



A case of herpes zoster developing after COVID-19 vaccine and recurring after COVID-19 infection in the same dermatome

COVID-19 aşısı ve COVID-19 enfeksiyonu sonrası aynı dermatomda zona gelişen bir olgu

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Abstract

Coronavirus disease-2019 (COVID-19) is an ongoing infectious respiratory disease recognized worldwide as a pandemic, and it can affect many organs and systems, including the skin. Various cutaneous manifestations, including reactivation of varicella-zoster virus related to COVID-19 and COVID-19 vaccination have been reported. We would like to present a 46-year-old female, who developed herpes zoster (HZ) in the right C3 dermatome after m-RNA COVID-19 vaccine and was admitted to our clinic with recurrent HZ in the same dermatome following COVID-19 infection, two months after the vaccination.

Keywords: COVID-19, COVID-19 vaccine, herpes zoster

Öz

Koronavirüs hastalığı-2019 (COVID-19), dünya çapında pandemik acil durum kabul edilmiş bulaşıcı bir solunum yolu hastalığıdır. Varisella zoster virüs reaktivasyonu dahil olmak üzere, hem COVID-19'a hem de COVID-19 aşısına bağlı çeşitli deri bulguları bildirilmiştir. Bu yazıda, m-RNA COVID-19 aşısı sonrası sağ C3 dermatomda herpes zoster (HZ) gelişen, aşıdan 2 ay sonra geçirdiği COVID-19'u takiben aynı dermatomal bölgede herpes zoster rekürrensi görülen 46 yaşında bir kadın hastayı sunmak istiyoruz.

Anahtar Kelimeler: COVID-19, COVID-19 aşısı, herpes zoster

Introduction

Coronavirus disease-2019 (COVID-19) is an infectious respiratory disease caused by severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) that emerged in Wuhan, China in late 2019¹. COVID-19, which spread rapidly around the world, mainly transmitted from person to person through droplets, was recognized as a pandemic emergency by the World Health Organization in March 2020². The primary site of infection is the lungs, but it can also affect

many organs and systems, including the skin. It has been reported that maculopapular, urticarial, and varicelliform lesions, erythema multiforme, livedo reticularis, and pernio-like lesions may develop during infection. In addition, numerous cases of herpes zoster (HZ) have been reported during the infection³⁻⁵. In December 2020, the COVID-19 vaccination programme was started by governments all over the world. The main vaccines for COVID-19 are DNA/RNA based vaccines, non-replicating viral vector vaccines, and inactivated vaccines⁶. In Türkiye, the vaccination programme

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with an mRNA-based vaccine, BNT162b2 (Biontech vaccine), was started in April 2021⁷. The most common skin reactions after mRNA-based vaccines are local injection site reactions, urticarial and morbilliform eruptions. However, cases of HZ after these vaccines have also been reported⁸. In this report, we would like to present a case that developed HZ in the same dermatome after both m-RNA COVID-19 vaccine and COVID-19 infection.

Case Report

A 46-year-old female patient was admitted to our outpatient clinic with a complaint of a painful rash on the right side of her neck of two days' duration. She had multiple sclerosis for 20 years and had been on natalizumab therapy for the last two years. She had received the second dose of Biontech vaccine two weeks before the rash. On dermatological examination, we noticed grouped papules and vesicles on an erythematous ground on the right side of the neck in C3 dermatomal area, expanding from the neck to the ear (Figure 1). The patient was diagnosed as HZ with these clinical findings, and systemic brivudine treatment was prescribed. After completing seven days of brivudine treatment, the patient's symptoms and lesions were resolved. Two months later, the patient was admitted to our department due to similar painful rashes on the right side of her neck for a duration of 10 days. Dermatological examination revealed grouped erythematous papules and vesicles in the same localization at C3 dermatome. The patient was diagnosed with recurrent HZ with the existing clinical findings. In the detailed questioning, it was learned that she was diagnosed with COVID-19 two weeks before the onset of the lesions. Her symptoms started while she was in quarantine during her COVID-19 infection. The patient thought she had HZ again and had started systemic brivudine treatment by herself. However, this time, the



Figure 1. Grouped papules and vesicles on the erythematous ground on the right side of the neck

disease did not regress. Her complaints were resolved after one week of systemic valacyclovir treatment. Informed consent was obtained.

