

Case Series

Preliminary Experience in the Treatment of Pearly Penile Papules with Holmium: YAG laser

John A. Lee, Jeffrey S. Larson, and Bruce R. Kava*

Department of Urology, University of Miami Miller School of Medicine, USA

***Corresponding author**

Bruce R. Kava, MD, Department of Urology, University of Miami Miller School of Medicine P.O. Box 016960 (M814) Miami, Florida 33101, USA, Tel: 305-243-4562; Email: bkava@med.miami.edu

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Abstract

Introduction: Pearly penile papules are common, benign lesions that may be a source of concern and embarrassment for many men. Therapeutic options such as electrodesiccation, shave excision, cryotherapy, and CO₂ laser ablation have demonstrated variable degrees of efficacy, and may result in scarring and hypopigmentation. Holmium: YAG lasers are widely available to most urologists, and have operational characteristics that make them safe for treating cutaneous lesions.

Aim: We herein describe three Caucasian males with extensive pearly penile papules, treated using the Holmium: YAG laser.

Methods: Following treatment, patients were followed for 8, 13, and 16 months.

Results: All patients were treated in the outpatient setting, had an uneventful recovery, did not require complex wound care, and did not develop scarring or hypopigmentation. All three patients were satisfied with their results, which proved to be aesthetically flawless.

Conclusions: Holmium: YAG laser ablation appears to be a safe and effective option for treatment of pearly penile papules in Caucasian men. Further experience is warranted, particularly in men with different skin colors and tones.

ABBREVIATIONS

PPP: Pearly Penile Papules; ErYAG: Erbium Yttrium Aluminium Garnet; Ho:YAG: Holmium Yttrium Aluminium Garnet

INTRODUCTION

Pearly Penile Papules (PPP) are benign, domed or acuminate-shaped papules, that are histologically similar to angiofibromas, and are present in 14.3- 48% of men [1]. They are usually asymptomatic, and are often noted as an incidental finding on a male genital examination. The vast majority of men with PPP are managed with reassurance. Despite this, 50% of men with PPP are either concerned or embarrassed by the lesions, and up to 75% would opt for treatment [2].

Many of the traditional surgical options for PPP are either ineffective, or associated with scarring, hypopigmentation, and other cosmetic impediments [3,4] A recent study in which dermatologists used the Erbium: yttrium-aluminium-garnet (Er:YAG) laser to treat patients with PPP has shown that it causes little scarring or loss of pigmentation.⁵ The Holmium (Ho): YAG

laser is functionally similar to the Er:YAG laser and is widely available to most urologists. We herein describe three patients who underwent successful management of PPP, using the Ho: YAG laser.

CASE PRESENTATION**Methods**

Three Caucasian patients, ages 23, 27, and 49 had extensive PPP. Two patients were single, and expressed considerable embarrassment from the lesions. The older patient was married, and indicated that he had always been self-conscious, despite knowing that the lesions were benign. All patients had been seen by several urologists and were dissatisfied with the conservative management strategy that had been uniformly recommended.

Technique: Patients underwent monitored anesthesia care using the short acting intravenous sedative, propofol. Subcutaneous lidocaine 1% was administered circumferentially around the coronal sulcus. Ho:YAG laser ablation of the PPP was performed using a 1000 mcg laser fiber, with an energy setting

of 0.5 Joules/pulse and a pulse frequency which varied between 5-10 Hz. The fiber was placed in direct contact with the lesions (see Figure 1a,1b). Initially, each PPP was treated individually, but as we became more comfortable with the technique, several lesions were treated simultaneously by waving the laser fiber over them using higher pulse frequencies. The lesions initially blanched, then vaporized, leaving the underlying skin with a dark brown crust- like coating (Figure 1c). Patients were instructed to shower as usual and apply an antibiotic cream for 5-7 days postoperatively. The coating sloughed within 2-3 weeks, leaving behind healthy-appearing skin that was of a very natural color and consistency (Figure 1d).

RESULTS

The first two patients underwent initial treatment of a very well defined area of the corona (spot- testing) that was re-evaluated at 3 months, in order to insure that the procedure was safe and cosmetically acceptable. They then underwent completion of the laser treatment at that time. The third patient underwent a single laser application, with the intent of completely eradicating all of the lesions. He did require a second treatment for five remaining lesions six weeks later see (Figure 2). At a follow up of 8, 13, and 16 months all patients are extremely satisfied and have had no recurrences, hypopigmentation, or scarring.

DISCUSSION

PPP is a common condition that may represent a source of considerable concern and embarrassment for many men, despite reassurance that they are benign and not sexually transmitted lesions [2]. The urologist is in a unique position among health professionals to recognize this condition, but currently there are no widely- accepted, accessible, and clinically efficacious modalities to treat the lesions.

