



Generalized Pustular Psoriasis Showing Improvement with Corticosteroid Therapy: Case Report

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Abstract

Introduction: Generalized pustular psoriasis (GPP) is a rare, acute inflammatory and potentially life-threatening variant of psoriasis, characterized by widespread sterile pustular eruptions on an erythematous base, often accompanied by systemic symptoms such as fever, malaise, and leukocytosis. GPP differs from chronic plaque psoriasis due to dysregulation of the IL-36 pathway and IL36RN mutations, classifying it as an autoinflammatory keratinization disease, which poses significant therapeutic challenges, especially in settings with limited healthcare resources and restricted access to biologic agents.

Case Report: A 43-year-old man presented with high fever, severe skin pain, and widespread pustules coalescing into “lakes of pus.” Histopathological examination revealed orthokeratosis, parakeratosis, regular acanthosis, thinning of the suprapapillary plate, Munro microabscesses, and Kogoj’s spongiform pustules.

Case Discussion: A diagnosis of Von Zumbusch-type GPP was established based on clinical and histopathological findings. Although biologic agents are the first-line treatment according to current guidelines, short-term systemic corticosteroids remain an important option in resource-limited settings. The patient responded well to intravenous methylprednisolone and topical corticosteroids, with significant reduction in the Psoriasis Area and Severity Index (PASI) and no relapse during eight weeks of follow-up.

Conclusion: This case underscores the feasibility of achieving remission in generalized pustular psoriasis using conventional systemic corticosteroids under close monitoring, particularly in resource-limited settings where access to biologic agents may be restricted.

Keywords: Generalized pustular psoriasis, Von Zumbusch, Biologic agents, Corticosteroids

Generalized Pustular Psoriasis yang Menunjukkan Perbaikan dengan Terapi Kortikosteroid: Laporan Kasus

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Abstrak

Pendahuluan: Generalized pustular psoriasis (GPP) merupakan varian psoriasis yang jarang, bersifat inflamasi akut, dan berpotensi mengancam nyawa, ditandai oleh sterile pustular eruptions yang menyebar luas di atas dasar eritematosa, sering disertai gejala sistemik seperti demam, malaise, serta leukositosis. GPP berbeda dari chronic plaque psoriasis karena adanya disregulasi jalur IL-36 dan mutasi IL36RN, sehingga diklasifikasikan sebagai autoinflammatory keratinization disease, yang menimbulkan tantangan terapi signifikan, terutama pada fasilitas kesehatan dengan keterbatasan sumber daya untuk akses biologic agents.

Laporan Kasus: Seorang laki-laki 43 tahun datang dengan demam tinggi, nyeri hebat pada kulit, dan pustula menyebar luas yang menyatu membentuk "lakes of pus." Pemeriksaan histopatologi menunjukkan orthokeratosis, parakeratosis, regular acanthosis, penipisan suprapapillary plate, Munro microabscesses, dan Kogoj's spongiform pustules.

Diskusi Kasus: Diagnosis Von Zumbusch-type GPP ditegakkan berdasarkan temuan klinis dan histopatologi. Meskipun biologic agents merupakan terapi lini pertama sesuai guidelines terkini, systemic corticosteroids jangka pendek tetap menjadi pilihan penting pada fasilitas kesehatan dengan keterbatasan sumber daya. Pasien menunjukkan respons baik terhadap systemic corticosteroids dan topical corticosteroids, dengan penurunan signifikan Psoriasis Area and Severity Index (PASI) serta tanpa relapse selama delapan minggu follow-up.

Kesimpulan: Kasus ini menegaskan bahwa GPP dapat mencapai remission melalui penggunaan systemic corticosteroids konvensional dengan monitoring ketat, khususnya pada fasilitas kesehatan dengan keterbatasan sumber daya terhadap akses biologic agents.

Kata Kunci: Generalized pustular psoriasis, Von Zumbusch, Biologic Agents, Kortikosteroid.

