

## A Case Report of Herpes Zoster Infection Manifested as Pricking Chest Pain Followed by Postherpetic Neuralgia in a Patient Recovered with COVID-19

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### Abstract

**Background:** COVID-19 infection affects Respiratory system as well as other organs such as the skin. Herein, we report a case of varicella zoster virus (VZV) reactivation in a patient who had recovered from COVID-19 infection and had also been vaccinated against COVID-19.

**Case Description:** After the 18th day of COVID-19 recovery, the 37-year-old patient began to have right-sided chest pain on and off. One week before to the COVID-19 attack, one dose of COVISHIELD was given. The patient was advised to undergo an electrocardiogram (ECG) and a postero-anterior chest x-ray (CXR-PA). The ECG revealed sinus tachycardia and did not show the hallmark characters for myocardial infarction (MI) such as ST segment elevation and ST segment depression. The CXR-PA was normal. He approached with a major complaint of severe blisters over his right chest after three days. However, there have been no reports of burning or itching. Herpes zoster (HZ) was confirmed when erythematous grouped vesicles corresponding to the right-sided T3 dermatome was discovered during an examination. For two months after finishing herpes zoster therapy, the patient suffered from post-herpetic neuralgia.

**Conclusion:** It is difficult to confirm if the COVID-19 infection or COVID-19 immunization increases the risk of HZ based on current information, which is restricted to case reports and case series. More research is needed to determine the precise mechanism of HZ after COVID-19 recovery and vaccines. During the pandemic, practitioners should be aware of the potential elevated risk of HZ and consider timely treatment and preventive actions.

**Keywords:** Herpes Zoster; Post-Herpetic Neuralgia; COVID-19; Vaccination

### Introduction

Corona virus disease (COVID-19) is a newly emerged multisystemic disease which may present with a wide spectrum of cutaneous manifestations. Emerging evidence suggests that it affects multiple organs with myriad clinical signs and symptoms. Preliminary evidence suggests that the virus also affects skin, nails, and mucus membranes, causing various dermatological manifestations [1].

In attempt to prevent both COVID-19 and viral transmission, DNA-based/RNA-based vaccines, non-replicating viral vector vaccines, and inactivated vaccines have been developed recently [2]. Herein, we report a case along with review of literature of varicella zoster virus (VZV) reactivation in a patient who was recovered from COVID-19 infection and also vaccinated against COVID-19.

## Case Presentation

A 37-year-old Indian male patient with a major complaint of right sided chest pain that had been on and off with no cutaneous reaction for the previous week and no complaint of shortness of breath, fever, cough, cold and no comorbidities. Patient had a history of varicella-zoster virus infection at the age of ten. The patient medication history revealed that he had taken Tizanidine and Aceclofenac for 5 days. The patient had recently been diagnosed with COVID-19 after a nasal swab reverse transcription-polymerase chain reaction (RT-PCR). He recovered following two weeks of treatment with a home-based regimen of doxycycline, apixaban, methylprednisolone, Acebrophylline with Acetylcysteine, Montelukast with levocetirizine, pantoprazole, zinc sulfate, and vitamin C, as well as other supportive medication. One dose of COVISHIELD was administered one week before the COVID-19 attack. The patient experienced right sided chest pain on and off after the 18<sup>th</sup> day of COVID-19 recovery.

## Result

The patient was advised to undergo an ECG and a posteroanterior chest x-ray (CXR-PA). The ECG revealed sinus tachycardia and did not showed the hallmark characters for myocardial infarction such as ST segment elevation and ST segment depression and also the patient did not experienced any clinical symptoms of MI. The CXR-PA was normal. Etoricoxib tablets were prescribed for three days. He approached with a major complaint of severe blisters over his right chest after three days. However, there have been no reports of burning or itching. Erythematous clustered vesicles corresponding to the right-sided T3 dermatome were seen on examination (Figure 1). Physical examination was normal, confirming a diagnosis of herpes zoster (HZ). The patient was given acyclovir five times a day orally for a week, as well as amitriptyline once a day at night and fusidic acid cream for 15 days. At the completion of course, patient healed from HZ and developed Postherpetic neuralgia at the end of the course.



**Figure 1:** Erythematous clustered vesicles in right-sided T3 dermatome.

## Discussion

Table 1 represents the studies reported for HZ following either COVID-19 infected or vaccinated. Evidences suggest that COVID-19 affects respiratory system and also affect other organs such as skin. A wide range of dermatological signs and symptoms manifested like urticarial rash, maculopapular eruptions, chickenpox like lesions, morbilliform rashes, livedo reticularis, COVID-19 toes, pityriasis rosea, erythema multiforme, and several others [1].

