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International Journal of Clinical Case Reports and Reviews
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Case Report

Advanced Wound Management in Suprapubic Pyoderma Gangrenosum Following Cesarean Section: A Strategic Therapeutic Approach

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Received Date: June 23, 2025 | **Accepted Date:** August 04, 2025 | **Published Date:** September 11, 2025

Citation: Eugenia P. Coronado, (2025), Advanced Wound Management in Suprapubic Pyoderma Gangrenosum Following Cesarean Section: A Strategic Therapeutic Approach, *International Journal of Clinical Case Reports and Reviews*, 29(4); **DOI:10.31579/2690-4861/896**

Abstract:

Pyoderma gangrenosum (PG) is a rare, painful skin condition characterized by rapidly progressing necrotic ulcers. Due to its complexity, it requires advanced wound management involving thorough assessment, multidisciplinary care, and appropriate use of wound care technology. This case report presents a patient who developed suprapubic PG as a postoperative complication following cesarean delivery. Specialized treatment was administered at the Wound Care Clinic (CH), including the application of antiseptic and bioactive topical agents, a range of advanced dressings -such as nonadherent films, antimicrobial-coated materials, silver-based hydrogels, and collagen matrices-, and the use of adjunctive therapies like magnetotherapy. A structured wound care strategy was implemented, emphasizing decontamination, protection, and the facilitation of tissue regeneration. The intervention resulted in complete reepithelialization and progressive surgical wound closure without further complications. This case underscores the value of advanced wound care protocols in managing complex presentations of PG and highlights the importance of tailored, multidisciplinary approaches in achieving favorable clinical outcomes.

Key words: pyoderma gangrenosum; skin condition; advanced wound management; surgical wound; magnetotherapy

Introduction

Pyoderma gangrenosum (PG) is an uncommon neutrophilic dermatosis of uncertain etiology, clinically characterized by painful, rapidly progressive necrotic ulcers with irregular borders. Current evidence points to the overproduction of proinflammatory cytokines -such as Th1, TNF-α, IL-6, and IL-8- as contributors to sterile inflammation driven by neutrophil chemotaxis [1-4]. PG may present at any age, with a reported prevalence of approximately 5.8 cases per 100,000 adults in the United States [5]. Although its pathogenesis remains incompletely understood, immune dysregulation is widely considered a central mechanism [1]. Clinically, PG is classified into six variants: ulcerative (the most prevalent), pustular, bullous, vegetative, peristomal, and postoperative [1,2]. Lesions are typically located on the lower extremities, buttocks, abdominal region, and face, and often manifest as painful necrotic ulcers with potential for permanent scarring [4-6].

Due to its complexity, PG necessitates a comprehensive and specialized wound management strategy [2]. This includes a detailed assessment of the wound's microenvironment -encompassing molecular, infectious, and genetic factors-alongside coordinated multidisciplinary care and the integration of advanced wound care technologies [7]. The healing process follows a sequence of cellular and molecular events, beginning with vasoconstriction and coagulation and progressing toward tissue regeneration [8]. A thorough patient evaluation should incorporate medical history, laboratory testing, imaging studies, and nutritional assessment. In parallel, wound evaluation must address key parameters such as size, depth, exudate volume and characteristics, condition of surrounding skin, signs of infection, and pain severity [7].

Following a comprehensive evaluation, individualized treatment goals and plans are established -encompassing wound cleansing frequency, appropriate dressing selection, and the use of technologies designed to sustain a moist healing environment and prevent reinfection [2, 7, 8]. One such adjunctive modality is magnetotherapy, which involves the therapeutic application of electromagnetic fields. Since the 19th century, studies have explored the biological effects of magnetic fields on living systems. Magnetotherapy promotes cellular regeneration and collagen formation by restoring membrane potential and correcting ion imbalances within injured tissues [9,10]. As a complementary approach, magnetotherapy may improve wound healing outcomes when integrated with conventional pharmacological interventions [9].

Optimal dressing selection plays a pivotal role in wound management. Contemporary dressings are designed to maintain a moist environment, prevent infection, facilitate gaseous exchange, and modulate local inflammatory responses through cytokine regulation. Essential attributes include biocompatibility and non-toxicity to ensure safe application across diverse wound types [8]. Among available options, collagen-based dressings are extensively utilized due to their regenerative capacity and compatibility with native tissue. Collagen promotes fibroblast and keratinocyte function, enhances the synthesis of extracellular matrix proteins, and supports tissue remodeling—rendering it particularly effective in the management of epithelial wounds [7, 8, 11, 12].