Introduction

Generalized pustular psoriasis (GPP) is a rare but potentially life-threatening acute inflammatory variant of psoriasis, characterized by widespread sterile pustular eruptions on an erythematous base, often accompanied by systemic symptoms such as fever, malaise, and leukocytosis. GPP differs significantly from psoriasis vulgaris in its clinical presentation and pathophysiology and requires a specific and often aggressive therapeutic approach.^{1,2}

Global data from the Global Burden of Disease Study 2019 indicate that psoriasis affects more than 60 million people worldwide, with GPP accounting for less than 2% of all

psoriasis cases but associated with considerably higher morbidity. In Asia, multicenter retrospective studies report that the incidence of GPP is low, with peak incidence in the fourth to fifth decades of life and no significant sex predilection.^{1,2}

Pathogenetically, GPP is driven by innate immune system dysregulation, characterized by overactivation of the interleukin (IL)-36 pathway and excessive production of proinflammatory cytokines such as IL-1 β , IL-17, IL-23, and TNF- α . Genetic mutations in the IL36RN gene (encoding the interleukin-36 receptor antagonist) have been identified in some patients, leading to the classification of GPP as an autoinflammatory keratinization disease (AiKD). This fundamental difference

warrants special attention in diagnosis and therapy compared to chronic plaque psoriasis.^{3,4}

Clinically, GPP is classified into several subtypes, including the classic Von Zumbusch form, the annular form, and the pregnancy-related form (impetigo herpetiformis). The Von Zumbusch variant is the most severe, characterized by acute onset, widespread pustules coalescing into “lakes of pus,” and potential complications such as acute kidney injury, secondary infections, and electrolyte imbalances.^{5,6}

Despite the availability of biologic agents as first-line treatment for GPP in international guidelines, financial constraints and limited availability often preclude their use in developing countries. Therefore, rational and effective conventional therapies remain critical in managing severe cases in low-resource settings. This report presents a case of GPP with typical clinical and histopathological manifestations, demonstrating a favorable response to conventional short-term systemic corticosteroid therapy and emphasizing the importance of early diagnosis and close monitoring to prevent recurrences and systemic complications.

Case Report

A 43-year-old man presented to the emergency department with high fever (38.7 °C), severe skin pain, and multiple pustular eruptions covering nearly his entire body for three days prior to admission. His symptoms were accompanied by a burning sensation, malaise, and a history of two similar episodes

in the past year. During the first episode, which occurred approximately ten months earlier, the patient was diagnosed clinically with generalized pustular psoriasis after presenting with widespread erythematous plaques and sterile pustules; he received a two-week course of topical high-potency corticosteroids and emollients with good improvement. A second flare occurred four months later and was managed with oral methotrexate 10 mg/week for four weeks, also resulting in partial remission. Both previous episodes were preceded by upper-respiratory tract infections and psychological stress, which were considered potential triggers. There was no history of other autoimmune diseases, recent drug use, or exposure to chemicals, and no family history of similar conditions.

Dermatological examination revealed multiple pustular lesions ranging from millet-sized to lentil-sized, scattered over the body, extremities, and axillary folds. These lesions coalesced into larger areas resembling “lakes of pus.” Crusts and scales were noted in several locations. No ulceration or signs of secondary infection were observed. Systemic examination revealed tachycardia (112 bpm), blood pressure of 128/78 mmHg, and leukocytosis (17,300/ μ L) on complete blood count.

A punch biopsy was performed on a pustular lesion. Histopathological examination of hematoxylin and eosin (HE)-stained sections showed orthokeratosis, focal parakeratosis, regular acanthosis with elongated rete ridges, and thinning of the suprapapillary plate. Munro microabscesses were observed in the stratum corneum, and Kogoj's spongiform pustules were present in the stratum



Figure 1. Clinical presentation of generalized pustular psoriasis (Von Zumbusch type), demonstrating widespread erythematous plaques covered with numerous sterile pustules ranging from millet-sized to lentil-sized. Some pustules coalesce into extensive “lakes of pus.” Lesions involve the upper extremities, trunk, and lower limbs. Crusts and scales are visible in several areas. No ulceration or signs of secondary infection were noted at presentation.

spinosum. The dermal papillae demonstrated dilated blood vessels with perivascular infiltration of inflammatory cells, predominantly neutrophils and lymphocytes, along with foci of interstitial hemorrhage.

tular psoriasis, balancing the need for rapid disease control and minimizing steroid-related adverse effects. Treatment was given for five days, then tapered to oral 16 mg/day for an additional ten days. Topical therapy includ-

