Although warts are a common skin condition/disease that recurs in childhood, treatment completion is difficult owing to the pain associated with conventional therapies. In this case, Korean herbal medicine, Guijakjihwang-Tang, and indirect moxibustion were used to treat a recalcitrant cutaneous wart without pain and recurrence. A 7-year-old boy presented with recurrent cutaneous warts on his right hand and received cryotherapy 3 times in the previous year. The wart recurred during the course of cryotherapy treatment, and the patient did not want to suffer any more pain from the previous treatment. Therefore, parents sought an efficient and painless therapy. The patient was treated for 2 months using Guijakjihwang-Tang combined with indirect moxibustion. The prominent lesion separated in the 2nd month of treatment and completely recovered without adverse events in the 3rd month. There was no recurrence over 12 months of follow-up. This report provides meaningful insights into the use of Korean medicine as a safe, painless and efficient treatment for warts in pediatric patients.

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Case Report

A Combination of Herbal Medicine and Moxibustion Treatment is Effective for a Recalcitrant Cutaneous Warts in a Pediatric Patient: A Case Report

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ABSTRACT

Although warts are a common skin condition/disease that recurs in childhood, treatment completion is difficult owing to the pain associated with conventional therapies. In this case, Korean herbal medicine, Guijakjihwang-Tang, and indirect moxibustion was used to treat a recalcitrant cutaneous wart without pain and recurrence. A 7-year-old boy presented with recurrent cutaneous warts on his right hand and received cryotherapy 3 times in the previous year. The wart recurred during the course of cryotherapy treatment, and the patient did not want to suffer any more pain from the previous treatment. Therefore, parents sought an efficient and painless therapy. The patient was treated for 2 months using Guijakjihwang-Tang combined with indirect moxibustion. The prominent lesion separated in the 2nd month of treatment and completely recovered without adverse events in the 3rd month. There was no recurrence over 12 months of follow-up. This report provides meaningful insights into the use of Korean medicine as a safe, painless and efficient treatment for warts in pediatric patients.

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common warts. A common wart measuring 8 × 8 × 6 mm (length × width × height) was observed at the dorsum of his right hand. The patient did not experience pain or discomfort, due to the skin lesion, whilst performing daily life activities (Fig. 1A).

The patient was prescribed Guijakjihwang-Tang which is a herbal medicine that mainly consists of Rehmannia glutinosa (Gaertn.) DC., Coix lacryma-jobi L., and Dioscorea japonica Thunb (Table 1), at a dose of 80 mL twice a day for 2 months.

After 1 month of treatment, the patient showed a positive attitude toward the treatment and cooperated with further treatment. Therefore, during the 2nd month of herbal medicine treatment, he was additionally treated with moxibustion to accelerate recovery (Fig. 1E).

In the 1st month of herbal medicine treatment, the wart became harder and cracks appeared (Fig. 1B). Indirect moxibustion (Ehwadang Company, Seoul, Korea) was applied on top of the wart for 3 minutes without changing moxibustion, with the maximum temperature controlled within 45-50°C, and this was performed once a week for 1 month. During the 2nd month of treatment, the wart became firmer, smaller, and separated earlier than expected (Fig. 1C). After the separation of the wart, moxibustion was no longer required, and skin recovery was observed. The skin recovered completely within 1 month (Fig. 1D), and the wart did not recur for over 12 months of follow-up, which was more than double the previous period of non-recurrence.

**Discussion**

Warts are benign proliferations of the skin and mucous membranes, and the conventional treatments for common warts are Salicylic acid, cryotherapy, bleomycin, and photodynamic therapy. However, some warts are resistant to these conventional treatments, thus, recurring warts are a persisting challenge for clinicians. At present, considering that the immune system controls the proliferation of warts [9], therapies that regulate the immune system such as intralesional immunotherapy, are used to treat warts [8]. In fact, effective cell-mediated immunity has been reported to eradicate HPV infection [10].

