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Title

Surgical management of extensive peristomal pyoderma gangrenosum associated with colon cancer

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Abstract

Background: Extensive peristomal skin ulcer due to pyoderma gangrenosum is difficult to manage and causes significant morbidity.

Case: A 69-year-old man presented with a 10×7-cm painful peristomal skin necrosis during cancer chemotherapy for metastatic colon adenocarcinoma. The diagnosis of peristomal pyoderma gangrenosum was made on the basis of the presence of the skin necrosis with a well-defined, undermined, violaceous border. One month after the presentation along with daily cleansing and minimal debridement without immunosuppressive treatments, wound bed preparation was deemed sufficient for a split-thickness skin graft using negative pressure wound therapy for graft fixation. One month after the operation, the ulcer was completely healed and the patient could manage ostomy pouching independently. He died of cancer 5 months later; no recurrence of the ulcer was observed during this period.

Conclusion: Peristomal pyoderma gangrenosum was successfully treated with skin grafting after local wound management. Negative pressure wound therapy was useful for skin graft fixation in the peristomal region.

Key words: colonic neoplasms, negative-pressure wound, ostomy, pyoderma gangrenosum skin transplantation, surgical stomas, therapy.

Introduction

Management of extensive ulceration of the peristomal skin poses multiple challenges, especially when applying ostomy appliances. This case report describes the successful surgical treatment and use of negative pressure wound therapy (NPWT) in the management of peristomal pyo-derma gangrenosum (PPG).

Case History

A 69-year-old man presented with a painful peristomal skin necrosis, while undergoing chemotherapy for colorectal cancer. He had undergone left hemicolectomy and end colostomy for obstructive ileus due to descending colon adenocarcinoma 3 months prior to presentation. Liver dysfunction due to hepatic metastases and prolonged hyperglycemia due to uncontrolled diabetes mellitus were noted. Physical examination revealed a 10 × 7-cm peristomal full-thickness skin necrosis with a well-defined, undermined, violaceous border (Figure 1A). We observed a 2-cm area of painful induration around the wound. According to the patient, he initially developed a pustule by the mucocutaneous junction of his stoma that rapidly extended outward over a course of days into a skin necrosis. Bacteriological examination of wound swab isolated normal skin and bowel flora.

Based on this clinical presentation, we diagnosed PPG with secondary infection. Because he had no underlying systemic inflammatory disease, we started topical treatment without systemic administration of steroids. After daily cleansing and minimal sharp

debridement of the necrotic tissue, a silver-coated calcium alginate dressing (Algisite Ag; Smith & Nephew, London, United Kingdom) was applied over the ulcer to manage the exudate with a wafer and a 2-piece ostomy appliance (SenSura; Coloplast, Humlebaek, Denmark). One month after the presentation, the necrotic tissue was removed and wound bed preparation was achieved with flattening of the raised border. This led to prompt development of granulation tissue, and epithelialization of the 8-mm width from the mucocutaneous junction (Figure 1B). Because his life expectancy was estimated to be approximately 6 months, we performed a meshed skin graft to heal the ulcer and alleviate bothersome symptoms as soon as possible (Figure 2A). The split-thickness skin graft was harvested from his thigh. At the end of the operation, we used a portable NPWT device (ActiV.A.C.; KCI, San Antonio, Texas) for graft fixation; 75 mm Hg pressure was applied. We applied a wafer on the epithelialized region around the mucocutaneous junction and draped over the cotton filler dressing after customizing the center of the drape to the size of the stoma (Figure 2B). Transparent drapes were applied over and over around the stoma without removing #2 layer (Figure 3A). A 1-piece ostomy pouching system (SenSura; Coloplast, Humlebaek, Denmark) was applied on the #2 layer of the top drape with an ostomy belt (Figure 3B). This arrangement allowed application of NPWT without interruption until postoperative day 7. The ostomy pouching system was changed every 3 days, along with the top drape. At the first dressing change on postoperative day 7, more than 85% of the skin graft was deemed successful (Figure 4A) and the ostomy appliances could be applied in the preoperative

manner.

