Subepidermal blistering eruption as a cutaneous reaction after mRNA boosted vaccination in a post-covid patient

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Abstract

COVID-19 is a worldwide pandemic disease that caused respiratory symptoms and severe complications. The mRNA vaccine were developed to prevent COVID-19 disease. Here we reported a case of a subepidermal blistering eruption as a cutaneous reaction after mRNA boosted vaccination in a post-covid patient.

Introduction

COVID-19 is a worldwide pandemic disease that caused respiratory symptoms and severe systemic complications. In August 2021, the FDA approved the first mRNA COVID-19 vaccine known as the Pfizer-BioNTech COVID-19 Vaccine (Comirnaty^{TM}) to prevent COVID-19 in adult patients. Common reported cutaneous adverse reactions were delayed large local reactions, swelling, urticarial rash, and flare existing dermatologic conditions.[2,3,4,5] However, only a few cases of the subepidermal blistering eruption were reported[6].

Our case

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

She received two doses of the Sinovac-CoronaVac COVID-19 vaccine four months prior, with no side effects observed. Two months after vaccination, she was hospitalized due to COVID- 19 pneumonia with no cutaneous eruption noted.

Two months after the COVID-19 infection, she got the 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 the next day, and some blisters developed on top of erythematous rashes on her left upper arm. The blisters are located 7 cm distal to the vaccine injected site. Three days after the blisters developed, she went to the hospital. Dermatologic examination revealed erythematous macules and papules coalesce into plaques on both arms, upper chest, and posterior aspect of the neck. Multiple tense bullae were found on top of erythematous plaque on the left arm (Fig. 1). The skin biopsy demonstrated a subepidermal separation with predominated neutrophils. The direct immunofluorescence had a negative result (Fig. 2). She was diagnosed with a subepidermal blistering eruption related to the Pfizer-BioNTech COVID-19 Vaccine. After three weeks of topical corticosteroid and oral antihistamine were administered, her blisters resolved. Only post-inflammatory hyperpigmented patches remained without lesion recurrence (Fig.3).

Discussion :

Many cutaneous adverse reactions were reported after receiving an mRNA vaccine. The typical reactions were delayed large local reaction, swelling, erythema, urticarial, and flare of existing dermatologic conditions.

[2,3,4,5] Few bullous reactions from mRNA vaccine were reported.[6] Moreover, there were still limited data about the cutaneous reactions from the booster vaccine in this kind of combination regimen, especially in post-covid 19 infectious patients.

