Case Report
Olgu Sunumu

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A case of concomitant hidradenitis suppurativa and psoriasis successfully treated with guselkumab in a patient with Down syndrome

Down sendromlu hastada guselkumab ile başarılı bir şekilde tedavi edilen eşzamanlı hidradenitis süpürativa ve psoriasis olgusu

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Abstract

In this case report, we present a 29-year-old patient with Down syndrome (DS) who manifested both psoriasis and hidradenitis suppurativa (HS) concurrently. The utilization of guselkumab, an interleukin 23 p19 subunit inhibitor that is approved for moderate to severe psoriasis vulgaris, resulted in significant improvement in symptoms for both conditions following the initial administration. The patient achieved a psoriasis area and severity index 90 response with significant amelioration of psoriatic plaques. Simultaneously, more than 50% improvement in abscess and inflammatory nodules secondary to HS was observed 4 weeks after the start of guselkumab therapy, resulting in a HiSCR score achievement. Throughout the 52-week follow-up, there were no observed exacerbations of symptoms or adverse effects. This case highlights the potential benefit of guselkumab in the simultaneous treatment of HS and psoriasis, and suggests that guselkumab is an effective and safe biologic agent of choice in individuals with DS, where the prevalence of both these diseases is increased, and treatment adherence may pose additional challenges compared to the normal population.
Keywords: Guselkumab, psoriasis, hidradenitis suppurativa, Down syndrome

Öz

Bu olgu raporunda, eş zamanlı hidradenitis süpürativa (HS) ve psoriazis birlikteliği olan Down sendromlu (DS) 29 yaşındaki bir hasta sunulmaktadır. Orta ila şiddetli psoriazis vulgaris tedavisi için onayı olan interlökin 23 p19 subünit inhibitörü guselkumabın ilk uygulamasını takiben, her iki durumdaki semptomlarda önemli bir iyileşme gözlendi. Hastanın psoriatik plaklarında düzelme gözlenip psoriazis alan ve şiddet indeksi 90 yanıtına ulaşılırken eş zamanlı olarak, guselkumab tedavisinin başlamasından 4 hafta sonra HS'ye sekonder apse ve enflamatuvar nodüllerde %50'den fazla iyileşme gözlendi ve HiSCR skoru elde edildi. Elli iki haftalık takip süresi boyunca semptomlarda alevlenme gözlenmedi ve herhangi bir yan etkiye rastlanmadı. Bu olgu, guselkumabın HS ve psoriazisin eş zamanlı tedavisindeki potansiyel faydasını vurgulamakta ve guselkumabın, her iki hastalığın insidansının daha yüksek olduğu ve tedaviye uyumun normal popülasyona göre daha zor olabileceği DS'li bireylerde tercih edilebilecek etkili ve güvenli bir biyolojik ajan olabileceğini düşündürmektedir.
Anahtar Kelimeler: Guselkumab, hidradenitis süpürativa, psoriasis, Down sendromu

Introduction

Down syndrome (DS) or trisomy 21 is one of the most common genomic disorders that exhibits a variety of clinical features, including intellectual disability and specific phenotypic features such as short stature, brachydactyly, small mouth and ears, flat nose ridge as well as other systemic problems[1]. DS also affects the skin and leads to several dermatologic manifestations. In a study examining dermatological disorders in individuals with DS, it was found that the prevalence of diseases associated with keratinocyte

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proliferation, such as psoriasis and other follicular disorders, including folliculitis and hidradenitis suppurativa (HS) is higher when compared to the normal population[2]. Increased amyloid precursor proteins (APP) in DS stimulate keratinocyte adhesion and proliferation, which may cause a tendency to keratinocyte proliferation and follicular occlusion[3]. It has been shown that tumour necrosis factor alpha (TNF-α) and T-helper 17 pathways [interleukin-17 (IL-17)/IL-23] play a role in the pathogenesis of both HS and psoriasis, which are both chronic inflammatory skin diseases[4]. For this reason, there are biological agents with common indications for the treatment of both conditions. Guselkumab, which is an inhibitor of the IL-23 p19 subunit, has been approved by U.S Food and Drug Administration (FDA) since February 2019 for the treatment of moderate-to-severe plaque psoriasis. Despite ongoing phase studies, there is currently no approval for the indication of use in HS. Here, we present a case of concomitant psoriasis and HS in a patient with DS in which both of the diseases were managed successfully after guselkumab treatment.

