

The Effect of The Target Heating Needle on The Treatment of Warts

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ABSTRACT

Background: Warts may persist for months, and full remission is not always achieved with conventional therapies. Lots of methods have been widely known with clinical success rates in treating warts. This article evaluated the use of the target heating needle for the treatment of warts.

Objective: To determine whether the target heating needle is safe and effective for the treatment of warts. **Patients and Methods:** Fifty patients with warts were treated by the target heating needle only for 1~2 days. The patients' clinical response, adverse effects such as nausea and scarring, recurrence, and patient satisfaction were assessed. Patients were clinically followed for 6 months.

Results: A total of 291 lesions of 50 participants were treated. Most of the patients received only one target heating needle therapy. Among the patients with multiple warts, if there was a patient who had difficulty receiving treatment at one time, the remaining lesions were treated the next day. Forty-seven patients (94.0%) achieved a complete response with 270 lesions (92.8%) being completely and 3 (6.0%) being partially healed. The post-treatment side effects were mild nausea and mild scar formation. No warts recurred in all patients. Forty-six patients (92.0%) were completely satisfied, and four (8.0%) were mostly satisfied with the treatment. **Conclusion:** The target heating needle is effective in patients with warts, particularly for cosmetically sensitive areas.

Keywords: Target Heating Needle, Wart, Human Papilloma Virus.

Article Information

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INTRODUCTION

Warts are caused by the human papilloma virus and common cutaneous infection. They are more common in children than adults, tend to be multiple and grouped, appear at the sites of skin trauma, and are more often found on sun-exposed areas such as the face, neck, and extremities.^[1] Although there are several therapeutic modalities for warts, such as salicylic acid, imiquimod, cryotherapy, retinoid, intralesional immunotherapy, laser

therapy, none has been proven to achieve complete remission in all cases. The cure rates for these treatments range from 34 to 99% and the treatment is often associated with severe side effects such as crusting, pigment alteration and atrophy.^[2]

There are several therapeutic options for warts but none of them can be considered ideal. The common treatments for warts include electrocautery, cryosurgery, lasers or the

application of different acidic or caustic chemicals to completely remove the affected area. There have been anecdotal reports that local hyperthermia with different devices such as microwaves, radiofrequency heat or thermal patch were effective in treatment of warts.^[3-5] However, there are no reports on the use of the target heating needle in patients with warts, particularly for cosmetically sensitive areas. In this study, we used the target heating needle in the treatment of warts.

PATIENTS AND METHODS

Patients selection

This prospective and randomized study was conducted at the Department of Dermatology, Hospital of Chongjin College of Medical Sciences, between January 2023 and June 2025. The institution's ethic committee

approved the study. All the patients were provided with a detailed description of the purpose and possible outcomes of the treatment, and they gave their informed consent for participation in the study and for clinical photographs to be taken before and after the treatment. 50 patients who were scheduled for the target heating needle therapy for the treatment of warts were included in the study and follow-up. The exclusion criteria were pregnancy, breastfeeding and history of hypertrophic scars or keloids. The mean disease duration was 30.06 ± 8.1 months (range: 12-48). The age of the patients ranged from 10 to 45 years (mean: 25.16 ± 9.8 years). Of the 50 participants, 30 were female and 20 were male with a mean age of 25.16 ± 9.8 years (range: 10-45). The number of lesions per patient ranged from 1 to 20 with the mean being 5.82 ± 3.34 SD (Figs. 1A, B).

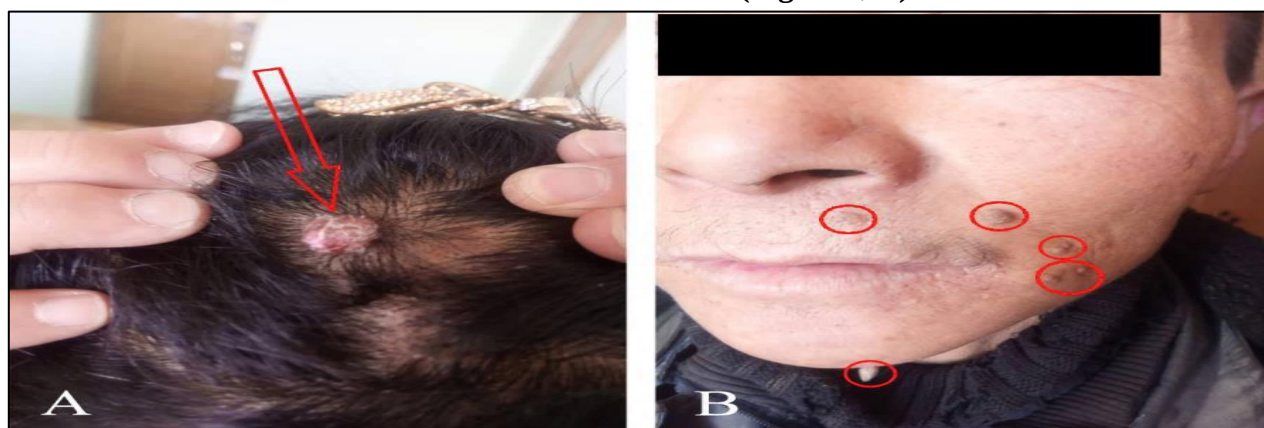


Fig. 1. Pre-treatment photograph of the patients. (A: a patient with a wart on her parietal region, red arrow. B: a patient with warts on his facial region (red circles).