He was evaluated 1 month following surgery; the ulcer was completely healed with a smooth surface and he could manage the ostomy appliances by himself to be discharged home with self-care. Until he succumbed to liver cirrhosis secondary to hepatic metastases 5 months later, neither recurrence of the ulcer nor complaint of pain around the stoma was observed (Figure 4B). It was noteworthy that throughout this time, his skin graft donor site healed uneventfully.

Discussion

Pyoderma gangrenosum (PG) is a rare, ulcerative, inflammatory skin disorder associated with systemic diseases such as inflammatory bowel disease, rheumatoid arthritis, and hematologic diseases in up to 50% of cases. The characteristic lesion is a painful ulceration with a well-defined, undermined, violaceous border.¹ Because its histologic features are nonspecific, diagnosis is based on clinical characteristics and exclusion of other causes, particularly malignancy or infection.¹ Peristomal PG is an unusual and probably underrecognized entity, which presents unique problems of clinical management. There have been a few reports of PPG associated with colorectal carcinoma.^{1, 2}

Treatment of patients with PG varies according to the acuity and severity of the disease and the person's response to different regimens.³ Successful management of PPG requires treatment of the underlying systemic disease and appropriate selection of local and

systemic therapies.⁴ The most common initial therapy for PG is topical, usually including steroids, tacrolimus, antibiotics, or other wound care agents. The systemic side effects and risks of immunosuppressive medications can be avoided if these treatments are successful.⁵ However, greasy topical treatments may be impractical for PPG because of its negative effects on the adherence of an ostomy pouching system.⁶ Local wound management using an absorptive agent can play an important role in enhancing the healing by providing a clean, moist wound environment.⁷

Surgical intervention in patients with PG is controversial because of the risk of pathergy, a phenomenon by which minor trauma to the skin can result in ulcers.⁸ It is this phenomenon that has restricted the use of skin grafting in the management of PG.⁹ Nonetheless, there have been reports of surgically treated PG with positive outcomes in a short term.⁹⁻¹¹ Nonsurgical treatments for extensive PG may take several months for final resolution of the ulcer.¹²⁻¹⁴ Moreover, when PPG heals with nonsurgical treatments, the resulting scar can leave an irregular surface that may compromise appliance adhesion to the skin.⁶ Although a course of medical therapy is essential before surgical intervention, successful operative management of PG can be performed during a controlled and quiescent period of the disease or after a course of hyperbaric oxygen therapy.^{3, 10} In case an underlying systemic disease is not confirmed, systemic treatments to promote healing may not be beneficial.⁷ In any case, surgical intervention should be carefully considered on a case-by-case basis.

Negative pressure wound therapy has been widely adopted for a broad range of wound indications including management of peristomal ulcers.^{15,16} Application of NPWT over split-thickness skin grafts can reduce graft failure compared with standard bolster techniques.¹⁵ The successful use of NPWT for graft fixation was reported in the management of PG over a lower extremity.¹⁰ In our case, after local wound management using a silver-coated dressing, wound bed preparation was deemed sufficient for skin grafting. Provided epithelialization around mucocutaneous junction allows coverage with a drape that maintains separation from the stoma, NPWT can be used in the peristomal region. Due to the ease of application, minimal discomfort to the patient, and formation of a barrier to pathogens, this dressing method can be used for peristomal wounds and graft fixation.

Summary

This case demonstrates the difficulty in treating extensive PPG. Our experience suggests that skin grafting is an option for managing PPG when an underlying systemic disease is not confirmed or well controlled. Additionally, the case illustrates the successful use of NPWT for graft fixation in the postoperative management of PPG.