The primary aim of this case report is to demonstrate the effectiveness of advanced wound management strategies—including the use of specialized dressings and complementary therapies like magnetotherapy—in promoting healing and achieving full epithelialization in a complex case of suprapubic pyoderma gangrenosum (PG) following a cesarean section. By detailing an interdisciplinary, personalized treatment approach, the article contributes valuable insights into clinical practices for managing rare and challenging postoperative skin conditions.

Case presentation

A 34-year-old female patient, previously healthy and nulliparous, experienced an uncomplicated pregnancy and underwent a cesarean section on November 28, 2022. The procedure was uneventful, and she was discharged 24 hours postoperatively. Three days later, on December 1, she reported the onset of fever and general malaise. By December 3, wound dehiscence had developed, measuring approximately 2 cm in length and presenting with a brownish discoloration. On December 4, 2022, the wound exhibited a marked change in coloration, appearing violet, along with increased extension compared to the previous day. The patient reported a fever reaching 39 °C, abdominal pain, jaundice, and a foul odor emanating from the wound site (Figure. 1).

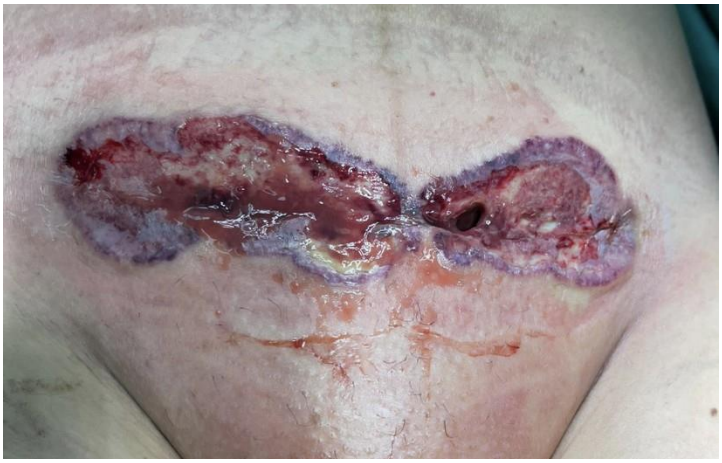

Figure 1: Increased dehiscence of the wound, with color change (violet), jaundice, and foul odor. Source: Dr. Rauff, 2022.

Following an evaluation by her attending gynecologist, a referral was made for interdisciplinary management involving specialists in Infectious Diseases, Dermatology, and Intensive Care. That same day, the patient underwent surgical debridement of the affected area (Fig. 2), after which the wound was closed surgically.

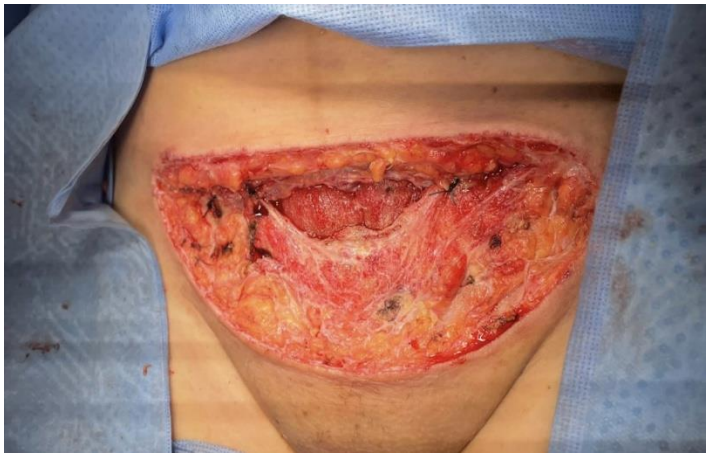

Figure 2: Surgical cleaning of the wound. Source: Dr. Rauff, 2022.