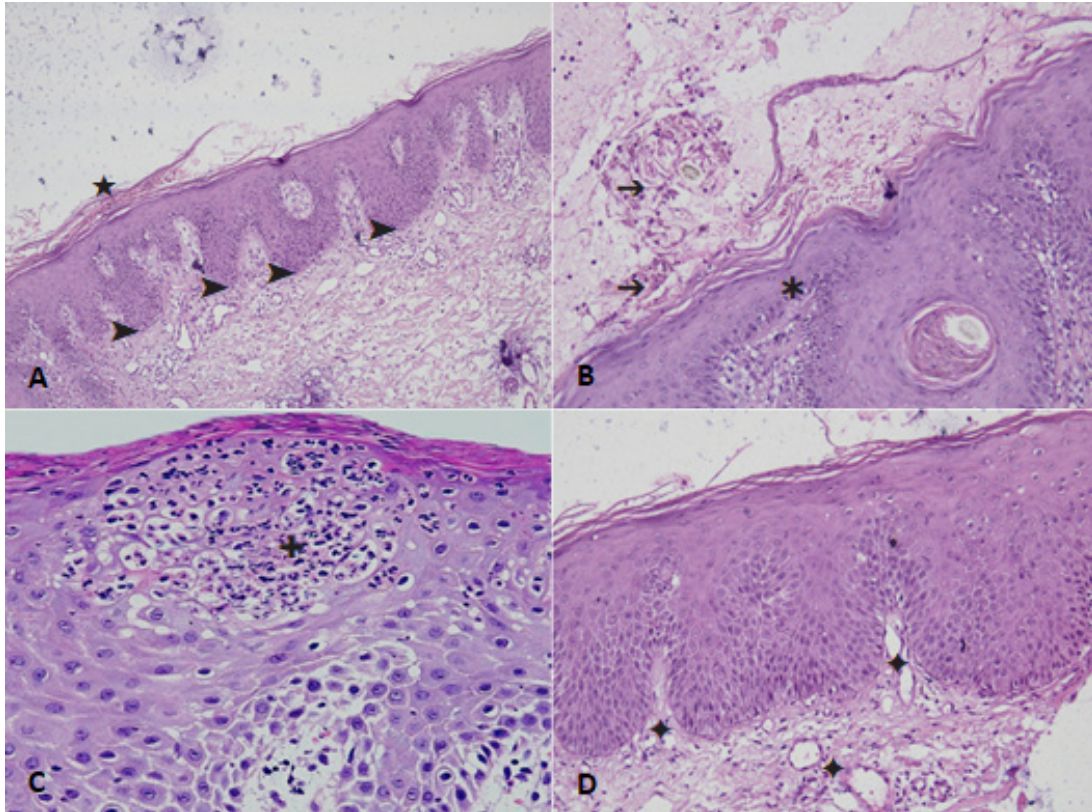


Figure 2. A. Tissue specimen showing stratified squamous epithelium with parakeratosis and some orthokeratosis (★), acanthosis with regular elongated rete ridges (►), and normal nuclear morphology (100×, HE). B. Neutrophil infiltration was found in areas with hyperkeratosis (Munro microabscesses →), as well as thinning of the suprapapillary plate (*) (200×, HE). C. Stratum spinosum layer forming pus (spongiform pustules of Kogoj +) (200×, HE). D. Foci of dilated and congested blood vessels with neutrophil and lymphocyte perivascular inflammation (◆) (200×, HE). Symbols: ★ parakeratosis and orthokeratosis; ► acanthosis with regular elongated rete ridges; → Munro microabscesses; * thinning of the suprapapillary plate; + spongiform pustules of Kogoj; ◆ dilated and congested blood vessels with neutrophil and lymphocyte perivascular inflammation.

Based on clinical features and histopathological findings, a diagnosis of Von Zumbusch-type GPP was established. Differential diagnoses included acute generalized exanthematous pustulosis (AGEP) and subcorneal pustular dermatosis; however, the patient's history of relapses, distribution of lesions, and histological features strongly supported GPP. The patient was hospitalized and managed with a multidisciplinary approach. Intravenous methylprednisolone was started at 32 mg/day (divided into two doses). This dosage corresponds to approximately 0.5 mg/kg body weight and follows the standard acute-flare protocol used in our institution for severe pus-

ed betamethasone valerate cream 0.1% twice daily and 10% urea cream for hydration and desquamation. Oral cetirizine 10 mg/day was administered for pruritus, and pantoprazole 40 mg/day was given for gastric protection during systemic steroid therapy.

By day five of treatment, erythema had decreased, pain and burning sensations were reduced, and pustules had dried, forming superficial scales. Active lesions significantly regressed, and no signs of secondary infection were noted. The patient was discharged on day six with a tapering regimen of oral methylprednisolone for two weeks and continued topical therapy.

Outpatient follow-up at weeks two and eight showed no new recurrences. The patient maintained stable improvement, with the Psoriasis Area and Severity Index (PASI) decreasing from an initial score of 18 to below 3. Long-term management after completion of the steroid taper includes regular dermatology follow-up every two to three months, strict trigger avoidance, and consideration of maintenance therapy with non-biologic systemic agents such as methotrexate or acitretin if recurrent flares occur or if biologic therapy remains inaccessible. Patient education focused on identifying flare triggers, the importance of treatment adherence, and plans for prompt referral in the event of future severe recurrences.