Case Report

A 29-year-old male patient with DS, diagnosed with HS for 12 years and psoriasis for 16 years, has presented to our clinic because of the uncontrolled management of both conditions. Upon reviewing the patient's medical history, it was found that he had only been diagnosed with epilepsy, and congenital hypothyroidism and was suffering from frequent lower respiratory tract infections. For epilepsy, he was using quetiapine and valproic acid daily. The patient was severely obese, with a body mass index of 35.

Physical examination revealed erythematous thick scaly plaques on the dorsum of both hands and feet, on the back, on the knees, elbows, and anterior legs [psoriasis area and severity index (PASI): 10]. Pitting, onycholysis, and subungual hyperkeratosis were present in multiple fingernails and toenails. The patient had multiple abscesses, atrophic scarring, and postinflammatory hyperpigmentation bilaterally in the axilla, abdominal region, pubis, and intergluteal regions, accompanied by sinus tracts (hurley stage 2) (Figure 1A-C).

The patient had a history of using topical corticosteroids for psoriasis and oral doxycycline and topical antibiotics for HS. Since there was no response to treatment for both diseases, acitretin, which is indicated in both psoriasis and HS was initiated at a dose of 25 mg/day in June 2021. After 2 months of use, the patient was unable to tolerate acitretin due to xerosis, could not comply with the treatment, and left it uncontrolled. On follow-up, it was observed that the patient's complaints persisted. Consequently, guselkumab treatment (100 mg subcutaneously on week 0, week 4, and every 8 weeks thereafter) was planned for the patient in May 2022. On the week 4 follow-up, it was recorded that there was a significant improvement in the clinical symptoms of the patient after the first injection.

The patient, whose PASI score was calculated as 1 (PASI90 was reached) had a more than 50% improvement in abscess and inflammatory nodules secondary to HS (HiSCR score was reached) (Figure 2A-C, Figure 3A, B). At 52 weeks, the patient is followed-up, and psoriasis and HS lesions are remitted, continuing with guselkumab treatment, and no adverse effects were observed. Informed consent was obtained from the patient.

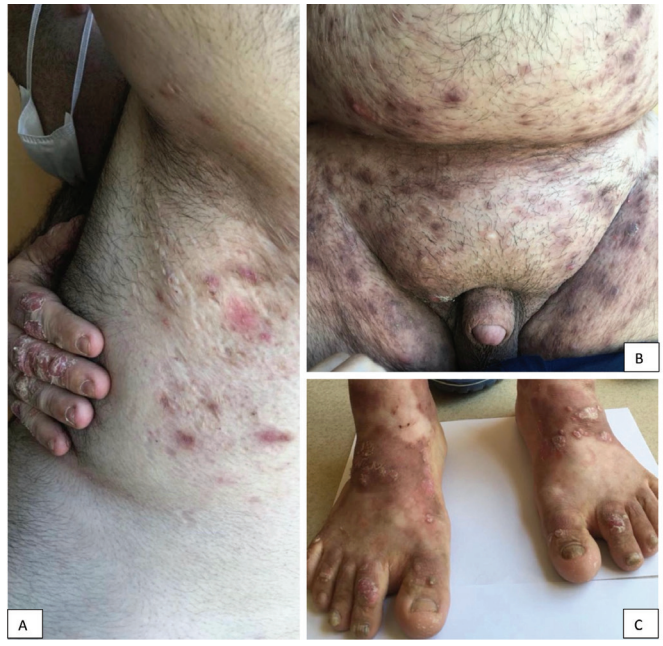

Figure 1. (A-C) Psoriatic and HS lesions of the patient prior to guselkumab treatment; multiple erythematous scaly plaques on the dorsum of the left hand and bilateral feet, subungual hyperkeratosis, yellow-brown discoloration on multiple toenails, multiple erythematous nodules, abscesses on axilla, pubis, abdomen and bilateral inguinal folds with multiple hyperpigmented and atrophic postinflammatory scars and few sinus tracts
HS: Hidradenitis suppurativa

Discussion

It has been shown that the incidence of psoriasis and HS is higher in patients with DS compared to the normal population. In psoriasis, the leading cause for this susceptibility may be related to the dominance of TH1 cells in individuals with DS and, consequently elevated serum interferon-gamma (IFN-γ) levels. Furthermore, the presence of an additional chromosome 21 may also enhance the sensitivity of IFN-γ, potentially contributing to the induction of psoriasis in this particular population of individuals[5].

