

## Case Report



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# A Case Report of Verruca Vulgaris on basis of Alopecia Areata Successfully Treated with Diphenylcyclopropenone

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## ABSTRACT

Alopecia areata is an autoimmune skin disease which is usually characterized by patchy hair loss in effected regions. Diagnosis usually based on clinical findings and main treatment options include topical, intralesional, systemic corticosteroids, and topical immunotherapy. Verruca vulgaris is an infectious disease caused by human papillomavirus which is usually characterized by well-marginated hyperkeratotic papules or plaques. There are several treatment modalities such as physical and chemical destruction and topical immunotherapy. A 23-year-old male patient presented to our outpatient clinic with multifocal noncicatricial alopecic plaques on scalp and multiple periungual verrucous papules on bilateral hands. High potent corticosteroid cream and minoxidil lotion 5% were offered for his scalp lesions, and topical 5-fluorouracil lotion was initiated for his verrucous lesions. In the 1<sup>st</sup> month visit, we detected contamination of viral warts on alopecic plaques of his scalp and all the previous therapeutics were stopped. We initiated topical diphenylcyclopropenone (DPCP) sensitization weekly. After the fourth application of DPCP, we observed that all of hyperkeratotic papules disappeared. Diphenylcyclopropenone treatment was continued, and with further applications, hair growth as vellus type was observed. DPCP is relatively beneficial treatment option for both diseases although it is not a first-line therapy most times. There are case reports and series about this treatment for both of these diseases. We want to present this case to by regard of the unusual presentation and efficacy of DPCP in both indications.

**Key words:** Alopecia areata, diphenylcyclopropenone, immunotherapy, verruca vulgaris

## INTRODUCTION

Alopecia areata is an autoimmune disorder of terminal anagen hair follicles which is effecting both children and adults.<sup>[1]</sup> Decision of treatment modality in alopecia areata is dependent on patient's age and the extent and duration of the involvement. Primary treatment options include topical steroids, topical immunotherapy, topical minoxidil, anthralin, and immunosuppressants.<sup>[2]</sup>

Verruca vulgaris is a very common infectious disease of the skin in daily practice, and according to localization of lesions and patient's age, cryotherapy, electrosurgery, keratolytics, 5-fluorouracil, bleomycin, antiviral agents, hypnosis, ultrasound, X-ray therapy, laser, photodynamic inactivation, levamisole, cimetidine, interferon, and retinoids are main treatment options.<sup>[3]</sup>

Topical immunotherapy has been used in dermatology for treatment of many benign diseases since the 1970s.<sup>[4]</sup> Diphenylcyclopropenone (DPCP) is one of the immunotherapeutic agents and its effect in alopecia areata was first reported by Happle *et al.* and its effect on viral warts was reported by Wiesner-Menzel and Happle in 1984 in the literature, and different results have been reported up to date.<sup>[5,6]</sup>

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## CASE REPORT

A 23-year-old male patient presented to our outpatient clinic with multifocal noncicatricial alopecic plaques on the scalp and multiple periungual verrucous papules on the bilateral hands. He does not have any other autoimmune or immunosuppressive disorder history. High potent, 17 alpha clobetasol propionate cream and minoxidil lotion 5% were offered for alopecic plaques and topical 5-fluorouracil lotion was initiated for his periungual verrucous lesions. In 1<sup>st</sup> month visit, we detected contamination of viral warts on alopecic plaques on the scalp, and all the previous therapeutics were stopped [Figure 1]. We initiated topical DPCP sensitization biweekly for both alopecic plaques and periungual warts. After fourth application of DPCP, we observed that all of hyperkeratotic papules disappeared on the scalp [Figure 2]. Diphenycprone treatment was continued and with further applications hair growth as vellus type was observed. After the 17<sup>th</sup> application, total hair growth was detected [Figure 3]. However, we could not achieve a satisfactory result for periungual warts with DPCP 2% solution, after this therapy we applied 12 sessions of cryotherapy for periungual warts during 10 s, but we did not again detect a good result. Hence, we decided to apply intralesional bleomycin and marked regression was detected 3 weeks after injection in periungual warts.

## DISCUSSION

DPCP is one of the contact sensitizers which was first synthesized in 1959 and was identified as a potent contact sensitizer in 1980.<sup>[7]</sup> It was used mainly in treatment of alopecia areata and recalcitrant viral warts, occasionally in molluscum contagiosum and even in metastatic melanoma.<sup>[5-10]</sup>

The effect of DPCP in alopecia areata has been reported in several studies from different countries in the literature with varying efficacy results.<sup>[7]</sup> The mechanism of the action of immunotherapy is not very well known, but it is thought that the irritant reaction leads to recruit different T-cell populations to the treatment area that enhances clearance of effected follicular antigen, either by antigen competition or by increased production of proinflammatory cytokines; also upregulation of cellular immunity was reported to be associated with clinical improvement.<sup>[7]</sup>

Recalcitrant viral warts are common and challenging clinical problem in daily practice. They are usually



**Figure 1:** Pinkish papular lesions of viral warts on alopecic plaques



**Figure 2:** Marked remission in warts after the 4<sup>th</sup> application of diphenylcyclopropenone



**Figure 3:** Almost totally hair growth after the 17<sup>th</sup> application of diphenylcyclopropenone

located on periungual, anogenital region, and plantar surface. Furthermore, verru plana may be resistant to treatments. Different treatment options have been tried

with varying efficacy including keratolytics, cryotherapy, electrocautery, laser ablation, intralesional bleomycin, microneedling, Vitamin D injections, vaccination, photodynamic therapy, and oral cimetidine.<sup>[11-13]</sup> Usage of immunotherapy for viral warts was first described by Lewis in 1973 with dinitrochlorobenzene. DPCP was first used in the treatment of warts in 1984.<sup>[6]</sup> There are different efficacy reports about the success of DPCP in viral warts ranging 8%–88%. In our case, we applied 2% of DPCP to periungual warts concomitantly with alopecic plaques, and in spite of a very rapid and good result in alopecic plaques, we could not see a satisfactory result in periungual warts. This result may be associated with low concentration of DPCP for periungual warts. While Choi *et al.* reported good response with 2% concentration of DPCP in periungual warts, Buckley *et al.* reported better results with higher concentrations of DPCP for viral warts.<sup>[14,15]</sup>

In our patient, alopecic plaques were treated by topical potent steroid cream and periungual viral warts were treated with topical 5-fluorouracil firstly; but in the 1<sup>st</sup> month of the treatment, his alopecic plaques were contaminated by these lesions. The local corticosteroid-induced immunodeficiency on the scalp may facilitate this contamination.

We want to present this case because of its unusual presentation and excellent and rapidly response to topical immunotherapy.

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### Conflicts of interest

There are no conflicts of interest.

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