

SHORT COMMUNICATION

Halo Nevi After Covid-19 Vaccination: Molecular Mimicry Attributed Cutaneous Side-Effect?Kelly E. Owens, BS¹, Jeffery T. Kwock, MD², Matilda W. Nicholas, MD, PhD²¹ School of Medicine, Duke University, Durham, NC² Department of Dermatology, Duke University, Durham, NC**ABSTRACT**

Covid-19 vaccination is a crucial component of the public health response to reduce the spread of Covid-19. Although well-tolerated, Covid-19 vaccination is associated with several cutaneous adverse reactions. Here, we document a case of a young man who developed numerous halo nevi at sites of pre-existing nevi following Covid-19 vaccination. Our patient is a 21-year-old male who presented to clinic after noticing a recent change in his moles. Three months after receiving the Johnson & Johnson (J&J) Covid-19 vaccine, the patient reported that he developed a ring of “vitiligo” surrounding each of his existing moles. He also received the Moderna Covid-19 booster 8 months after receiving the J&J vaccine and contracted Covid-19 two months later, with no additional change in his moles. The patient was otherwise well with no past medical or family medical history of skin cancer. On examination, the patient was found to have numerous halo nevi that had developed at sites of pre-existing nevi and were distributed over his face, neck, trunk, and extremities. Examination of his scalp revealed patches of white hair, underneath which were additional halo nevi. The development of vitiligo in the setting of Covid-19 vaccination is thought to be related to the activation of autoimmunity. Autoimmunity secondary to Covid-19 vaccination may be the cause of this patient’s halo nevi, given the patient’s age and absence of any systemic symptoms.

INTRODUCTION

Although well tolerated, Covid-19 vaccination is associated with several cutaneous adverse reactions such as injection site reactions, urticaria and less commonly erythema multiforme, subacute cutaneous lupus erythematosus, pityriasis rosea, and vitiligo.^{1,2} To date, there has been one report of halo nevi appearing after Covid-19 vaccination. Here, we document a second case of a young man who developed numerous halo nevi at sites of pre-existing nevi following Covid-19 vaccination.

CASE REPORT

Fifteen months prior to presentation to clinic, a healthy 21-year-old male received the Johnson & Johnson (J&J) Covid-19 vaccine. Three months later, the patient noticed a change in his pre-existing moles—a ring of “vitiligo” now surrounded each mole. Eight months after receiving the J&J Covid-19 vaccine, the patient received the Moderna booster and subsequently contracted Covid-19 two months later. Despite these added exposures, he did not notice any further change in his moles.

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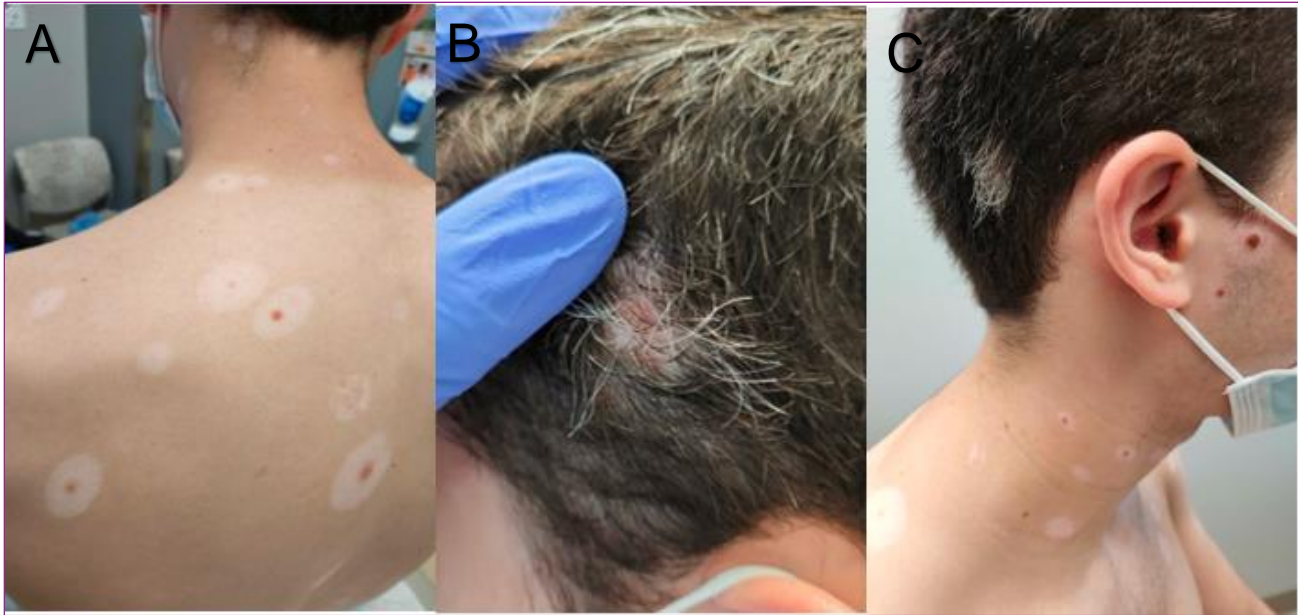