Discussion

HZ is an acute dermatomal viral infection that occurs because of reactivation of the varicella zoster virus (VZV), remains latently in the dorsal root or cranial nerve ganglia throughout life, and caused by impairment of immunity, aging, or stressful events⁹. It is characterized by usually painful and/or itchy grouped vesicles, superficial ulcers, and crusts on an erythematous background with unilateral, dermatomal distribution. The disease usually regresses within 7-10 days, but in rare cases, cutaneous dissemination, encephalomyelitis, and pneumonia may develop in immunocompromised patients¹⁰. Recurrence rates of HZ have been reported ranging from 0,4-6,41% in the literature¹¹⁻¹⁵. Immunosuppressive status, concurrent chronic diseases, such as diabetes mellitus, hypertension, dyslipidemia, chronic obstructive lung disease, depression, older age, and female gender, are the risk factors suggested to play a role in HZ recurrence¹³⁻¹⁵.

Decrease of VZV-specific CD4 memory cells and attenuation of VZV-specific T-cell mediated immunity responsible for HZ recurrence¹³. In the literature, several cases of HZ following COVID-19 and COVID-19 vaccination have been reported¹⁶⁻²². However, there is no evidence to suggest that the frequency of HZ is increasing after COVID-19 or COVID-19 vaccination. The causal relationship between HZ and COVID-19 has not been proven^{16,17,20}.

It has been suggested that VZV reactivation during COVID-19 might be due to lymphopenia and T-cell dysfunction^{16,17}. In a review, it was reported that most cases developing HZ after COVID-19 had a mild course, usually had a typical clinical appearance involving a single dermatome, and had developed within two weeks after the diagnosis of COVID-19¹⁷. Another review reported that HZ developed on average 17 days after COVID-19 infection; however, in a few cases it developed simultaneously with the symptoms of COVID-19 or a few days before the onset of symptoms. Lesions were most frequently observed in the trigeminal nerve distribution (41.3%)⁵.

VZV reactivation after COVID-19 vaccination has been reported in case reports, and it has been reported following influenza, hepatitis A, and rabies vaccination¹⁸⁻²². Although the underlying mechanism of VZV reactivation after vaccination is not known, it is believed that post-vaccine immune dysregulation or transient lymphopenia may play a role^{19,20}. In a review that included 91 cases of HZ after COVID-19 vaccines, 68.13% of cases emerged following the mRNA vaccine. The majority of patients developed symptoms after the first dose (58%), the lesions appeared an average of 5.8 days after the vaccination and occurred mostly in T4 dermatome²¹. In another review that analyzed 52 cases, only one case developed after inactivated vaccination and the remaining 51 cases after mRNA vaccine. Similarly, most cases developed after the first dose (67%), and symptoms appeared 1-26 days after vaccination²².

In our case, we observed recurrent HZ in the same dermatome; first attack was after the COVID-19 mRNA vaccine and the second attack was following the COVID-19 two months later. In a study evaluating 16,784 HZ cases, recurrent HZ developed in 1076 patients (6.41%), and in 16.3% of these patients, the same dermatome was involved¹¹. Three patients diagnosed with HZ, who have been receiving cyclosporine

for chronic idiopathic urticaria, were reported with the diagnosis of recurrent HZ after COVID-19 vaccine²³. To the best of our knowledge, this is the first report of HZ where the first episode was triggered by COVID-19 vaccination, and recurrence occurred following COVID-19 infection.

Our patient had been receiving natalizumab for two years. Natalizumab is a monoclonal antibody developed against the alpha chain of VLA-4 integrin (CD49d). It shows its effect by inhibiting cell migration to tissues such as the central nervous system²⁴. In the literature, only three cases of HZ have been reported during the use of natalizumab. In the first case, after the fourth month of natalizumab usage, HZ developed in the cervical region and it led to the discontinuation of the drug. Case two developed severe intercostal HZ in the seventh month of therapy, and natalizumab treatment was stopped. Last, after the 28th month, case three presented intercostal HZ; however, the drug was continued. The authors argued that HZ occurring in these patients might be related to immunosuppression of the nervous system due to natalizumab²⁵. Our patient had been using natalizumab for two years with no VZV reactivation. She had HZ two weeks after the COVID-19 vaccination and 5 days following the COVID-19 infection. Therefore, we attributed the HZ occurrences to COVID-19 and COVID-19 vaccination. Although many cases of VZV reactivation were reported after COVID-19 and COVID-19 vaccination, the relationship between HZ and COVID-19 has not been proven. In our case, the development of HZ in the same dermatome both after the COVID-19 vaccine and COVID-19 supported this relationship. New studies are needed to clarify this issue and to verify the relationship.

Ethics

Informed Consent: It was obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: S.K., I.D.O., B.A., Concept: S.K., Design: S.K., Data Collection or Processing: S.K., Literature Search: S.K., I.D.O., Writing: S.K., I.D.O.

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