

RADIOFREQUENCY SURGERY FOR THE TREATMENT OF PEARLY PENILE PAPULES

Yuriy Yagudin compares traditional methods for the treatment of PPP with a novel and effective method that harnesses radiofrequency ablation



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ABSTRACT

This article presents a case report of an innovative and cost-effective method of radiofrequency surgery used to effectively and safely eradicate pearly penile papules as an alternative to more expensive laser methods.

Methods Lesion-targeted radiofrequency ablation using Dento-Surg™ 90 F.F.P. (Ellman® International, Inc.)

Treatment parameters Filter set for coagulation partially rectified. AC power

set at 7. Hand piece is set for fulgurate. Ball-shaped electrode used.


Results Successful removal of pearly penile papules in over 100 cases with no major side-effects.

Conclusions Radiofrequency surgery devices can be used as an alternative to more expensive laser devices to achieve excellent cosmetic results in a single treatment, both safely and efficiently.

KEYWORDS

pearly penile papules, radiofrequency ablation, safety, effective treatment

THE TRADITIONAL METHODS FOR treating pearly penile papules (PPP) have included the use of CO₂ laser ablation with full-field ablative resurfacing, and the more recent fractional resurfacing using a fractional photothermolysis laser (typically a Fraxel SR750)^{1,2}. While these methods have proven effective in treating PPP, there are disadvantages to their use. These include the destruction of surrounding tissue immediate to the papules when using a CO₂ laser, as a full-field ablation mode is typically used. Fractional resurfacing reduces the tissue destruction seen during a single CO₂ laser session, but still requires multiple treatments, usually five sessions each separated by 2 weeks of healing time³. The author proposes that the use of a radiofrequency surgical treatment offers an alternative papule removal method that addresses these shortcomings. ▸

A female surgeon is shown from the chest up, wearing blue surgical scrubs, a blue bouffant cap, and a white surgical mask. She is holding a thin, blue, flexible radiofrequency surgical probe in her right hand, which is gloved. Her left hand, also gloved, is holding a black control handle for the probe. The background is a bright, out-of-focus clinical setting.

“ The use of a radiofrequency surgery for the treatment of PPP has not been described in the current literature. Its use destroys the papules on direct contact, leaving the surrounding tissue undamaged. **”**



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► The use of a radiofrequency surgery device for the treatment of PPP has not been described in the current literature. Its use destroys the papules on direct contact, leaving the surrounding tissue undamaged. The radiofrequency surgical device also allows for precise control over the depth of tissue destruction, helping to avoid skin discolouration and the loss of sensation. It also allows for rapid healing with minimal side-effects and scarring, and usually requires only one treatment session to obtain the desired outcome. Radiofrequency surgical devices are also markedly cheaper than CO₂ lasers and much smaller in size, and have been used extensively and safely in medicine, dentistry and veterinary practice for many years.

“PPP are typically found on the corona of the glans penis and around the frenulum situated in a string of pearls and clusters.”

Background

PPP are in fact angiofibromas of the penis. They are typically found on the corona of the glans penis and around the frenulum situated in a string of pearls and clusters. The aetiology of this condition is unknown, but the majority of those affected will develop the condition in their early teens. Uncircumcised males are more likely to develop PPP⁴. According to some studies⁵, the incidence among the male population has been reported to be as high as 45%. This benign condition can create significant psychological discomfort owing to cosmetic appearance and its similarity to genital warts. Many patients are looking for a cure in order to avoid embarrassment with potential sexual partners.

A number of therapeutic modalities have been reported using full field ablative CO₂ laser resurfacing¹², fractional resurfacing³, and the 2940nm Er:YAG laser in ablation mode⁶. Although^{*} in the hands of an experienced surgeon^{*} all of these methods will potentially yield good results, one has to consider the costs of the procedure, the possible risk of infection and scarring, as well as the number of treatments it would require to eradicate the papules. The proposed radiofrequency surgery method, presented in this article as a case report, which has been successfully performed on over 100 other patients by the author, demonstrates efficacy, safety and affordability.

Radiofrequency is a type of electrical energy that has been used in medicine for decades. During a radiofrequency procedure, an ablative probe is placed directly on the target tissue. The radiofrequency energy passes through the electrode, causing ionic agitation, and friction to the adjacent tissue. This friction creates heat, and once the tissue temperature rises above 113 F (50 C), proteins are permanently damaged and cell membranes are destroyed within a few milliseconds. The process is rapid: full treatment of pearly penile papules on one patient typically requires less than 15-20 minutes. There is a sharp margin between dead ►

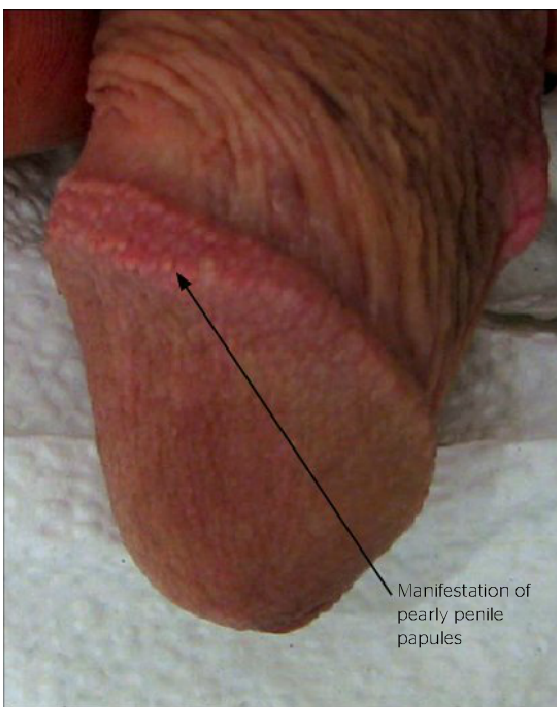


Figure 1 37-year-old male with a 20-year history of papules, prior to treatment with radiofrequency surgical device

“Radiofrequency surgery for the treatment of PPP is a convenient and moderately easy to perform method of treatment.”

