# Treatment of Verruca Vulgaris with Nd: YAG 1064-nm Laser

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***Figure 1. Finger with wart before (left) and after (right) laser treatment.***

## Case presentation

A 39-year-old, healthy Caucasian female presented to the dermatology office with a non-itchy, painless bump on her finger that had been increasing in size for the past few months. Physical examination revealed a 2 mm, flesh-colored, firm, hyperkeratotic, verrucous papule with disruption of normal skin markings and display of small black dots on the right middle finger, close to the nail. A clinical diagnosis of verruca vulgaris was made, and the patient received multiple treatment sessions using liquid nitrogen for wart destruction. However, she reported no improvement at her follow-up visits, and the wart remained the same size. Subsequently, the patient was prescribed topical treatments including imiquimod 5% cream, sinecatechins 15% ointment, and imiquimod 3.75% cream, but they did not significantly decrease the size of the wart. At her tenth visit to our office, the patient began to receive Nd:YAG 1064-nm laser therapy for wart treatment at two-week intervals. After the completion of the fourth laser treatment, the wart was completely resolved (Fig. 1).

Discussion

Verruca vulgaris is caused by HPV infection (subtypes 1, 2, 4, 27, 57, and 63) and occurs mostly in children and young adults. They are usually asymptomatic and are transmitted via skin-to-skin contact. Trauma and maceration may facilitate initial epidermal inoculation, and spreading may subsequently occur by autoinoculation.[1] Common warts often present as well-demarcated, rough, hard nodules or plaques with irregular surfaces. Diagnosis of verrucae is based upon clinical appearance. Spontaneous remission of warts occurs in up to two-thirds of patients within two years; hence, observation is an option for all patients.[2] However, since recurrence of verrucae is common, early intervention may be preferred to prevent wart spreading.

Treatment of verruca involves two approaches: destruction of the wart and induction of local immune reaction with immunotherapy. Destructive methods are most commonly used as initial therapy, and they include cryosurgery, electrocautery, curettage, excision, and laser therapy. Immunotherapy is aimed at eliciting an immune response to HPV, which may be achieved by applying a topical irritant such as salicylic acid, cantharidin, trichloroacetic acid, podophyllum resin, 5-fluorouracil, or tretinoin over the


***Figure 2. Nd:YAG 1064nm Laser.***

wart. These compounds can also be used in combination or with a destructive method.[3,4] Cryotherapy is one of the most commonly used first-line treatments for verruca vulgaris. The wart is frozen with a thaw time of 30 to 45 seconds to produce a blister in one to two days. A sustained 10-second freeze with a spray gun has been found to be more effective than simply freezing to obtain a 2 mm to 3 mm halo around the wart. The ideal frequency of treatment is every two to three weeks, as the old blister desquamates. Complications of cryotherapy include hypopigmentation, scarring, and rarely, damage to the digital nerves from freezing too deeply on the side of the digit when treating a periungual wart.[1]

Immunotherapy may also be used for treatment of verruca vulgaris. Antiviral effect can be achieved with bleomycin and interferon alpha-2b, but they are reserved for recalcitrant warts. Imiquimod 5% cream may be used to induce local production of antiviral cytokines in the skin.[3] Intralesional immunotherapy with skin test antigens (e.g., mumps, Candida, or Trichophyton antigens) and HPV vaccine have demonstrated success in treating warts.[5] Lesions that have failed to respond to routine office modalities are often successfully treated with laser therapy such as carbon dioxide or pulsed dye laser.[6,7] Nd:YAG 1064-nm laser has also been reported to be successful in treating verruca and has received FDA clearance for this indication (Fig. 2).

The Nd:YAG 1064-nm laser treatment involves the delivery of laser light irradiation at wavelength 1064 nm, which allows deeper penetration into thicker tissue compared to shorter-wavelength lasers without direct skin or verruca contact. This laser is also used for treating vascular and pigmented lesions, hair removal, skin rejuvenation, onychomycosis and many other aesthetic and medical treatments.[8] A minimum of one to two treatment sessions is needed, with sessions spaced two to three weeks apart. Treatment sessions usually begin using a focused lens with a 2-mm spot under the settings of 1.5-ms pulse duration and energy mode of 8 or 9 (fluence of 255 J/cm² to 287 J/cm²). A Zimmer cooler is used upon the end of the laser treatment. In the case of our patient, a total of two passes over the wart was applied with each treatment session, and the patient tolerated the treatment very well. Upon the end of the fourth treatment session, the patient's wart had completely resolved.

Conclusion

We have demonstrated the success of utilizing Nd:YAG 1064-nm laser in treating a verruca that had failed to respond to standard treatment. Dermatologists should consider using this laser therapy early in the course of treating resistant warts since it is well-tolerated by patients, and it provides timely, significant results that help to bring disease remission.

# References

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