

Table 1. HUMAN PAPILLOMAVIRUS DNA TYPING

Lesion Location	HPV DNA Type	Causes
Cutaneous	1, 2, 3, 4	Flat warts (common)
	1, 2	Plantar verruca
	5, 8, 14, 17, 20	Epidermodysplasia verruciformis
Anogenital: cervix, vulva, penis, anus	6, 11, 16, 18	Condyloma acuminatum
	6, 11	Low-grade cervical dysplasia
	16, 18	High-grade cervical dysplasia
		Carcinoma in situ, invasive carcinoma
Additional penis	31, 42	
Oral	16, 18	Squamous cell carcinoma, dysplasia
	6, 11	Dysplastic and benign oral lesions (SCC)
	2	Carcinoma and leukoplakia of tongue
		Oral verrucous carcinoma, oral Condyloma acuminata, verruca vulgaris
Laryngeal	6, 11	Papillomatosis found latent, carcinoma
	6, 11, 16	Squamous cell carcinoma
	30 (16)	Carcinoma
Nasal, paranasal	6, 11, 16, 18	Nasal-inverting papillomas
	6, 11	Squamous cell carcinoma
Conjunctiva	6, 11	Conjunctiva papilloma
	16	Dysplastic, malignant lesions

aided by the presence of progenitors that permit viral particle adherence to receptors located on host cells. HP virions are approximately 55 nm in diameter.

Infection most likely occurs in the basal cell layers of the skin through fissures, cracks, cuts, or some other portal whereby viral particles that are either picked up or lying dormant are transported to deeper cutaneous layers where they remain. Latent papilloma viruses¹² are dormant viral particles that coexist within normal tissue sites and sites

Table 2. HUMAN PAPILLOMAVIRUS DNA TYPING AND LESION SPECIFICITY

Lesion	HPV DNA Type
Common warts	1, 2, 3, 4
Plantar verruca	1, 2
Epidermodysplasia verruciformis	5, 8, 14, 17, 20
Basal cell carcinoma	2 (immunosuppressed kidney transplant pts.)
Malignant melanoma (sup. spreading)	17, 38 (immunosuppressed)
Keratocanthoma	9, 16, 19, 25, 37
Squamous cell carcinoma	16, 1, 2, 3, 4 (verruca vulgaris)

adjacent to clinical verrucal areas. Verrucae can remain latent, or dormant, without any evidence of clinical symptomatology. The mechanism by which a latent HPV transforms into one expressing morphologic evidence of disease remains unknown. The authors hypothesize that, in effect, immunity has a great bearing on this transformation. Although cutaneous HPVs are benign, malignant transformation, although rare, can occur as evidenced by HPV 5 and HPV 8.²³

Human papilloma virus is epitheliotropic, that is, it can infect only human epithelial cells. Because the varying HPV types also have a predilection for either cutaneous or mucosal areas, the chance of cross-infection is rare. This, combined with genetic predispositions, makes the actual transmission of HPV one of ordered occurrence and not a random or haphazard event. Replication of viral DNA mainly occurs in the strata spinosum and granulosum where capsid proteins and virions are evident. Wart size is independent of virion number, and, in fact it is the expression of nonstructural viral proteins rather than structural ones that determines size and morphology.²³ Growth and latency are also unrelated to virion number. The relative chronicity and resistance of certain verrucal lesions to various treatments is thought to be related to the presence of viral genomes in the deeper epidermal layers. According to studies by Cobb,⁷ there are 55 specific genotypes of HPV that correlate to clinical sites of predilection.

Reproduction of a virus takes place within the cells of the host. Viruses are loosely categorized as obligate intracellular parasites, as their replication and overall lifespan are host-dependent. Viral genomes have the potential to be either RNA or DNA, depending on viral specificity. The formation of a particular virion, which is the infectious portion, occurs with the transmission of the viral genome to host cells where replication begins. Some viruses, such as the herpes viruses, are afforded protection by an outer layer, or envelope, that covers the capsid or protein shell. These viruses are sensitive to drying and lose their infectivity if this occurs. Other viruses, such as the pox viruses, have a more evolved structure and are resistant to drying. HPV virions do not possess an envelope and are therefore unlikely to be destroyed by drying. The infectivity of HPV virions is maintained when sloughing of superficial skin layers occurs.

The lesions caused by HPVs are described as being (1) solitary single lesions or less than three isolated lesions on one foot; (2) a multiple mosaic pattern of grouped warts or greater than three lesions together in any anatomical distribution (Fig. 1); or (3) recalcitrant, any verruca that has failed to respond to any type of treatment before presentation.