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Figures

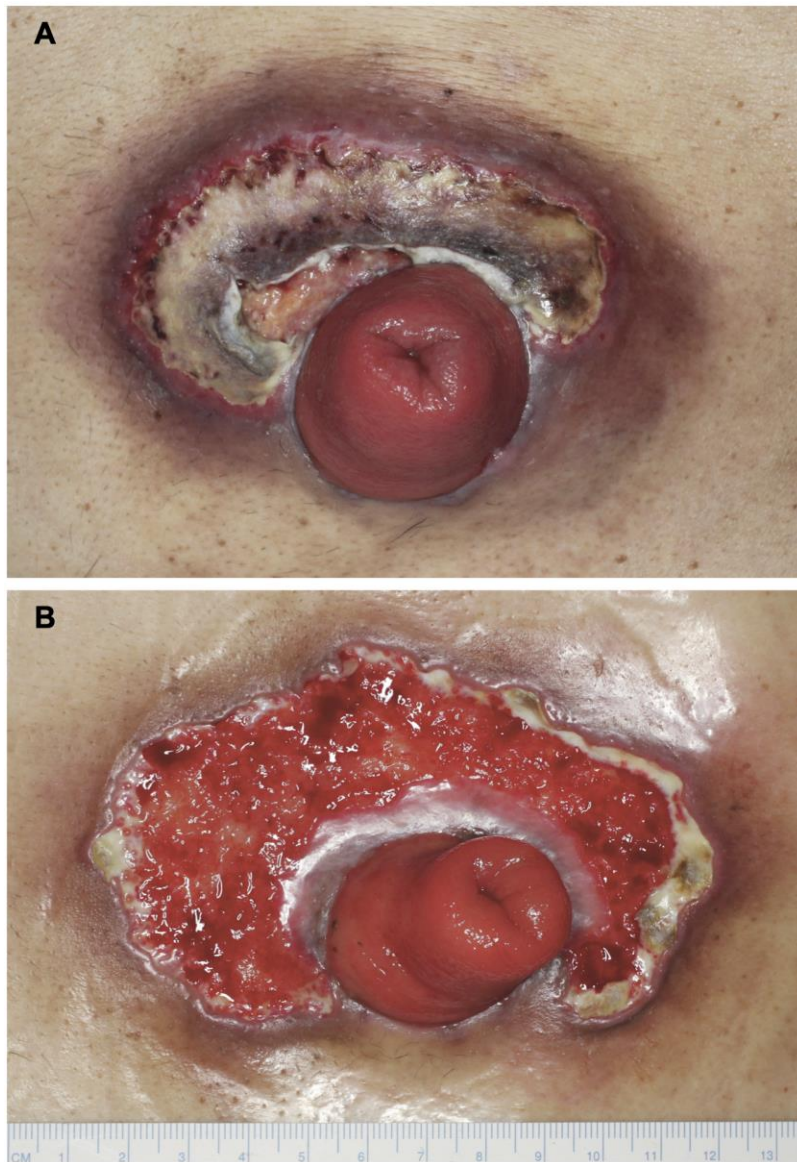


Figure 1. (A) Peristomal skin necrosis with a well-defined, undermined, violaceous border on initial presentation. (B) Preoperative view of the peristomal ulcer.

