

# A Case of the Co-Existence of Subcorneal Pustular Dermatitis and Pyoderma Gangrenosum and a Review of the Literature

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## Abstract

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**BACKGROUND:** Subcorneal pustular dermatosis, also known as Sneddon-Wilkinson disease, can be classified as one of the neutrophilic dermatoses together with pyoderma gangrenosum. The development of both SPD and PG in the same patient has rarely been reported and may be a strong indicator of IgA dysglobulinemia

**CASE REPORT:** We report the case of a 34-year-old woman with a 2-year history of relapsing pustular eruptions mainly affecting the abdomen, gluteus region, elbows, and the extremities. Four years after the onset of subcorneal pustular dermatosis (SPD), she developed pyoderma gangrenosum (PG) on her right hand. In literature, the coexistence of SPD and PG in the same patient has already been described. This co-occurrence might indicate a certain predisposition for immune dysregulation.

**CONCLUSION:** Although the two NDs are often associated with systemic diseases, these patients should be followed up for any malignancy because of the strong association between these disorders.

## Introduction

Subcorneal pustular dermatosis (SPD), also known as Sneddon-Wilkinson disease, can be classified as one of the neutrophilic dermatoses (NDs) together with pyoderma gangrenosum (PG). The development of both SPD and PG in the same patient has rarely been reported and may be a strong indicator of IgA dysglobulinemia [1].

We describe the case of a patient exhibiting SPD lesions associated after two years' duration with typical PG.

## Case report

A 34-year-old woman was admitted to our hospital in 2015 with 2 years-history of relapsing pustular eruptions mainly affecting the abdomen, gluteus region, elbows, and the extremities (Figure 1). Clinical examination showed multiple small painful flaccid pustules varying in size from 0.5-2 cm that tended to coalesce to form an annular or circinate pattern and superficial crusts on the normal or mildly erythematous skin. A skin biopsy specimen showed subcorneal neutrophilic infiltrate with occasional eosinophils and absence of spongiosis or acantholysis. In the dermis, there was a dense perivascular infiltrate of neutrophils and occasional eosinophils (Figure 2). Direct immunofluorescence was negative.



Figure 1: Subcorneal pustular dermatosis. Small flaccid pustules varying in size from 0.5-2 cm that tended to coalesce to form annular or circinate pattern

These findings were consistent with SPD diagnosis. Dapsone was introduced at a dose of 100 mg/daily resulting in gradual improvement of SPD with few residual scarring. She remained on dapsone for 20 months with almost complete remission of the neutrophilic disease.

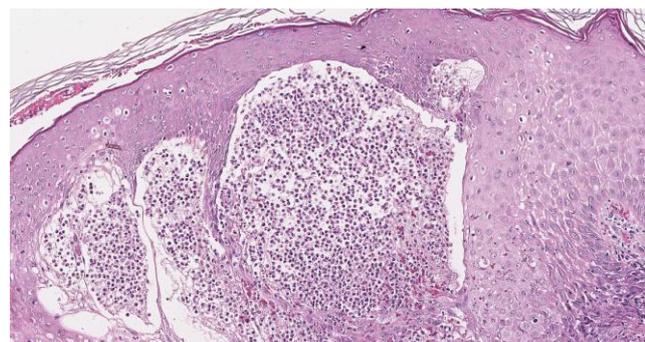


Figure 2: SPD histological examination: subcorneal pustule below the stratum corneum containing mainly neutrophils

In 2017, the patient developed on the right hand an area of painful, rapidly enlarging, ulceration

(Figure 3). Clinical examination showed a 2.5 cm diameter-ulceration with violaceous borders and surrounding erythema. Similar lesions were also present on the lower extremities.



Figure 3: Pyoderma gangrenosum. An area of ulceration with violaceous borders and surrounding erythema

A skin biopsy found a mixed inflammatory infiltrate of neutrophils and lymphocytes, extending into the panniculus (Figure 4).

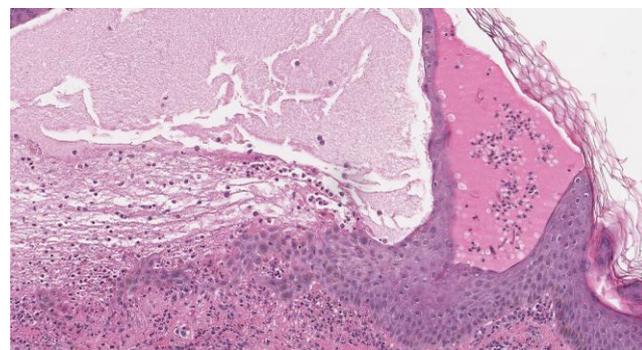


Figure 4: PG histological examination: an intensive mixed inflammatory infiltrate including mainly neutrophils associated with vessel destruction and necrosis of the epithelium

Direct immunofluorescence was negative. Clinical and histopathologic features were compatible with PG diagnosis, according to Delphi Consensus criterion [2]. Laboratory investigations showed an increased white cell count ( $11,000/\text{mm}^3$ ) with a normal differential. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were elevated (ESR: 20 mm; CRP: 0.72 mg/dL). The blood chemistry, liver function and renal function tests were within the normal limit. Abdominal and pelvic ultrasound and computed tomography were normal. A gastroenterological visit excluded the presence of inflammatory bowel disease. The patient did not respond to topical and oral corticosteroids (prednisone 50 mg/daily for a month); cyclosporine was introduced at a dosage of 150 mg/daily (2 mg/kg) in association with tacrolimus 0.1% ointment, thus resulting in gradual improvement of PG, while SPD remained in remission [3].