Infections with HPV in certain individuals may wax and wane for extended periods of time. As chronic infections have been attributed to infection of cells within the reproductive cell layers, cell-mediated immunity is also linked to chronicity or reactivation. Spontaneous resolution of HPV infections is possible, but not probable. Patients with unimpaired, cell-mediated immune function show both a propensity to

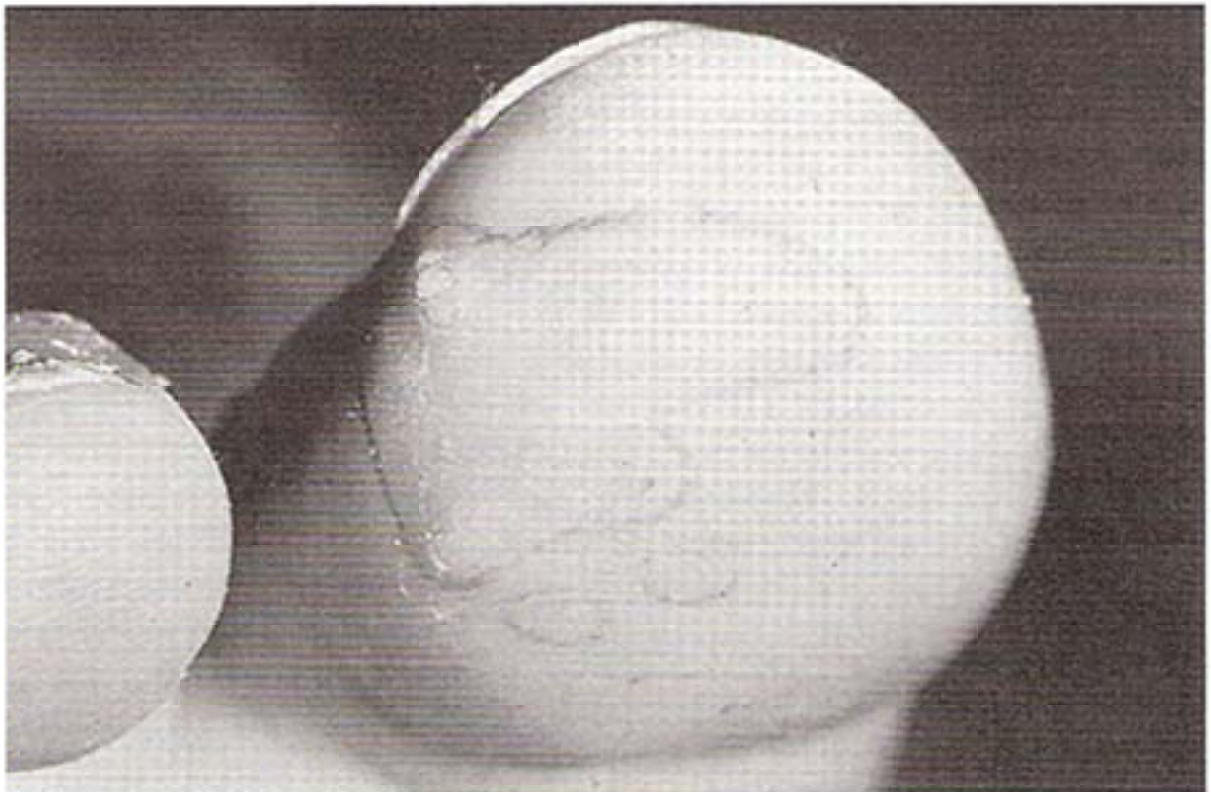
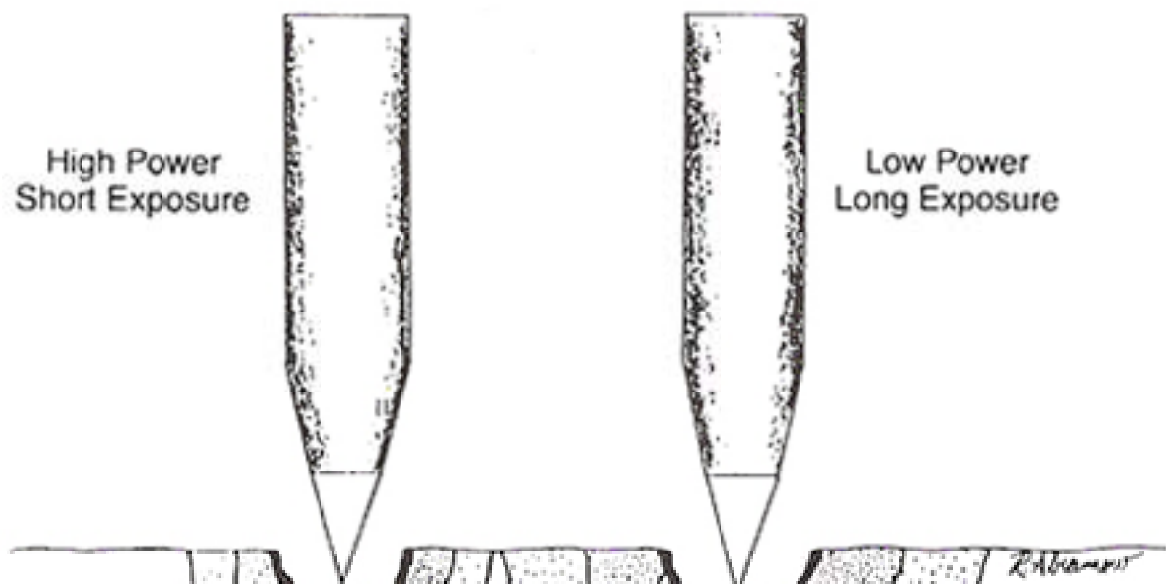