In this patient, Guijakjihwang-Tang was prescribed to promote effective immune activation. *Guijakjihwang-Tang* is a herbal medicine that mainly consists of Rehmannia glutinosa (Gaertn.) DC., Coix lacryma-jobi L., and Dioscorea japonica Thunb (Table 1), at a dose of 80 mL twice a day for 2 months.

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Amount (g)</th>
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<tbody>
<tr>
<td>Rehmannia glutinosa (Gaertn.) DC.</td>
<td>12</td>
</tr>
<tr>
<td>Coix lacryma-jobi L.</td>
<td>12</td>
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<tr>
<td>Dioscorea septemloba Thunb.</td>
<td>6</td>
</tr>
<tr>
<td>Angelica gigas Nakai</td>
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<tr>
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<td>4</td>
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<tr>
<td>Paeonia suffruticosa Andrews</td>
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<td>Alisma canaliculatum A. Braun &amp; C.D. Bouche</td>
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<tr>
<td>Poria cocos</td>
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<tr>
<td>Herbal medicine</td>
<td>Moxibustion</td>
<td>Separation</td>
<td>Complete recovery and No recurrence</td>
</tr>
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</table>

Fig. 1. Procedure of treatment. (A) January 30, 2020: White or skin-colored wart appeared on the back of the right hand. The wart was firm and clotted blood vessels were seen at the center of the lesion. (B) February 25, 2020: After administering herbal medicine, the lesion seemed to have cracked. (C) March 30, 2020: After 3 courses of moxibustion treatment, the lesion became firmer and smaller, and was detached by accident. (D) April 13, 2020: The lesion recovered completely 2 weeks after separation. (E) Simple schematic of the entire treatment process.
medicine originating from Wai ke zheng zhi quan shu (外科證治全書) [11], which is prescribed when a patient shows shortage of yin. The constituents of Guijakjihwang-Tang enhance the cellular and humoral immune system response by increasing the number of T cells and inducing the proliferation of spleen cells [12-14]. Even a single herb prescription of C. lacryma-jobi L., a constituent of Guijakjihwang-Tang, has been reported to lead to the complete treatment of warts [13].

Moxibustion, a type of thermotherapy, refers to the burning of herb moxa (Artemisia Argyi Folium or mugwort) at a certain distance from the skin (Fig. 2) [15]. A case of complete treatment of warts using direct moxibustion has been reported [16]. However, considering that the patient in this case report had been afraid of pain caused by previous treatments, indirect moxibustion was prescribed. Local hyperthermia therapy at a temperature of approximately 42-45°C can promote the migration and maturation of immune cells, thereby activating cell-mediated immunity [17].

The present case report provides meaningful insights into the management and treatment of warts using Korean medicine in pediatric patients. In Korea, there are medical licenses for Western medicine doctors and Korean traditional medicine doctors. Korean medicine doctors can treat recalcitrant and hardly curable conditions/diseases using Korean medicinal treatments, such as acupuncture, moxibustion, and herbal medicines. The combination of herbal medicine and indirect moxibustion prompted the patient to voluntarily cooperate to complete treatment. A gradual introduction of treatment has been reported to have an important implication for medical results in children because their fear of hospitals can lead to inappropriate treatment regimens [18]. Hence, herbal medicine followed by indirect moxibustion therapy could ensure high treatment compliance in children. In addition, no recurrence was observed for over 12 months of follow-up, indicating that combined therapy may be effective in clinical settings. Future studies are needed to support the safety and efficacy of combined therapy with herbal medicine and indirect moxibustion.

Conflicts of Interest

The authors declare no conflicts of interest.

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[11] Xu K, Bi F. Wai ke zheng zhi quan shu (外科證治全書) [11], which is prescribed when a patient shows shortage of yin. The constituents of Guijakjihwang-Tang enhance the cellular and humoral immune system response by increasing the number of T cells and inducing the proliferation of spleen cells [12-14]. Even a single herb prescription of C. lacryma-jobi L., a constituent of Guijakjihwang-Tang, has been reported to lead to the complete treatment of warts [13].

Fig. 2. Aplication of indirect moxibustion. The hand does not belong to the patient in this study.