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# Gardasil 9 vaccine for the treatment of recalcitrant plantar warts in an immunocompromised patient

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## Introduction

Plantar warts (verruca plantaris) are benign epithelial tumors caused by HPV-1 (myrmecia) and HPV-2,-27 or,-57 (mosaic). They may be difficult to treat with many failures or recurrences after multiple treatments, especially in immunosuppressed patients. Small series have reported the interest of two HPV vaccines, Gardasil 4 (a quadrivalent vaccine targeting HPVs 6/11/16/18), and Cervarix (a bivalent vaccine targeting serotypes 16/18) in the treatment of cutaneous warts [1,2]. We report a demonstrative case of resolution of recalcitrant plantar warts in an immunosuppressed HIV-infected patient after one dose of Gardasil 9 (a nonavalent vaccine targeting HPVs 6/11/16/18/31/33/45/52/58) [3].

## Case report

A 56-year-old HIV infected man had multiple resistant plantar warts on the feet and toes. His HIV infection was controlled for many years by association of emtricitabine/tenofovir/alafenamide/rilpivirine with undetectable HIV viral load and normal CD4 T cell count. His warts have been treated for 12 years with multiple treatments, including salicylic acid, liquid nitrogen, $CO_2$ laser, topical cidofovir, oral zinc sulfate, imiquimod and 5% fluoro uracil. On December 2020, physical examination revealed persistant multiple proliferative verrucous lesions localized on his feet (Figure 1a,b). We proposed Gardasil 9 vaccine. As the treatment was not reimbursed, he only had one dose. After 6 months, there was a complete clearance of the warts lesions on both feet (Figure 1c,d). There was no other modification in his treatment within these 6 months.

## Discussion

Treatment of plantar warts may be very challenging especially in immunosuppressed patients [1,2]. We report the second case of clearance of recalcitrant warts after vaccination with Gardasil 9. Ferguson et al reported a 77-year-old immunosup-


**Figure 1:** (a and b) Plantar warts on the right foot before vaccination. (c and d) Regression of cutaneous warts at 6 months following vaccination.

pressed patient with a 6-month history of eruptive warts on the trunk and extremities who experienced a rapid clearance after vaccination with Gardasil-9 [4].

Despite many available treatments for cutaneous wart, new options for recalcitrant warts are warranted for patients. Small series evaluated the interest of Cervarix and Gardasil-4. A prospective study (44 patients) documented the effect of intralesional injection of bivalent Cervarix (every 2 weeks) with 81.8% of complete clearance as compared to 63.3% after intramuscular immunization [1]. In a retrospective study (30 patients) 46.6% of the patients had also a complete clearance of plantar warts after 3 doses of the quadrivalent Gardasil [2]. Several case reports illustrated the interest of HPV vaccines in the treatment of common or plantar warts [5-9].

These HPV vaccines are approved to prevent anogenital warts and cancers caused by mucosal HPV types. Theses vaccines are composed of major capsid protein L1 virus-like particles. Therapeutic effect may be due to antigenic similarities of the L1 capsid proteins cross the different types of HPV.

Second-generation HPV vaccine (Gardasil 9) may be a promising therapeutic choice for treating resistant warts. This treatment needs to be evaluated in a prospective study.

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