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CASE REPORT

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Successful treatment with cyclosporine and guselkumab for pityriasis rubra pilaris

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Abstract

A man with pityriasis rubra pilaris (PRP) showed no improvement in skin symptoms despite treatment with several drugs. The patient was diagnosed as having type 1 PRP. Combination therapy with cyclosporine and guselkumab improved his skin condition. Here, we propose a novel therapeutic strategy for intractable PRP.

KEYWORDS

cyclosporine, guselkumab, IL-23p19, pityriasis rubra pilaris

1 | INTRODUCTION

Pityriasis rubra pilaris (PRP) is a rare idiopathic papulosquamous disorder characterized by follicular-based papules that coalesce into large confluent plaques, often progressing to erythroderma with distinctive areas of spared skin.[1] The cause of this condition is still unknown. The disease may be acquired or inherited and is divided into five types: classic adult, atypical adult, classic juvenile, circumscribed juvenile, and atypical juvenile. More recently, an HIV-associated type was included in this classification. Our patient fit the description of classical adult-type PRP, a variant that accounts for 50% of cases and has a favorable prognosis, resolving in 3 years in approximately 80% of patients.[2] However, PRP is a highly emotionally and physically distressing condition for patients due to its skin manifestations. Therefore, early disease control is important. PRP treatments include vitamin A, methotrexate, and cyclosporine, although recent reports have indicated that the use of biologics may also be effective.[3–5] We report on a case of PRP resolved using a combination of cyclosporin and guselkumab.

2 | CLINICAL CASE

A man in his 60s with no medical history developed a pruritic skin rash on his hands and body. He had been diagnosed with atopic dermatitis (AD) by a previous doctor with no symptom alleviation for 2 years. He presented to our hospital with an erythematous indurative plaque with pityriasis-like desquamation on his forehead, and his trunk had keratotic papules consistent with pores (Figure 1A,B). Clinically, we suspected psoriasis vulgaris or PRP, rather than AD.

Thereafter, oral methotrexate and retinoids were administered; however, they failed to control the skin rash. Brodalumab (anti-IL17RA) was dispensed, but the orange-red keratotic proliferation and deep fissures on the patient's palms worsened. Keratotic papules were still evident on the patient's trunk (Figure 1C–E). To confirm diagnosis, we performed a biopsy which revealed acanthosis and psoriasiform hyperplasia in the epidermis and horn cysts in the follicles (Figure 2A). A keratin plug was observed in the follicular structures (Figure 2B). Parakeratotic foci were identified in the horny layer of the

