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Research Letter

Rapid recovery of vulvar pyoderma gangrenosum in response to aggressive surgery and steroid treatment

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Pyoderma gangrenosum (PG) is an acute inflammatory process of the skin, also referred to as sterile neutrophil dermatosis because of observations of skin ulceration with neutrophil infiltration during histopathological examination [1]. The gross appearance of PG includes bullae, pustules, erosion, and deep ulceration with suppurative discharge or necrosis [2]. Although some systemic diseases can induce PG, its exact cause and etiology remain unclear [3]. It is considered an autoimmune-mediated neutrophilic vasculitis that develops after skin trauma [4]. Steroid and immunosuppressive therapies are typically the most effective treatments for PG [1].

Vulvar PG is extreme rare and easily misdiagnosed as a sexually transmitted disease or vulvar malignancy. Genital skin defects typically fail to heal because of ease of contamination. Patients often experience local hygiene problems and psychological stress. In this study, we present a case of bilateral vulvar extensive PG, which showed rapid recovery following aggressive debridement and systemic steroid treatment.

A 60-year-old para 2 menopausal Taiwanese woman reported experiencing persistent vulvar discomfort for 1.5 months. A pruritic pustule in her right labium majora had developed into two deep and painful ulcerative wounds in both labia majora, with a sharp and elevated border covered with granulation tissue. The use of topical therapy had not improved her condition before referral.

The patient's general gynecological and surgical history had not contributed to her condition. Her menopausal age was 50 years old and she had not received any hormonal therapy. She had had no sexual intercourse for 10 years following the onset of menopause. No systemic symptoms, such as joint pain, redness of the eyes, oral ulcers, hematochezia, or diarrhea, were noted. Pelvic examination revealed a deep ulceration with a purulent discharge coating in the right labium majora. It measured approximately 10 cm × 3 cm, extending from the right monk of the pubis to the perineal area. A small superficial skin erosion, measuring approximately 2 cm × 2 cm, was also located in the left labium majora (Fig. 1). The vaginal mucosa, anus, and cervix were grossly normal. Bimanual examination revealed typically sized uterine and bilateral adnexa. The bilateral inguinal lymph nodes were not palpable.

The results from a series of laboratory studies, including routine blood tests, squamous cell carcinoma antigen (tumor marker), and syphilis tests, were all within reference ranges. Culture of local purulent discharge did not reveal any bacterial growth. Biopsy of the lesion was not conducted because of the patient's personal decision. A computed tomography scan of the pelvis extending to the inguinal area, cystoscopy, and colonoscopy all provided unremarkable findings. Limited improvement was shown following conservative treatment using a topical cream containing gramicidin, neomycin, nystatin, and triamcinolone (Mycomb cream; Sinphar Pharmaceutical, Taipei, Taiwan).

After patient counseling, surgical debridement and reconstruction of the deep skin defects were conducted following colonic preparation. The unviable necrotic skin and granulation tissue were superficially excised. Primary repair without flap reconstruction was performed (Fig. 2). Histopathological studies revealed mixed acute and chronic inflammation, granulation tissue formation, and adjacent epithelial hyperplasia. Tissue with neutrophil infiltration was compatible with the diagnosis of PG, the same as benign chronic neutrophilic dermatosis.

For treatment of PG, postoperative therapeutic goals are wound care and the provision of systemic immunosuppressive therapy. Steroids are helpful in preventing the recurrence of PG close to the surgical area (pathergy phenomenon; Wegener's granulomatosis). First, 100 mg hydrocortisol was injected intravenously every 6 hours for 3 days. Oral dexamethasone treatment was then