Figure 1. (A) Regular, brown nevi surrounded by an ovoid, circumferential area of hypopigmentation, consistent with halo nevi, located on patient's left upper back. Some areas of hypopigmentation without a central mole were also noted. (B) Halo nevus on left scalp with overlying hypopigmented hair. (C) Numerous halo nevi on right cheek and neck. Hypopigmented section of hair overlying halo nevus on right scalp.

Fifteen months after first receiving the J&J Covid-19 vaccine, the patient presented to clinic and underwent a full body skin exam. Numerous regular, brown macules with a surrounding halo of hypopigmentation were noted on the trunk and upper extremities. Examination of his scalp revealed patches of white hair which overlaid further halo nevi. On dermoscopy, the halo nevi were normal in size, symmetric with regular borders, and had no significant color variation. The patient denied any accompanying itching, burning, pain, or bleeding. He had no past medical or family medical history of skin cancer. The patient did report a history of blistering sunburns but denied a history of tanning bed use. He had no known allergies or outpatient medications. The patient denied fever, chills, weight loss, night sweats, joint pain, headaches, nausea, vomiting, or bleeding problems.

The patient was assured that his nevi were benign and was scheduled to return to clinic in 6 months for a follow-up evaluation of the halo nevi.

DISCUSSION

Halo nevi typically progress through four stages, starting with the development of hypopigmentation surrounding the nevus and ultimately resulting in the loss of the original nevus and return of hypopigmentation to previous skin tone. Vitiligo and a paraneoplastic phenomenon have previously been associated with halo nevi, often prompting closer investigation.³ Given our patient's age, lack of concerning features on dermoscopy, timeline of presentation, and absence of any systemic symptoms, we found it unlikely that his halo nevi were neoplastic in origin. Rather, autoimmunity

secondary to Covid-19 vaccination may have been the cause of his halo nevi.

Covid-19 vaccination is known to elicit a powerful humoral and cellular immune response.⁴ Numerous case reports detailing an exacerbation or new-onset of vitiligo after Covid-19 vaccination have been published since early 2021. Although the etiology of halo nevi is not fully understood, it is thought that vitiligo and halo nevi share a common feature: destruction of melanocytes by cytotoxic T cells; therefore, it is possible that the occurrence of halo nevi and vitiligo after Covid-19 vaccination stems from a similar pathophysiology.⁵

Several theories have been proposed on the mechanism surrounding Covid-19 vaccination and autoimmune skin reactions. One prominent theory is molecular mimicry, where cross reactivity of T or B cells between the adenovirus vector and melanocytes causes hypopigmentation. With increased T-cell, B-cell, antibody, interferon, and interleukin production after vaccination, it is plausible that melanocytes could become an accidental target of this robust immune response.⁴ In fact, a study in 2020 found that SARS-CoV-2 antibodies had a moderate to strong reaction with 21 out of 50 human tissue antigens, including transglutaminase 2 and 3, collagen, myelin basic protein, and thyroid peroxidase.⁶ To conclude, more research is needed to understand the intricacies of new onset halo nevi and vitiligo after Covid-19 vaccination.

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