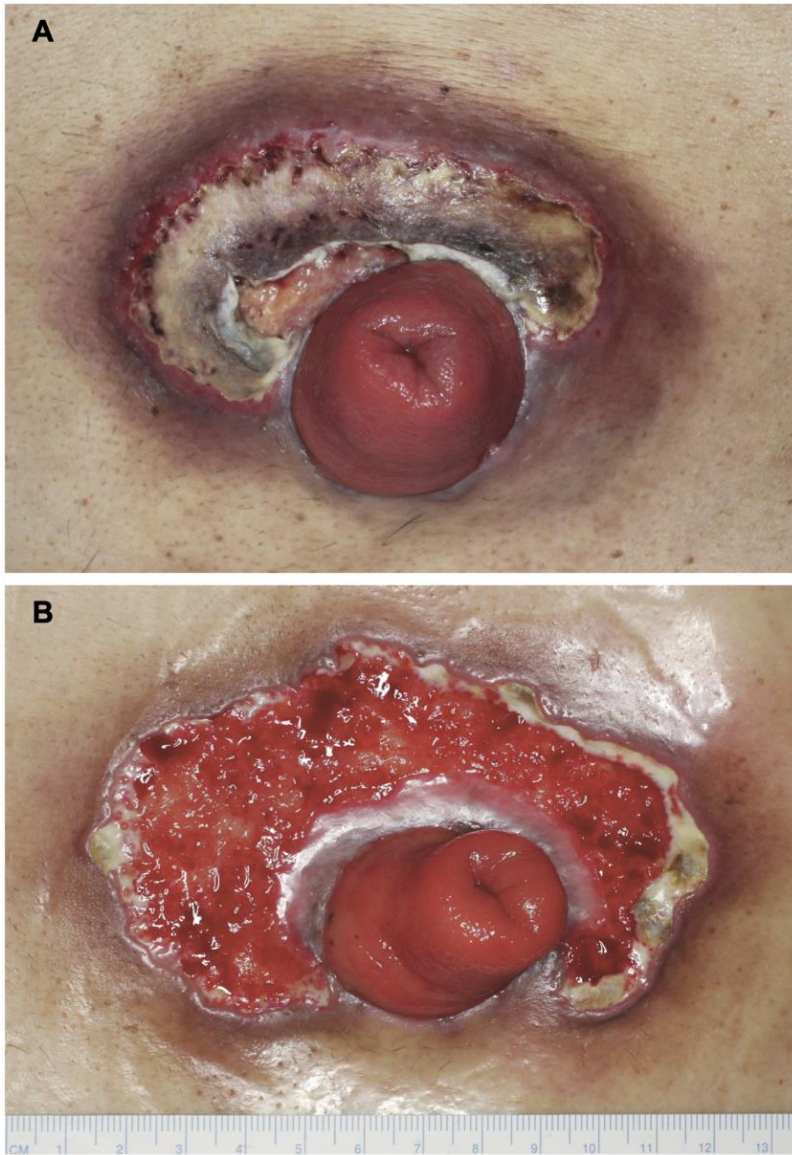


Figure 2. (A) Intraoperative view of the peristomal ulcer with a skin graft. **(B)** A negative pressure wound therapy device applied for graft fixation.

