

Resolution of recalcitrant verruca following Moderna COVID-19 vaccination in a person with HIV



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INTRODUCTION

Human papillomavirus (HPV) is a DNA virus with more than 170 strains, some of which cause common warts, also known as verruca vulgaris (VV).¹ There is no viremia in HPV, and infections are localized to the skin or mucosa; VV can be persistent due to evasion and suppression of local cellular immunity.¹ Some of the treatment options available for VV attempt to activate local immunity. However, persistent infection is common in people with human immunodeficiency virus (HIV) and organ transplant recipients due to decreased cellular immunity. Herein, we present a person with undetectable HIV and a 10-year history of intractable extensive VV that spontaneously regressed shortly after receiving the second dose of the Moderna COVID-19 vaccination.

CASE PRESENTATION

A 63-year-old male with a medical history of HIV and treated Hepatitis C (with ledipasvir/sofosbuvir) has been in outpatient dermatology care for a decade-long history of extensive recalcitrant VV on his hands and feet (Fig 1). During the prior 10 years, many treatment modalities were used but were ineffective to complete resolution; these included the following: cryotherapy, topical 5-fluorouracil, topical imiquimod, intralesional bleomycin, topical cidofovir, and acitretin which only flattened the lesions of VV. Active medications at the time of vaccination included abacavir/lamivudine,

Abbreviations used:

HIV: human immunodeficiency virus
HPV: human papillomavirus
VV: verruca vulgaris

darunavir/cobicistat, atorvastatin, enalapril, metformin, and oral acitretin.

The patient received the first dose of Moderna COVID-19 vaccination in March 2021. No response to warts was noted after the first dose. He received a second dose 29 days later (April 2021) and a third booster dose in August 2021. Within 2 weeks after the second injection (April 2021), all verruca spontaneously disappeared completely. The patient stated that his warts improved continuously for 2 weeks, and no additional lesions developed. There were no visible inflammatory reactions during these 2 weeks leading to complete wart resolution. After resolution, the patient discontinued acitretin. Physical examination 8 months later (December 2021) showed a significant complete resolution of lesions on his hands and feet without recurrence (Fig 2).

DISCUSSION

COVID-19 and cutaneous reactions

Cutaneous effects have been noted with COVID-19 vaccination.² These include local site reaction, delayed large local reactions, urticaria, morbilliform

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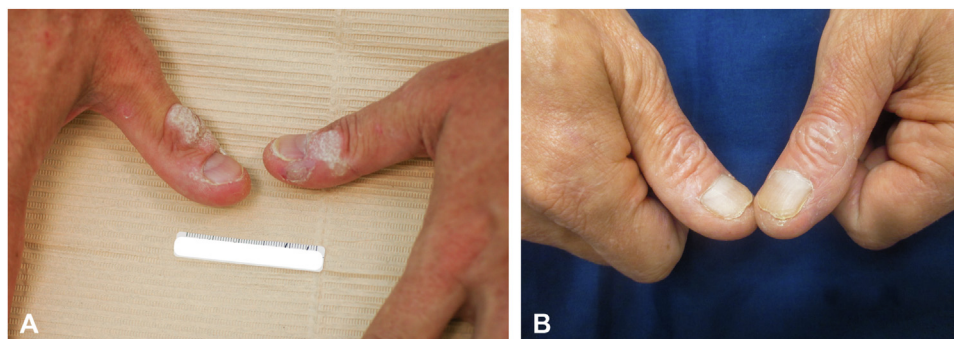


Fig 1. Longstanding treatment-resistant warts on a 63-year-old male's thumbs, first presenting for care in May 2012 (**A**), following second Moderna COVID-19 vaccination all lesions resolved with no evidence of recurrence (photos from December 2021) (**B**).



Fig 2. Numerous longstanding warts on the fingers and periungual areas dating from July 2013 (**A**), which cleared shortly after second Moderna COVID-19 vaccination, (photos from December 2021) (**B**).

rash, and erythromelalgia. Cutaneous reactions typically began within 7 days of vaccination and were noted more frequently in recipients of the Moderna vaccine (compared to Pfizer-BioNTech vaccine).²

There are currently 2 other reports documenting spontaneous regression of cutaneous warts after COVID-19 infection or vaccination. To our knowledge, this is the first report of spontaneous regression of recalcitrant warts following COVID-19 (Moderna) vaccination in a person with HIV, with no previously documented COVID-19 infection.

Comparison of other cases

1. Płaszczyńska et al report regression of viral warts after receiving the AstraZeneca ChAdOx1-S COVID-19 vaccine, it is unknown if the person ever tested positive for COVID-19 infection.³
2. Erkeyman and Bilen present a case of numerous treatment-resistant warts clearing during infection with COVID-19 in a transplant recipient.⁴

Saadeh et al⁵ offer an explanation to Erkeyman's case suggesting that the COVID-19 virus activates plasmacytoid-dendritic-cells to migrate to the skin

and release type I interferons, contributing to SARS-CoV-2 associated chilblains and other skin findings. These immune cells are speculated to be highly active in inflamed warts and inactive in non-inflamed warts.⁵

Our findings support the hypothesis that the immunological response to COVID-19 infection or vaccination causes a wide array of systemic and cutaneous manifestations. Infection or vaccination may reactivate local cutaneous immunity, thus triggering clearance of persistent HPV infected cells.⁵ A similar mechanism is theorized to explain the clearance of widespread cutaneous warts and skin cancers after HPV vaccination.⁶ More than 16 infectious diseases vaccines are ongoing studies to examine their cancer-fighting immunological properties as adjuncts to immunotherapies.⁷ Additionally, the COVID-19 pandemic rapidly accelerated RNA-vaccine research, and studies are examining utilizing RNA-vaccines to produce proteins that can treat numerous pathologies ranging from oncology to wound healing.⁸

The incidence of cutaneous warts is significantly increased in HIV-positive people and solid organ transplant recipients,¹ and warts tend to be more

numerous and aggressive.⁹ This is explained by impaired cellular immunity.¹⁰

Although the timeline of this case is compelling, there is a possibility this observed phenomenon was due to chance, and correlation does not imply causation. Additionally, our patient was receiving oral acetrutin at the time of wart clearance, and the immune response may have augmented a vaccine-initiated response. Therefore, coincidental clearance cannot be entirely excluded without larger studies.

CONCLUSION

We present a novel case of recalcitrant VV that spontaneously regressed after Moderna COVID-19 vaccination in a person with undetectable HIV. This case supports the theories that COVID-19 infection or vaccination may reactivate local cellular immunity triggering clearance of longstanding HPV infection. Documentation of other vaccination-induced clearance of HPV and further exploration can pave the way for potential systemic treatments for widespread verrucae, possibly delivered in the form of a vaccination.

Conflicts of interest

None disclosed.

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