Pyoderma Gangrenosum Following Cesarean Delivery

C. Sanz-Muñoz, C. Martínez-Morán, and A. Miranda-Romero
Servicio de Dermatología, Hospital Clínico Universitario de Valladolid, Valladolid, Spain

Abstract. We describe the case of a 30-year-old woman who, 5 days after giving birth to her first child by cesarean section, presented with dehiscence of one end of the surgical wound and a lesion on her leg that developed into a well-defined ulcer; both lesions were very painful. The patient was initially diagnosed with a skin infection and later with superficial pyoderma gangrenosum. The lesions were treated with topical corticosteroids and a good response was observed. No evidence was found of underlying disease. Isolated cases of pyoderma gangrenosum associated with pregnancy or cesarean delivery have been reported in the literature. The etiology of pyoderma gangrenosum is currently unknown, but some theories suggest an immunologic mechanism. Gestation is known to generate a state of immune tolerance that could play a role in the development of the disease and future studies may help to clarify the significance of this association.

Key words: pyoderma gangrenosum, cesarean section, pregnancy.

CASE REPORTS

Introduction

Pyoderma gangrenosum (PG) was first described by Brunsting et al in 1930, defining it as ulceration of the skin produced by Streptococcus species, hence the name pyoderma as a purulent infection of the skin induced by pyogenic organisms. Nevertheless, its etiology remains unknown. As PG is associated with many other diseases, specialists from a variety of fields have to be able to diagnose it. Diagnosis is basically clinical and seeks to rule out other causes of cutaneous ulceration.

Case Description

The patient was a 30-year-old woman with no individual or family medical history of note who had given birth by cesarean section 9 days before consultation. The patient attended the emergency section of the dermatology clinic due to a painful lesion that had appeared 4 days earlier on the anterior side of the left leg. The lesion was accompanied by general discomfort and a fever of 38°C. Physical exploration showed a 4-cm diameter ulcer with well-defined and raised edges and an irregular base exuding seropurulent discharge onto erythematous-edematous skin (Figure 1). This lesion was very painful to palpation and spontaneously. Further examination of the skin surface showed a 3-cm dehiscence of the cesarean wound at its right extremity, with violaceous raised edges and a yellowish base (Figure 2). The patient was interviewed again and she said that this had occurred 5 days before and had been diagnosed in the...
gynecology clinic as a surgical wound infection and treated with a topical antibiotics. Emergency tests were performed and blood counts showed leukocytosis with left shift and thrombocytosis.

Diagnostic suspicion focused on an infection involving the surgical wound and the lesion on the leg. Samples were taken for microbiologic culture, antibiotic treatment was started with amoxicillin and clavulanic acid at 875/125 mg every 8 hours, oral nonsteroidal anti-inflammatory drugs were administered, and poultices were applied. Two days later, the patient reported a general improvement in her condition, but the surgical wound had not changed and the lesion on the leg had worsened, since the size of the ulcer had increased. Physical examination showed no change in the surgical lesion, but the edematous skin on the leg observed during the initial examination had become indurated, with a clearly formed ulcer with broken edges at the ridge and a sanious base. Skin biopsies were taken from both lesions and a sample sent for microbiologic culture. The results of histopathologic examination were similar for both lesions. They showed an ulcer that, at the level of the dermis, was continuous with a squamous epithelial inclusion with pseudoepitheliomatous features, of possible infundibular origin, appearing broken and adjacent to a necrotizing dermis that was deeply abscessed in relation to the ulcer, together with a mixed inflammatory infiltrate of neutrophils and lymphocytes. Fibrinoid deposits were observed around the squamous epithelial inclusion in the dermis and in the vessels around the ulcer. The epidermis surrounding the ulcer showed irregular hyperplasia and a subcorneal pustule, possibly associated with an ostium and the epithelial inclusion described above (Figure 3). Direct immunofluorescence was negative.

The clinical course of the lesions, their morphology, and the histopathologic findings suggested a diagnosis of PG, and so topical corticosteroids were added to the treatment while waiting for the results of the additional tests.

Serologic tests were negative, antibody tests were normal, and repeat blood counts, biochemical study, protein study, and thyroid hormone tests were all within normal values. The samples taken for microbiologic culture during the first visit as well as the biopsy specimens also proved negative.