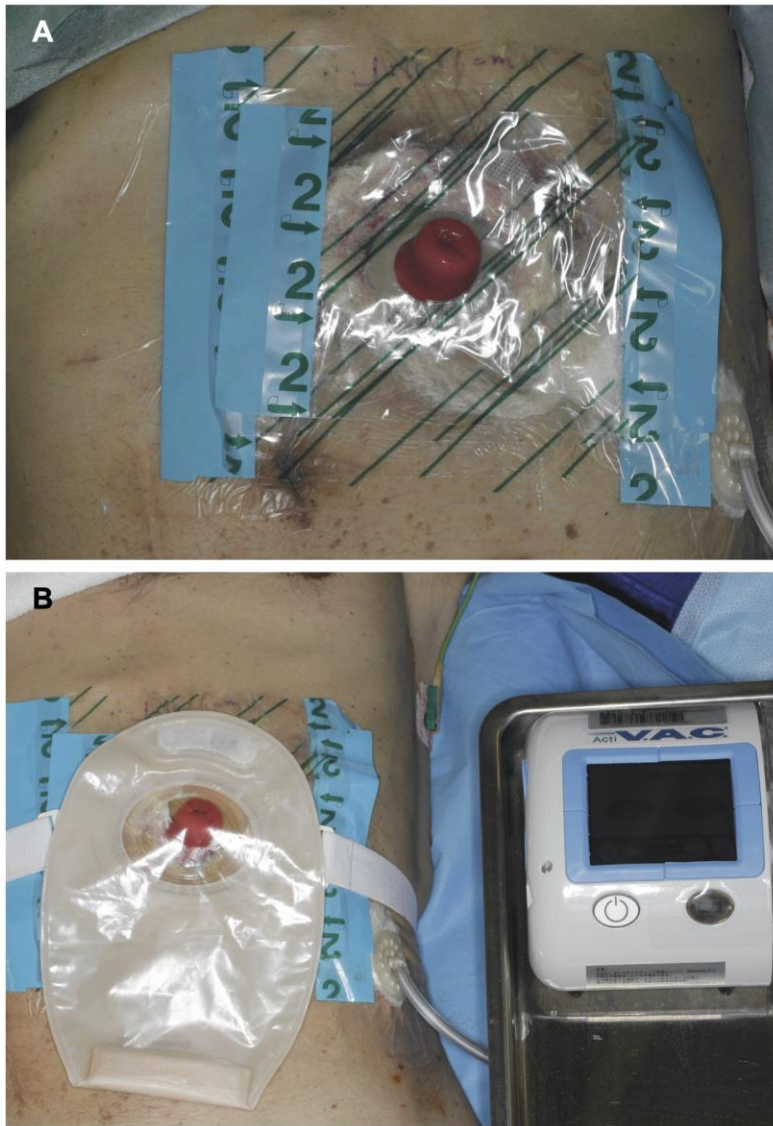


Figure 3. (A) Drapes were applied over and over without removing #2 layer. **(B)** An ostomy appliance was applied with a stoma belt.

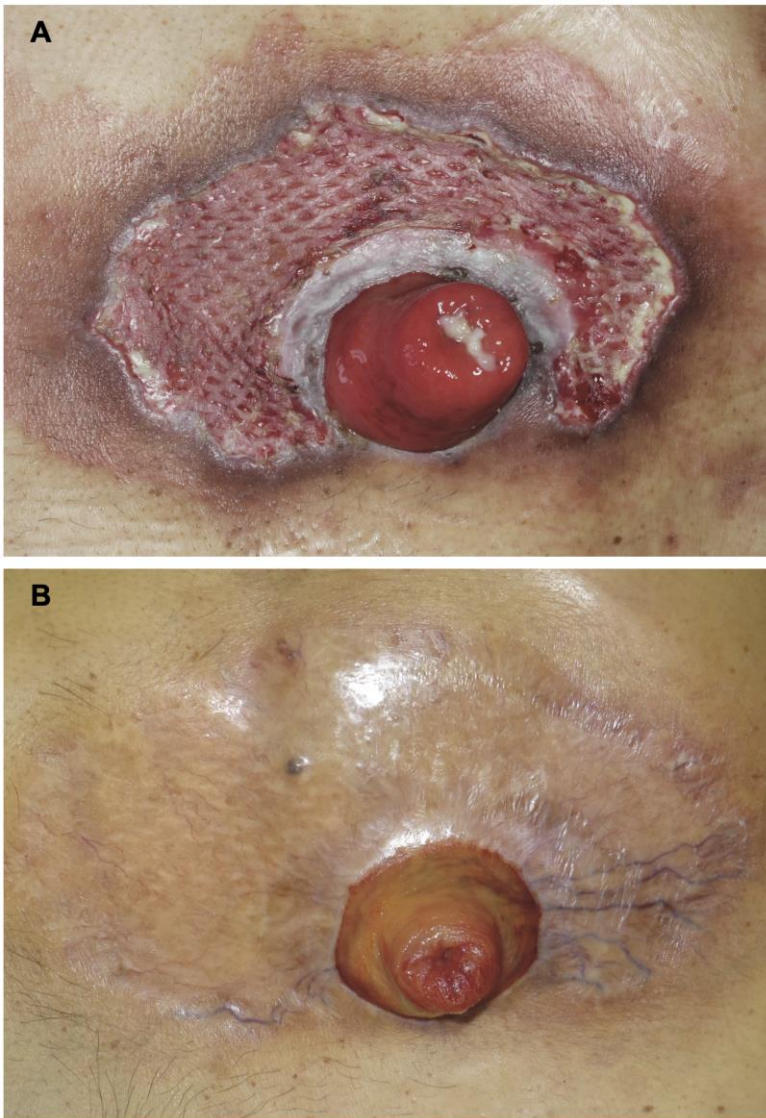


Figure 4. (A) Seven days postoperative view of the peristomal region with graft take. **(B)** Five months postoperative view of the peristomal region after death.