Treating Peristomal Pyoderma Gangrenosum With Topical Crushed Prednisone: A Report of Three Cases

Lynn E. DeMartyn, BSN, RN, CWOCN; Nancy Ann Faller, RN, MSN, PhD, CWOCN; and Laurie Miller, RN, BSN, CWOCN

Abstract
The main goals of treating peristomal pyoderma gangrenosum (PPG) — ulcerations in the stomal area — are to decrease pain, increase pouch adherence, and decrease pyoderma. The literature suggests a wide variety of approaches to achieve this goal, but few studies report outcomes on the use of topical steroids. The purpose of this case study is to describe the results of a protocol developed to meet the goals of care for patients with PPG. Three patients presenting with PPG lesions were instructed to crush a 1-mg prednisone tablet for mixing with an equal part of a hydrocolloid powder. The mix was applied directly on the PPG lesions, covered with a calcium alginate (or hydrofiber) primary dressing, and secured with a hydrocolloid secondary dressing. The pouching system then was applied over the hydrocolloid dressing. Three goals of treatment were met: pain dissipated (in as quickly as 1 week); pouch adherence improved (within 0 to 3 days); and closure/healing of the lesions occurred (within 3 to 5 weeks), recurring in only one case in which the patient had a peristomal hernia. No side effects were observed. Although this self-treatment provided satisfactory results, further study is needed to evaluate its effectiveness in a larger population and longer follow-up.

Keywords: case study, stoma, pyoderma gangrenosum, ostomy, peristomal

Index: Ostomy Wound Management 2014;60(6):50–54

Potential Conflicts of Interest: These three cases will be presented as a poster at the WOCN National Conference, Nashville, TN, June 21–25, 2014.

Pyoderma gangrenosum (PG) was first described in 1908 by Dr. L. Brocq and his student and friend, Dr. Clément Simon, both French physicians. Their presentation on Phagédénisme Géométrique to the Société Médicale des Hôpitaux de Paris (Medical Society of Paris Hospitals) received very little attention. In 1916, their original findings were resubmitted with some additional facts in the Annales de Dermatologie & Syphiligraphie.

PG was further described in 1930 by Brunsting et al; four of the five cases they presented had ulcerative colitis dating back over a 2- to 9-year period. During extended observation in hospital, a “parallel relationship” was noted between the cutaneous signs and the colitis symptoms.

The occurrence of PG around a stoma was first described in 1984 as peristomal pyoderma in a case report of Crohn’s Disease by an American enterostomal therapy (ET) nurse. The patient’s lesion developed along a transverse peristomal incision from the local repair of a strangulated peristomal hernia. The author noted ET nurses should be able to recognize and manage this condition. Later that year, physicians presented four case reports of three patients with Crohn’s Disease and parastomal pyoderma. The patients’ lesions developed at their ileostomy sites. The authors noted this condition may not always be recognized and that management must be individualized.

In their review article, Trent and Kirsner included peristomal pyoderma gangrenosum (PPG) as one of five clinical variants of PG: ulcerative, pustular, bullous, vegetative, and peristomal. No occurrence rates were given. Of note, in that same work, pyoderma gangrenosum was called a “mismomer” because it is not an infectious or a gangrenous process; the authors noted its inflammatory nature and unknown etiology.

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PG/PPG subsequently was described as “an ulcerative, inflammatory skin disorder.”6,7 PPG has been linked to various systemic diseases, including inflammatory bowel disease (IBD), malignancy, perforated diverticular disease, and chronic fecal/urinary dysfunction. It is most commonly (71% of cases) linked to IBD. There is no known cause, and the etiology may be multifactorial. In the general population, PPG occurs more often than PG, usually does not occur other than on the peristomal skin, and often is triggered by trauma (eg, pouch removal, pressure from a hernia or convexity).6,7

The side effects of steroid therapy are well known. The protocol described in the three cases presented was trialed to assess the possibility of local versus systemic prednisone treatment.

**Literature Review**

A review of the literature relevant to PPG from 1985 through 2012 was performed using EBSCOhost WEB to investigate the history of treatment for PPG. The search was completed using the “title” option and the words pyoderma and ostomy, pyoderma and parastomal, pyoderma and peristomal, and pyoderma and ostomy. This search identified 68 articles in CINAHL and/or MEDLINE, and one article in Biomedical Reference Collection: Comprehensive. Three articles were from the 39th Annual Wound, Ostomy and Continence Nurses Annual Conference and were not related to the presence of an ostomy; they were excluded. After excluding articles not in English, not related to the treatment of pyoderma, and not research-based, 44 articles remained (see Table 1). Eleven of the research studies had five or more participants, eight had 10 or more, and two had more than 20 participants. Because 80% of all the publications included the term peristomal rather than parastomal, the former is used in this study.