Although a similar pathomechanism for HS is yet to be clarified in patients with DS, it is thought that the reason for the high incidence of HS is the likelihood of accumulation of APP. It has been suggested that individuals with DS may exhibit an elevated level of APP expression, given that the gene encoding APP is situated on chromosome 21, according to the "gene dosage hypothesis". APP, along with one of its cleavage products, secretory N-terminal ectodomain of APP, has a major impact on keratinocyte adhesion, migration, and proliferation. As a result, it is likely that patients with DS are more prone to keratinocyte hyperproliferation, which could lead to the development of follicular occlusion-a characteristic histopathological feature of HS[6].

Additionally, it can also be suggested that the higher prevalence of obesity in individuals with DS may be associated with the higher incidence of psoriasis and HS in this population, given that obesity is already established as a risk factor for both diseases[7].

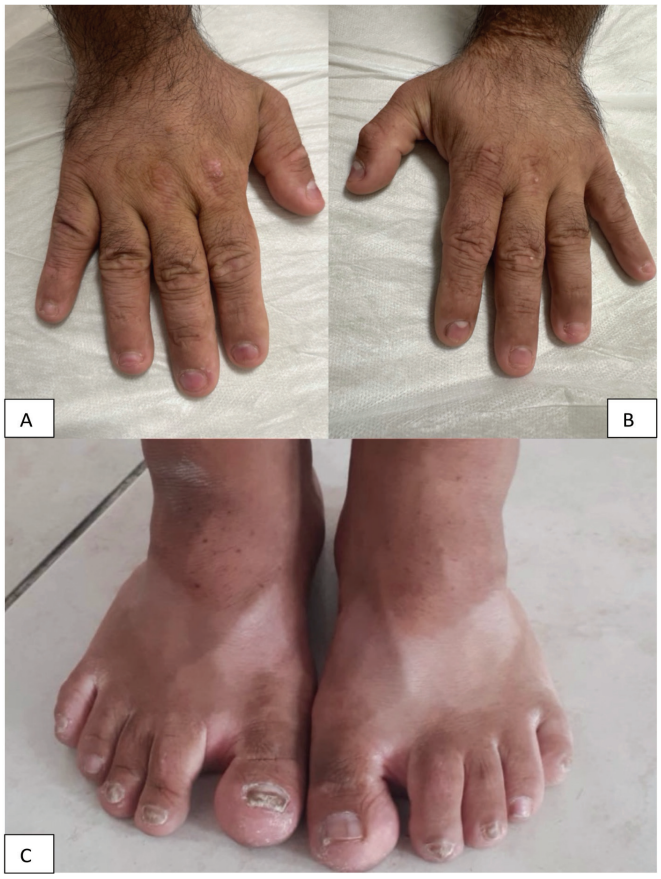

Figure 2. (A-C) Enhancement of psoriatic lesions observed at the 52-week follow-up on guselkumab treatment

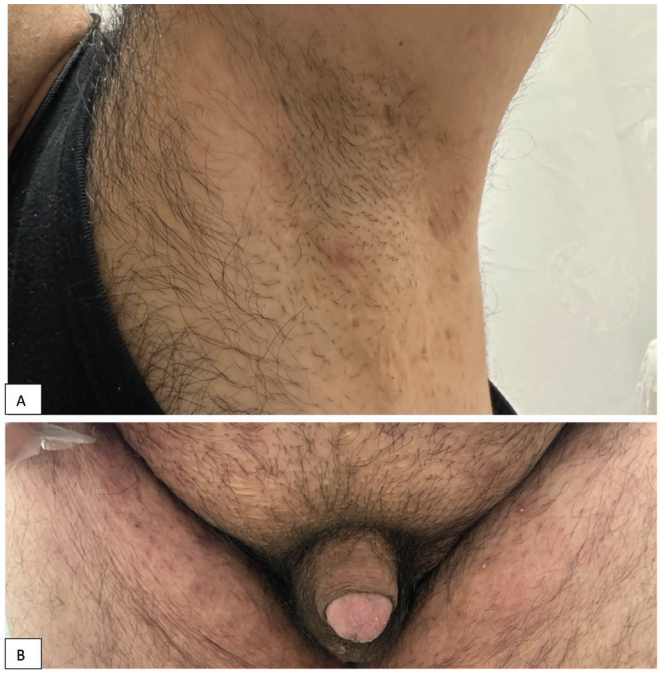

Figure 3. (A, B) Enhancement of HS lesions observed at the 52-week follow-up on guselkumab treatment
HS: Hidradenitis suppurativa