By December 11, 2022 -one week after surgical closure- partial wound edge separation was observed (Figure. 3). Based on clinical presentation and histopathological findings from biopsies of suprapubic tissue, Dermatology confirmed a diagnosis of pyoderma gangrenosum. The patient was referred to the Wound Care Clinic (CH) for specialized evaluation and advanced wound management. Systemic corticosteroid therapy was initiated. Dermatology further emphasized the importance of gentle wound care and advised the use of non-irritating topical products to minimize trauma and support healing. During the CH's initial assessment, poorly defined lesions were identified, measuring approximately 4 cm on the right and 3 cm on the left, with abundant yellowish serous exudate. The right side was sutured by Plastic Surgery, while the left was left open in accordance with Dermatology's guidance to continue conservative, specialized care under CH supervision.

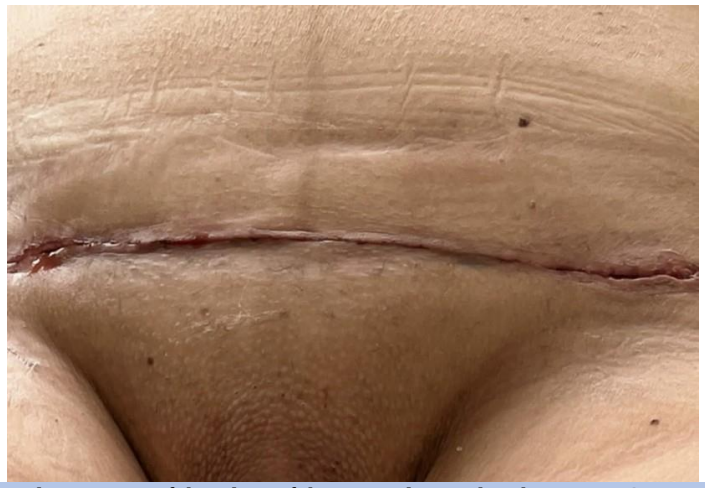

Figure 3: Initial separation of the edges of the surgical wound in the patient. Source: Own, 2022.

The initial treatment selected by the CH involved cleansing the wound with a sodium hypochlorite solution for five minutes, followed by the application of a biological dressing designed to promote microbial binding. Four hours later, the patient reported excessive exudate and intolerance to the dressing. The wound was cleansed again with the same antiseptic solution, and an antimicrobial silver-based dressing - formulated to absorb excess fluid and maintain a moist healing environment- was applied, with dressing changes scheduled every 24 hours. On December 13, 2022, the patient presented with dehiscence of the wound's left margin, measuring approximately 7 cm, accompanied by abundant exudate and erythematous peri-wound tissue (Figure. 4).

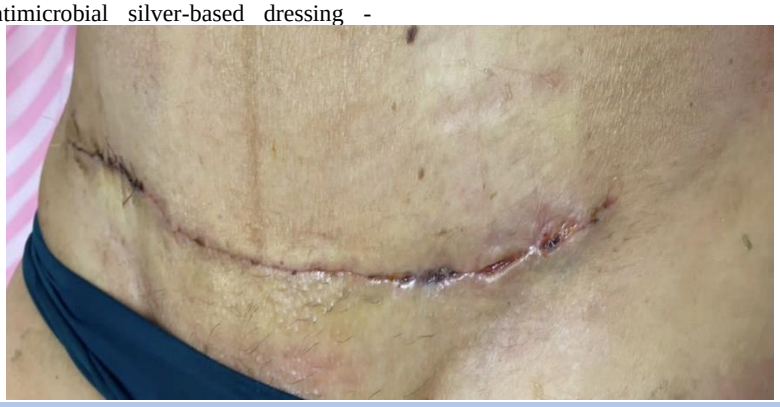

Figure 4: Separation of the left edge of the wound, with an extension of 7 cm, abundant exudate, and edges surrounded by reddish coloration. Source: Own, 2022.

The clinical team continued treatment using a silver-based antimicrobial dressing as the primary layer, secured with an adhesive bandage. To support wound stability and reduce tension in the abdominal area, a binder was added to the therapeutic approach (Figure. 5).

Figure 5: An abdominal binder was added to the treatment. Source: Own, 2022.

By December 17, 2022, additional dehiscence was noted along the left edge of the wound, measuring approximately 4 cm by 1 cm, characterized by a pearly gray base and erythematous margins. Exudate levels appeared to be better controlled at this stage (Figure. 6).