Discussion

Generalized pustular psoriasis (GPP) is an acute inflammatory variant of psoriasis, separately classified under the WHO ICD-11 due to distinct pathogenesis and clinical manifestations compared to chronic plaque psoriasis. The Von Zumbusch subtype is the most common and severe form, characterized by sudden onset, widespread pustules, and potential systemic complications, including sepsis, electrolyte imbalances, and multiorgan failure.¹

Molecularly, GPP is driven by dysregulation of innate proinflammatory cytokines, particularly interleukin-36 (IL-36), IL-17, IL-1 β , and TNF- α . Mutations in the IL36RN gene, encoding the IL-36 receptor antagonist, have been identified in a subset of patients and result in an abnormal keratinocyte response to inflammatory stimuli.^{2,3} Overactivation of the IL-36 pathway leads to massive recruitment of neutrophils into the epidermis, forming characteristic histopathological features such as Kogoj's spongiform pustules and Munro microabscesses.⁴

Diagnosis of GPP requires correlation between clinical presentation, history of relapses, and histopathological confirmation. GPP can mimic other pustular dermatoses, including acute generalized exanthematous pustulosis (AGEP), subcorneal pustular dermatosis (Sneddon–Wilkinson disease), and severe drug eruptions.^{5,6} However, unlike AGEP, GPP has a slower course, is not related to a specific drug history, and histologically exhibits acanthosis as well as intraepidermal pustules with a predominance of neutrophils rather than eosinophils.⁷ The histopathology of this case shows classic characteristics: orthokeratosis,

parakeratosis, psoriasiform acanthosis, suprapapillary thinning, Munro microabscess and Kogoj pustules, reinforcing the diagnosis of Von Zumbusch-type GPP.

Although international guidelines, such as the AAD/NPF 2021 and the European Dermatology Forum (EDF) 2022, recommend biologic agents as first-line therapy—particularly IL-17 antagonists like secukinumab or IL-36 antagonists like spesolimab—limited access and high costs in developing countries continue to make conventional systemic therapies relevant.^{8,9} Short-term systemic corticosteroids, when carefully tapered, can be effective in controlling acute flares. To minimize the well-known risk of rebound after abrupt discontinuation, our tapering protocol reduced the total dose by approximately 25% every five to seven days, allowing gradual physiologic adaptation of the hypothalamic–pituitary–adrenal axis and reducing the likelihood of disease flare.¹⁰ Careful monitoring during tapering is essential, and patient education regarding early signs of relapse remains a key preventive strategy.¹¹ Other systemic agents, such as cyclosporine, methotrexate, and acitretin, remain viable non-biologic options for maintenance therapy or partial relapse management.¹² Topical high-potency corticosteroids also play a crucial role in accelerating lesion resolution.

Relapses in GPP are often triggered by abrupt discontinuation of therapy, systemic infections, psychological or emotional stress, or certain medications.¹³ Therefore, maintenance strategies should include gradual tapering of systemic treatments, thorough patient education regarding triggers, and regular clinical follow-up.¹⁴ This case highlights the importance of conventional treatment strategies in achieving remission for GPP patients when biologic agents are inaccessible, and it emphasizes the value of early diagnosis and close clinical monitoring in preventing relapses and systemic complications.

Conclusion

Generalized pustular psoriasis is a rare and severe variant of psoriasis characterized by widespread sterile pustular eruptions over an erythematous base, often forming “lakes of pus” and accompanied by systemic inflammation, with a risk of multiorgan failure. Its unique pathogenic basis involves hyperactivation of the interleukin-36 pathway and IL36RN mutations, classifying it as an auto-inflammatory keratinization disease. Estab-

lishing a diagnosis requires clinical assessment and histopathological confirmation to differentiate it from other pustular dermatoses such as acute generalized exanthematous pustulosis and subcorneal pustular dermatosis, with hallmark histopathological findings including Munro microabscesses in the stratum corneum and Kogoj's spongiform pustules in the spinosum layer. This case demonstrates that even in resource-limited settings, conventional systemic corticosteroid therapy, when carefully monitored and tapered, can effectively induce remission in GPP, emphasizing the ongoing relevance of traditional therapeutic approaches where access to biologic agents remains limited.

Declaration

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Competing Interests

The authors declare no competing interests in this study.

Author Contributions

All authors contributed equally to the planning, data collection, histomorphological examination, clinical analysis, and drafting and revising of the article. All authors have read and approved the final draft of this article.

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