received the mRNA COVID-19 vaccine revealed that circulating anti-SARS-CoV-2 antibodies do not cross-react with pemphigus or pemphigoid autoantigens including desmoglein 1, desmoglein 3, envoplakin, BP180, BP230 and type VII collagen.\(^4\) This argues against a link between SARS-CoV-2 vaccines and AIBDs with respect to disease-triggering antibody cross-reactivity.

In conclusion, although further observational studies on that controversial topic are needed, current epidemiological and mechanistic data basically encourage COVID-19 vaccination in patients with AIBDs since benefits of vaccination far outweigh these reported uncommon, questionable, and otherwise manageable risks. This is of particular relevance in terms of patient counselling and physician endorsement, considering that SARS-CoV-2 vaccine hesitancy is prevalent across the AIBD population (approximately one third), with concern regarding immunobullous exacerbation representing a major factor contributing to hesitancy.\(^3\)

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None.

**Data availability statement**
Data sharing not applicable to this article as no datasets were generated or analyzed.

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**Development of delayed dermal hypersensitivity reaction following the second dose of COVID-19 vaccine – A series of 37 cases**

To the Editor,

Delayed immunologic reactions are being increasingly reported following the administration of COVID-19 vaccines.\(^1,2\) Dermal hypersensitivity reaction is one such reaction pattern. Clinically, the lesions of dermal hypersensitivity reaction are characterized by papular urticaria-like eruptions lasting for longer than 24 h.\(^3\) Eruptive pseudoangiomatosis (EPA) is a variant of dermal hypersensitivity reaction consisting of benign, self-limiting exanthematous lesions. The lesions of EPA are pinpoint erythematous macules and urticarial papules having a blanched perilesional halo.\(^4\) This series is an extension of our previously published work on post-COVID-19 vaccine EPA with special emphasis on histopathological changes.\(^5\) Herein, we report a series of 37 cases of EPA developing following the administration of COVID-19 vaccine with typical features of dermal hypersensitivity on histopathology.

In our cases, EPA was clinically diagnosed on the basis of classical clinical features in 37 cases (Fig. 1a,b). The lesions clinically manifested as pinhead-sized bright, red maculopapular lesions, which blanch completely on pressure and refill from centre once the pressure is released. Histopathological and dermatoscopic features were noted in cases.

In our study, all patients developed EP following the second dose of COVID-19 vaccination. The most frequently affected age group was between 21 and 30 years (83.8% cases). While 29 (78.4%) cases were asymptomatic, the remaining 8 (21.6%) cases had mild-to-moderate pruritus. The average latency between second dose of vaccination and onset of eruptions was 6.8 days. The lesions resolved on their own within 2 weeks of onset without any postinflammatory dyspigmentation. The lesions occurred following a localized or distant solicited adverse event following immunization (AEFI) after first or both doses of vaccination in all cases. These solicited reactions included injection-site erythema, oedema, pruritus or systemic involvement like transient fever or myalgia.

Dermatoscopic features included central red dots, red globules and perilesional pale structureless areas (Fig. 1c). Histopathologically, there was the presence of moderately dense infiltration of perivascular and interstitial neutrophils, eosinophils and lymphocytes. Other features included papillary dermal oedema and plump endothelium with no RBC extravasation (Fig. 1d). Additionally, the epidermis was silent in all the specimens. On the basis of clinical and histopathological picture, a diagnosis of EPA with delayed dermal hypersensitivity reaction was made.
Localized and generalized delayed dermal hypersensitivity reactions following COVID-19 vaccine are still poorly understood. The prototype localized form of this reaction type is COVID-arm. The role of T-cell-mediated hypersensitivity at injection-site reactions has been observed by Blumenthal et al.\(^1\) While we now understand the pathogenesis of COVID-arm, the mechanisms at play in disseminated hypersensitivity reaction are still elusive. However, according to a report by Myrdal et al., these reactions are not a contraindication for subsequent doses of vaccination.\(^2\)

According to our hypothesis, while the first dose of vaccination primes the immune cells, the second dose leads to the elicitation of a hypersensitivity reaction. The role of delayed host immunity has also been suggested in the case of urticarial eruptions following COVID-19 even by McMahon et al.\(^6\)

In conclusion, cases of EPA following the second dose of vaccination commonly develop due to delayed dermal hypersensitivity reactions. However, there are still limited data regarding such reactions. There is a need to conduct larger clinic-histopathological studies over a longer duration for further characterization of these reactions. Owing to the benign and self-limiting nature of such eruptions, the development of EPA is not a contraindication for subsequent doses of COVID-19 vaccine.