Figure 1. Clinical photograph of the multiple-mosaic pattern of plantar verruca.



have HPV infections and a resistance to most forms of treatment. If treatment is eventually successful, the risk of reinfection or recurrence is increased by overall immune suppression.

Recalcitrance in a host with normal immune function has been linked to the presence of occult viral particles¹⁹ that lie in areas contiguous with visible verrucal lesions but are nondetectable clinically owing to their being directly under normal-appearing epidermal layers (Fig. 2).

Clinically, verrucal lesions are usually firm hyperkeratoses with tiny areas of pinpoint petechiae or thrombosed capillaries evident centrally. Electron microscopy has shown the presence of a central arteriole and small venules that exhibit the pinpoint hemorrhaging that is pathognomonic for a verruca. The central arteriole may cause some of the pulsatile extravasation of blood that occurs after deep débridement or surgical excision of a lesion. Plantar verrucae tend to be endophytic,²⁰ that is, the actual lesion size is much larger than is clinically evident owing to the involution and ingrowth within the epidermis (Fig. 3). Even though viral growth is within the epidermis proper, the extension of verrucal cells into dermal regions by their incorporation into epidermal rete ridges and pegs must be noted (Fig. 4). For these reasons, Lemont and Parekh²² advocate surgical excision down to the level of the superficial fascia to ensure complete removal of potentially verrucous tissue. Typically, the verrucae tend to remain above the basement membrane and do not violate that boundary.²⁷ They also tend to occur under weight-bearing areas of the foot, such as the heel or metatarsal head regions, where inoculation occurs more easily owing to fissures, cuts, callosities, or other mechanical means. Regardless, direct exposure is the means whereby transmission occurs in humans.



Figure 3. Clinical verrucal specimen following curettage.