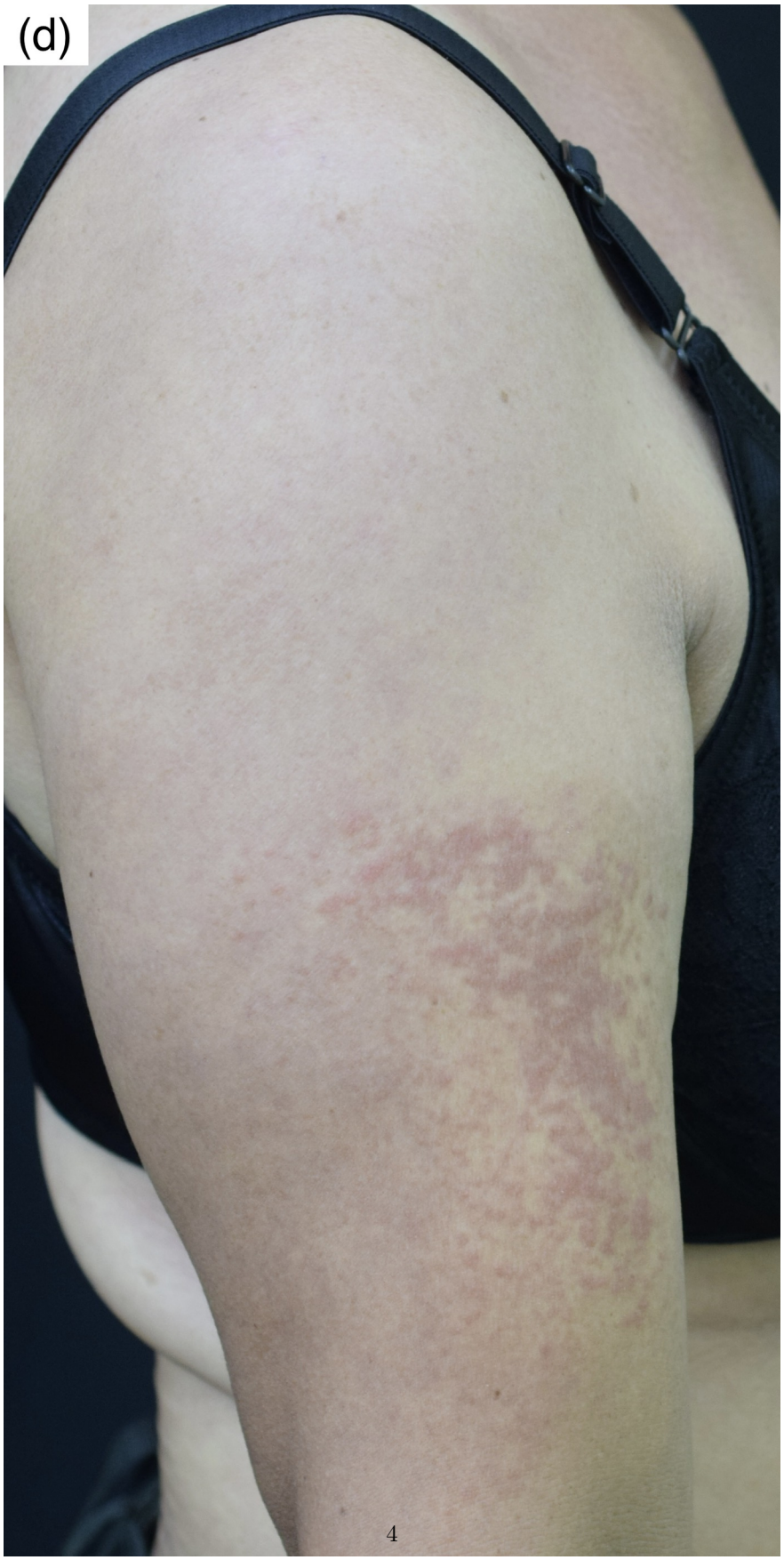
Tomayko et al. [6]. reported that 12 out of 733 patients experienced subepidermal blistering eruption after mRNA vaccination. The onset of bullae is usually seven days after vaccination. Our patient seemed to develop blisters earlier than the median time in Tomayko's report, while the duration of the rash was similar at a median time of three weeks.

Krammer et al.[7] revealed that the previously infected patients with only one vaccination dose usually have higher immunity levels than the uninfected patients with two vaccinations. The result corresponded with a higher rate of systemic adverse effects (headache, fever, muscle pain) after vaccination in post-infectious patients. However, there were no differences between the two groups in local injected site reactions. Nevertheless, this study did not emphasize cutaneous reactions other than local reactions.

It is possible that the blistering eruption in our patient was caused by a high antibody response to the vaccination after the recent COVID-19 infection. Since the mRNA vaccines are novel medications, more understanding is needed to prove this hypothesis.

Conclusion

The subepidermal blistering eruption could be a cutaneous reaction after a COVID-19 mRNA vaccination. However, these reactions are usually minor and self-limited. During this period of the ongoing pandemic and a growing number of SARS-CoV-2 variants, counseling about vaccination's benefits and side effects should be emphasized.