MATERIALS AND METHODS

Materials and Methods

Instrumentation

The target heating device and needle is used (Fig. 2). It is based on the electric current heating modality by electrical resistance difference of different metals. The needle consists of the tip and handle, and the tip ($\phi=0.6$ mm) consists of 2 different metals. The length of the needle is adjustable according to the depth of approach. The temperature of 1 cm of the tip

of the needle is adjustable to up to 400°C in the atmosphere.

The temperature of the rest of the needle tip is the conduction temperature produced by 1 cm of the heated needle tip. When the needle tip is inserted into the lesion, the focal temperature around the needle tip reaches $45-65^{\circ}\text{C}$, thus causing tissue degeneration. When the tip of the needle reached the deep part of the lesion, the maximum area of coagulation degeneration was 0.7-1 cm in diameter.



Fig. 2. Target heating needle device.

Intervention

A target heating needle was used to slough the warts. The surgeon punctured the needle to the lesions. The target heating needle therapy was delivered for a day in most of the patients. Among the patients with multiple warts, if there was a patient who had difficulty receiving treatment at one time, the remaining lesions were treated the next day.

Follow-up and adverse events

The patients' response to treatment was clinically evaluated 6 weeks after treatment. The short-term and long-term side effects and complications such as scarring or recurrence on the treated area were noted. Treatment was considered successful if the warts was completely cleared and did not recur within the three-month of follow-up period. The clinical response was evaluated as complete (100% lesion clearance), excellent (75-99%), good (50-75%), or poor (<50%). Patient satisfaction was measured at third month following the completion of the treatment using a four-point scale (one=minimally, two=somewhat, three=mostly, four=completely satisfied). Patients scoring three or four were considered satisfied with the treatment. All the patients completed the questionnaire both at the beginning and at the end of the treatment.^[6]

Statistical analysis

Statistical data were analyzed using SPSS 25.0 program was used to analyze the variables. Statistical analysis was performed using the independent *t*-test. Quantitative variables were shown as mean $\pm$ SD (standard deviation) and categorical variables were shown as n (%). A value of $p < 0.05$ was accepted as statistically meaningful.

RESULTS

One puncture of needle was sufficient to ablate a wart (Figs. 3A, B). 46 patients (92.0%) achieved a complete response, two (4.0%) an excellent response and two (4.0%) a good response. Of the 291 lesions, 270 (92.8%) were completely and 21 (7.2%) were partially healed (Figs. 4A, B, C).

All the lesions were completely recovered within 8.2 ± 3.26 days (range: 5-14 days). The post-treatment side effects were mild scar formation (10%). Warts recurred in no patients. Most of the patients tolerated the treatment well. 46 patients (92.0%) were completely satisfied, and 4 (8.0%) were mostly satisfied with the treatment.



Fig. 3. Insertion of the target heating needle into the lesion (A: a patient of Fig. 2A. B: a patient with warts on his face).



Fig. 4. Post-treatment photograph of the patients (A: Soon after intervention, the patient of Fig. 2A. B: Soon after intervention, the patient of Fig. 2B. C: A day after intervention, the patient of Fig. 3B).

DISCUSSION

In this clinical trial, we used the target heating needle in the treatment of 50 patients with warts. Of the 291 lesions, 270 (92.8%) were completely and 21 (7.2%) were partially healed (Figs. 4A, B, C). Apart from minor side effects such as mild nausea, mild scar formation, no serious adverse events were observed in the patients. While many treatments such as cryotherapy have common side effects like hypo and hyper pigmentation, the target heating needle therapy has little side effect.^[6] We found

that the target heating needle therapy produced good clinical results and high patient satisfaction. Wart, a common cutaneous infection, is difficult to treat. Although multiple treatments options are available for this condition, no single therapy has, to date, been proven beneficial to all patients.^[7]

Some patients with recurrent warts of longer duration (≥ 2 years) are recalcitrant to a variety of standard treatments such as cryotherapy, electrosurgery, 5-fluorouracil, ultrasound, and CO₂ laser. Although some therapies can cause

enormous physical and psychological harm to patients, our therapy didn't cause harm.^[8]

No serious adverse events were observed during the study period. Compared to the clinical success rates reported for radiofrequency ablation, it can be considered that the target heating needle therapy achieved good clinical results. This study suggests that the target heating needle therapy may be an effective treatment option for warts. It selectively destroys warts without damaging the surrounding normal skin and is a particularly good choice of treatment for cosmetically sensitive areas.

CONCLUSION

The target heating needle is effective in patients with warts, particularly for cosmetically sensitive areas.

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Conflicts of interest

There are no conflicts of interest.

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