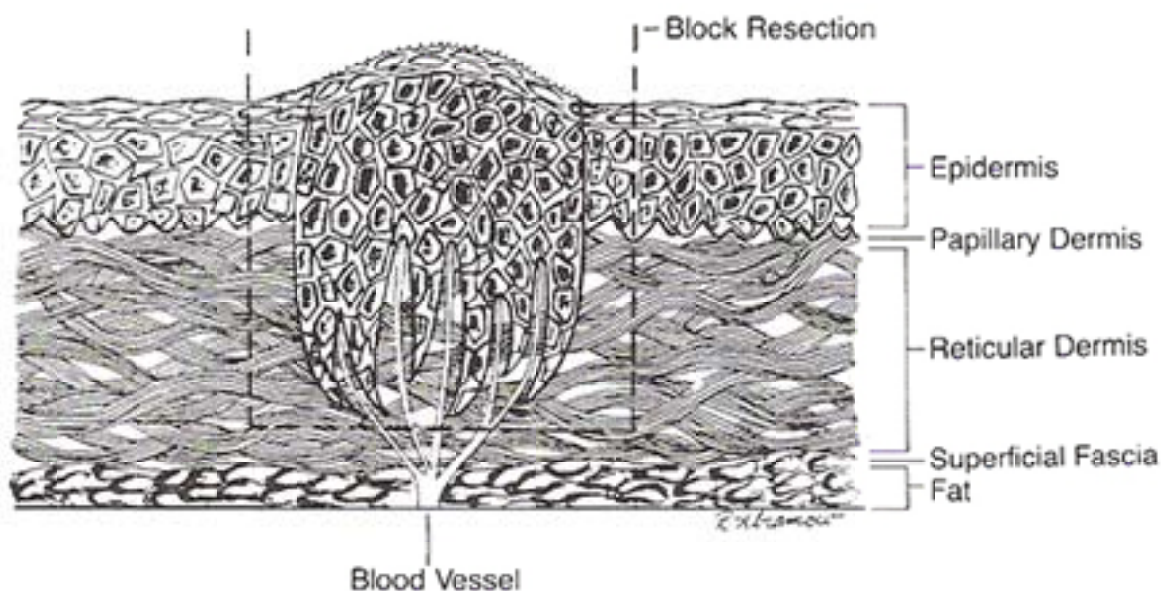


Figure 4. Lesion extending into the papillary and reticular dermal regions. (From Landsman MJ, et al: Carbon dioxide laser treatment of pedal verrucae. *Clin Podiatr Med Surg* 9:659–669, 1992.)

The tendency for verrucae to develop may be congenital. Soulier³⁴ reported the presence of verrucal lesions in nearly the same location in identical twins. The ability to contract verrucal infections is greater in younger populations and may be related to a less developed immune system, excessive perspiration, or other environmental factors. In older patient populations, the presence of verrucae is negligible. Some physicians believe that because verrucal infections are self-limiting, they do not need to be treated. The authors have, in fact, seen spontaneous resolution of plantar verrucae that were small, isolated lesions and also larger, mosaic lesions. We almost always advocate treatment to alleviate and prevent pain due to the lesions, to eradicate and prevent the spread of the lesions, and to prevent recurrence.

Treatment of verrucal lesions usually is geared toward removal of the offending growth along with the peripheral area, approximately 3 to 4 mm larger in diameter than the visualized area, to decrease the chance of recurrence by eradicating any occult verrucae.^{26, 29} The medical and surgical management of HPV encompasses a multitude of modalities owing to both the resiliency of the virus as well as the less than optimal success rates of most methods. The treatment variations, which we review, vary in methodology, complexity, and success from practitioner to practitioner.

TREATMENT

Environmental

The theory behind this mode of treatment stems from the belief that an alteration in the milieu of the verruca will destroy it. Methods include

topical astringents, such as Domeboro soaks. Warm water soaks have shown limited success.

Psychotherapy

A comparison of the effectiveness of placebos and hypnosis by Spanos and co-workers²³ showed that hypnotic suggestion was more effective than either placebos or no treatment at all. Other treatments have included the use of colored liquids, crystals, and saline.

Roentgenotherapy

X-ray radiation has been utilized for its ability to inhibit cell growth in epidermal lesions, thus, interfering with viral cell growth and reproduction. Side effects have included scarring, chronic ulcerations, radio-dermatitis, and carcinomas.

Cryotherapy

One of the more commonly utilized procedures, the use of liquid nitrogen, has been shown to have a 91% cure rate.²² Carbon dioxide snow or dry ice is also used. More commonly utilized by practitioners is Histofreezer (Pedinol), composed of dimethylether and propane. Before the application of any cryosurgical technique, the verrucal tissue is débrided to bleeding to increase the penetration of the cryotherapeutic agent. One or more applications may be necessary, and individual application times range from 40 to 60 seconds each. The degree of superficial necrosis that ensues depends on the lesion size and depth. Treatment can be repeated weekly. Advantages of cryotherapy include no need for anesthesia, minimal discomfort and scarring, and the likelihood that fewer treatment sessions will be needed. Disadvantages with large or mosaic lesions include localized burning and pain and decreased effectiveness. Cryotherapy is performed on children because it is easily tolerated and effective for lesions in children and adolescents, which tend to be more superficial than those in adults.

Injection Therapy

Bleomycin

Use of bleomycin has been advocated by Sollitto and co-workers,³² who had a 32.2% cure rate, and by Bremner⁵ who showed a 63% success rate. Bleomycin binds to the viral DNA in warts and prevents replication, leading to cell death. Dosage is usually 1 mL per lesion.

Systemic toxicity has not been seen; scarring is rare, but local tissue destruction, microthrombosis, and pain are common side effects.

