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Systemic Corticosteroids in the Perioperative Setting for Prevention of Pyoderma Gangrenosum During Reconstructive Surgery

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ABSTRACT

Pyoderma gangrenosum (PG) is classified as a neutrophilic dermatosis, often presenting as a rapidly enlarging ulcer and associated with inflammatory bowel disease, specifically ulcerative colitis and Crohn's disease. PG has been typically reported to occur after trauma and surgical procedures. We present a unique case of PG following multiple breast augmentation procedures and illustrate various therapeutic strategies to prevent recurrence during subsequent breast reconstruction. The combination of cyclosporine and prednisone was successfully used to prevent PG in this patient when given before and after her third breast surgery.

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INTRODUCTION

Pyoderma gangrenosum (PG) is classified as a neutrophilic dermatosis, often presenting as a rapidly enlarging ulcer and associated with inflammatory bowel disease (IBD), specifically ulcerative colitis and Crohn's disease (CD).[1] The pathophysiology of PG stems from abnormal neutrophil activity and immune dysregulation, leading to uncontrolled inflammation, progressive tissue damage, and ulcer formation. PG is a rare skin condition, with a worldwide incidence of around 3 to 10 cases per million population per year,[2] and its occurrence on the breast is less common.[3] PG has been typically reported to occur after trauma and surgical procedures (Table 1).[1,9,10]

Recurrence of PG is a common finding after surgery, with a prior cohort study demonstrating an overall recurrence rate of 16.7%, irrespective of whether any perioperative intervention was included.[4-6] There have been reported cases in which pre- and postoperative corticosteroids were used to prevent PG recurrence after surgery, many of which achieved successful outcomes.[4-6] Currently, there is no gold standard regimen in preventing PG recurrence following surgery.[7] We present a unique case of PG following multiple breast augmentation procedures and illustrate various therapeutic strategies to prevent recurrence during subsequent breast reconstruction.

TABLE 1.

Published Studies of Patients With PG Who Were Treated Prophylactically With Systemic Corticosteroids and Other Therapeutic Modalities

Case Report	Surgery	Perioperative Steroid Regimen	Duration
Hill et al, (2013)[9]	Elective total knee replacement in a patient with prior PG	Prednisolone 60 mg/day	14 days total, started 5 days pre-op; then tapered by 5 mg every 5 days post-op
Fujita et al, (2009)[10]	Renal transplant (pt with prior development of intractable aseptic ulcers at surgical sites)	IV Methylprednisone 500 mg/day, prednisone 20 mg/day, tacrolimus 0.2 mg/kg/day, mycophenolate mofetil 2000 mg/day, basiliximab 20 mg	Tacrolimus given 1 day before surgery, and continued through surgery day, then tapered to 6-10 ng/mL; mycophenolate mofetil given 1 day before surgery and continued daily after surgery for long-term maintenance; IV Methylprednisone postoperative day 0-2; 2 doses of basiliximab, postoperative day 0 and 4; prednisone taken from postoperative day 3 and onward, tapered to 10 mg daily
Hill et al, (2013)[9]	Revision knee arthroplasty (pt with prior severe PG)	Cyclosporine 150 mg twice daily; intravenous immunoglobulin (IVIG) 40 mg/kg given peri-op	14 days total ciclosporin, started 7 days pre-op; IVIG given postoperative day 2

CASE REPORT

In August 2023, a 23-year-old woman with a history of celiac disease and CD was evaluated in our clinic for large ulcers on the bilateral breasts two to three months following two breast lift procedures (Figure 1). The patient was experiencing pain associated with the ulcers and a CD flare with bloody diarrhea. Because of her CD, she had been on prednisone 40 mg daily and was recently started on infliximab by her gastroenterologist. Following one month of treatment with infliximab, the patient demonstrated improvement of her PG ulcers and did not experience any additional CD flares. Given her improving clinical status, her prednisone dose was tapered down from 35 mg by 5 mg per week over 7 weeks (Figure 2).

In December 2023, she was started on cyclosporine 150 mg daily to prevent recurrence of PG, as she was expected to undergo additional breast reconstruction and meniscus repair surgery within the next few months. The PG lesions were closed, but there was persistent bilateral breast erythema and scarring at the sites of her previous surgery. She was instructed to begin tapering the cyclosporine by 25 mg every week and discontinue infliximab due to her stable clinical status. Shortly afterwards, however, the patient reported worsening PG with breast edema while on cyclosporine 125 mg daily. 0.4 mL of 10 mg/mL intralesional triamcinolone was subsequently injected into the lesions on the bilateral breasts. She continued on cyclosporine 100 mg daily with a stable response.

FIGURE 1. Pyoderma gangrenosum of the right breast at initial dermatology consultation.

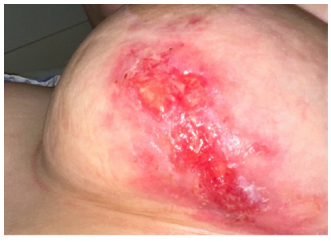
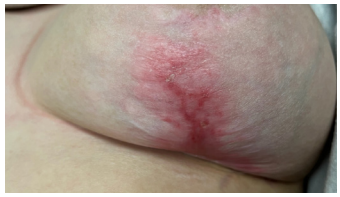


FIGURE 2. Resolving pyoderma gangrenosum of the right breast after 3 months of systemic prednisone, starting at 35 mg and tapering by 5 mg each month.



In May 2024, there was still extensive scarring throughout the bilateral breasts, periareolar regions, and beneath the left areola. Given her dissatisfaction with the overall appearance of her breasts, she elected to pursue reconstructive surgery. In anticipation of the procedure, her dose of cyclosporine was increased to 150 mg followed by a taper of 25 mg every week after starting. Two weeks before the surgery, she was started on the increased cyclosporine dose, which was gradually tapered each week and discontinued two weeks post-operatively. In addition to the cyclosporine, the patient took 60 mg of prednisone the day before and the day after surgery to further prevent recurrence of PG.

In the days to weeks following the surgery, the patient did not report any recurrence. At the patient's one-month follow-up, her skin continued to remain clear with an excellent reconstructive outcome. The patient was advised that future surgical procedures would require preoperative and postoperative administration of prednisone and cyclosporine to prevent PG recurrence.

DISCUSSION

PG is often treated with systemic corticosteroid monotherapy, systemic corticosteroids along with cyclosporine, or other combinations.[1] The combination of cyclosporine and prednisone was successfully used to prevent PG in this patient when given before and after her third breast surgery. The patient is scheduled for a meniscal tear surgery, which is a risk for PG recurrence based on her clinical status following prior surgeries. This case underscores the importance of pre- and postoperative corticosteroids along with cyclosporine in mitigating the risk of PG recurrence. While current clinical evidence in treating and preventing recurrence of PG is still limited, perioperative use of corticosteroids and other immunosuppressants has been associated with favorable outcomes in preventing PG lesions following surgery.[7] Further studies are warranted to develop safe and effective regimens for preventing PG recurrence in elective surgical procedures.

DISCLOSURES

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