Sheldon et al’s retrospective review involved 20 consecutive cases of patients with IBD and PPG at an American hospital. The investigators did not find biopsies to be of clinical value. Eradication of the underlying IBD improved PPG healing time from an average of 11.4 to 8.1 months. In this study, PPG was considered healed when there was 90% epithelialization. The recurrence rate was 10%.

Lyon et al8 reported the results of a prospective, descriptive review of 26 cases of PPG. All patients were seen in a British clinic created specifically to investigate this disease process. The study identified seven primary reasons for surgery, including Crohn’s disease, ulcerative colitis, and diverticular disease. IBD accounted for 43% of all cases, and each of the patients studied had an ileostomy. The investigators were unable to distinguish any clinical or histologic differences between patients with IBD and those who had surgery for other indications. All PPG lesions occurred totally or partially under the adhesive of the pouching system. The average time to healing in these studies was 1.75 months, and the average recurrence was 33%.

Treatments included a variety of pharmacologic agents, surgical interventions, and local wound care. Sheldon et al8 directed therapy toward active IBD. Neither study supported the use of surgical revisions or relocation.

A 2004 seminal systematic literature review by Gray and Catanzaro9 did not identify an adequate body of research on the management of PPG; no randomized clinical trials were found, although the literature search revealed 23 articles representing approximately 114 cases of PPG. Treatments included debridement, dressings, drugs (intrarectal, systemic, and topical), and displacement (stoma relocation) (see

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### Table 1. Citations that include title word pyoderma with ostomy, parastomal, peristomal, and stoma, 1985–2012

<table>
<thead>
<tr>
<th>Title word with:</th>
<th>Articles</th>
<th>Articles in English</th>
<th>Articles related to treatment of pyoderma</th>
<th>Articles: Research</th>
<th>Articles: Research with 5 or more participants</th>
<th>Articles: Research with 10 or more participants</th>
<th>Articles: Research with 20 or more participants</th>
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</thead>
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<td>Ostomy</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Parastomal</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Peristomal</td>
<td>52</td>
<td>45</td>
<td>39</td>
<td>37</td>
<td>9</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Stoma</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Total</td>
<td>65</td>
<td>55</td>
<td>46</td>
<td>44</td>
<td>11</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

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**Key Points**

- Peristomal pyoderma gangrenosum (PPG) lesions are painful, generally nonhealing, or very slow to heal and interfere with pouch adhesion.
- The authors of this case report describe the use of a topical prednisone mixture in three patients with PPG.
- Lesions resolved and no adverse effects were observed.
- More research is needed to elucidate optimal treatment methods for patients with these painful lesions.
Table 2. Treatments reported by Gray and Catanzaro10

<table>
<thead>
<tr>
<th>The Ds of treatment</th>
<th>Debridement</th>
<th>Local debridement may be effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dressings</td>
<td>Topical wound therapy</td>
<td></td>
</tr>
<tr>
<td>Drugs: intraleisional — steroids</td>
<td>May be effective</td>
<td></td>
</tr>
<tr>
<td>Drugs: systemic</td>
<td>Antibodies, antimicrobials, corticosteroids, cyclosporine</td>
<td></td>
</tr>
<tr>
<td>Drugs: topical — steroids</td>
<td>Effective - with systemic therapy</td>
<td></td>
</tr>
<tr>
<td>Displacement: stoma relocation</td>
<td>Ineffective</td>
<td></td>
</tr>
</tbody>
</table>

The Ds of treatment. Lyon’s6,7 research suggested similar interventions. It is interesting to note that in less than 10 years, the literature now includes 44 articles, almost double the number available in 2004.

Prednisone protocol for pain, pouch adherence, and pyoderma. Three issues have been identified that direct the treatment of PPG: pain,3,5-9 pouching,3,6-9 and pyoderma.3-9 Thus, treatment of PPG has three aims: to decrease pain, to increase pouch adherence, and to decrease pyoderma.

Gray and Catanzaro10 cite the use of systemic prednisone for the treatment of PPG. However, the need for high doses and additional treatment was reported.

Over a 12-year span, the ET nursing department in a 400-bed city hospital treated patients with PPG who experienced substantial discomfort, frequent pouch leakage, and delayed lesion healing. Various topical dressing protocols were used with varying degrees of success. One patient required a stoma relocation. In an effort to develop an alternative protocol, ET nursing collaborated with colorectal surgery to develop a combined topical drug/dressing protocol.