Recombinant Alpha-2 Interferon

The mechanisms of action of interferons are antiviral, antiproliferative, and immunoregulatory. Vance and co-workers³⁸ treated isolated lesions with 10^6 IU of interferon, 10^5 IU of interferon, or placebo. Clearing occurred in 13%, 22%, and 21% of patients, respectively, indicating no statistical difference between interferon and placebo. Another study, however, showed that intramuscular injections of human lymphoblastoid interferon alpha provided 33% improvement.¹⁴ The most effective interferon was an intralesional interferon beta injection, which provided 81% improvement.²⁹ Major side effects, including flulike symptoms, pain at the injection site, leukopenia, anemia, thrombocytopenia, and liver enzyme abnormalities, may preclude the use of interferons for the treatment of verrucae.

Others

Intralesional injection of 0.1 to 0.4 mL of 5-fluorouracil was shown by McCarthy and colleagues²⁷ to have a 92% cure rate. Sulfarsphenamine, bismuth salicylate, novocaine, and procaine have all been utilized intralesionally with varied success. Intralesional injection of podophyllin resulted in near-fatal systemic toxicity.²¹ Vitamin A and alcohol injections also have been used but without benefit.

Immunotherapy

Dinitrochlorobenzene

Following patient sensitization to dinitrochlorobenzene (DNCB), a solution of approximately 1% DNCB is used. The area is initially débrided, the DNCB applied and rubbed into the verruca, and then the entire site covered with an occlusive dressing that is left in place for approximately 2 weeks. An acute inflammatory reaction occurs, causing local vesiculation of the verruca. Débridement is performed, and treatment is repeated until eradication is complete (approximately 3 to 6 weeks). This technique has been advocated by Carrel and Davidson.⁶ Grayson and co-workers¹⁶ used DNCB for recalcitrant verrucae in 10 patients, 6 of whom were cured. DNCB should be used with caution as it has been implicated as cross-reacting with other chemicals and causing contact dermatitis as well as having possible mutagenic and carcinogenic effects.

Vaccines

Israel¹⁹ compared the efficacy of inoculation of vaccinia virus with saline injections. Of 50 patients treated with saline, nearly 50% had

eradication of the lesions, as did 52% of patients treated with vaccine. There was no statistical difference, and the inherent risk of systemic side effects, such as lymphangitis and lymphadenopathy, precluded further study. Biberstein¹ utilized wart autolysate intralesionally twice a week for 7 to 10 weeks and noted a 75% cure rate. Sakuranne and Sugan³¹ used 0.1 g of gamma globulin intradermally in the forearm twice a week for 6 weeks, which resulted in a cure of 28 of 32 verrucae. With all vaccines, the antigen-antibody reaction to destroy the viral cells is elicited by this type of treatment.

Electrical

Electrodesiccation (Hyfrecation, Fulguration)

Following administration of local anesthesia and débridement, the hyfrecator tip is brought near the verrucal surface until sparking is evidenced between the two. The charred tissue is periodically wiped clean with saline or bluntly débrided. This process is repeated until no verrucal tissue remains. Horwitz and Marker¹⁷ reported a success rate of 65% with this technique. A major benefit of this methodology is that one treatment is usually effective, but side effects, such as moderate-to-severe pain, difficulty in controlling depth, and recurrence of larger or recalcitrant warts may preclude its use. Negative galvanic current also has been utilized with similar results and side effects. Another side effect of this technique, which has also been seen with many lasers, including the CO₂, is the laser plume that is generated during vaporization and ablation of a verruca. The viability of cellular particulate matter within the laser plume has been documented^{13, 31} and may have a far-reaching effect in terms of recurrences.

Static Electricity

Hughes and co-workers¹⁸ showed that utilizing the Covington electrical device to create static electricity afforded an 81% cure rate. The average course of treatment was nine applications over 9 weeks. Most patients had verrucae that had failed treatment by a variety of methods but that responded to this technique.

Ultrasound

Delacerda¹⁰ used ultrasound treatments of 0.5 to 1.5 w/cm² for 7 to 15 minutes to eradicate warts in athletes. This technique was based on the theory that ultrasound produces two necessary elements for successful treatment of verrucae: (1) heat to cause thermal necrosis and (2) activation of an immune system response. Direct application was successful in 83% of patients, but the placebo success rate was 86%.