Previous methods for treating PPP such as podophylin or liquid nitrogen have proven to be ineffective [3]. Electrodessication and shave excision, can be technically difficult to perform due to the high volume and distribution of the lesions [3]. In addition to cryotherapy, these modalities have been found to be associated



Figure 2 The need for secondary treatment for residual lesions Figure a pretreatment appearance of the lesions; Figure b. residual lesions found at 6 weeks follow up and requiring a second intervention.

with hypopigmentation and are at increased risk of scar formation due to collateral damage to the healthy skin [3,4].

There are currently a number of laser systems that are available for treatment of soft tissue lesions on penile skin. Precise delivery of the laser energy to the lesion, avoidance of collateral tissue damage, and providing hemostasis are three criteria that factor into the decision to use a particular laser.

The CO₂ laser is widely available in most operating rooms and has been used since the 1980s to treat penile condyloma and select penile cancers. With a wavelength of 10.6 micrometers, CO₂ lasers are highly absorbed by water, providing efficient surface ablation of cutaneous lesions with a penetration depth of only 10 micrometers. Case reports using CO₂ lasers to ablate PPP have reported good results, but CO₂ lasers do not have a delivery fiber that provides direct contact with the tissue. Very subtle miscalculations in aiming the laser beam, or delivering too much laser energy may exert collateral damage to adjacent tissue, resulting in scarring and hypopigmentation [6,7]. Bleeding may also occur as a result of CO₂ lasers, which can be avoided by utilizing a continuous wave CO₂ laser instead of the traditional pulsed CO₂ laser [6].

The Er:YAG laser operates at a wavelength of 2.940 micrometers, where it is strongly absorbed by water. This results in a tissue penetration depth of only 30 micrometers, which results in minimal thermal damage to deep and adjacent tissue. These characteristics make it ideal for cutaneous surgery in cosmetically- sensitive areas [7]. In one study, 45 patients were successfully treated using the Er: YAG laser [5]. Patients underwent an average of 2 treatment cycles, recovery time was approximately 2 weeks, and no pigmentation abnormalities or scarring occurred in the treated patients at one year of follow- up.

The Ho:YAG laser has operational characteristics which are similar to the Er:YAG lasers. At a wavelength of 2100nm, it is highly absorbed by water, and has a tissue penetration depth which is slightly larger than the Er:YAG laser, between 200-400micrometers [8]. The advantage of the Ho:YAG laser is that it has a contact hand-piece that provides precision and excellent hemostasis. It is also widely accessible and familiar to most urologists, who typically use these lasers for treatment of urolithiasis.

In the three patients who we treated, the Ho:YAG laser was easy to use, successful, and resulted in no perioperative or long term complications. Aesthetically, all patients were satisfied, and there have been no recurrences in any of the patients.

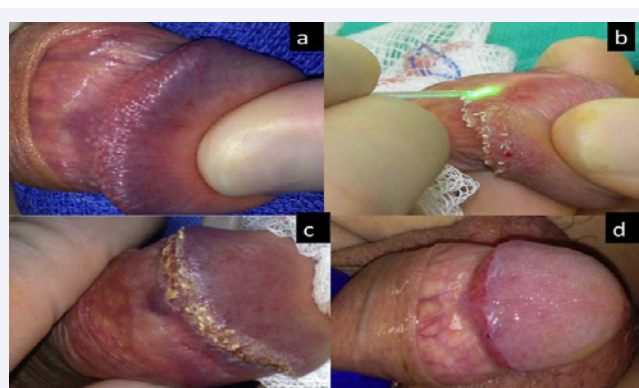


Figure 1 Treatment of pearly penile papules using the Ho:YAG laser. Figure a. pretreatment appearance of the lesions; Figure b. Ho:YAG laser is placed directly upon the lesions causing blanching and vaporization; Figure c. crust-like appearance of the treated area immediately following laser ablation; Figure d. at 6 weeks the surface layer has sloughed, leaving healthy-appearing appearance to the coronal sulcus and glans.

It is notable that all three of our patients were Caucasian males, with slightly darker hues of skin color. There is no difference in the melanocyte density in individuals with fair and dark skin. However, there is an increase in the number of melanin granules, which may competitively absorb laser light targeted for other chromophores (ie water or hemoglobin). The resulting heat generated within the epidermis may, in some cases, lead to blisters, burns, pigmentation abnormalities, and scarring [9]. Although reports of successful treatment of PPP in an African American male has been described using the CO₂ laser [10]. The CO₂, Er: YAG, and Ho: YAG lasers should be used with caution in individuals with darker skin colors. Spot testing may be used, as in two of our patients in order to determine the response of the skin to laser treatment, prior to treating the entire surface of the penis.

CONCLUSIONS

Holmium: YAG laser therapy provides a simple, effective, and cosmetically acceptable cure for bothersome PPP in Caucasian individuals. It can be performed in the outpatient setting, is completed in one or two sessions, and results in little scarring or hypopigmentation. Importantly, the widespread availability of the Holmium laser to urologists makes it an excellent addition to the urological armamentarium. Men's health experts are encouraged to initiate a dialogue with men who are found to have PPP, offering treatment for those who express the desire to have them treated. The Ho: YAG laser should be used with caution in those individuals with dark skin color.

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