

onwards. We hereby transfer, assign, or otherwise convey all copyright ownership, including all rights incidental thereto, exclusively to the journal, if such work is published by the journal.

Conflict of interest

The authors have no conflict of interest to declare.

Funding source

This article has no funding source.

Data availability statement

Data sharing is not applicable to this article, as no new data were created or analysed in this study.

L.-w. Zhang,  W.-j. Wang, C.-h. Li,  T. Chen*

Department of Dermatovenereology, Chengdu Second People's Hospital, Chengdu, China

*Correspondence: T. Chen. E-mail: 13980427003@163.com
Li-wen Zhang and Wen-ju Wang contributed equally to this work

References

- 1 Edriss M, Farshchian M, Daveluy S. Localized cutaneous reaction to an mRNA COVID-19 vaccine. *J Cosmet Dermatol* 2021; **20**: 2380–2381.
- 2 Merhy R, Sarkis AS, Kaikati J, El Khoury L, Ghosn S, Stephan F. New-onset cutaneous lichen planus triggered by COVID-19 vaccination. *J Eur Acad Dermatol Venereol* 2021; **35**: e729–e730. <https://doi.org/10.1111/jdv.17504>
- 3 Lopes NT, Pinilla CEO, Gerbase AC. Erythema multiforme after Corona-Vac vaccination. *J Eur Acad Dermatol Venereol* 2021; **35**: e717–e719. <https://doi.org/10.1111/jdv.17495>
- 4 Corbeddu M, Diociaiuti A, Vinci MR *et al*. Transient cutaneous manifestations after administration of Pfizer-BioNTech COVID-19 Vaccine: an Italian single-centre case series. *J Eur Acad Dermatol Venereol* 2021; **35**: e483–e485.

DOI: 10.1111/jdv.17689

Flagellate purpura associated with COVID-19 vaccination

Dear Editor,

Flagellate skin eruptions are characterized by 'whip-like' linear or curvilinear streaks, most frequently occurring on the trunk and usually erythematous or pigmented. Common underlying causes include drugs (e.g. bleomycin; peplomycin), diet (e.g. undercooked Shiitake mushrooms) or diseases (e.g. dermatomyositis; adult-onset Still's disease).^{1,2} We describe a unique case of flagellate purpura associated with the AstraZeneca (ChAdOx1-S) COVID-19 vaccine.

A systemically well 48-year-old man presented with acute onset of an asymptomatic skin eruption that started to appear 4 h after receiving his first dose of the AstraZeneca COVID-19 vaccine. He denied any recent illness (including no previous

SARS-CoV-2 infection and negative COVID-19 test 5 months prior), new medications, ingestion of undercooked Shiitake mushrooms or coining/cupping procedures. Past medical history was significant for immune thrombocytopenia in childhood, which had since resolved. Physical examination revealed linear purpuric patches involving the trunk and bilateral upper extremities; many of these areas had a flagellate appearance (Figures 1 and 2). Laboratory investigations demonstrated neutrophilia and hyperbilirubinemia, but no other abnormalities (including normal platelet count and coagulation profile). Skin biopsies showed perivascular lymphocytic infiltrate with red blood cell extravasation and perifollicular fibrosis, consistent with purpura or a purpuric drug reaction without evidence of vasculitis.

The patient received one dose of a systemic corticosteroid (prednisone 40 mg orally), but no other treatments given the asymptomatic nature. Complete resolution occurred within two weeks without sequelae.

We report a unique case of flagellate purpura following the AstraZeneca COVID-19 vaccine. Given the timeline and absence of other known triggers for this type of presentation, it appears that the COVID-19 vaccine was the underlying cause. The pathogenesis of flagellate skin eruptions is poorly understood. In cases where bleomycin is the cause, it may be secondary to microtrauma (scratching), which results in the drug leaking out



Figure 1 Clinical findings 20 h after vaccination: flagellate purpura on the trunk and bilateral upper extremities.