Chemical Destruction/Pharmacological Agents

Salicylic Acid

Once the mainstay of the practitioner's armamentarium for verrucal treatment, the use of salicylic acid has declined owing to the difficulty in procuring adequate strengths of the acid. Concentrations range from 15% to 60%, with 60% being most widely used in the physician's office. Initial treatment includes débridement of the lesion to bleeding, with removal of all hyperkeratotic tissue. An aperture dispersion pad is often employed to protect surrounding skin. The appropriate concentration of salicylic acid is applied, and an occlusive dressing is utilized. The patient is told to keep the site dry, and the process is repeated a week later. Treatment continues for several weeks to several months, depending upon lesion site, depth, and recalcitrance. As may be expected, mosaic lesions usually respond poorly to this technique. Steele and co-workers³⁶ combined 60% salicylic acid with monochloroacetic acid and reported a 66% cure rate for mosaic lesions. Some practitioners aid absorption of the acid by needling the verrucal site, but this has not shown to be beneficial. Regardless of the type of acid used, action is by keratolysis of the viral tissue. Advantages include minimum disability, no anesthesia, minimal discomfort, and a low risk of scarring. Obvious disadvantages include the need for multiple treatments, varying cure rates, and recurrences.

Formalin

The mechanism of action of formalin, which is 37% formaldehyde in water at concentrations of 2% to 3%, is tissue dehydration³⁴ that leads to tissue destruction. Treatment includes warm water soaks to soften the skin, followed by application of formalin to the site, which is then covered with a bandage. Vickers³⁹ documented an 80% cure rate after 2 months.

Side effects are dryness, cracking or fissuring of the skin, and dermatitis. The authors advocate the use of Lazer Formalyde solution or spray (Pedinol Pharmica), as this formalin preparation offers ease of application for daily use.

Cantharidin

Derived from the blister beetle, cantharidin is applied topically and causes vesiculation of verrucal tissue. Cell death occurs as the preparation is absorbed. Typically, cantharidin, 0.7% collodion solution, is applied after local débridement, and the site is then placed under occlusion for 3 to 7 days. A blistering of the tissue usually occurs, and treatment may need to be repeated over the course of 2 to 4 weeks. Typically, much pain and blistering is encountered owing to the intense reaction, which hampers ambulation in certain individuals. Cure rates of 80%

have been seen.¹¹ Difficulty in procuring cantharidin has caused this modality to be seldom used today. Another preparation called Verrusol (Palisades Pharmaceutical, Tenaflly, NJ) contained cantharidin, but this product has been discontinued.

Retinoic Acid

Retinoic acid (tretinoin) in concentrations of 0.05% to 0.1% has been used in the treatment of warts. Its method of action includes epidermal proliferation and sloughing. Tretinoin is applied once a day until the lesion disappears. This modality has limited use in the treatment of plantar verrucae.

Caustic Agents

These include silver nitrate and mono-, bi-, and trichloroacetic acids used topically to elicit localized hydrolysis, inflammation, and eventual destruction of the verruca. Occlusive dressings are often indicated to promote absorption.

Glutaraldehyde

A 10% solution of glutaraldehyde is employed topically every day. Local drying, fissuring, or cracking may occur. One side effect peculiar to glutaraldehyde is local skin discoloration.

Podophyllin

This resin mixture has been utilized topically for plantar verrucae with a success rate of 80% to 90%.¹⁰ Derived from the *Podophyllum peltatum* and *Podophyllum emodi* plant species, the resin acts via inhibition of mitosis by binding to tubulin as well as by causing local circulatory disruption. Treatment begin with local débridement, followed by application of the resin in a 25% liquid paraffin base and an occlusive bandage. The bandage is left in place for approximately 1 week, and then the area is débrided and inspected. The practitioner should be aware of potential systemic absorption,³⁶ which has been seen because of the variability of concentrations of the podophyllin resin. An alternative being utilized is podophyllotoxin solution, which affords more standardized concentrations. As is true with other topical agents, local pain, erythema, edema, blistering, and burning may occur during the therapeutic course, which may last for several weeks.

5-Fluorouracil

5-fluorouracil (5-FU) is a topical cream most commonly used for actinic keratoses. It is an antimetabolite that has been utilized for the treatment of plantar verrucae, with a 60% cure rate noted by Bunney.⁴

The mechanism of action includes destruction of the cells via inhibition of DNA and RNA synthesis. Treatment includes application under occlusion after débridement of the lesion. The authors advocate its use as an adjunct therapeutic modality following laser excision of verrucae. 5-FU can cause delayed wound healing in surgical wounds, and this should be considered before its use. Side effects also include hyperpigmentation, erythema, local inflammation, and delayed or prolonged healing time.