Seven days after beginning treatment with topical corticosteroids, the edema and induration surrounding the leg ulcer had disappeared and the ulcer had begun to close. The surgical wound had completely healed. One month later, the leg ulcer had completely closed. Six months later, the patient was still without symptoms and additional tests, which included blood counts, biochemical study, and antibody tests, were normal.
Discussion

PG is a destructive inflammatory disease classified within the group of so-called neutrophilic dermatoses. The lesions can develop spontaneously, after surgery, or following minor injury. Between 50% and 70% of the cases of PG are associated with other diseases, the most frequent being inflammatory bowel disease (ulcerative colitis and Crohn disease). Other associated diseases are arthritis, including seronegative arthritis, spondylitis of inflammatory bowel disease, and rheumatologic disorders such as myeloid leukemia, hairy cell leukemia, myelofibrosis, and benign monoclonal gammopathy. PG has also been described in association with other neutrophilic dermatoses such as Sweet syndrome, subcorneal pustular dermatosis, and Behçet disease. It is also associated with active hepatitis or systemic lupus erythematosus.

The appearance of PG during gestation is rare, and a review of series of 15, 21, 86 and 350 cases of PG found no mention of an association between PG and gestation or giving birth by cesarean section. This association has been reported in the literature in relation to individual cases. We know of 7 cases of PG during gestation, 7 following birth by cesarean section, and 1 case during the postnatal period. The Table summarizes the clinical characteristics of these patients. Of the 7 cases of PG after giving birth by cesarean section, only 3 patients did not present any associated disease.1-3 Shands et al4 described 5 patients from 1 family who developed PG, 3 after abdominal surgery (including cesarean section) and 2 following minor injuries, without a history of any other disease. Karim et al5 described another case of PG which developed on the cesarean wound; another member of the patient’s family had a history of abdominal PG, following normal vaginal delivery, although neither had any underlying disease. Karim et al5 described another case of PG which developed on the cesarean wound; another member of the patient’s family had a history of abdominal PG, following normal vaginal delivery, although neither had any underlying disease. In the other 2 cases of PG following birth by cesarean section, hypogammaglobulinemia6 and chronic hepatitis C virus infection7 were confirmed. In all these cases, PG developed on the surgical wound, appearing between the first and sixth day after birth by cesarean section. Of the patients who developed PG during gestation, 3 developed PG on the leg,8-10 1 on the foot,11 2 on the abdomen,12,13 and 1 on the axilla.14 The cases described by Maier et al,12 Sassolas et al,14 Sergent et al,13 and Aytekin et al9 were not associated with any other disease. Two of these patients subsequently gave birth by cesarean section.

### Table. Clinical Characteristics of the Cases of Pyoderma Gangrenosum Associated With Gestation and Birth by Cesarean Section Reported in the Literature

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Time of Onset</th>
<th>Associated Disease</th>
<th>Location</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shands et al4</td>
<td>1987</td>
<td>5 d postcesarean</td>
<td>Family history</td>
<td>Cesarean wound</td>
<td>SC</td>
</tr>
<tr>
<td>Harland et al1</td>
<td>1993</td>
<td>5 d postcesarean</td>
<td>No</td>
<td>Cesarean wound</td>
<td>SC + surgery</td>
</tr>
<tr>
<td>Stone et al2</td>
<td>1996</td>
<td>Postcesarean</td>
<td>No</td>
<td>Cesarean wound</td>
<td>SC + surgery</td>
</tr>
<tr>
<td>Steadman et al6</td>
<td>1998</td>
<td>1 d postcesarean</td>
<td>Hypogammaglobulinemia</td>
<td>Cesarean wound</td>
<td>SC</td>
</tr>
<tr>
<td>Rönna et al7</td>
<td>2000</td>
<td>6 d postcesarean</td>
<td>VHC</td>
<td>Cesarean wound</td>
<td>SC + cyclosporin</td>
</tr>
<tr>
<td>Karim et al5</td>
<td>2006</td>
<td>3 d postcesarean</td>
<td>Family history</td>
<td>Cesarean wound</td>
<td>SC</td>
</tr>
<tr>
<td>Banga et al2</td>
<td>2006</td>
<td>5 d postcesarean</td>
<td>No</td>
<td>Cesarean wound</td>
<td>SC</td>
</tr>
<tr>
<td>Roger et al11</td>
<td>1993</td>
<td>Second quarter</td>
<td>SLE</td>
<td>Foot</td>
<td>SC + CPM + PP</td>
</tr>
<tr>
<td>Maier et al12</td>
<td>1995</td>
<td>Second quarter</td>
<td>No</td>
<td>Abdomen</td>
<td>SC + dapsone + cyclosporin</td>
</tr>
<tr>
<td>Freedman et al8</td>
<td>1997</td>
<td>Second quarter</td>
<td>Anticardiolipin antibodies</td>
<td>Leg</td>
<td>SC</td>
</tr>
<tr>
<td>Sassolas et al14</td>
<td>2000</td>
<td>First quarter</td>
<td>No</td>
<td>Axilla</td>
<td>SC + cyclosporin</td>
</tr>
<tr>
<td>Sergent et al13</td>
<td>2002</td>
<td>Third quarter</td>
<td>No</td>
<td>Abdomen</td>
<td>SC</td>
</tr>
<tr>
<td>Aytekin et al9</td>
<td>2002</td>
<td>Third quarter</td>
<td>No</td>
<td>Leg</td>
<td>SC</td>
</tr>
<tr>
<td>Tsanadis et al10</td>
<td>2002</td>
<td>First quarter</td>
<td>Relapsing polychondritis</td>
<td>Leg</td>
<td>SC + azathioprine</td>
</tr>
<tr>
<td>Futami et al15</td>
<td>1998</td>
<td>Postpartum (4 wk)</td>
<td>Ulcerative colitis</td>
<td>Face, neck, arms</td>
<td>SC + cyclosporin</td>
</tr>
<tr>
<td>Our case</td>
<td>2007</td>
<td>5 d postcesarean</td>
<td>No</td>
<td>Cesarean wound and leg</td>
<td>Topical corticosteroids</td>
</tr>
</tbody>
</table>