Figure 2 Clinical findings 20 h after vaccination: flagellate purpura on the left upper extremity (close-up).

of blood vessels into the skin. However, many of these patients deny a history of pruritus. In cases where consumption of undercooked Shiitake mushrooms is the cause, a toxic mechanism has been proposed, although there may be an element of a delayed T-cell-mediated hypersensitivity reaction.^{1–3}

To our knowledge, there have been no published reports of flagellate purpura following receipt of the AstraZeneca COVID-19 vaccine. The cutaneous adverse events (AEs) reported in clinical trials were primarily injection-site reactions (ISRs), manifesting as pain, erythema, warmth, pruritus, swelling, induration or tenderness.⁴ In an interim analysis of four phase 3 randomized controlled trials of ChAdOx1-S, three cases of potential immune-mediated cutaneous AEs occurred in the vaccine group (one case each of psoriasis, rosacea and vitiligo), although these may be unrelated.⁵ In addition, there are several reported cases of delayed large local skin reactions following the AstraZeneca COVID-19 vaccine, with onset ranging from days 4 to 17.⁶

The International COVID-19 Dermatology Registry recently published 414 cases with cutaneous AEs to the Pfizer (BNT162b2) and Moderna (mRNA-1273) COVID-19 vaccines. The most common dermatologic findings were delayed large local skin reactions, local ISRs, and urticarial and morbilliform skin eruptions. Flagellate purpura was not reported, although eight cases of chilblains/perniosis did occur.⁷ Farinazzo *et al.* reported similar findings amongst 44 registered cutaneous AEs from north-eastern Italy following the Pfizer COVID-19 vaccine.⁸

In summary, this case is unique in that vaccinations are not known to be a typical trigger for a flagellate skin eruption. Furthermore, to our knowledge, this is the first report of flagellate purpura following the AstraZeneca (ChAdOx1-S) COVID-19 vaccine. Moving forward, it will be prudent to monitor

cutaneous AEs following adenoviral vector vaccination and encourage additional reporting to further understand the epidemiology, pathogenesis and risk factors for this type of cutaneous AE following receipt of a COVID-19 vaccine.

Funding sources




This study received no financial or material support.

Acknowledgement

The patient in this manuscript has given written informed consent to the publication of their case details.

Conflict of interest

The authors have no conflicts of interest to disclose.

E. Heck,¹  B.D. Rankin,²  M. Schneider,³
V.H. Prajapati^{1,4,5,6,7,8,*} 

¹Division of Dermatology, Department of Medicine, University of Calgary, Calgary, Alberta, Canada, ²Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada, ³Department of Pathology and Laboratory Medicine, University of Calgary, Calgary, Alberta, Canada, ⁴Dermatology Research Institute, Calgary, Alberta, Canada, ⁵Skin Health & Wellness Centre, Calgary, Alberta, Canada, ⁶Probit Medical Research, Calgary, Alberta, Canada, ⁷Section of Community Pediatrics, Department of Pediatrics, University of Calgary, Calgary, Alberta, Canada, ⁸Section of Pediatric Rheumatology, Department of Pediatrics, University of Calgary, Calgary, Alberta, Canada

*Correspondence: V. H. Prajapati. E-mail: vimal@dermatologyresearch.ca

References

- 1 Yamamoto T, Nishioka K. Flagellate erythema. *Int J Dermatol* 2006; **45**:627–631.
- 2 Nakamura T. Shiitake (*Lentinus edodes*) dermatitis. *Contact Derm* 1992; **27**: 65–70.
- 3 Mendonça FMI, Márquez-García A, Méndez-Abad C *et al.* Flagellate dermatitis and flagellate erythema: report of 4 cases. *Int J Dermatol* 2017; **56**: 461–463.
- 4 Bogdano G, Bogdano I, Kazandjieva J, Tsankov N. Cutaneous adverse effects of the available COVID-19 vaccines. *Clin Dermatol* 2021. <https://doi.org/10.1016/j.clindermatol.2021.04.001>
- 5 Voysey M, Clemens SAC, Madhi SA *et al.* Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *Lancet* 2021; **397**: 99–111.
- 6 Kim JE, Lee H, Paik SS, Moon J-Y, Yoon HJ, Kim S-H. Delayed cutaneous reaction to ChAdOx1 nCoV-19 vaccine: Is it an 'AstraZeneca arm'? *J Eur Acad Dermatol Venereol* 2021; **35**: e711–e714.
- 7 McMahon DE, Amerson E, Rosenbach M *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
- 8 Farinazzo E, Ponis G, Zelin E *et al.* Cutaneous adverse reactions after mRNA COVID-19 vaccine: early reports from Northeast Italy. *J Eur Acad Dermatol Venereol* 2021; **35**: e548–e551.

DOI: 10.1111/jdv.17609