Although they differ in clinical manifestations, both psoriasis and HS share common inflammatory mediators such as TNF-α, IL-17, and IL-23 that play a role in pathogenesis. Therefore, the selective inhibition of these particular cytokines in the treatment of both diseases will most likely involve the use of common monoclonal antibodies. Previously, the TNF-α inhibitor adalimumab was the exclusive biologic agent approved by the FDA for both psoriasis and HS. However, in October 2023, the FDA approved the use of the IL-17A inhibitor secukinumab, which is initially intended for psoriasis, in the treatment of HS[8]. In an open-label clinical trial with secukinumab, a HiSCR response was observed in two-thirds of the patients. Additionally, the utilization of another IL-17A inhibitor, ixekizumab, in HS has been documented in case reports and series, revealing variable outcomes[9,10].

Based on our patient's history of frequent lower respiratory tract infections and the increased risk of hematologic malignancy in individuals with DS, adalimumab was not the preferred treatment option due to the higher likelihood of immunosuppressive side effects. Additionally, IL-17 inhibitors were not favorable because of the need for more frequent injections and possible incompatibility with our patient.

IL-23 is a heterodimeric cytokine containing a p40 and a p19 subunit, which is involved in the pathogenesis of both psoriasis and HS by causing Th17 differentiation. In both diseases, the primary sources of IL-23 are monocytes and dendritic cells. It acts by activating the Th17 lineage, leading to the proliferation of Th17 cells and secretion of proinflammatory cytokines such as IL-17, IL-22, and IL-1β. Additionally, IL-23 also serves as a robust activator of keratinocyte proliferation, which leads to further keratinocyte proliferation and proinflammatory cytokine release, contributing to the development of both diseases.

Guselkumab is a monoclonal antibody that acts by binding to the p19 subunit of IL-23. Currently, the FDA has only approved the use of guselkumab for the treatment of psoriasis and psoriatic arthritis. In the literature, there is a limited amount of data regarding the efficacy and the posology of guselkumab in the treatment of HS. In a phase II open-label study with 20 HS patients, guselkumab at a dose of 200 mg/4 weeks was used subcutaneously, and it was shown that 65% of the patients reached HiSCR at the 16th week while another larger placebo-controlled phase trial published in June 2021 revealed lower percentage of HiSCR achievement[11].

In a case series of 3 patients, one of which was accompanied by psoriasis, treatment of HS patients with guselkumab at the psoriasis dosage led to a significant improvement in the International Hidradenitis Suppurativa Severity Score System and Dermatology Life Quality Index in all patients[12].

A case report in the literature describes a patient with coexisting psoriasis, HS, and Crohn's disease with known resistance to multiple biological agents, including infliximab, adalimumab, secukinumab, and ustekinumab who achieved remission in all three conditions with the use of guselkumab[13]. Likewise, in another reported case of concomitant HS and Crohn's disease, the combination of guselkumab and apremilast has demonstrated improvement in both diseases[14]. Finally, Burzi et al.[15] reported a patient using adalimumab for HS who then developed psoriasis lesions and switched to guselkumab (at psoriasis dosage). After 16 weeks of guselkumab treatment, there was a significant improvement in both HS and psoriasis lesions[15].

In our DS patient with coexistent psoriasis and HS, we observed that administration of guselkumab at the psoriasis dosage regimen significantly improved the clinical symptoms of HS after the initial injection, and on follow-up, the patient was still kept at remission through the 52 weeks.

Clinicians should remember that HS and psoriasis share common features in their pathogenesis, and it should be noted that patients with DS are more likely to suffer from both diseases. We also want to highlight that in such patient groups where adherence to treatment is difficult, guselkumab may be a good option for severe cases where biologic agent treatments are indicated due to the lower number of injections per year. To our knowledge, there is currently no existing literature documenting the use of guselkumab for the treatment of both psoriasis and HS in a DS patient, which makes our case unique. It should be noted that guselkumab may be an effective and safe treatment agent for HS in the future, especially in cases accompanied by psoriasis. However, large-scale studies are still required to demonstrate its effectiveness and determine the appropriate dose regimen for HS.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Authorship Contributions

Surgical and Medical Practices: S.Ü., T.Y., Concept: S.Ü., T.Y., Design: S.Ü., T.Y., Data Collection or Processing: S.Ü., T.Y., Analysis or Interpretation: S.Ü., T.Y., Literature Search: S.Ü., T.Y., Writing: S.Ü., T.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

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