



## Is HO-YAG Laser in Perianal Warts Safe in Children? A Report of 3 Cases

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### Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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### ABSTRACT

Verruca Vulgaris or wart is a common skin disease caused by human papillomavirus (HPV) infection. Warts are usually located on fingers, hands, elbows and feet. Anogenital region is an uncommon location for warts. Three children with large perianal warts were treated by holmium: Yttrium Aluminum Garnet (Ho-YAG) laser. No recurrences or significant complications were seen in 2 years of follow up period. Ho-YAG Laser was successfully applied in the treatment of pediatric perianal warts. It is a safe and effective method.

*Keywords:* Perianal warts; laser treatment; children.

### 1. INTRODUCTION

Verruca vulgaris (VV) is a benign cutaneous neoplasm caused by human papillomavirus (HPV) infection. It is also commonly referred to as warts and tends to affect epithelial tissues and mucous membranes. The clinical presentation of

VV depends on the type of the virus and the affected area. Benign VV consists of squamous papilloma with verruca vulgaris, focal epithelial hyperplasia and condyloma [1,2].

We report three children with anogenital warts (AW) who were treated with holmium: Yttrium

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Aluminum Garnet (Ho-YAG) laser and comment on the effectiveness and safety of Ho-YAG laser.

## 2. CASE PRESENTATION

We treated 3 pediatric patients with widespread perianal warts. Two of these patients were male and one was female and they were 2.5, 3 and 5 years old respectively. Children were not related each other. It was learned that these warts were small and localized initially but they became widespread in the perianal region during the last months (Fig. 1). Signs of sexual abuse were not detected. Wart transmission was from the lesion on the parent's finger during the diaper change and cleansing. Warts were not detected in other locations. Dermatology department in our hospital had not recommended chemical therapy both due to localization and the large volume of the lesions. Because of the size of

the lesions and the small age of the patients, we decided to perform surgical procedure under laryngeal mask anesthesia. All precautions were taken to prevent viral transmission in the operating room. The lesions were treated with Ho-YAG laser lithotripsy unit (StoneLight® Holmium Laser System; AMS Inc., Minnetonka, MN, USA) with various sizes (150–550 µm) of laser fibers as the energy source. The laser energy and frequency were 0.6-1.0 J and 5-10 Hz, respectively. Beginning from the largest lesions, all of the warts were ablated without any lesions left behind. This approach is recommended for effective results and to prevent recurrence. Postoperative care included betadine and antibacterial ointment application for the first 5 days. No dressings were applied. No recurrences had been noted in the observed area in 2 years of follow-up period (Fig. 2).



**Fig. 1. Large perianal wart before the treatment in 2.5 year old boy**



**Fig. 2. Perianal region after the Ho-YAG Laser treatment**

### 3. DISCUSSION

Verruca Vulgaris is a common skin disease caused by HPV infection. The passage of HPV is through skin contact with infected skin or from other surrounding objects when the skin barrier is damaged [3]. Hands, feet and face are often affected areas. AWs are less common in children. Its prevalence has been reported to be 5-30% in children and young adults [3]. The incidence of AWs in children has increased in recent decades [4].

Various treatment modalities such as cryotherapy, chemical cauterization with salicylic acid, electrocautery, surgical excision, immunotherapy, cidofovir cream and carbon dioxide laser have been used for VV. In addition, immunotherapy methods such as oral cimetidine, topical imiquimod and intralesional antigen applications have been applied [3,5,6]. Some modalities are 100% effective although recurrences may occur, higher remission rates have been achieved with various combined treatment options such as cryotherapy and salicylic acid, photodynamic therapy, pulsed dye lasers (PDL) and YAG lasers [3]. Surgical excisional therapy is a good and effective method, when topical and combined treatments fail for some patients and large lesions. However; this method needs preoperative preparation and as a result of surgery there may be large defects which require flaps or grafts to repair [7]. Laser therapy has been used as a new treatment method especially for wart types resistant to other modalities in recent years [8]. PDL and YAG laser are thought to treat the VV by coagulating and damaging the blood vessels in the papillary dermis of the wart [3]. PDL has insufficient tissue penetration due to its short wave length resulting in inefficient wart ablation. Although CO<sub>2</sub> laser has been used in treating the warts in different body areas, it has the disadvantage of increased scar formation due to serious deep tissue damage. This feature makes CO<sub>2</sub> laser unfavorable for use in the perianal region, prone to stricture formation and infection. Ho-YAG laser on the other hand is absorbed mainly by the tissue water due to its wavelength, acting through a photothermal mode. This characteristic allows for the treatment of warts with larger sizes, leaving the normal skin within the close proximity of the lesion intact. This feature is very advantageous for its use in the perianal area. Another advantage of the Ho-YAG is its penetration depth of 0.4 mm which results in complete cure

of the lesion, compared with 0.17mm depth of CO<sub>2</sub> laser. These characteristics led us to consider the use of Ho-YAG in the treatment of perianal warts. There is also a report of its use in the treatment of anal canal warts [9-11]. Indeed, in this limited number of cases, we have not detected any recurrences or any stricture formation due to scarring.

Only betadine and antibacterial ointment application postoperatively have sufficed in our patients and it was observed on the 4th or 5th days that the treated areas were seen only as skin erosions.

### 4. CONCLUSION

Ho-YAG Laser was successfully applied in the treatment of pediatric perianal warts. It is a safe and effective method. The efficacy of laser treatment for these lesions should be supported by a larger number of cases.

### DISCLAIMER

Authors have declared that no competing interests exist. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

### CONSENT INFORMATION

As per international standard or university standard guideline informed consent has been collected and preserved by the authors.

### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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