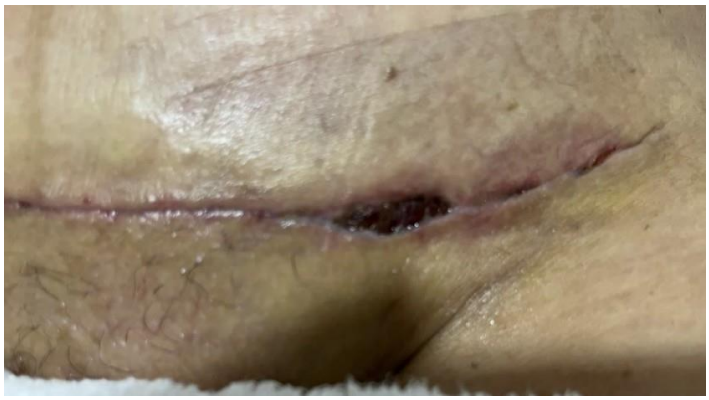

Figure 6: Wound with further separation of the edges in a section of the left edge, with an extension of 4 cm x 1 cm, pearly gray coloration, and erythematous borders, with better control of the exudate. Source: Own, 2022.

The CH maintained the use of an antimicrobial silver dressing as the primary layer, secured with an adhesive support. On December 26, 2022, additional wound edge separation was noted, reaching a depth of 2 cm. The edges were detached from the base with minimal exudate present (Figure. 7).

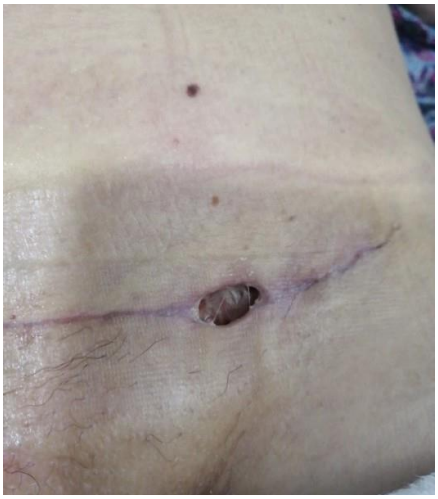

Figure 7: Further separation of the wound edges, with a depth of 2 cm, edges lifting from the bottom with minimal exudate. Source: Own, 2022.

At this stage, the CH opted to fill the lesion with a hydrofiber dressing containing silver, chosen for its antimicrobial action and stability in both moist and dry conditions. The site was then covered with an outer antimicrobial layer and secured using an adhesive bandage. Ongoing communication with the attending physician supported treatment planning, including the introduction of corticosteroids. Dressing changes were scheduled at 72-hour intervals.

By January 4, 2023 -just over a week later-the wound exhibited reduced depth, increased granulation tissue formation, and minimal exudate (Figure. 8).

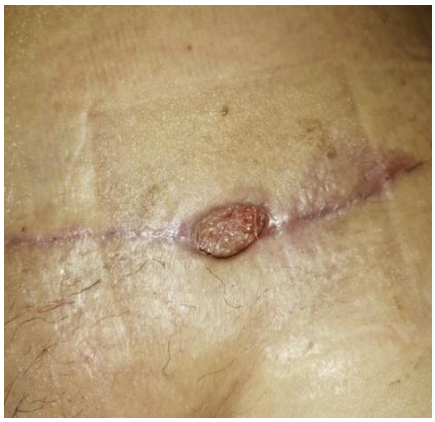

Figure 8: Wound with less depth, more granulation tissue, and minimal exudate. Source: Own, 2023.

Residual sutures were observed maintaining edge approximation and were subsequently removed. The dressing protocol remained unchanged, with applications scheduled every 72 hours. One week later, by January 11, 2023, the wound margins appeared healthy, and the wound bed measured approximately 4 cm × 3 cm, with visible granulation tissue and minimal exudate (Figure. 9).