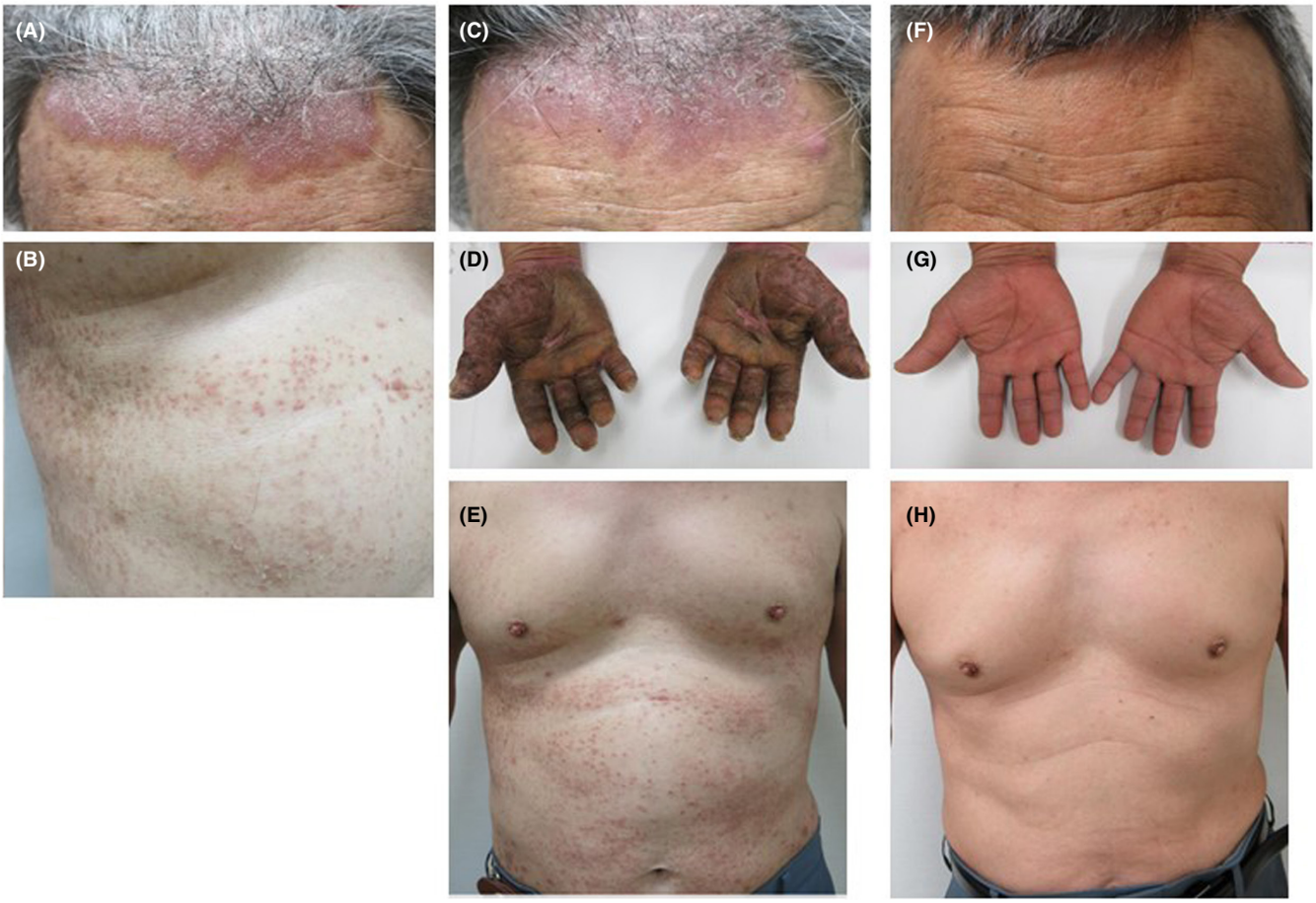

FIGURE 1 (A) Patient skin condition as observed at the first consultation. The patient developed scales on his forehead. (B) Keratotic papules consistent with pores on his trunk. (C) Worsening skin conditions on the patient's forehead following brodalumab injection. (D) Worsening palmar. (E) Worsening trunk. (F) Patient's forehead was well controlled at the end of 9 months. (G) Improved palmar. (H) Improved trunk.

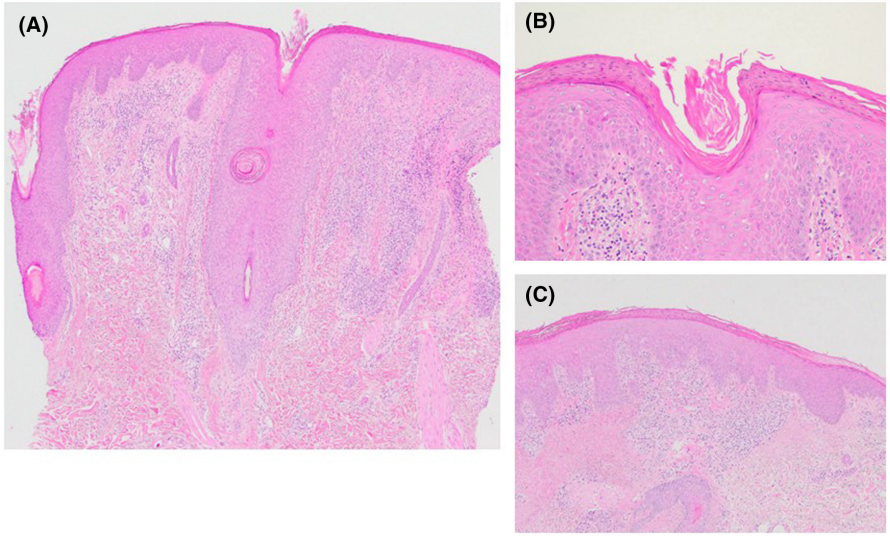

FIGURE 2 (A) Initial pathological findings on the forehead area. The epidermis showed psoriasiform hyperplasia, and the horn had parakeratotic foci in the orthokeratosis. Inflammatory cell infiltration from the basal layer of the epidermis to the dermis was mainly composed of lymphocytes. (H&E stain 40). (B) Keratin plug in follicular structures (H&E stain 200). (C) Orthokeratosis with parakeratosis (H&E stain 40).

orthokeratosis (Figure 2C). Inflammatory cell infiltration from the basal layer of the epidermis to the dermis mainly comprised lymphocytes (Figure 2A). Clinical and pathological findings indicated the presence of PRP.