## Discussion

NDs are a group of heterogeneous skin diseases, with common features and a common histopathologic characterised by polymorphonuclear leukocyte infiltrates at various levels within the epidermis, dermis, or panniculus [4] (Table 1).

**Table 1: NDs classification**

NEUTROPHILIC DERMATOSIS [4]		
Superficial (epidermal) Subcorneal pustular dermatosis	En plaque (dermal) Sweet's syndrome	Deep (dermal and hypoderma) Pyoderma gangrenosum
IgA pemphigus	Neutrophilic eczrine hydratenitis	Neutrophilic panniculitis
Bullous neutrophilic dermatoses	Erythema elavatum diutinum	Aseptic abscesses
Other pustuloses	Neutrophilic rheumatoid dermatitis	-
-	Granulomatous pyoderma gangrenosum	-

SPD is a rare chronic and relapsing skin disease, characterised by symmetrical sterile pustular eruption typically involving the flexural sites of the trunk and proximal limbs [1]. Although it is typically seen in women over the age of 40 years, there have been a few cases found in children [4] [5]. The etiopathogenesis of SPD remains unknown [6]. A trigger for aberrant neutrophil chemotaxis in SPD has not been identified. Faulty immune mechanisms and genetic susceptibility have been proposed, but no widely accepted hypothesis has been substantiated [3]. PG is a neutrophilic, non-infective skin disorder characterised by pustules or nodules, in which sterile destructive inflammatory process leads to necrotic cutaneous ulceration with violaceous borders and central necrosis. Lesions are mainly localised on the lower legs, especially on pretibial area [7] [8].

In our patient, the SPD preceded the PG onset by 2 years. In literature, the coexistence of SPD and PG in the same patient has been described previously in 12 patients (Table 2) [1]. This co-occurrence might indicate a certain predisposition for immune dysregulation. Although the neutrophilic accumulation appears to be the hallmark of neutrophilic disorders, the exact pathophysiology is still unknown. Probably, it is implicated the production from T cells activated by polymorphonuclear cells of several chemotactic factors, including the pro-inflammatory cytokines: tumour necrosis factor (TNF)- $\alpha$ , interleukin (IL)-8 and complement fragment C5a [4] [9]. Indeed, a complete remission of clinical manifestations, with the off-label use of TNF blocking agents in 29-years old man with SPD, refractory to first-line therapy, has previously been described [10].

The two NDs are often associated with systemic diseases, including inflammatory bowel disease, rheumatoid arthritis, paraproteinemia or haematological malignancy, such as monoclonal

gammopathies, lymphomas and multiple myeloma [11].

**Table 2: Articles reporting the coexistence of the two neutrophilic diseases published in the literature**

Authors	Sex	Age	Associated disease	Therapy	Outcome
Wolff K. 1971 [12]	-	-	IgA gammopathy	-	-
Marsden JR, et al. 1986 [15]	-	-	IgA gammopathy	-	-
Venning VA, et al. 1986 [16]	F	59	IgA gammopathy	dapsone	remission
Freire Murgueyio P, et al. 1989 [17]	-	-	-	-	-
Kohl PK, et al. 1991 [18]	F	60	IgA gammopathy	-	-
Scerri L. 1994 [14]	F	89	-	CCS, dapsone, minocycline	remission
Cartier H, et al. 1995 [19]	F	54	IgA gammopathy	CCS, dapsone	remission
Stone MS, et al. 1996 [20]	F	72	Multiple myelomas	CCS, dapsone	Remission
T.A.Chave, et al. 2001 [21]	M	82	IgA paraproteinaemia and IgG antiepitheial antibodies.	CCS	-
Puechguiral-Renaud I, et al. 2006 [22]	M	67	IgA and IgG gammopathy	CCS	-
Ahmad K, et al. 2009 [1]	F	57	IgA and IgG gammopathy, multiple myeloma	CCS, dapsone, tacrolimus, acitretin, colchicine, clofazimine, nbUVB cyclosporin, cyclophosphamide	Remission
Audemard A, et al. 2012 [23]	M	82	Spleen abscess	CCS	Remission

It is of interest that this diseases combination has been reported in the presence of an IgA monoclonal gammopathy [12]. However, in 2006 a case of a 67-year-old man, affected by both PG and SPD simultaneously, who developed a biclonal benign IgA and IgG kappa gammopathy have been reported [13]. Furthermore, *Ahmad et al.* described the case of a 57-year-old woman, with a 5-year history of PG before she developed SPD, associated with biclonal IgA and IgG gammopathy, that 12 years later, developed myeloma [1]. In our patient, no evidence of myeloma or myeloproliferative disorders has been found. Although PG and SPD may occur without the association of an underlying malignancy as in our case, these patients should be followed up for any malignancy because of the strong association between these disorders [14].

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