Corticosteroid

The use of topical steroids for the treatment of plantar verrucae has been equivocally beneficial at best. The mechanism of action is thought to be interference in the fibroblastic activity in the inflammatory process, leading to decreased production and growth of epidermal cells. High-potency steroids such as diflorasone diacetate, 0.05%, and desoximetasone, 0.25%, as well as superpotent forms including augmented betamethasone dipropionate, 0.05%, and halobetasol propionate, 0.05%, have been utilized. Cream or ointment forms tend to be absorbed more readily. Care should be taken with topical steroid administration, and typical side effects should be monitored.

Others

Other chemicals and substances have been utilized with varied success. These include topical deoxyribonuclease, chymotrypsin, trypsin, fibrinolysin, euphorbium resin, phenol, silver nitrate, vitamin A (both oral and topical), pyrogalllic acid paste, and linseed oil (reduces keratogenesis). Recently, the use of cimetidine has been advocated for the treatment of verrucae. The theory behind its use is that a side effect of cimetidine is immunomodulation. Dosages for the treatment of verrucae include 300 mg of either cimetidine or ranitidine daily. Patients taking anticoagulants, phenytoin, or theophylline should avoid these medications.

Surgical Management

Excision

Surgical excision utilizing a scalpel and suturing the deficit was once a very popular treatment option. Poor wound healing, trauma, painful scarring, bleeding, and prolonged discomfort have caused this method to fall out of favor.

Curettage

With local anesthesia, the verruca is débrided to bleeding, and a surgical dermal curette is employed to excochleate the lesion. Care is

taken to make the diameter of excised tissue larger than the visible verruca to ensure removal of peripheral viral cells not clinically evident. The area is scooped out to the level of the basement membrane and sent for pathological examination if deemed necessary by the practitioner. The base is then cauterized either chemically or electrically. Davidson and Schuler⁹ report a 92% cure rate with this technique. Possible side effects and complications include recurrence, poor or painful scar formation, ulcerations, new eruptions, and delayed healing. Care should be taken not to violate the superficial fascia, as this may lead to increased scar formation.¹¹

Plastic Surgical Repair

Although deemed radical by today's standards, cross-leg pedicle grafts, full-thickness grafts, and plantar condylectomies have been used for plantar verrucae.

Laser Ablation

CO₂. The mainstay in recent years for the laser treatment of verrucae, the CO₂ laser operates on a wavelength of 10,600 nm in the infrared spectrum. Because the CO₂ laser beam is invisible, it is coaxially aligned with a visible helium-neon beam (630 nm, red spectrum). High power (6 to 10 W/cm²) and short exposure time are optimally effective in reducing the zones of both thermal necrosis (irreversible) and thermal effect (reversible) (Fig. 5). Anesthesia, usually with epinephrine, is utilized. Success rates have ranged from 62% for multiple recalcitrant lesions²⁵ to 94.7% for isolated lesions.²⁸