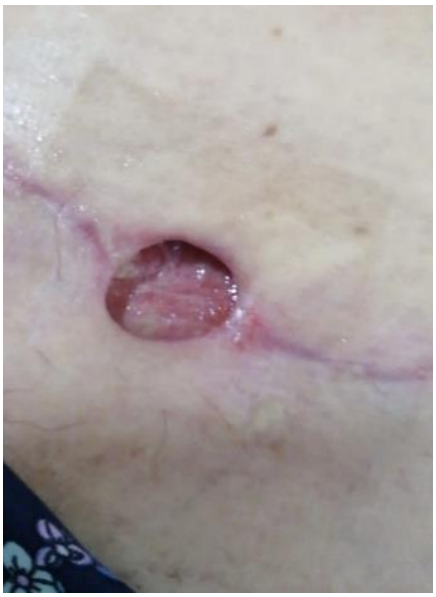

Figure 9: Wound with healthy edges, a bed of 4 cm x 3 cm with granulation tissue and minimal exudate. Source: Own, 2023.

Dermatology recommended tapering the prednisone dosage by 5 mg weekly over four weeks, beginning at 55 mg. For wound management, the CH employed a silver-infused hydrofiber dressing secured with an adhesive bandage. In response to continued lesion activity and suboptimal healing progression, daily magnetotherapy was initiated. The therapy consisted of fifteen 30-minute sessions, calibrated to 200 gauss and 49 Hz. To facilitate continuity of care, the patient was provided with a portable device for home-based application.

On January 16, 2023, the CH initiated simultaneous treatment with magnetotherapy and collagen-based dressings. Following wound cleansing with a sodium hypochlorite solution, a collagen sheet was applied to cover the entire wound bed, leaving a 0.5 cm margin beyond the wound edges. An adhesive dressing was used as a secondary layer, with dressing changes scheduled every three days. This combined approach led to noticeable and accelerated improvements in wound closure. By January 30, 2023, the wound edges were well-adhered to the underlying dermis, and the lesion had reduced in size to approximately 1 cm × 0.5 cm, with minimal exudate. Both the depth and separation of the wound had significantly improved, and the wound bed demonstrated robust, healthy granulation tissue (Figure. 10).

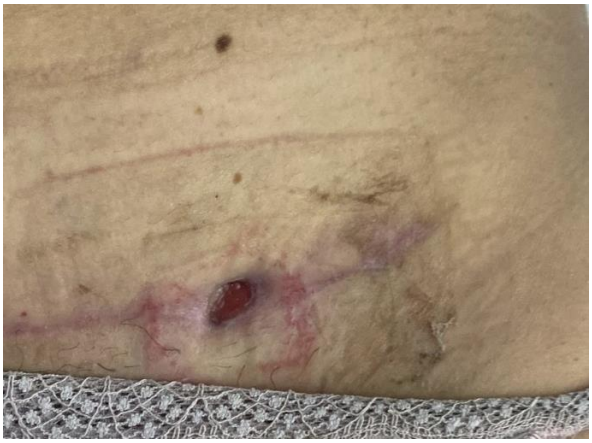

Figure 10: Lesion with edges adhered to the dermal layers, measuring 1 x 0.5 cm, with minimal exudate, reduced depth, and good-quality granulation tissue. Source: Own, 2023.

The integrated approach combining collagen-based dressings with magnetotherapy contributed substantially to the accelerated healing process. By February 20, 2023, the wound had contracted to a diameter of 0.2 cm, presenting with healthy granulation tissue, absence of exudate, and no reported complications. Collagen-based dressing therapy was maintained in the wound bed. Systemic corticosteroid therapy was discontinued; however, Dermatology confirmed continued tapering of prednisone, with the dose at that time set at 40 mg. Between February 20 and March 27, 2023, the wound remained stable, with no notable changes. Incomplete epithelialization persisted, and the lesion measured approximately 0.5 × 0.2 cm, characterized by healthy granulation tissue, absence of exudate, and no signs of infection (Figure. 11).

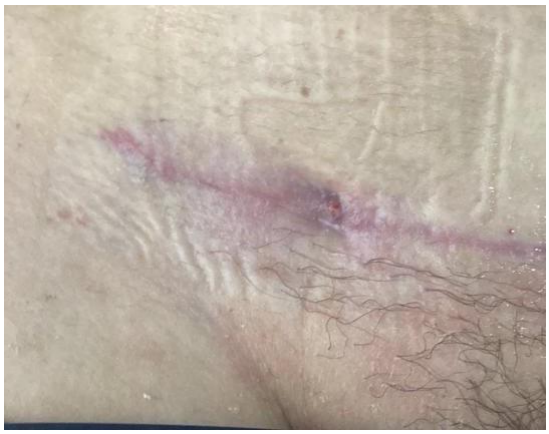

Figure 11: Granulation tissue lesion measuring approximately 0.5 x 0.2 cm. Source: Own, 2023.

