**INTRODUCTION**

COVID-19 rapidly developed into a worldwide pandemic that caused respiratory symptoms and severe systemic complications.\(^1\) In August 2021, the FDA approved the first mRNA COVID-19 vaccine known as the Pfizer-BioNTech COVID-19 Vaccine (Comirnaty™) for use in adult patients. Commonly reported cutaneous reactions included delayed large local reactions, swelling, urticarial and morbilliform rashes and exacerbations or flares of existing dermatologic conditions.\(^2\)-\(^5\) However, only a few cases of local bullous reactions have been reported.\(^6\),\(^7\)

**OUR CASE**

A 54-year-old Thai woman presented with multiple blisters on top of erythematous rashes that started three days after receiving the first dose of Pfizer-BioNTech as the booster shot.

She received two doses of Sinovac-CoronaVac COVID-19 vaccine four months earlier, with no observed side effects. Two months after vaccination, the patient was hospitalized with COVID-19 pneumonia, and no cutaneous eruptions were noted.

Two months after COVID-19 infection, the patient received a Pfizer-BioNTech booster shot. A couple of days later, she developed mild itchy erythematous rashes on her left upper arm. The rashes spread to her upper chest, posterior aspect of the neck and right arm on the next day. Blisters also developed on top of erythematous rashes on her left upper arm, located 7 cm distal to the vaccine injected site. Three days after blister development, she went to the hospital. Dermatologic examination revealed erythematous macules and papules coalesced into plaques on both arms, the upper chest and the posterior aspect of the neck. Multiple tense bullae were found on top of erythematous plaque on the left arm (Figure 1). Our patient had two forms of cutaneous lesions. The first was a maculopapular rash on her chest and both upper arms,
as a common reaction after administration of the vaccine, while the second lesion type presented as blisters on her left arm. Differential diagnoses of the blisters in this patient included a bullous reaction caused by the severe local reaction, vaccine-triggered immunobullous disease or conventional autoimmune bullous disease (such as bullous pemphigoid) coincident with vaccination.

The skin biopsy demonstrated a subepidermal separation with predominated neutrophils (Figure 2). Direct immunofluorescence gave a negative result. The patient was diagnosed with a local bullous reaction related to the Pfizer-BioNTech COVID-19 Vaccine. After three weeks of administering topical corticosteroid and oral antihistamine, the skin recovered with only post-inflammatory hyperpigmented patches remaining without lesion recurrence (Figure 3).

3 | DISCUSSION

Many adverse cutaneous reactions were reported after receiving an mRNA vaccine, typically presenting as delayed

![Figure 1](image1.png)

**Figure 1** (A) Multiple tense bullae on top of erythematous plaque on the left arm. (B) The rashes on the upper chest. (C) The rashes on the posterior aspect of the neck. (D) The rashes on the right arm.

![Figure 2](image2.png)

**Figure 2** Histological examination showed subepidermal separation with predominated neutrophils and superficial perivascular infiltration with lymphocytes and neutrophils (A, H&E 40x; B, H&E 200x).
large local reactions, swelling, erythema, urticarial and morbilliform rashes, and exacerbation or flares of existing dermatologic conditions. Some bullous reactions from the mRNA vaccine were also reported. However, limited data exist about cutaneous reactions from the booster vaccine in combination regimens, especially in post-COVID-19 infectious patients.

Recent data demonstrated that bullous eruptions accounted for 0.04% of reported skin reactions following COVID-19 vaccination. All the reported cases in the review occurred after mRNA vaccination, with most occurring after the first dose. The bullous eruptions were composed of bullous pemphigoid (18/20; 90%), pemphigus vulgaris (1/20; 5%), and bullous fixed drug eruption (1/20; 5%), with no mention of local bullous reactions.

Tomayko et al. reported that 12 out of 733 patients experienced subepidermal blistering eruption after mRNA vaccination, with onset of bullae seven days after vaccination. Our patient developed blisters earlier than the median time in Tomayko’s report, while the duration of the rash was similar to median time of three weeks.

A case of massive local bullous reaction that occurred 12 h after COVID-19 vaccination was also reported after administration of Janssen Ad26.COV2.S COVID-19 vaccine. The bullae fully recovered after surgical drainage and one week of oral and topical corticosteroid treatment. Our case had the same clinical type of lesions but with delayed onset and less severity. The lesions healed without systemic therapy.

Krammer et al. revealed that previously infected patients with only one vaccination dose usually had higher immunity levels than uninfected patients with two vaccinations, corresponding to a higher rate of systemic adverse effects (headache, fever, and muscle pain) after vaccination in post-infectious patients. However, no differences were recorded between the two groups in local injected site reactions, and this study did not emphasize cutaneous reactions other than local reactions.

The blistering eruption in our patient may have been caused by high antibody response to vaccination after recent COVID-19 infection. The mRNA vaccines are novel medications, and a more detailed understanding is required to prove this hypothesis.

4 CONCLUSIONS

Local bullous reactions can occur after COVID-19 mRNA vaccination but symptoms are usually minor and self-limited. Because of the growing numbers of SARS-CoV-2 variants, counseling is required to explain the benefits and possible side effects of vaccination.

AUTHOR CONTRIBUTIONS

Kwanhatai Kultawanich: Conceptualization; data curation; funding acquisition; investigation; methodology; project administration; resources; writing – original draft.
Nattaporn Sampattavanich: Conceptualization; supervision; validation; writing – review and editing.

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CONFLICT OF INTEREST

None declared.

DATA AVAILABILITY STATEMENT

All data relevant to the study are included in the article.

ETHICAL APPROVAL

We confirm that the manuscript has been read and approved by all named authors. The protection of intellectual property associated with this manuscript had been in our consideration.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal’s patient consent policy.
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