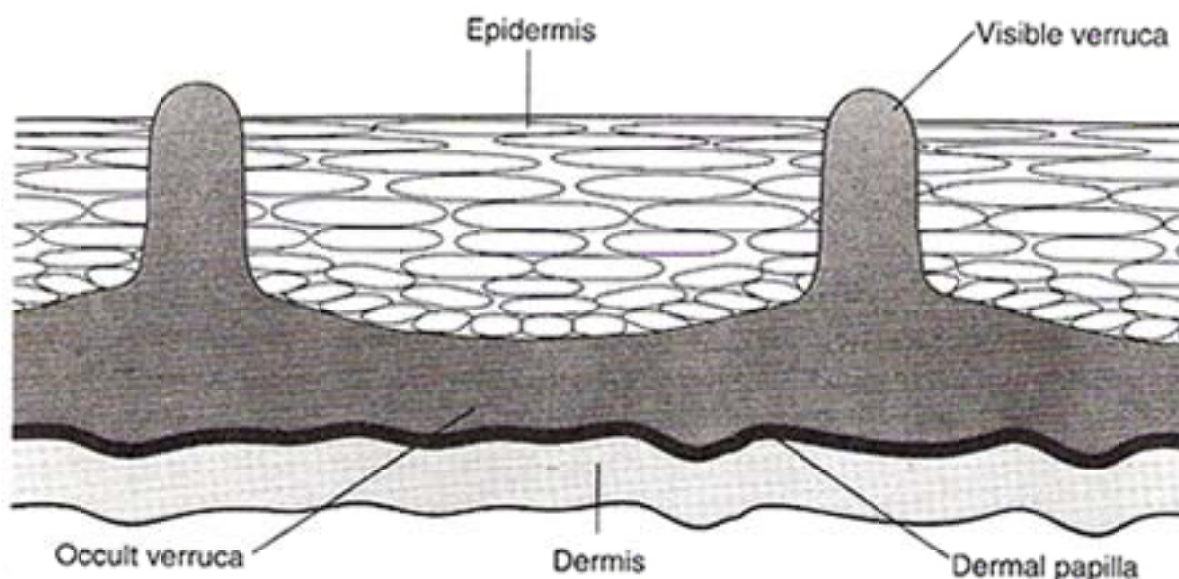


Figure 5. The impact of CO₂ lasers on tissue, which causes a centralized carbonization zone (char) surrounded by zones of thermal necrosis and thermal effect. (From Landsman MJ, et al: Carbon dioxide laser treatment of pedal verrucae. Clin Podiatr Med Surg 9:659-669, 1992.)

The authors utilize a boundary of approximately 3 to 4 mm larger in diameter than the visual lesion to decrease the chance of recurrence by ablation of occult or latent verrucae^{26, 29} (Fig. 6). Borovoy² and Mancuso and co-workers²⁶ reported success rates of 85% and 93% for isolated lesions. This method also has been combined with the use of 5-FU for added effectiveness of treatment, but delayed healing time may ensue. Advantages of the CO₂ laser include minimal discomfort, minimal post-operative complications, and a high success rate. Disadvantages and possible complications include scar tissue formation, recurrence, sterile abscess formation, and infection. The CO₂ laser offers nonselective destruction of all tissues, regardless of pigmentation, but is limited in that it needs a bloodless or fluidless field to function.

Nd:YAG (Neodymium-doped Yttrium-aluminum-garnet). The Nd:YAG laser operates in the infrared spectrum at 1064 nm and has gained widespread acceptance as an excellent alternative to the CO₂ laser for the ablation of verrucae. It also is coupled with a helium-neon beam to afford visualization. It has a deep penetrability and, thus, can cause more intense burning and scaling than does the CO₂ laser. This penetrability does, however, afford lower recurrence rates. The Nd:YAG laser has poor absorption in water and, thus, is better than the CO₂ for use in areas where fluid or blood is present.

KTP (Potassium Titanyl Phosphate). The KTP laser combines the excellent cosmetic results of the CO₂ laser and the lower recurrence rates



Figure 6. A boundary of 3–4 mm wider in diameter than the visualized lesion is utilized with CO₂ laser ablation and excision.

owing to deeper tissue penetrability of the Nd:YAG. There is less tissue response than with the Nd:YAG laser and a better cosmetic result than with the CO₂. Using the KTP laser with a saline medium can increase depth of penetration by 50%. It is also effective in darker-skinned patients, as melanin absorbs the wavelength very effectively (511 nm). A 5% acetic acid wash is sometimes used in targeting to turn suspected lesions white for better visualization. From 3 to 8 W/cm² is used, and, at temperatures of 70° C, the DNA in the viral cells is killed while the skin is left intact. No plume is generated by the KTP laser.

Copper Vapor. This laser operates at the 511-nm wavelength and is used as a superpulsed type of laser with 10,000 to 15,000 pulses per second. It selectively ablates the epidermis where verrucae replicate above the melanocytic layer. By doing so, it can destroy as much of the epidermal layer as needed, but it is unable to penetrate deeper to any areas where the epidermal ridges and pegs descend into the dermis. Therefore, the recurrence rate may be greater than with other lasers. Advantages include the lack of plume generation. Also, anesthesia is sometimes not needed.

Super-Pulsed CO₂. This laser is better suited for superficial epidermal lesions and is less than optimal for deeper lesions, including verrucae.

Others. Many lasers, including the erbium:YAG, excimer, holmium:YAG, and argon, have been utilized both clinically and experimentally with varied success. Each has its advantages and disadvantages, but more clinical trials need to be done. One other laser type is the tuneable dye, which can "tune in" to any wavelength in the visible near-infrared and near-ultraviolet spectrums. Obviously, this allows more diversification as greater tissue selectivity is afforded.

CONCLUSION

The treatment of verrucae, as evidenced by the abundance and variation of options available, can be extremely varied in method and outcome. Although many treatment alternatives are available, some afford greater success rates, some are easier to perform, and others have fewer complications. The practitioner must decide, based upon the type and location of the lesion and his or her experience with available techniques, which is optimal for a particular set of circumstances and for a particular patient.

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