Section

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Chapter
1

HPV Infection

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INTRODUCTION

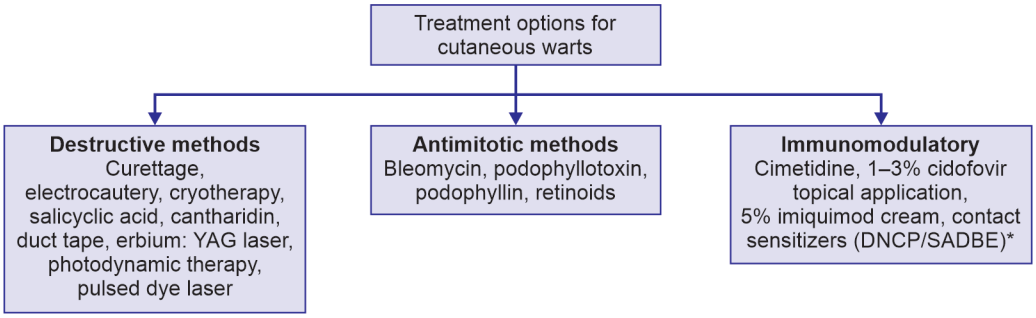
Human papillomavirus is a DNA virus with over 200 different types. Depending upon the carcinogenic potential, HPVs are divided into high-risk types and low-risk types. Low-risk HPV presents with cutaneous warts as flat warts (verruca plana), common warts (verruca vulgaris), plantar warts (verruca plantaris, on soles of feet), filiform warts, periungual warts and condyloma acuminatum (anogenital warts, on genitalia, anus or perianal area). High-risk HPV (6, 11, 16, 18, 31, and 35) have the potential for malignant transformation to carcinoma.[1] Warts are usually diagnosed clinically. However, histopathological examination demonstrates hyperkeratosis, papillomatosis, and koilocytes and is required in a diagnostic dilemma.[2]

TREATMENT PROTOCOL

Many therapeutic approaches are used to treat warts to prevent recurrences. The American Academy of Dermatology developed criteria for the indications for wart treatment, which include:

1. The patient's desire for therapy,
2. Symptoms of pain, bleeding, itching, or burning,
3. Disabling or disfiguring lesions,
4. Large numbers or sizes of lesions,
5. Prevention of the further spread of warts.[2] The treatment protocol is given in **Flowcharts 1.1 and 1.2**.[3,4] In this chapter, we will be focussing on various anecdotal therapies for non-genital warts.

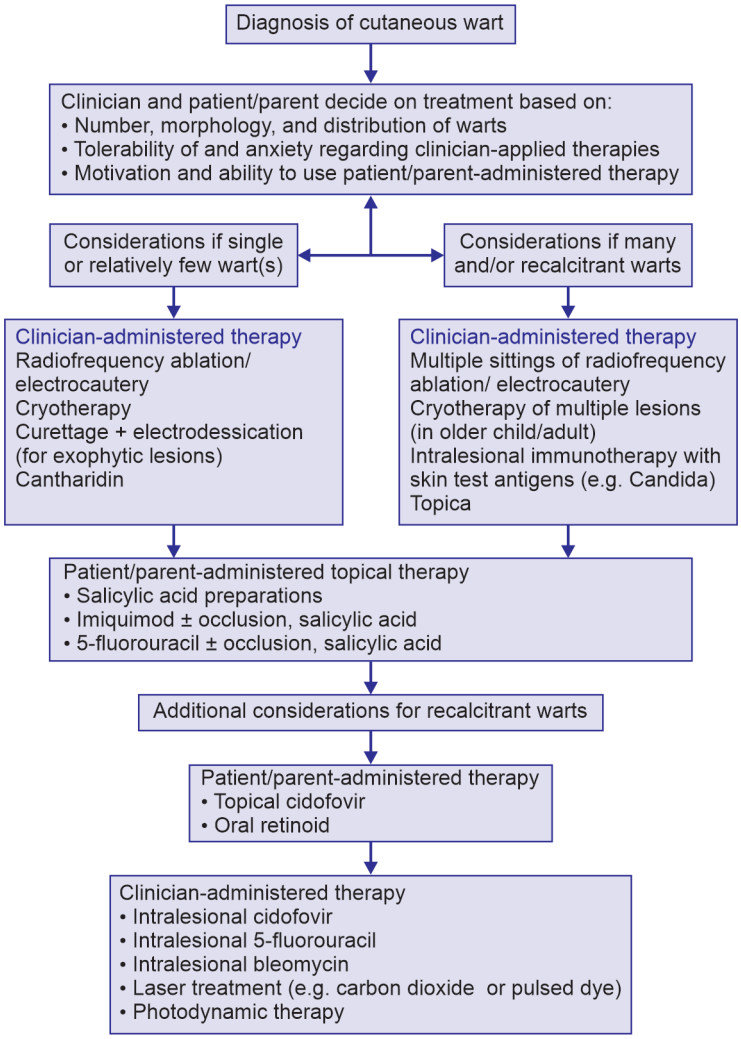
Flowchart 1.1: Classification of treatment options for cutaneous warts



[DPCP—diphenylcyclopropenone, SADBE—squaric acid dibutylester]

*(topical sensitization with 2% DPCP followed by at least six applications of 0.5–4% DPCP to warts at 3-week intervals for six months, similarly for SADBE)[3]

Flowchart 1.2: Approach to management of cutaneous warts



ANECDOTAL THERAPIES

The anecdotal therapies used in warts are given in Table 1.1.