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

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**Figure 1** Multiple erythematous papules with perilesional halos (a) involving dorsum of hand in a 24-year-old man, which developed 7 days after vaccination, (b) over face and pinna of a 22-year-old man, which 6 days after vaccination. (c) Dermatoscopic features included red dots (black circles), surrounding dull red structureless-zones (yellow arrow), and pale zones at periphery of lesions (blue stars) seen on DermLite DL3 \(10\times\) magnification. (d) Silent epidermis, papillary dermal oedema and mixed infiltrates with dilated superficial vessels, plump endothelium, perivascular neutrophilic and lymphohistiocytic infiltration with absence of red blood cell extravasation (Haematoxylin and eosin stain, \(\times 100\)).
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To the Editor,

Chilblain-like lesions (CLLs) were widely described in children
adolescents during the coronavirus disease 2019 (COVID-19) pandemic. Increasing evidence suggests the COVID-19
correlation and several different associated manifestations are reported. Hereby, we present a 11-year-old girl who was referred
to the Paediatric Dermatology Unit of Fondazione IRCCS Ca’
Granda in Milan on 27 January 2022 with a 7-day history of nail
shedding involving upper extremities. The patient started noting
the nail changes 3 days after resolution of painful, erythematous
plaques above both hands and was diagnosed as CLLs. Her medical
history revealed COVID-19 infection confirmed by a
nasopharyngeal swab performed on 2021 December. She
referred mild symptoms including diarrhoea, abdominal pain
and fever (temperature 38°C) that did not require any treat-
ment. Skin examination demonstrated onychomadesis of II, III,
IV right hand’s fingernails and II left hand’s fingernail. More-
over, a residual dusky erythematous macule was noticed on the
lateral margin of II right hand’s finger. Laboratory testing,
including complete blood count and C-reactive protein, was
within normal range. Cytomegalovirus, Epstein–Barr virus, Par-
vovirus B19, Coxsackievirus serology and Mycoplasma pneumo-
niae did not show any recent infection. To our knowledge, this
is the first report of onychomadesis associated with chilblain-like
lesions after Sars-CoV-2 infection. Onychomadesis is the result
of nail matrix temporary arrest secondary to numerous causes,
including infections and inflammatory dermatosis. However, in
case of viral infection (e.g. Coxsackievirus), it is still debated
whether the matrix inhibition is imputable more to direct virus
damage rather than inflammation spreading from skin lesions.3
CLLs related to COVID-19 infection have been widely docu-
mended in mild symptomatic or asymptomatic children and
adolescents.3 Among different pathogenetic hypothesis, the role
of cytokine-mediated inflammatory response and endothelial
damage induced by obliteratorive microangiopathy caused by
Sars-CoV-2 seem to be the most accredited.4 We assume that,
likewise onychomadesis induced by Coxsackievirus, the imbalance
between inflammation and direct virus damage could be
responsible for nail discharge in our case.5 The acknowledge-
ment of a possible association between CLLs and onychomadesis
could avoid unnecessary treatment and reassure the patient’s
caregivers. Nevertheless, as this is the first documented associ-
ation in the literature, we suggest that complete history, physical
and laboratory examinations should be conducted to rule out
other culprit diseases. Until our findings could be further
accredited by new observations, dermatologists should be alert
to the presentation of onychomadesis as a possible consequence
of COVID-19 chilblain-like lesions (Fig. 1).

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consent to the publication of their case details.

Conflict of interest
The authors declare no conflict of interest