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Clinical Notes

Bacillus Calmette-Guérin Scar erythema in a 14-year-old girl post-BNT162b2 vaccination

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Key words BCG vaccine, BNT162b2 vaccine, COVID-19 vaccines, erythema.

In Hong Kong, *Bacillus Calmette-Guérin* (BCG) vaccinations are administered intradermally at birth to prevent TB infections. Containing an attenuated strain of *Mycobacterium bovis*, BCG vaccines induce granulomatous scars in immunocompetent infants at the injection site. Inflammation of the BCG scar is a common feature of Kawasaki disease in children.

The investigators launched the 'COVID-19 Vaccination in Adolescents' study (COVA, NCT04800133) in May 2021 to study the reactogenicity and immunogenicity of COVID-19 vaccines in adolescents. Of the 165 participants who received the BNT162b2 vaccine, 101 were male and 64 were female. Within the study, a 14-year-old Chinese girl presented with erythema and increased induration of the BCG scar, occurring as a wheal after BNT162b2 mRNA vaccination. Symptoms manifested near the injection site 18- and 8-h following doses 1 and 2, respectively (Fig. 1). The elevation of the wheal and diameter of the erythema peaked at 3 cm on day 2 after dose 1 (Fig. 1) and resolved on day 4. For dose 2, the elevation of the wheal peaked at day 1, but the diameter of the erythema continued to grow until day 3 to 8 cm (Fig. 1), resolving on day 4. The elevation of the wheal after dose 2 was significantly higher than that of dose 1.

In both episodes, after the injections the wheal was painful upon palpation and did not blanch with pressure. The patient also reported fatigue, mild fever, and myalgia after both doses, but no pain at the injection site, only at the BCG wheal. The symptoms for both doses resolved spontaneously without intervention.

At the time of writing, another case of BCG scar inflammation in an 11-year-old girl was reported within our trial (Fig. 1). There were also reports of individuals who received influenza or COVID-19 mRNA vaccines presenting with similar symptoms 1–3 days after vaccination.[1–3] Additionally, viral infections such as measles and type 6 human herpes virus have been described to cause BCG erythema.[4,5] However, the two adolescent girls in this case did not report any BCG scar erythema for influenza vaccinations nor viral infections.

As most of the patients were born in Hong Kong, they all received BCG vaccinations at birth; however, the parents of the 14-year-old Chinese girl reported that she received the BCG vaccine when she was 2-months old. In general, all the participants involved in the study have had the BCG vaccination for at least 10 years.

The symptoms in both cases proved to be transient without need for intervention. Clinicians and vaccinators should be aware of this reaction to prevent delay in the second dose of mRNA COVID-19 vaccines.

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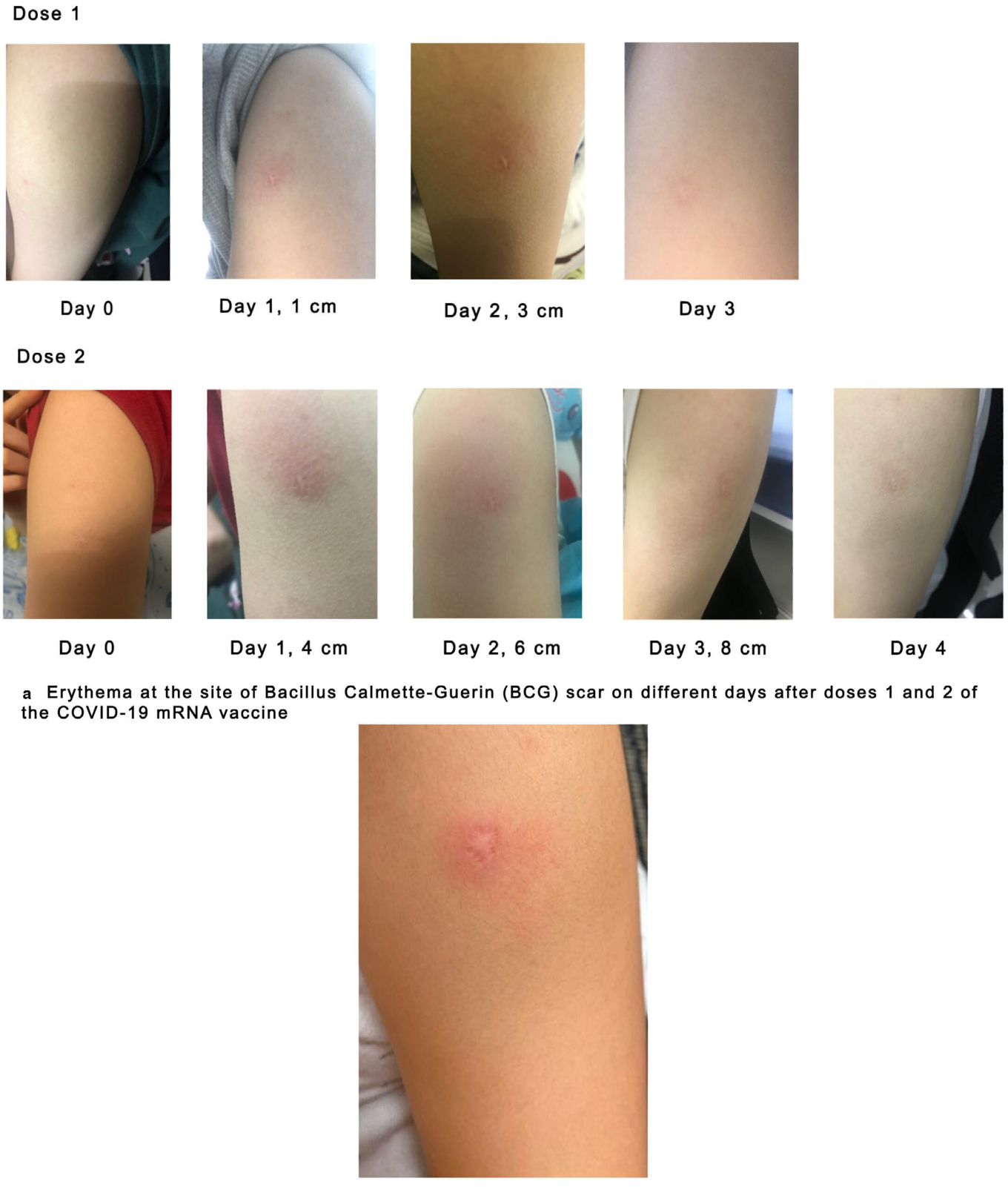

Fig. 1 (a) Erythema at the site of *Bacillus Calmette-Guerin* (BCG) scar erythema in a 14-year-old girl, on different days after doses 1 and 2 of the COVID-19 mRNA vaccine, with diameters shown. (b) Inflammation of the BCG scar after dose 2 of the COVID-19 mRNA vaccine in an 11-year-old Chinese girl.

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Disclosure

All authors have declared no conflicts of interest.

Ethics approval

This study was approved by the University of Hong Kong/ Hospital Authority Hong Kong West Cluster Institutional Review Board (UW21-157).

Author contributions

Y.L.L. was responsible for the concept and design of the study; T.K.H. acquired the data. Y.L.L., T.K.H., and D.L. analyzed the data; T.K.H. drafted of the manuscript; Y.L.L., T.K.H., and D.L. reviewed the manuscript for intellectual content. All authors read and approved the final manuscript.

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