Table 1.1: Anecdotal therapies in warts

Drug	Number of patients	Response	Adverse effect	Type of wart
Oral zinc sulfate[5] (10 mg/kg to a maximum dose of 600 mg/day) for two months	26	50% showed complete clearance	Nausea, gastric pain, and itching sensation	Verruca plana, verruca vulgaris, Planter wart
Intralesional measles mumps rubella (MMR)[6] 0.3 ml MMR vaccine injected with an insulin syringe into the most prominent wart every 3 weeks until complete clearance or for a maximum of 3 treatment sessions.	86	40/86 showed complete clearance, 18 showed partial response, and 28 had no response. Three patients showed recurrence on 6 months follow up	Pain at the injection site, erythema, and post-inflammatory hyperpigmentation	Verruca plana, verruca vulgaris, palmoplantar wart, interdigital wart
Intralesional Mycobacterium w vaccine[7] In sensitized patients, 0.1 ml of M vaccine was injected intralesionally into 3 to 5 lesions every week until either complete clearance or a maximum of 10 injections (12 weeks)	37	33/37 had complete clearance, (23 showed resolution of distant untreated warts) 1–50% clearance, 3–25 to 30% reduction in number of lesions	Erythematous tender nodule/pustule healing with superficial ulceration and scarring at the sensitization site, fever	Periungual warts, subungual warts, verruca vulgaris and plana
Intralesional Candida antigen[8] Candida antigen (0.2 ml of 1/1000 solution) intralesionally at two weekly intervals till complete clearance or a maximum of 5 sessions.	30	19/30, 19 showed complete had resolution, 3 had partial response, and 8 patients had no improvement	Local site reaction, flu-like symptoms	Multiple common warts
Intralesional BCG vaccine[9] 0.1 ml of BCG vaccine given intralesionally every 3 weeks till complete clearance of warts or for a maximum of 5 injections without response	30	21/30 showed complete clearance, seven partial, and two no response at the end of 3 months	Pain, edema, ulceration, scarring, and flu-like symptoms	Recalcitrant multiple nongenital common warts
Sirolimus[10] 5 mg/day dose	1	Significant clearance at the end of 6 months	–	Post-transplant, immunocompromised patient with cutaneous recalcitrant warts

Contd.

Table 1.1: Anecdotal therapies in warts (Contd.)

Drug	Number of patients	Response	Adverse effect	Type of wart
Oral retinoid[11] Acitretin 0.8 mg/kg per day for 2 months	14 (12 males and 2 females)	6 exhibited complete responses, four excellent responses, and 28.6% (4/14) good responses per the grading	Dry skin, cheilitis, hair loss, and dry mouth	Recalcitrant palmoplantar warts, periungual warts, common warts
Duct tape[12] A duct tape piece the size of the wart was applied to the wart and removed after six days, then was scrubbed the wart was scrubbed after soaking in water. The wart was left open to the air overnight. The 6-day cycle is repeated for up to 2 months	26	Of 26 patients, 22 had complete resolution		Common warts in pediatric and adolescent age group
Intralesional Bleomycin[13] Intralesional injection is 1 mg/ml or 1 U/ml One part of the bleomycin solution and two parts of 2% lidocaine are mixed in an insulin syringe to obtain a final bleomycin concentration of 1 U/ml. 0.2–0.5ml amount injected with a maximum total dose of 2 ml at 2–4 weeks intervals	293 warts (in 91 patients), 114 received placebo	Complete cure rates (CR) were seen in 78.6%, treatment failure in 21.2%, and recurrence in 2.7%	Transient hyperpigmentation (1–2%), Infection (1–3%), transient nail dystrophy in 3%, Raynaud's phenomenon in 2%	Periungual and palmer warts. Less responsive in plantar warts
Cantharidin[14] Cantharidin 0.7% solution in an adherent film-forming vehicle containing acetone was applied over warts for 4–6 hours every three weeks until the 16th week	15	The response ratings to previous treatments in 15 study subjects were as follows: three=worse, 3=none, 7=partial, 2=complete, and 3=scar formation	Post-inflammatory hyperpigmentation, blistering, burning, and scar formation	Facial verruca plana, verruca vulgaris

TREATMENT PEARLS FROM AUTHORS

The authors recommend cytodestructive methods in limited numbers of warts while multiple lesions need immunotherapy (BCG, MMR, DPCP), although the success rate of immunotherapy is around 40%.

CONCLUSION

Cutaneous warts are caused by HPV infection and are notorious for recurrences after treatment. The first line of treatment involves destructive procedures to clear the warts. However, there are other methods, such as antimitotic creams and immunotherapy. Treatment choice depends on the type of wart, site, duration, size, and number.

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