After administration of oral cyclosporine (100 mg/day), the skin rash markedly improved within 1 week. After the dose was reduced to 50 mg/day, the patient showed signs of relapse owing to the adverse effects of hypertension.

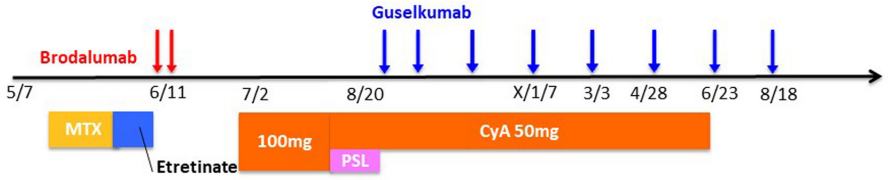

FIGURE 3 Course of treatment. The patient was treated with MTX, etretinate, and brodalumab, but his skin rash did not improve. Cyclosporine 100 mg was initiated and the skin rash improved, but the dose was reduced to 50 mg due to decreased renal function. Subsequently, the skin rash flared up again, and the patient was treated with guselkumab, which resolved the skin rash.

As treatment with methotrexate, etretinate, and brodalumab was ineffective, we decided to administer guselkumab. Before commencing guselkumab, screening was performed, including general blood samples; urinalysis; tests for hepatitis B virus, hepatitis C virus, HIV, HTLV-1, KL-6, antinuclear antibodies, and beta-D glucan; T-SPOT; and chest radiography. No abnormalities were found. We initiated treatment with guselkumab 100 mg/8 weeks (initially 100 mg/4 weeks). Improvement in symptoms with PRP was observed at approximately 12 weeks without any adverse effects. The skin rash remained in complete remission at 9 months (Figure 1F–H). 1 year after initiation of guselkumab, cyclosporine was discontinued, and the skin rash remained well controlled.

3 | DISCUSSION

PRP is difficult to diagnose owing to its diverse skin manifestations, and pathogenesis and treatment methods have not yet been established. In this case, we encountered an intractable case of PRP. Our patient achieved effective therapy after various treatment courses (Figure 3). A previous review article of 100 cases reported that only 26% of cases were diagnosed initially. Among these, 32% of cases were diagnosed as psoriasis and 14% as eczema or seborrheic dermatitis.[3] In the current case, the initial lesions were erythematous with desquamation and partly erythroderma-like, and the patient was diagnosed with and treated for atopic dermatitis. As the patient had been treated with steroids, there was no typical skin rash at the first visit to our hospital, and we had difficulty differentiating this case from psoriasis. Based on the appearance of pore-matched erythematous papules on his trunk, orange-red keratotic proliferation, and deep palm fissures during the course of treatment combined with the pathological findings, a definitive diagnosis of PRP was made. We assumed the disease to be type 1 as the patient presented with an erythroderma-like lesion under previous palmar conditions.

Biological therapy, including secukinumab,[4,5] has been used to treat PRP. Ustekinumab has also been administered to patients who failed to respond to secukinumab injection.[6] In our case, after activity was controlled with cyclosporine, the IL-23p19 inhibitor guselkumab achieved efficacy. Our results and previous reports suggest that IL-23p19 immune mechanisms may be involved in PRP pathogenesis. It has been proposed that guselkumab converts Th17 cells into regulatory T cells (Tregs).[7] Therefore, immune balance modification by Tregs may suppress excessive PRP immune responses.

4 | CONCLUSION

PRP is difficult to diagnose and treat. We propose a novel therapy using cyclosporine and guselkumab for intractable PRP.

AUTHOR CONTRIBUTIONS

Mai Nishimura and Makoto Kondo examined and treated the patient. Mai Nishimura, Makoto Kondo, Koji Habe, Akinobu Hayashi, and Keiichi Yamanaka drafted, reviewed, and edited the manuscript.

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None.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

All data that support the findings of this study are included in this article.

ETHICAL APPROVAL

Ethics approval was not required for this study based on local and national guidelines.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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