Low-dose corticosteroid therapy was reinitiated by Dermatology, with a recommended gradual tapering of prednisone at a rate of 10 mg per week. Wound care continued every 72 hours, including cleansing with a sodium hypochlorite solution and the application of collagen-based dressings. Additionally, topical micronutrients -comprising ionic zinc, calcium, magnesium, sodium, and vitamins A and B6- were applied to the wound margins, followed by adhesive dressing coverage.

By March 28, 2023, the wound was being managed with collagen-based dressings in combination with topical micronutrient therapy. However, signs of cutaneous irritation were noted, likely resulting from friction with denim clothing (Figure. 12).

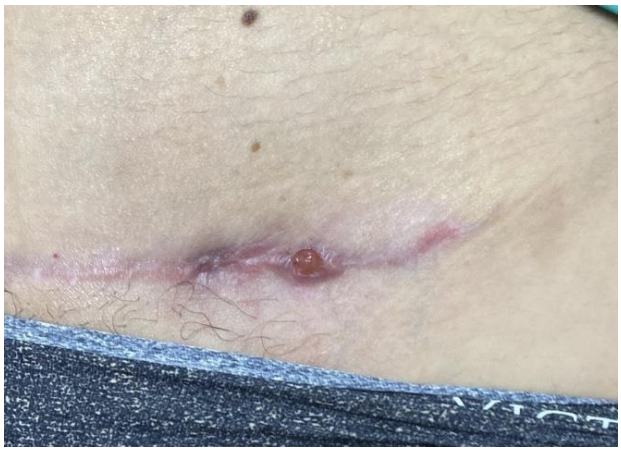

Figure 12: Wound in recovery, seemingly affected by rubbing against denim pants. Source: Own, 2023.

The treatment protocol remained unchanged. On April 10, 2023, the patient's progress was confirmed, with complete epithelialization of the wound and sustained closure, absent any exudate. Healing was achieved without complications, attributable to the advanced wound care delivered by the CH (Figure 13). No further corticosteroid therapy was indicated, following a final taper to 2.5 mg of prednisone, as previously recommended by Dermatology

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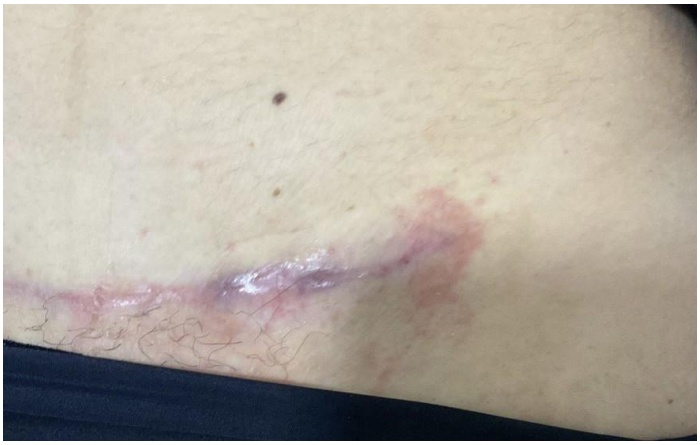

Figure 13: Fully epithelialized wound. Source: Own, 2023.