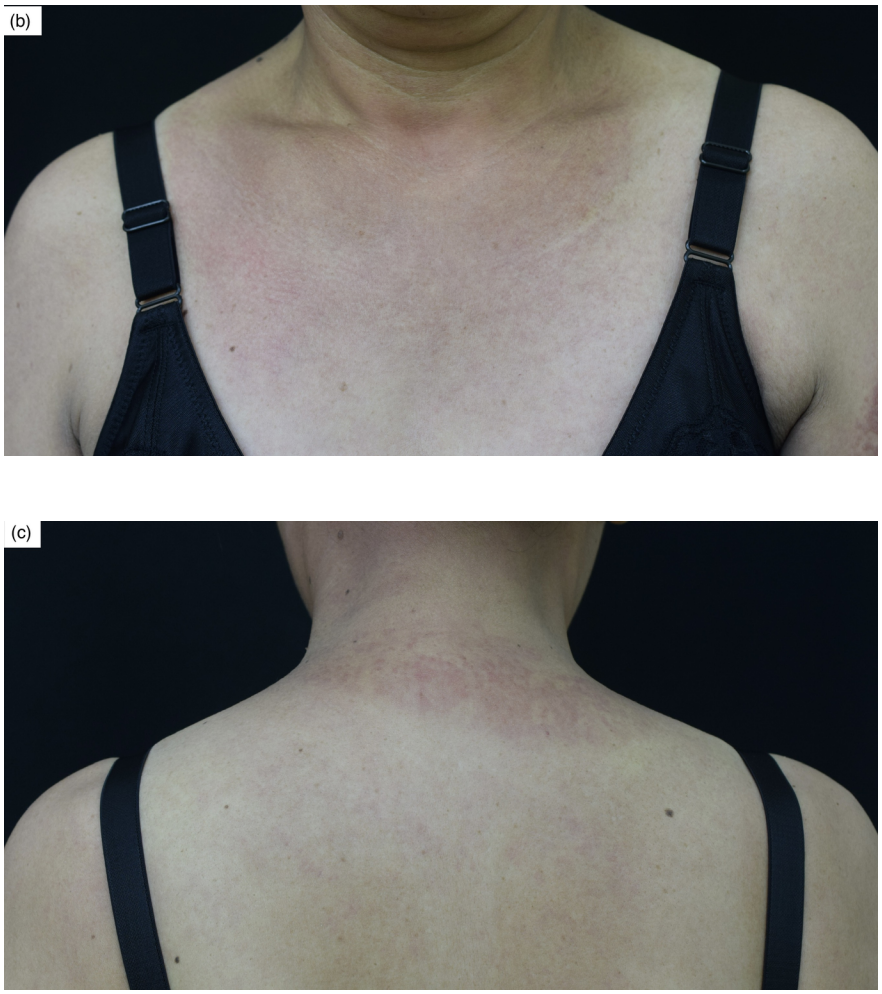


Figure 1 (a) multiple tense bullae on top of erythematous plaque on the left arm. (b) The rashes on the upper chest. (c) The rashes on the posterior aspect of the neck. (d) The rashes on the right arm.