In order to avoid the systemic side effects from oral prednisone therapy, a trial of topical prednisone therapy was instituted in three cases (see Table 3). A 1-mg, prednisone tablet (crushed by the patient) was mixed with an equal part of a hydrocolloid powder and applied directly on the PPG lesions. After application of the prednisone powder, the lesions were covered with a calcium alginate (or hydrofiber) primary dressing and secured with a hydrocolloid secondary dressing. The pouching system then was applied over the hydrocolloid dressing. Instructions for care included crushing and mixing the prednisone tablet with an equal amount of the hydrocolloid powder, treating and dressing the lesions, and changing the appliance every 3 days. The pouch was changed on a schedule that allowed timely inspection and redressing of the lesion, and all cases were monitored for systemic complications from prednisone use, as well as recurrence.

Case Reports

Patient 1. Eighty-two-year-old Mr. P was 2 years post end ileostomy for Crohn’s Disease. His clinical course was complicated by coronary artery disease and bypass surgery. Medications included metoprolol tartrate and ranitidine HCl. His initial symptoms appeared 3 weeks before presenting to ET Nursing on July 9, 2009 with a “painful ulcer” and the inability to maintain a pouch seal. He was noted to have a 28 mm x 18 mm x 4 mm PPG lesion between 9 and 11 o’clock (see Figure 1a). Initial treatment included a silver-impregnated hydrofiber with hydrocolloid barrier and paste for 2 weeks followed by a methylene blue crystal violet dressing with hydrocolloid barrier and paste for an additional 2 weeks. At the end of 4 weeks, his pain had not lessened, and he still was unable to maintain a pouch seal. The lesion now measured 25 mm x 15 mm x 3 mm (see Figure 1b). Despite a 45% decrease in lesion area during this 1-month period, the presenting symptoms persisted.

With the approval of his colorectal surgeon, the prednisone protocol was initiated on August 7, 2009. At the end of 2 weeks, Mr. P reported a decrease in pain and a consistent ability to maintain his pouching system for 3 days. The PPG lesion now measured 7 mm x 4 mm x 1 mm. On

Table 3. Summary of case reports

<table>
<thead>
<tr>
<th></th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age and gender</td>
<td>82-year-old man</td>
<td>82-year-old man</td>
<td>81-year-old woman</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Crohn’s Disease</td>
<td>Crohn’s Disease</td>
<td>Diverticulitis</td>
</tr>
<tr>
<td>Stoma type and timing</td>
<td>2 years post ileostomy</td>
<td>6 months post colostomy</td>
<td>4 years post colostomy</td>
</tr>
<tr>
<td>Previous treatment</td>
<td>Silver hydrofiber x 2 weeks; gentian violet dressing x 2 weeks</td>
<td>None</td>
<td>Multiple treatments over a 1-year period</td>
</tr>
<tr>
<td>Prednisone treatment time</td>
<td>4 weeks</td>
<td>3 weeks</td>
<td>5 weeks</td>
</tr>
<tr>
<td>Outcome at 2 weeks</td>
<td>98% decrease</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Outcome at 3 weeks</td>
<td>Not available</td>
<td>Healed</td>
<td>98% decrease</td>
</tr>
<tr>
<td>Outcome at 4 weeks</td>
<td>Healed</td>
<td></td>
<td>99+% decrease</td>
</tr>
<tr>
<td>Outcome at 5 weeks</td>
<td></td>
<td></td>
<td>Healed</td>
</tr>
</tbody>
</table>
Pyoderma gangrenosum treated with local prednisone

a follow-up visit at 4 weeks, it was noted his lesion had resolved (see Figure 1c).

Patient 2. Mr. B was 82 years old and 6 months post end colostomy for Crohn’s Disease. He had no remarkable medical history and did not take prescription medications. His initial symptoms appeared 3 weeks before presenting to ET nursing on September 7, 2011 with a “painful draining ulcer” and the inability to maintain a pouch seal. He was noted to have a 50 mm x 22 mm x 3 mm PPG lesion between 9 and 12 o’clock (see Figure 2a). With the approval of his colorectal surgeon, the prednisone protocol was initiated. Weekly reports were made to the ET nurse via telephone (Mr. B lived 40 minutes from clinic). At the end of 1 week, Mr. B reported a decrease in pain and was consistently able to maintain his pouching system for 3 days. On a follow-up visit at 3 weeks, his lesion had resolved (see Figure 2b).