Discussion

The clinical presentation of PG is notably heterogeneous. In this case, the lesion was morphologically categorized as ulcerative and, due to its atypical progression, further classified as a clinical variant (postoperative). This aligns with the predominant phenotype reported in the literature [1,2], as the lesion originated as an inflammatory pustule at a site of recent trauma—a cesarean section incision. The condition evolved with the development of an erythematous halo extending over previously unaffected skin, followed by central ulceration and severe pain. In this case, the ulcer exhibited an elevated inflammatory border with a bullous configuration, violaceous discoloration, and a secretion-covered base. The lesion progressed asymmetrically -advancing more rapidly on the left side and more slowly on the right- forming a serpiginous pattern consistent with published descriptions [2-4]. Although PG typically manifests on the trunk and lower extremities [1,3], this presentation involved the suprapubic region, arising at a site of surgical trauma following cesarean delivery and associated with wound dehiscence. The diagnosis of PG is primarily clinical, with histopathological evaluation serving as a complementary tool to exclude other differential diagnoses [2]. In this case, Dermatology established the diagnosis based on clinical presentation, which was subsequently reconfirmed by biopsy findings. Additionally, Crohn's disease and other potential underlying conditions were ruled out during the diagnostic process. Although no specific laboratory markers exist for the diagnosis of pyoderma gangrenosum, leukocytosis—particularly with a predominance of polymorphonuclear cells—and elevated acute-phase reactants are frequently observed [3]. In this case, laboratory testing revealed an increased white blood cell count, supporting the presence of systemic inflammation.

Currently, no standardized clinical guidelines exist for the treatment of PG [13]. Consequently, management relies on suppressing the inflammatory response and implementing optimized wound care to support healing. Although initial improvement may be observed, full remission often requires prolonged complex and challenging treatment [1]. These therapeutic principles were fully reflected in the clinical progression and outcome documented in this case. In this case, the CH oversaw the management and recovery process, tailoring treatment objectives to the lesion's underlying etiology [14]. A comprehensive wound assessment guided the selection of interventions aimed at promoting epithelialization and minimizing the risk of reinfection. Management included antimicrobial cleansers, topical micronutrients, and advanced primary and secondary dressings. Complementary therapies—such as magnetotherapy—were integrated into a structured wound care regimen. This multidisciplinary, evidence-informed approach proved highly effective in treating pyoderma gangrenosum–related lesions [7].

Therapeutic management of PG remains highly individualized, as no universally effective treatment has been established [13,14]. In most cases, localized wound care serves as an adjunct to systemic therapy, commonly involving immunosuppressive or immunomodulatory agents [4,5]. In this case, treatment combined oral corticosteroids with advanced wound care—incorporating biological and silver-based dressings, alongside magnetotherapy—achieving complete epithelialization within four months. Systemic corticosteroids represent a first-line therapeutic option for PG due to their prompt efficacy, affordability, and ease of administration, with prednisone being the agent of choice [2,3]. In this case, Dermatology initiated treatment with 60 mg of prednisone daily, subsequently tapering the dose in alignment with the patient's clinical improvement until complete discontinuation upon full resolution of the lesion.

The concurrent use of alternative therapies -specifically magnetotherapy combined with collagen-based dressings- played a key role in promoting accelerated epithelialization through non-invasive mechanisms. These effects were consistently observed during each wound care session conducted by the CH. In this case, magnetotherapy supported wound closure and pain relief, aligning with documented evidence of electromagnetic fields' influence on cellular regeneration and their physiological and biochemical impact [7, 9]. The integration of pharmacologic interventions with complementary therapies -such as advanced wound care and magnetotherapy- resulted in complete and satisfactory resolution of the pyoderma gangrenosum lesion documented in this case.

Conclusion

This case underscores the complexity of managing pyoderma gangrenosum (PG), a condition that requires prolonged care, specialized wound management, and interdisciplinary collaboration. Timely diagnosis and thorough wound assessment are critical in guiding an effective, adaptable treatment plan. A combination of pharmacologic and complementary therapies -including wound cleansing, biological dressings, collagen-based materials, and magnetotherapy- successfully promoted complete epithelialization and 100% wound closure without complications or continued steroid use. The case illustrates that PG management must be tailored to the wound's dynamic healing trajectory, using gentle, phase-specific interventions to prevent tissue damage and avoid enlarging the wound cavity. This case contributes valuable clinical evidence supporting innovative advanced wound management techniques in complex PG presentations.

Authors Acknowledgment

The authors would like to express their sincere gratitude to all individuals who contributed to the completion of this work. Special thanks are extended to the team of doctors: **Rauff A, Soria T, González D**, for their guidance, support, and valuable input throughout the manuscript preparation.

Acknowledgement

No funds, resources or financial support from individuals or grant particulars, so there is no conflict of interest. The author is the only contributor for design, data collection, and preparation of article.

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DOI:10.31579/2690-4861/896