Authors	Type of study	Sample size	Time duration between COVID-19 end and HZ reaction starts	Site of HZ	Drugs to manage COVID-19	Drugs to manage HZ	Vaccination details	Time duration between vaccination and HZ reaction starts	Major findings
Oliver Voisin., <i>et al.</i> [5], 2021 (France)	Case Report	1	8 days	Palms of the hands and soles of the feet	Off label Anakinra	Symptomatic treatment was instituted with local disinfection of the lesions. Clinical improvement occurred spontaneously within 8 days.	Not Vaccinated	Nil	This is the first case of diffuse vesicular rash postCOVID-19 with positive Varicella Zoster Virus (VZV) PCR. This highlights the need for increased vigilance.
Hardik D. Desai [1] 2021 (India)	Case Report	1	20 days	Right lower abdomen	Hydroxyl-chloroquine, azithromycin, amoxicillin with clavulanic acid, and zinc sulfate with other supportive treatment	Acyclovir Oral, Acyclovir Topical, Pregabalin and Amitriptyline	Not Vaccinated	Nil	This is the first case of VZV reactivation after 20 days following recovery from COVID-19.
Victoria Furer [6] 2021 (Israel)	Case series	590 in which 6 cases of HZ found	Not affected with COVID-19	Dermatone L5	-	Did not receive any treatment for HZ with a spontaneous resolution of symptoms within 3 weeks.	1st and 2nd dose of the BNT162b2 mRNA vaccine	3 days later after 1st dose	These cases raise awareness to a potential causal link between COVID-19 vaccination as a trigger of HZ reactivation in relatively young patients with stable AIIRD.
Victoria Furer [6] 2021 (Israel)				Ophthalmic division (V1) of the V cranial nerve	-	Acyclovir lubricant eye drops, and analgesics	1st dose of the BNT162b2 mRNA vaccine	4 days after 1st dose	
Victoria Furer [6] 2021 (Israel)				Low abdomen, inguinal area, upper thigh and buttock,	-	Valacyclovir	1st and 2nd dose of the BNT162b2 mRNA vaccine	2 days after 2nd dose	
Victoria Furer [6] 2021 (Israel)				T10 dermatome	-	Acyclovir for one week with a resolution of symptoms within 6 weeks.	1st and 2nd dose of the BNT162b2 mRNA vaccine	10 days after 1st dose	
Victoria Furer [6] 2021 (Israel)				Right breast	-	Acyclovir for one week with a consequent resolution of symptoms in 3 weeks	1st and 2nd dose of the BNT162b2 mRNA vaccine	14 days after 1st dose	
Victoria Furer [6] 2021 (Israel)				T6 dermatome	-	Valacyclovir for one week with a complete recovery within 10 days.	1st and 2nd dose of the BNT162b2 mRNA vaccine	14 days after 1st dose	

Javier Diez-Domingo., <i>et al.</i> [3] 2021 (Spain and Belgium)	Review article	27 HZ cases	Within a week=13 cases Within 10 weeks=10 cases Within a week of hospitalization for COVID-19=4	Lesions on the face, trunk, hips/buttocks or inguinal region.	Nil	Nil	Not Vaccinated	Nil	This case suggests possible biological basis for an increase in the risk of HZ in COVID-19 patients.
Mohamed L. Elsaie and Hesham A. Nada [7] 2020 (Egypt)	Case Report	1	Within a week of hospitalization	Upper left chest	Oseltamivir Azithromycin paracetamol and Vitamin C	Valaciclovir along with continuing his other COVID-19 prescribed protocol	Not Vaccinated	Nil	HZ could be an alarming sign or a complication of COVID-19 infection.
Edward Eid., <i>et al.</i> [8] 2021 (Lebanon)	Case Report	1	Not affected by COVID-19	Right thigh	-	Systemic antiviral treatment was initiated resulting in the resolution of the condition	1 <sup>st</sup> dose of COVID-19 vaccine	5 days after 1 <sup>st</sup> dose	The mass mRNA COVID-19 vaccination campaigns conducted on a global scale will inevitably lead to the emergence of a larger number of cases with HZ and will subsequently facilitate further research into the underlying patho-mechanism at play.
Pooja Arora., <i>et al.</i> [2] 2021 (India)	Case Report	1	Not affected by COVID-19	Right thigh	-	Oral valacyclovir along with topical fusidic acid for local application.	1 <sup>st</sup> dose of covaxin	4 days after 1 <sup>st</sup> dose	We feel such cases should be documented to assess the overall incidence of such effects and assuage the fear that is prevalent and leads to vaccine hesitancy.
Tessas., <i>et al.</i> [9] 2021 (Finland)	Case Report	1	Not affected by COVID-19	Left upper back	-	Oral valaciclovir	First dose of BNT162b2 mRNA COVID-19 vaccine	5 days after 1 <sup>st</sup> dose	It is likely that immune dysregulation created by the vaccine played a role in the reactivation of latent Varicella Zoster Virus infection.
Adrian Pona., <i>et al.</i> [10] 2020 (North Carolina)	Case Report	1	6 days	Left superior buttock	She was advised to self-quarantine and take acetaminophen for fever.	Gabapentin	Not Vaccinated	Nil	Although the association of HZ and COVID-19 is not well known, this study present a case suggesting HZ may be a complication of COVID-19.