Patient 3. Ms. B was 81 years old and 4 years post end colostomy for diverticulitis with perforation. Her clinical course was complicated by arthritis, chronic constipation, coronary artery disease, hypothyroidism, hypertension, osteoporosis, and severe osteoarthritis, especially in the knees, rendering her wheelchair dependent. She had a history of three myocardial infarctions and coronary artery bypass graft surgery. Her medications included amiodarone, amlodipine, low-dose aspirin, carvedilol, furosemide, iron, isosorbide, levothyroxine, lorazepam, losartan, magnesium oxide, polyethylene glycol, pravastatin, and vitamin D. Her symptoms appeared 1 year before she was referred by her surgeon to home care on July 24, 2012 for treatment of a nonhealing pyoderma lesion. She was unable to maintain a pouch seal for 48 hours. She was noted to have a 60 mm x 30 mm x 3 mm, painful PPG lesion between 4 and 7 o’clock (see Figure 3a). Assessment also included the notation of the presence of a peristomal hernia. Initial treatment included a silver hydrofiber and a hydrocolloid. At the end of 2 weeks, the pain had resolved, but she still was unable to maintain a pouch seal. Her lesion now measured 55 mm x 24 mm x 3 mm lesion (see Figure 3b). With only a 27% decrease in lesion area during this 2-week period, her surgeon approved starting the prednisone protocol. This was initiated August 8, 2012. Her ability to maintain a pouching system improved, and on a follow-up visit at 5 weeks, her lesion had resolved (see Figure 3c).

Table 3 provides a summary of the cases presented.

Discussion

The cases presented demonstrate the rapid and complete resolution of PPG ulcers using a combined topical drug/dressing protocol. No systemic complications were noted from the use of prednisone in any of the cases. It is significant to note that recurrence of these lesions occurred only in Case 3 where the stoma was complicated by a peristomal hernia.

This is not the first report of crushing an oral medication for topical use. Handler et al11 described the use of crushed dapsone for the treatment of PPG in a 27-year-old man with a history of Crohn’s disease. The patient had responded to oral dapsone, but it was discontinued due to high transaminase levels. His healing time with daily topical dapsone was 6 months, and he had no recurrence at 5-month follow up. The patient self-crushed the dapsone, as did patients with...
prednisone in the current series. This report of offlabel use of dapsone for PPG was published after this series was initiated and a year following the resolution of case study 2.

**Time to heal.** Reported times to heal in the PG literature vary: 9 months (Williams3), up to 21 weeks (McGarrity et al4), 11.4 months (Sheldon et al5), and 1.75 months (Lyon6). Comparing these results is difficult; three authors3,4,8 report time to healing from first treatment to healing, and one author9 as time of last treatment to healing. Thus, the 4-week average to healing in the current case series (from time of crushed prednisone application to healing) cannot be compared with previous times to healing.

**Recurrence.** Recurrence was reported by three authors4,8,9; two authors4,9 related recurrence to stoma relocation. However, not all patients were followed long-term. Recurrence was reported in the current case study 3 in the same location. The lesion opened over a peristomal hernia while the patient was being treated for bronchitis with coughing. As mentioned earlier, Lyon6,7 identifies trauma as a trigger for the occurrence of PPG. He specifically pinpoints the trauma from pressure under the pouching system placed over a peristomal hernia as a causative factor.

**Conclusion**

This small case series presents a protocol utilizing crushed prednisone for local treatment in the management of PPG. The three goals of care — to decrease pain, to increase pouch adherence, and to decrease pyoderma — were achieved. Pain dissipated shortly, pouch adherence improved immediately, and pyoderma healed quickly. Additionally, using topical prednisone does not traumatize the lesion. Although this treatment provided satisfactory results, further study is needed to evaluate its effectiveness in a larger population.

**Acknowledgment**

The authors are grateful to Margaret T. Matthews, ND, BS, RN, CWOCN, ET Nurse, Pinnacle Health, Harrisburg, PA, for photographing cases 1 and 2; Elizabeth Morgan, MLS, Librarian, Pinnacle Health, Harrisburg, PA, for acquiring literature; David Rioux, PhD, and Pauline Rioux Burnham, RN, for translating the 1916 French manuscript; and Larry Sollenberger, MD, and Andrew Richards, MD, Sollenberger Colon and Rectal Surgery, Harrisburg, PA, and Barbara Klatchko MD, General Surgeon, Private Practice, Lebanon, PA, for supporting the treatment plan.

**References**