

## Neutrophilic Pustular Eruption with Behcet's Like Illness Post Covid-19 Vaccination

### Abstract

The COVID-19 pandemic has deeply impacted the lives of many. In such unprecedented times, mass vaccination has been the cornerstone in decreasing morbidity and mortality. However, various adverse events (AEs) to COVID-19 vaccines including cutaneous AEs have been reported worldwide. We report a case of neutrophilic pustular eruption with a Behcet's disease-like illness following COVID-19 vaccination with no history of known allergies or prior severe acute respiratory syndrome *Coronavirus 2* (SARS-CoV-2) infection.

**Keywords:** COVID-19, COVID-19 vaccination, inflammatory dermatoses, neutrophilic dermatoses

**Anmol Bhargava,  
Vidya Kharkar,  
Sunanda Mahajan,  
Prachi Gole**

*Department of Dermatology,  
Seth G.S Medical College &  
K.E.M Hospital, Parel, Mumbai,  
Maharashtra, India*

### Introduction

The COVID-19 pandemic and its impact on global health have made the development of effective and safe vaccines crucial. So far, there are three main types of COVID-19 vaccines in use around the world: messenger RNA-based vaccines, adenoviral vector vaccines, and inactivated whole-virus vaccines. With the increase in the number of people receiving COVID-19 vaccines, multiple reports of cutaneous adverse events (AEs) to COVID-19 vaccines have emerged. Rare reactions to vaccines may be observed in the post-approval period, due to the larger number of people exposed, as compared with a clinical trial. We report a case of neutrophilic pustular eruption with a Behcet's disease-like illness following COVID-19 vaccination.

### Case Report

A 32-year-old male presented with multiple painful pus-filled lesions over the face and body with oral and genital ulcers, 5 days after his first dose of COVID-19 vaccination (Covishield™, ChAdOx1 nCoV-19 Corona Virus Vaccine [Recombinant], Serum Institute of India Pvt Ltd, Pune, India). The lesions were associated with fever, malaise, and photosensitivity. There was no history of joint pains, ocular symptoms, drug intake prior to the onset or COVID-19 infection

in the past. On examination, erythematous tender papulonodules and pustules were present over the face, scalp, bilateral extremities including palms and soles. Punched out painful ulcers were present on the lateral border of the tongue and root of the penis and scrotum [Figure 1]. Our provisional diagnoses were Behcet's disease, atypical varicella with secondary infection, erythema multiforme, and acne fulminans. COVID-19 reverse transcription-polymerase chain reaction (RT-PCR) was negative. Gram stain from pustule showed multiple neutrophils, and no organisms were grown on culture. Tzanck smear did not show multinucleate giant cells. Pathergy test was negative. Ophthalmologic examination was normal. Venereal disease research laboratory (VDRL), human immunodeficiency virus (HIV), hepatitis B surface antigen (HbsAg), and anti hepatitis C virus (HCV) antibodies were negative. Herpes simplex virus type 1 (HSV-1) IgG and IgM were negative. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were raised. All other baseline investigations were normal. Biopsy from pustule showed subcorneal neutrophilic pustules with dense intrafollicular, perifollicular, perivascular, and interstitial neutrophilic infiltrate in the superficial and deep dermis with RBC extravasation [Figure 2].

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Bhargava A, Kharkar V, Mahajan S, Gole P. Neutrophilic pustular eruption with Behcet's-like illness post-COVID-19 vaccination. *Indian Dermatol Online J* 2022;13:493-6.