Xueqin Cao., <i>et al.</i> [11] 2020 (UK)	Case Report	1	7 days	Right 10 to 12 lumbar dermatomes	Tacrolimus	Acyclovir Pregabalin and ibuprofen	Not Vaccinated	Nil	For COVID-19 patients with herpes zoster, antiviral treatment should be started as early as possible and last longer than a typical course. This report indicates that longer term outcomes of pain management in COVID-19 patients should be monitored in future studies.
H.-H. Chiu., <i>et al.</i> [12] 2021 (Taiwan)	Case series	1	Not affected by COVID-19	Left flank	-	Acyclovir	First dose of Moderna COVID-19 vaccine.	2 days after 1 <sup>st</sup> dose	There are increasing case reports about development of HZ following mRNA-based COVID-19 vaccine, and this is the first cases of HZ following adenovirus-based vaccine.
H.-H. Chiu., <i>et al.</i> [12] 2021 (Taiwan)		2		Left T11 dermatomes		Acyclovir	First dose of AZD1222 vaccine.	2 days After 1 <sup>st</sup> dose	
H.-H. Chiu., <i>et al.</i> [12] 2021 (Taiwan)		3		Right T10 dermatomes		Acyclovir	First dose of AZD1222 vaccine.	7 days after 1 <sup>st</sup> dose	
Saliha Buşra Aksu., <i>et al.</i> [13] 2021 (Turkey)	Case report	1	Not affected by COVID-19	Right mammary region and back corresponding to T3-T5 dermatomes	-	Valaciclovir	Second dose of COVID-19 vaccine	5 days after 2 <sup>nd</sup> dose	In order to examine possible relationships, epidemiological studies are needed to clarify the possible connection between vaccination and reactivation of herpes virus infections.

**Table 1:** Description of reports for HZ following either COVID-19 infected or vaccinated.

**Abbreviations:** COVID-19: Corona Virus Disease-19; HZ: Herpes Zoster; AIIRD: Autoimmune Inflammatory Rheumatic Disease; VZV: Varicella Zoster Virus; PCR: Polymerase Chain Reaction.

Our case is of a man who had Herpes zoster after 18<sup>th</sup> day of COVID-19 recovery which is in accordance with Hardik D. Desai study where herpes zoster affected after 20<sup>th</sup> day of COVID-19 recovery [1]. Reactivation of the latent varicella zoster virus (VZV) causes Herpes zoster (HZ) following decline in cell-mediated immunity, which occurs commonly in individuals with immunosuppressive diseases and/or treatment. COVID-19 infection has been associated with T cell immune dysfunction [3].

The patient was prescribed with methylprednisolone and montelukast for the management of COVID-19. These medicines might weaken the immune system and making it easier to get an another infection. This could be a possible reason for this patient to get HZ.

Postherpetic neuralgia is a debilitating complication of HZ. The risk of PHN after HZ increases with age. The pain results in large part from damage to the sensory nerves, causing neuropathic pain. The pain is often intermittent and not correlated with external stimuli. Paradoxically, areas of the skin that lack normal sensitivity to touch may be associated with increased pain. Light touch or the brush of clothing is sometimes perceived as being painful, a phenomenon called *allodynia*. It is not uncommon for the pain of PHN to interfere with sleep and recreational activities and to be associated with clinical depression [4].

There is herpes zoster infection occurred after post- COVID-19 recovery in the regions of Palms of the hands and soles of the feet, Left superior buttock and Right 10 to 12 lumbar dermatomes [5,10,11]. Herpes Zoster manifested as erythematous grouped vesicles corresponding to right-sided T3 dermatome after undertaking 1<sup>st</sup> dose of COVISHIELD, is similar to Victoria Furer study where HZ manifested as vesicular skin rash typical for HZ at the right breast after undertaking 1<sup>st</sup> dose of mRNA vaccine [6,12]. Our patient comes under adult category similar to that of Mohamed L. Elsaie., *et al.* and Tensas., *et al.* study whereas most of HZ reported cases comes under senior adult category [7,9].

One dose of COVISHIELD was administered one week before the COVID-19 attack recently, the inactivated COVID-19 vaccine has also been indicted in the rise of herpes zoster [8]. Only HZ occurred as a consequence with no other co-morbidities unlike Tensas., *et al.* study where along with HZ, Rowell's syndrome occurred after 24 hrs of vaccination [9]. Our patient was diagnosed with HZ after 18<sup>th</sup> day of COVID-19 recovery, also vaccinated with first dose of COVISHIELD whereas in Aksu SB., *et al.* study reveals that HZ was diagnosed after 5 days after 2<sup>nd</sup> dose of COVID-19 vaccine [13].

## Conclusion

To our knowledge, this is the first case of herpes zoster occurred as a consequence of either COVID-19 infection or vaccination as our patient undertook vaccination and suffered COVID-19 attack after a week and followed HZ after 18<sup>th</sup> day of recovery. There are hypotheses that how HZ occurs after COVID-19 recovery and vaccination in separate ways but it is controversial as both the factors are present here. The role of methylprednisolone and montelukast in causing HZ were also unclear. Further studies are needed to find the exact mechanism of HZ occurring after COVID-19 recovery and vaccinations.

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