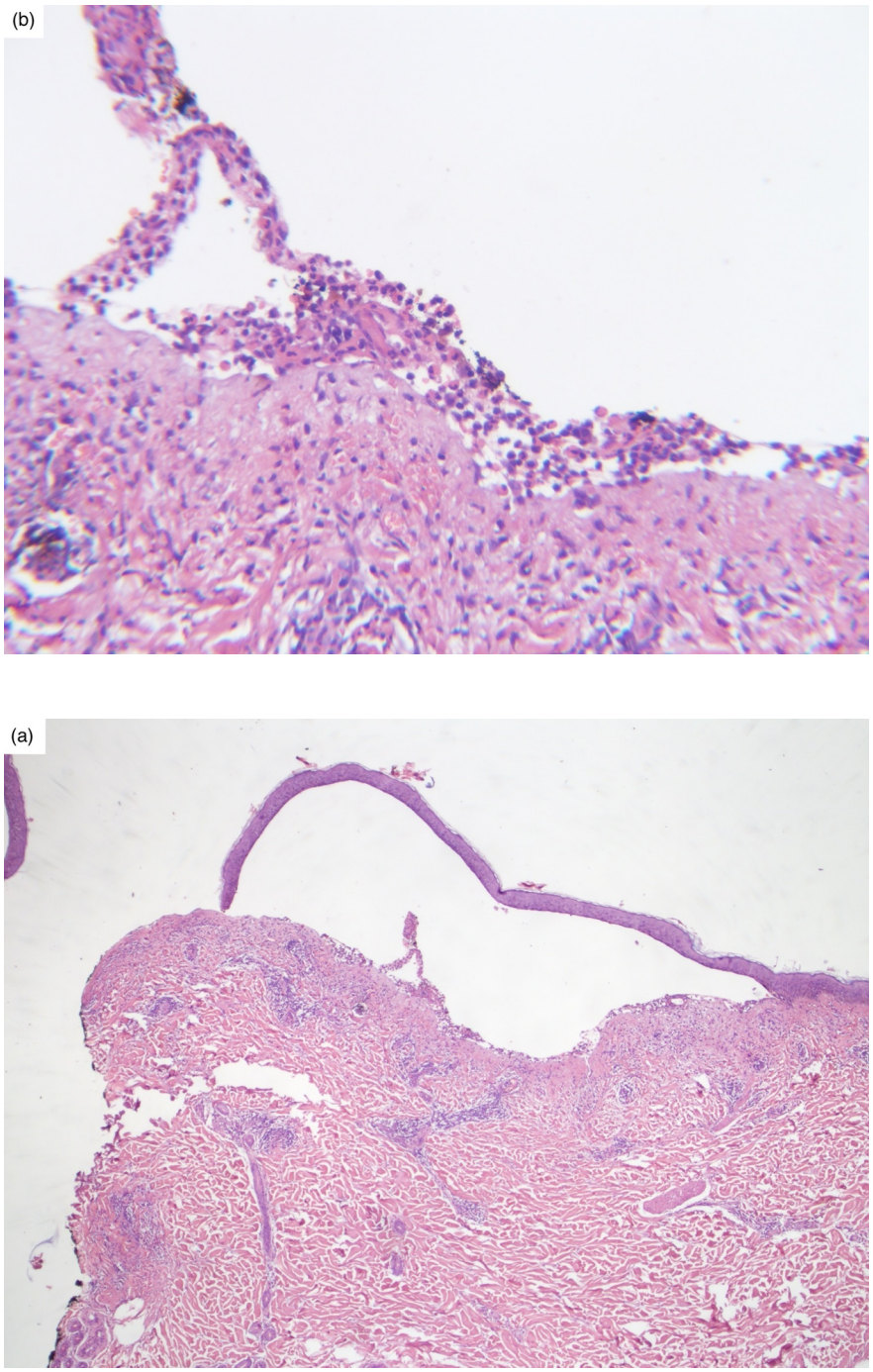


Figure 2 Histological examination showed subepidermal separation with predominated neutrophils and superficial perivascular infiltration with lymphocytes and neutrophils (a, H&E x 40; b, H&E x200)

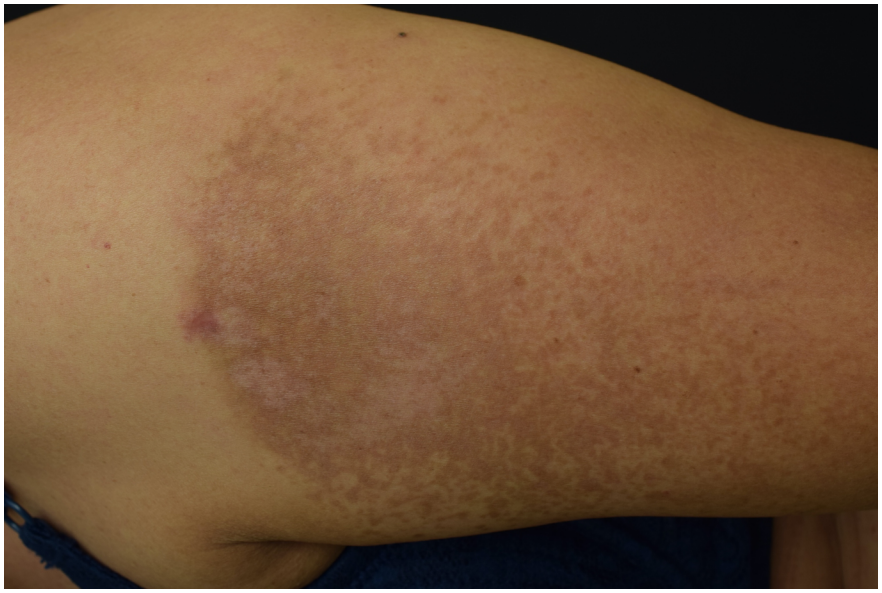


Figure 3 The rashes after three weeks of topical corticosteroid and an oral antihistamine.