**Received:** 15-Jan-2022. **Revised:** 18-Feb-2022.  
**Accepted:** 19-Feb-2022. **Published:** 24-Jun-2022.

### Address for correspondence:

*Dr. Anmol Bhargava,  
Department of Dermatology,  
Seth G.S Medical College  
& K.E.M hospital, Parel,  
Mumbai- 400 012, Maharashtra,  
India.  
E-mail: precious95anmol@  
gmail.com*

### Access this article online

**Website:** www.idoj.in

**DOI:** 10.4103/idoj.idoj\_29\_22

### Quick Response Code:





**Figure 1:** (a and b) Erythematous papulonodules and pustules over bilateral cheeks, nose, forehead, and chin. Deep dermal tenderness positive. (c) Erosions and ulcers present on the lateral border of the tongue. (d) and inset- Pustules on an erythematous base resolving with post-inflammatory hyperpigmentation seen over back. (e) Pustules near lateral border of the left palm. (f) Well defined ulcer with an erythematous floor at the root of the penis

Based on the above findings, a final diagnosis of neutrophilic pustular eruption post-COVID-19 vaccination was made. Dapsone 50 mg once daily was started along with intravenous (IV) antibiotics, analgesics, and hydration. Topically, dapsone 5% gel was applied over the right cheek and 1% clindamycin gel on the left cheek. Post-treatment, 80% of the lesions resolved within 10–12 days with complete resolution in 3 weeks [Figure 3]. Lesions on the right cheek responded better as compared to the left cheek. There were no recurrences during the follow-up period of 3 months.

## Discussion

There are three main types of COVID-19 vaccines in use around the world: messenger RNA-based vaccines, adenoviral vector vaccines, and inactivated whole-virus vaccines. With the increase in the number of people receiving COVID-19 vaccines, multiple reports of cutaneous AEs to COVID-19 vaccines have emerged. The largest series of 414 patients described local reactions as the commonest AEs. Delayed large local reactions were most common, followed by local injection site reactions, urticarial eruptions, and morbilliform eruptions. Additional less common reactions included pernio/chilblains, cosmetic

filler reactions, zoster, herpes simplex flares, and pityriasis rosea-like reactions.<sup>[1]</sup>

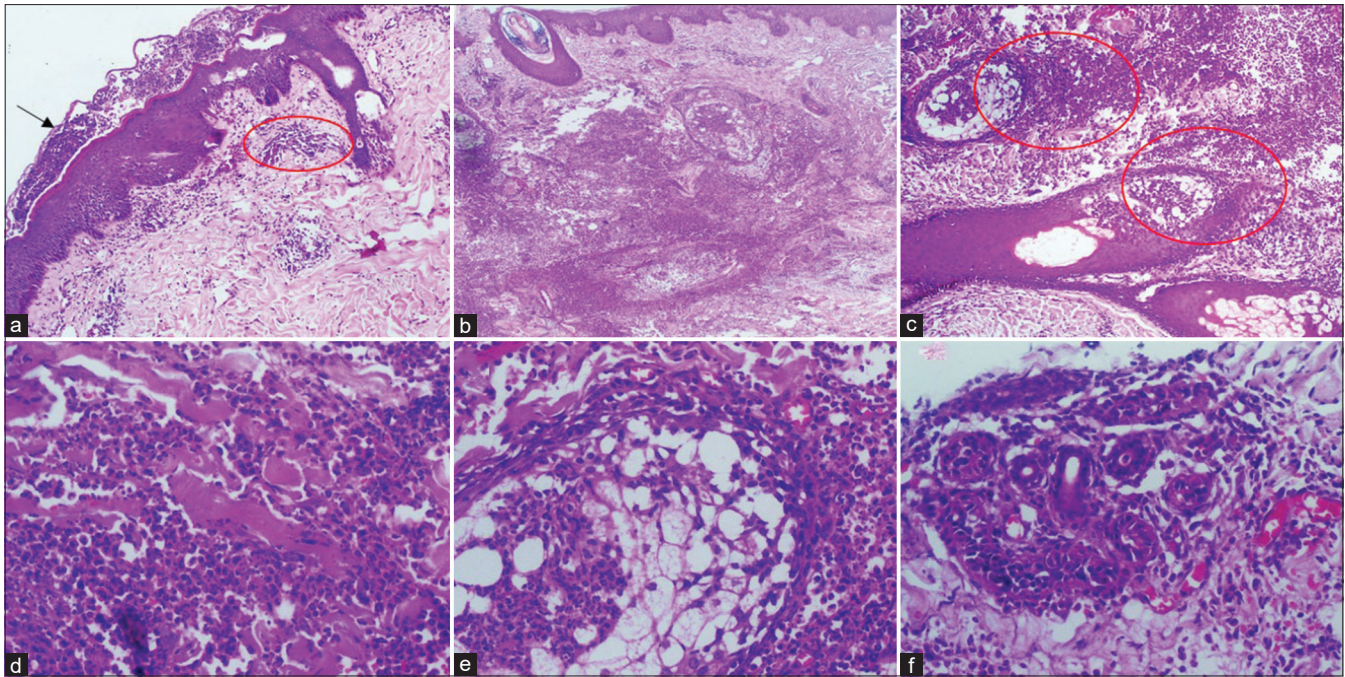
Neutrophilic dermatoses have been associated with several vaccines including pneumococcal, influenza, Bacillus Calmette-Guerin (BCG), and smallpox.<sup>[2]</sup>

