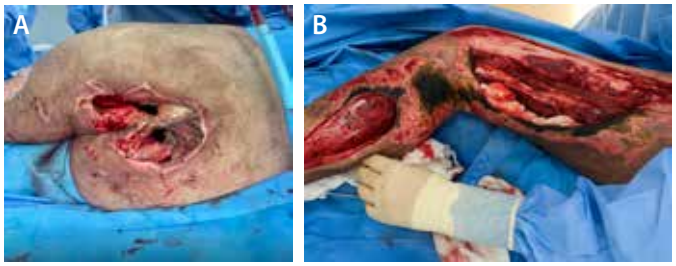


*Figure 1. Initial wound presentation on 11 December 2023*
*(A) sacral wound; (B) left lower limb wound*

*Figure 2. Evolution of the left lower limb wound*
*(A) wound on 1March 2024, at the start of LLLT and 50% TCA application;*
*(B) wound on 18 March 2024*

*Figure 3. Evolution of the sacral wound*
*(A) sacral wound on 29 January 2024;*
*(B) sacral wound on 17 April 2024, at hospital discharge*

## DISCUSSION

Colorectal cancer is among the most common malignancies worldwide, ranking third in incidence and second in cancer-related mortality.[10] Although it predominantly affects older adults, early-onset colorectal cancer, defined as diagnosis before 50 years, has received increasing attention because population-based data show rising incidence among younger adults in several countries.[11]

In this case, the patient developed necrotising fasciitis secondary to low colorectal anastomotic dehiscence, pelvic collection, and extensive infectious spread. Necrotising fasciitis is a severe, rapidly progressive soft tissue infection associated with high morbidity and mortality. Management requires early recognition, broad-spectrum antimicrobial therapy, repeated surgical debridement, source control and intensive support.[12] The need for multiple debridements and prolonged intensive care reflected the severity of infection and subsequent wound complexity.

After surgical source control, wound management required a staged, multidisciplinary approach. Repeated debridement, skin grafting, NPWT, LLLT, antimicrobial silver foam dressings, and 50% TCA were used according to wound evolution to prepare the wound bed, control exudate and bioburden, promote granulation, manage hypergranulation and facilitate tissue repair. The stomal therapy nurse played a central role in coordination, structured assessment, monitoring of adjunctive therapies and communication among teams. Specialised wound, ostomy, and continence nurses contribute to education, quality of life, resource use, care efficiency and evidence-based practice.[6]

NPWT supports exudate removal, edema reduction, granulation tissue formation and wound bed preparation.[7] In necrotising fasciitis, a systematic review and meta-analysis reported that vacuum-assisted closure was associated with reduced mortality compared with conventional dressings, although differences in debridement frequency, length of stay and complication rates were not significant.[13] Evidence from head and neck necrotising fasciitis also suggests that NPWT may facilitate postoperative wound management after debridement and infection control.[14] Therefore, in this case, NPWT should be interpreted as part of a multimodal strategy rather than an isolated determinant of outcome.

LLLT was incorporated after reassessment to support tissue repair, reduce inflammation, and assist pain control. Experimental and clinical literature suggests that LLLT may modulate inflammation, stimulate cellular activity, support angiogenesis, and promote collagen synthesis.[8] Systematic reviews in diabetic foot ulcers report favorable effects with red-light wavelengths and comparable energy parameters,

although evidence remains heterogeneous and optimal parameters for complex wounds require further study.[15]

Hypergranulation was managed with antimicrobial silver foam dressings and topical 50% TCA. Silver dressings are recommended for wounds with local infection or increased bioburden when used for defined periods with regular reassessment.[16] TCA has been described as a chemical cauterising agent for peristomal granulomas and hypergranulation-related conditions, although evidence in complex wounds remains limited.[17] In this case, TCA was used as a targeted local intervention under specialist supervision.

Care coordination was clinically relevant because the case required simultaneous involvement of colorectal surgery, reconstructive surgery, infectious disease, palliative care, nutrition, physiotherapy, psychology and stomal therapy nursing. Rather than attributing the favorable outcome to one intervention, this case suggests that structured interdisciplinary planning, continuous reassessment, shared decision-making and access to adjunctive therapies contributed to infection control, wound healing, functional recovery and autonomy preservation.

This report is limited by its single-patient design and by being conducted in a well-resourced Cancer Center, which may limit transferability. Nevertheless, it illustrates the operational complexity of managing extensive complex wounds in oncology and highlights the importance of interdisciplinary protocols, specialised nursing involvement and individualised use of adjunctive wound therapies. Further studies should evaluate the safety, effectiveness, cost-effectiveness and sequencing of these therapies in complex oncological wounds.

## CONCLUSION

Care coordination and access to adjunctive therapies were crucial for effective wound management, emphasising multidisciplinary collaboration. This patient-centered approach supported infection control, clinical recovery, autonomy and quality of life.

## ETHICS STATEMENT

This descriptive case report was conducted at a Cancer Center in São Paulo, Brazil. The study was approved by the Research Ethics Committee under protocol number RC142/25 on 15 July 2025, in accordance with the ethical principles established by Resolution No. 466/12 of the Brazilian National Health Council. Written informed consent was obtained from the patient for publication of the case report and clinical images.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest.


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