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CASE REPORTS

Pyoderma Gangrenosum Following Cesarean Delivery

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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.

PIODERMA GANGRENOSO DESPUÉS DEL PARTO POR CESÁREA

Resumen. Presentamos el caso de una mujer de 30 años, primípara, que 5 días después del parto por cesárea presenta dehiscencia de uno de los extremos de la herida quirúrgica y una lesión en la pierna, que evolucionó a una úlcera bien constituida, ambas lesiones muy dolorosas. Fue diagnosticada inicialmente de infección cutánea y posteriormente de pioderma gangrenoso superficial; se trataron las lesiones con corticoides tópicos con buena respuesta al tratamiento. Tras el estudio de la paciente no se encontró patología subyacente. La asociación del pioderma gangrenoso con el embarazo o parto por cesárea se encuentra en la literatura como casos individuales. En la actualidad no se conoce la etiología del pioderma gangrenoso, aunque algunas teorías apuntan a un trastorno de la función inmunológica. Se sabe que la gestación determina un estado de inmunotolerancia que podría tener algún papel en el desarrollo del pioderma gangrenoso; futuras investigaciones podrán aclarar la relevancia de esta asociación.

Palabras clave: pioderma gangrenoso, parto por cesárea, embarazo.

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.

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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

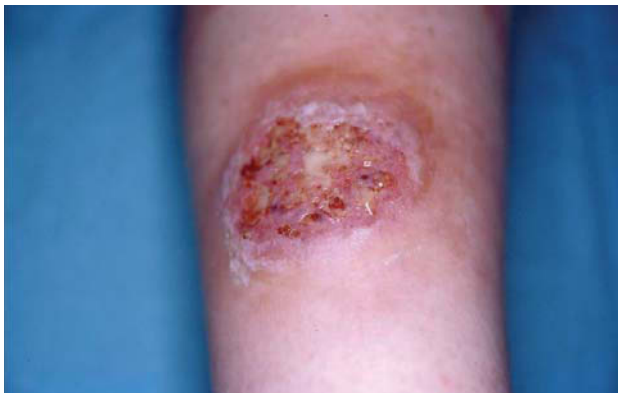

Figure 1. Ulcer on the leg with well-defined and raised edges and with an irregular base and seropurulent discharge. The ulcer was located on erythematous-edematous skin.

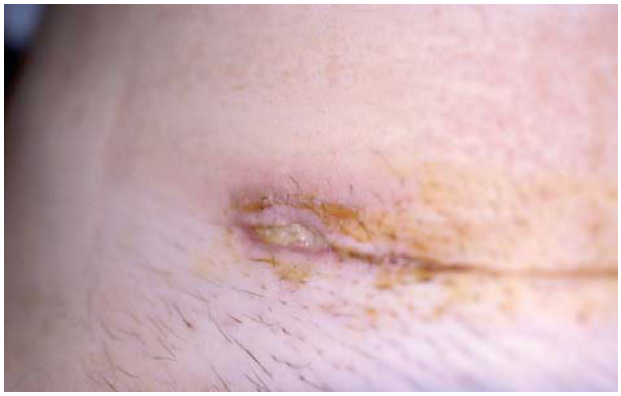

Figure 2. Dehiscence of the surgical wound, with violaceous raised edges and a yellowish base. Raised erythematous papules can be seen near the surgical wound.

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

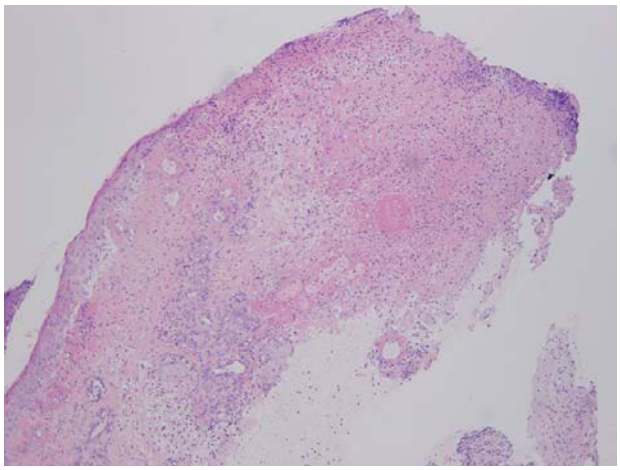

Figure 3. Hematoxylin-eosin, ×10. Ulcer with a dense neutrophilic inflammatory infiltrate and presence of vessels with fibrinoid necrosis.

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.

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

Author	*Year*	*Time of Onset*	*Associated Disease*	*Location*	*Treatment*
Shands et al[4]	1987	5 d postcesarean	Family history	Cesarean wound	SC
Harland et al[1]	1993	5 d postcesarean	No	Cesarean wound	SC + surgery
Stone et al[2]	1996	Postcesarean	No	Cesarean wound	SC + surgery
Steadman et al[6]	1998	1 d postcesarean	Hypogammaglobulinemia	Cesarean wound	SC
Rönnau et al[7]	2000	6 d postcesarean	VHC	Cesarean wound	SC + cyclosporin
Karim et al[5]	2006	3 d postcesarean	Family history	Cesarean wound	SC
Banga et al[3]	2006	5 d postcesarean	No	Cesarean wound	SC
Roger et al[11]	1993	Second quarter	SLE	Foot	SC + CPM + PP
Maier et al[12] cyclosporin	1995	Second quarter	No	Abdomen	SC + dapsone +
Freedman et al[8]	1997	Second quarter	Anticardiolipin antibodies	Leg	SC
Sassolas et al[14]	2000	First quarter	No	Axilla	SC + cyclosporin
Sergent et al[13]	2002	Third quarter	No	Abdomen	SC
Aytekin et al[9]	2002	Third quarter	No	Leg	SC
Tsanadis et al[10]	2002	First quarter	Relapsing polychondritis	Leg	SC + azathioprine
Futami et al[15]	1998	Postpartum (4 wk)	Ulcerative colitis	Face, neck, arms	SC + cyclosporin
Our case	2007	5 d postcesarean	No	Cesarean wound and leg	Topical corticosteroids

Abbreviations: CPM, cyclophosphamide; HCV, hepatitis C virus; PP, plasmapheresis; SC, systemic corticosteroids; SLE, systemic lupus erythematosus.

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 rheumatoid arthritis, and hematologic 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 al[4] 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 al[5] 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, hypogammaglobulinemia[6] and chronic hepatitis C virus infection[7] 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 al[9] were not associated with any other disease. Two of these patients subsequently gave birth by cesarean section

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[15] 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 α, 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[14] (15 cm×20 cm) or by Rönnau et al[7] (25 cm×15 cm). All the cases were treated using systemic corticosteroids with or without cyclosporin,[7,12,14,15] cyclophosphamide,[11] dapsone[12], azathioprine,[10] or plasmapheresis.[11] In some cases surgical debridement and skin grafts were performed.[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[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.

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