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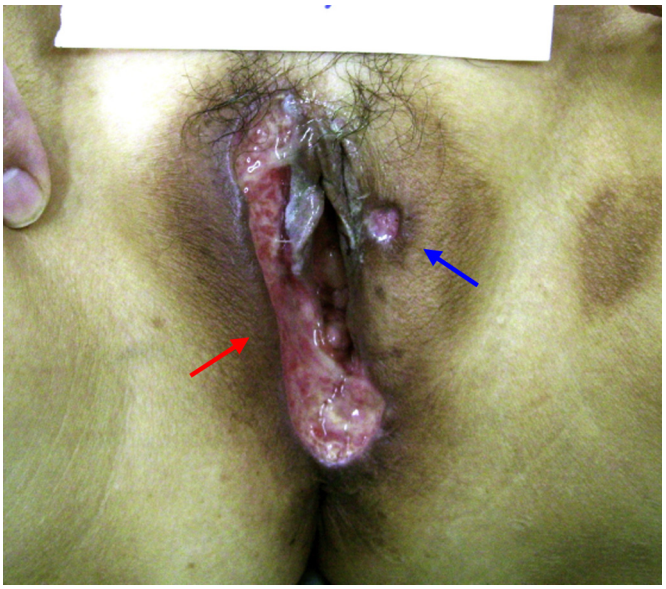

Fig. 1. Pyoderma gangrenosum of the bilateral vulva. The right side ulceration measured approximately 10 cm × 3 cm (red arrow head), extending from the monk of the pubis to the perineal area. The left side superficial skin erosion measured 2 cm × 2 cm (blue arrow head), located in the labium majora only.

introduced to replace the hydrocortisol treatment. The patient had an uneventful postoperative course, showing good wound healing and cosmetic recovery within 3 weeks of surgery (Fig. 3). Oral dexamethasone treatment was ceased 3 months after surgery using a gradual tapering schedule. The patient remains no local recurrence.

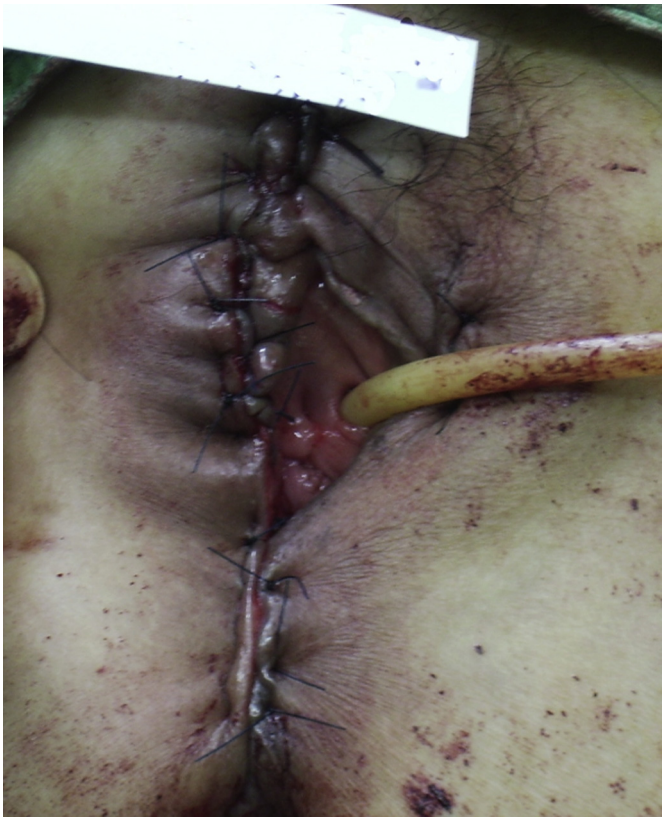

Fig. 2. Surgical debridement and primary repair of the vulvar lesion.