An association of facial pustular neutrophilic eruption with mRNA-1273 SARS-CoV-2 vaccine has been reported,<sup>[3]</sup> although, unlike our case, the eruption was confined to the face, and there was no oral or genital mucosal involvement.

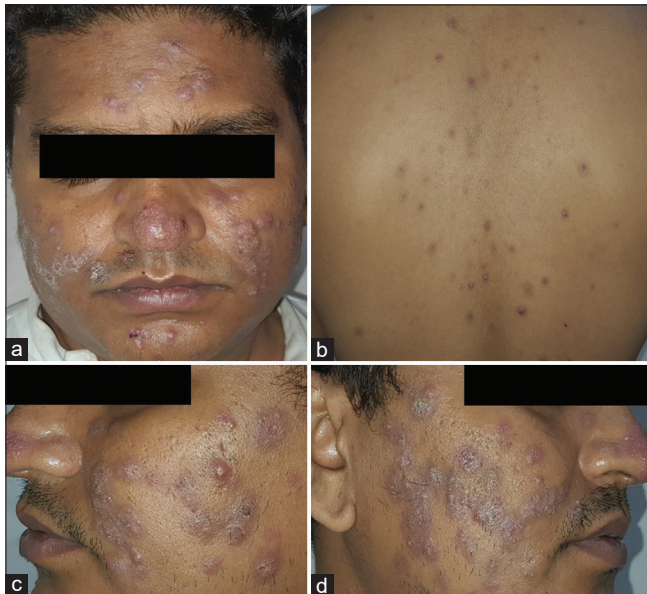
The eruption in our case showed a striking clinical resemblance to Behcet's disease with the presence of aphthous stomatitis, painful genital erosions involving the scrotum and root of the penis, acral and facial sterile acneiform papulopustules although there was absence of pathergy, no ocular involvement, and lack of vasculitis on histopathology.

Atypical varicella infection was ruled out due to relative sparing of trunk and absence of multinucleate giant cells on Tzanck smear. The generalized involvement of the body including palms, soles, genital and oral mucosa did not favor acne fulminans.





**Figure 2:** (a) Subcorneal pustule (arrow) with perivascular and periappendageal infiltrate in the upper dermis (circled) (H&E, 2.5 ×). (b) Diffuse periappendageal and interstitial infiltrate extending up to deep dermis (H&E, 2.5 ×). (c) Further magnification shows neutrophils infiltrating the appendages and hair follicles (circle) (H&E, 10 ×). (2d, 2e, and 2f) Multiple neutrophils seen in the interstitial space, infiltrating the sebaceous glands and periappendageal space as well as perivascularly along with RBC extravasation (H&E, 40 ×)



**Figure 3:** (a-d) Significant resolution of lesions 10 days post-treatment

The reaction showed a score of 5 on the Naranjo Adverse Drug Reaction Probability Scale suggesting a “probable” causal relationship between vaccine administration and the reaction.