Abbreviations: CPM, cyclophosphamide; HCV, hepatitis C virus; PP, plasmapheresis; SC, systemic corticosteroids; SLE, systemic lupus erythematosus.
without PG developing on the wound; however, both were under treatment, one with cyclosporin and the other with oral corticosteroids and azathioprine, with great improvement of the initial lesions. Futami et al\textsuperscript{13} presented a case of postpartum multiple PG in a patient with a history of ulcerative colitis and PG.

The etiology of PG remains unknown, although some theories suggest impaired immunologic function. Gestation is known to generate a state of humoral and cellular immunosuppression, with serum inhibition of interleukin (IL) 2 formation and IL-1 activation and a reduction in polymorphonuclear cell chemotaxis and adhesion. The immunomodulatory function of some glycoproteins specific to gestation known as pregnancy-specific glycoproteins has been described; these glycoproteins stimulate the secretion of IL-10 and IL-6 and inhibit the production of IL-12 and tumor necrosis factor $\alpha$, that is, they induce the secretion of anti-inflammatory cytokines. It has also been observed that during gestation there is an increase in the levels of various coagulation factors. In addition, during gestation, interactions between the immune and endocrine systems influence the inflammatory cascade. It is possible that these immunologic alterations could play some role in the development of PG.

All the reported cases of PG associated with gestation or birth by cesarean section show good clinical improvement, even those involving large lesions such as those described by Sassolas et al\textsuperscript{14} (15 cm×20 cm) or by Rönnau et al\textsuperscript{7} (25 cm×15 cm). All the cases were treated using systemic corticosteroids with or without cyclosporin,\textsuperscript{7,12,14,15} cyclophosphamide,\textsuperscript{11} dapsone,\textsuperscript{12} azathioprine,\textsuperscript{10} or plasmapheresis.\textsuperscript{11} In some cases surgical debridement and skin grafts were performed.\textsuperscript{1,2}

It is well documented that in selected cases of localized PG topical treatment is sufficient to resolve symptoms, and is even more effective when begun early, since success is more likely the smaller the ulcer. Topical treatment is more effective when PG is superficial and when it is not associated with another disease. The course of a surgical wound affected by PG often leads to an initial search for a possible infection. This delays correct diagnosis and leads to a series of ineffective treatments, thus prolonging the condition; it may even become impossible to diagnose. Shands et al\textsuperscript{4} described such a situation where the relatives of the patient had a history of slowly developing surgical wound infections that were not diagnosed at that time as PG and who underwent multiple antibiotic and surgical treatments. PG associated with gestation and birth by cesarean section may be underdiagnosed, due to its favorable course and its similarity to surgical wound infection. We therefore believe that interdisciplinary collaboration is essential to establish an early diagnosis and initiate appropriate treatment.

**Conflicts of Interest**
The authors declare no conflicts of interest.

**References**


**Actas Dermosifiliogr. 2008;99:477-80**