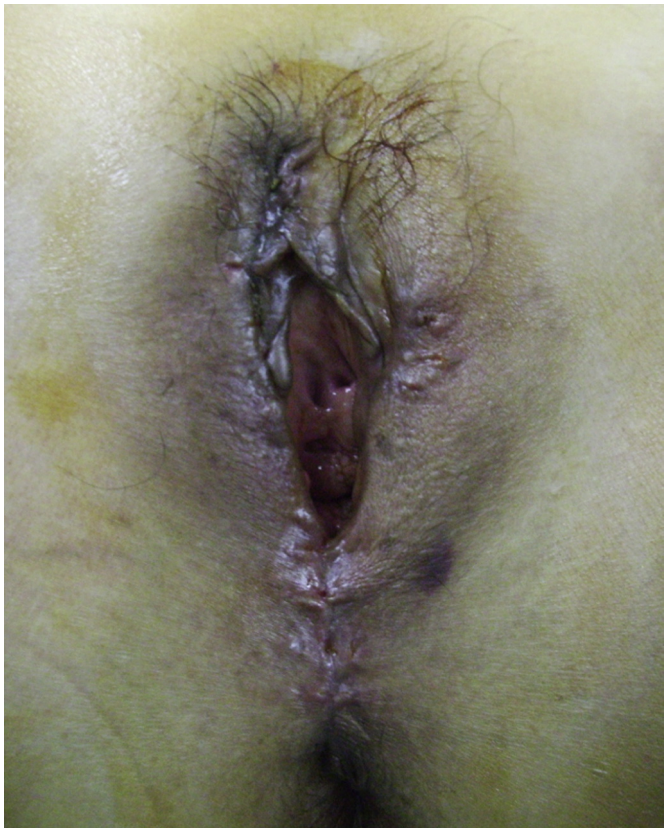

Fig. 3. Twenty-one days after surgery, the patient showed cosmetic recovery with no ulcer recurrence (no pathergy phenomenon).

PG is a rare dermatological aseptic neutrophil-infiltrated cutaneous destructive disease. It has an estimated incidence of 3–10 cases per million people/year [5]. The primary affected group is women of reproductive age [6]. In 1996, Powell et al clinically classified PG into four subgroups: ulcerative, pustular, bullous, and vegetative types [2]. The most common subgroup is the ulcerative type (>80%), and the most frequently affected sites are the legs, trunk, upper limbs, and head and neck region [6]. Symptoms of PG include painful enlarging necrotic ulcers with bluish undermined borders surrounded by advancing zones of erythema [7].

Vulvar PG is extremely rare, predominantly occurring in pediatric patients, and reported only in case reports. The cases reported worldwide are summarized in Table 1. A diagnosis of vulvar PG is made by exclusion. Physicians need to exclude venereal vulvar ulcer (a sexually transmitted disease, such as chancre or chancroid), premalignancy, malignancy (primary vulvar carcinoma), non-venereal vulvar ulcer (Behçet's disease or Crohn's disease), and traumatic and factitial ulceration before confirming vulvar PG [8].

Because of its rarity, the mechanism underlying PG remains unclear. However, it is believed to be associated with immune-mediated dysfunction or autoimmune reaction [6]. Although most cases are idiopathic, PG is often associated with other systemic diseases, such as Crohn's disease, ulcerative colitis, rheumatological disease, and hematological malignancy [9]. Occasionally, PG develops after surgery without any known etiology. Recently, Wollina et al associated PG with pyogenic arthritis, pyoderma gangrenosum, and acne syndrome (PAPA syndrome), an autosomal dominant hereditary disease [7]. A case series by Binus et al further associated hepatitis C infection with PG [6].

Treatment of PG is challenging. Systemic steroid treatment represents the most acceptable and effective therapy for acute stage PG;

Table 1
Systematic summary and literature review of vulvar PG.