Fortunately, the illness resolved within 10–12 days with no permanent sequelae and showed a good response to dapsone.

This eruption in the setting of the COVID vaccination could represent a distinct entity or an un-masking of a dermatologic condition in a predisposed individual.

Immunogenic effects of vaccines lead to altered levels of chemokines and cytokines, which activate different key players of the innate and adaptive immune system. The skin and mucosa are largely affected by the general activation of the immune system sparked by vaccines. According to the predominant type of cutaneous inflammation, one can differentiate at least four different patterns of inflammatory skin reactions- predominantly Th1-polarized, predominantly Th2-polarized, Th17/Th22-predominant, and granulomatous reactions.<sup>[4]</sup> Psoriasiform, pustular reactions, and Sweet’s syndrome triggered post-COVID-19 vaccines,<sup>[5]</sup> are due to a Th17/Th22-predominant milieu.

Self-limited hypersensitivity reactions post-COVID vaccination have been reported possibly owing to substances found in the vaccine vehicle like polyethylene glycol. Vaccine-associated immune enhancement attributable to the adjuvant properties of the vaccine may unmask certain inflammatory milieus operational in certain dermatoses.<sup>[6]</sup>

One study reported a vesiculopustular rash following administration of Pfizer vaccine showed a sterile neutrophilic folliculitis with folliculocentric vascular injury.<sup>[6]</sup> One postulated hypothesis is that antibodies bound to an undefined foreign protein introduced by the vaccine could be deposited in microvessels as an immune complex and trigger the classic complement pathway to result in a neutrophil-rich inflammatory reaction.

Rare reactions to vaccines may be observed in the post approval period, due to the larger number of people

exposed, as compared with a clinical trial. Awareness and reporting of systemic and cutaneous AEs of vaccines by physicians are crucial. Dapsone may be used in vaccine-induced severe neutrophilic eruptions which do not show a tendency to self resolve. A wait-and-watch policy may be adopted in milder cases showing a tendency towards self resolution.

### ***Declaration of patient consent***

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### ***Financial support and sponsorship***

Nil.

### ***Conflicts of interest***

There are no conflicts of interest.

## **References**

1. McMahon DE, Amerson E, Rosenbach M, Lipoff JB, Moustafa D, Tyagi A, *et al.* Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: A registry-based study of 414 cases. *J Am Acad Dermatol* 2021;85:46-55.
2. Nelson CA, Stephen S, Ashchyan HJ, James WD, Micheletti RG, Rosenbach M, *et al.* Neutrophilic dermatoses: Pathogenesis, Sweet syndrome, neutrophilic eccrine hidradenitis, and Behçet disease. *J Am Acad Dermatol* 2018;79:987-1006.
3. Merrill ED, Kashem SW, Amerson EH, Pincus LB, Lang UE, Shinkai K, *et al.* Association of facial pustular neutrophilic eruption with messenger RNA-1273 SARS-CoV-2 vaccine. *JAMA Dermatol* 2021;157:1128-30.
4. Niebel D, Novak N, Wilhelmi J, Ziob J, Wilsmann-Theis D, Bieber T, *et al.* Cutaneous adverse reactions to COVID-19 vaccines: Insights from an immuno-dermatological perspective. *Vaccines (Basel)* 2021;9:944.
5. Torrealba-Acosta G, Martin JC, Huttenbach Y, Garcia CR, Sohail MR, Agarwal SK, *et al.* Acute encephalitis, myoclonus and Sweet syndrome after mRNA-1273 vaccine. *BMJ Case Reports CP* 2021;14:243-73.
6. Magro C, Crowson AN, Franks L, Schaffer PR, Whelan P, Nuovo G. The histologic and molecular correlates of COVID-19 vaccine-induced changes in the skin. *Clin Dermatol* 2021;39:966-84.