Author	Year	Age	Associated disease	Treatment of vulvar PG	Refs
Chen et al	2012/2013	67	None	Surgical debridement and systemic steroid, hydrocortisol 100 mg every 6 h	This article
Marzano et al	2012	37	Renal involvement	Systemic steroid	Eur J Dermatol. 2012;22:537–9. (case report)
Browning et al	2011	10	None	Systemic steroid prednisone 1 mg/kg/d	Child Abuse Negl. 2011;35:230–3 (case report)
Walsh et al	2011	51	Non-Hodgkin's lymphoma with rituximab therapy	Systemic steroid prednisolone 1 mg/kg/d and minocycline 200 mg/d	J Low Genit Tract Dis. 2011;15:158–60. (case report)
Garcovich et al	2009	10	None	Systemic steroid methylprednisolone 30 mg/d, cyclosporine A 3.2 mg/kg/d	Pediatr Dermatol. 2009;26:629–31. (case report)
Matsuo et al	2009	48 and 37	Vulvar mucinous adenocarcinoma	Surgery and chemotherapy (5-fluorouracl, oxaliplatin, bevacizumab)	Gynecol Obstet Invest. 2009;68:276–8. (case report, 2 cases)
Leu et al	2009	43, 25 and 52	Crohn's disease	Systemic steroid, 6-mercaptopurine (1st case), oral budesonide and azathioprine (2nd case), adalimumab (3rd case)	Dig Dis Sci. 2009;54:1565–71. (case report, 3 cases)
Sripathi et al	2008	48	Recurrence vulvar PG	Systemic steroid and dapsone	Indian J Dermatol Venereol Leprol. 2008;74:506–8. (case report)
Roé et al	2006	44	Collagenous colitis	Cyclosporine 3 mg/kg/d BID Topical tacrolimus 0.1% locally	Dermatology. 2006;213:234–5. (case report)
Langeland et al	2004	55	None	Cyclosporin A, 5 mg/kg/d	Acta Obstet Gynecol Scand. 2004;83:1220–1. (case report)
Valmadre et al	2002	19	None	Systemic steroid, prednisolone 30 mg	Aust N Z J Obstet Gynaecol. 2002;42:548–9. (case report)
Sau et al	2001	73	Pulmonary tuberculosis	Systemic steroid prednisolone 50 mg/d and minocycline 100 mg BID	BJOG. 2001;108:1197–8. (case report)
Borum et al	1998	44	Crohn's disease	Systemic steroid and azulfidine (initially), Azathioprine , Cyclophosphamide, plaquenil, minocycline, and thalidomide (recurrence)	Dig Dis Sci. 1998;43:720–2. (Letter to editor)
Lebbé et al	1992	58	Lung involvement	Systemic steroid, prednisolone 1 mg/kg/d	J Am Acad Dermatol. 1992;27:623–5. (case report)
McCalmont et al	1991	29	None	Systemic steroid, Prednisolone 80 mg/d	Int J Gynaecol Obstet. 1991;35:175–8. (2nd case report in gynecological literature)
Grant et al	1989	66 and 76	Leukemia (AML, 1st case), rheumatoid arthritis (2nd case)	No therapy (1st case), surgery (2nd case), both expired	Aust N Z J Obstet Gynaecol. 1989; 29:360–2. (2 cases)
Segal et al	1979	N/A	Crohn's disease and sclerosing cholangitis	N/A	S Afr Med J. 1979;7;55:596–9. (case report)
Chachaj et al	1977	N/A	Ulcerative colitis	N/A	Wiad Lek. 1977;1;30:715–8. (case report)

BID = twice daily; N/A = not available; PG = pyoderma gangrenosum.

similar to treatment of an autoimmune disorder. Second-line rheumatological therapies, such as immunosuppressants, immunomodulatory agents, anti-inflammatory drugs, cytotoxic drugs, interleukin-1, and tumor necrosis factor-α inhibitor or its antagonists, are all reportedly effective when administered in combination with traditional steroid treatment [1]. Leukocytapheresis can also remove active neutrophils in the blood to treat unresponsive PG [10].

Debridement of necrotic tissue for PG is not usually recommended because the surgical procedure might trigger an immune system response. Reported cases of surgical debridement and split skin grafts for PG lesions have generally had poor outcomes. As a result of the pathergy phenomenon, additional ulceration and necrosis in traumatic wound areas or skin flaps is probable. However, a case series study identified that ~30% of patients who had undergone gentle sharp debridement and active wound management through skin graft or reconstruction showed successful disease remission [6]. A Korean study further described that surgical intervention following immunosuppressant stabilization can accelerate the PG healing course [11]. According to a case report by Vieira et al, hyperbaric oxygen therapy improves the surgical outcome of PG [12].

Vulvar or genital PG causes local hygiene problems, irritation during urination and defecation, and secondary infection in affected skin areas receiving traditional medical treatment. In our reported case, surgical intervention, including debridement of nonviable tissue and local reconstruction, provided three main benefits: acceleration of ulcer healing when combined with systemic therapy; provision of a specimen for histopathological examination to exclude other underlying etiologies or malignancy of the skin defect; and cosmetic improvement.

In conclusion, vulvar PG is extremely rare and requires specific management. In our reported case, accurate diagnosis, opportune systemic steroid treatment, and surgical intervention reduced the patient's comorbidity and accelerated her healing course without any complications.

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