▷ tissue and unaffected surrounding tissue, therefore unwanted papules can be ablated without much sacrifice to the surrounding normal tissue.

Materials and methods

Before undertaking radiofrequency surgery, a correct diagnosis of PPP is made based on patient medical history and a physical examination. The patient medical history is reviewed to make sure that he has no contraindications to the procedure, such as a history of keloids and hypertrophic scars, uncontrolled diabetes, or a history of poor healing. His medical history is also reviewed to make sure he has not used Accutane (isotretinoin) for the 6 months prior to treatment. Isotretinoin is used to treat recalcitrant cystic acne, and is well known for impairing the skin healing mechanism, contributing to exaggerated scar formation for up to 6 months after its use.

Figure 2 The patient immediately following treatment with a radiofrequency surgical device



Prior to surgery, lidocaine (LipoThene) 20% ointment is applied to the treatment area under an occlusive dressing 40 minutes before treatment. After application, the treatment area is cleaned and prepped with a povidone iodine solution, and a surgical field is draped accordingly.

The author uses a Dento-Surg 90 FFP radiofrequency surgical instrument (Ellman International, Inc.). The instrument's power control dial is set at 7, and diamond and loop-shaped electrodes are used depending on the location, density and size of the papules.

All lesions are removed using a very gentle gliding, swiping or scraping action with a pinpoint motion. A binocular headband magnifier can be used for better visualisation of the surgical field. This procedure is operator-dependent and requires advanced skills in order to avoid the removal of tissue beyond the papules. During the procedures, patients have reported no sensation of pain and are able to observe treatment in comfort. The author has experienced no blood loss in patients while using this technique.

Following the procedure, petrolatum ointment and a loose sterile dressing is applied to the treatment area. The patient is instructed on how to care for the affected area, including correct sterilisation and dressing application. Restriction in sexual activity is advised for approximately 10 days, or until healing is complete.

Figures 1-3 illustrate the effectiveness of the radiofrequency surgical technique on a patient who underwent just one treatment. The patient was a 37-year-old male, with Fitzpatrick skin type IV and without a significant past medical history, who presented with PPP as diagnosed by another physician (*Figure 1*). In the author's experience, there are no restrictions to the skin types that can be treated using this methodology.

The patient reported an approximate 20-year history of papules that developed on his penis during his late teenage years. The patient reported that his lesions did not cause any itching, pain or progressive growth since their first emergence, but he did complain of significant psychological discomfort owing to the cosmetic >

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▷ appearance, and that the condition created an unnecessary topic of discussion with prospective sexual partners.

On physical examination, multiple 1mm pearly-to-skin coloured papules were noted in a string-like formation distributed along the corona of glans penis and around the frenulum (Figure 1). Figure 2 shows the patient immediately following treatment with radiofrequency surgery. Figure 3 shows the patient 2 weeks following treatment with no visible scarring or discolouration. The patient reported no change to skin sensitivity. The patient underwent a single treatment.

Results

The patient had a follow-up visit 2 weeks after a single treatment. He reported localised redness and swelling in the treatment area for approximately 4-5 days post-procedure (Figure 2). No significant pain or loss of sensation had been reported. On physical examination, the treatment area looked smooth with no significant scarring or discolouration. At 1-year follow-up, the patient reported no recurrence of papules. During the course of 3 years, over 100 cases of PPP treatments have been performed by the author. No recurrences have been reported.

Discussion

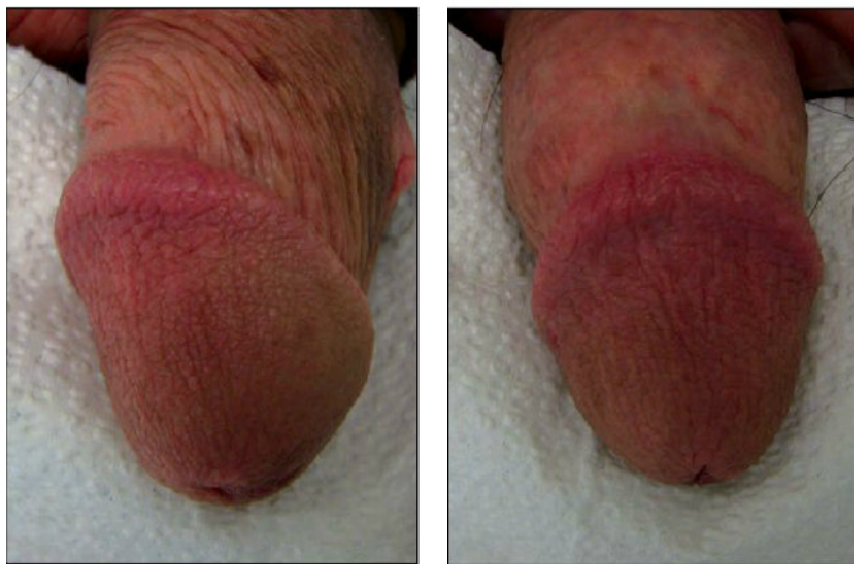
The majority of dermatologic surgeons will generally use a CO₂ laser or fractional resurfacing for the treatment of PPP. While these treatments have proven reliable and effective, there are limitations associated with their use. For the patient, the procedures are expensive and require either weeks of treatment in the case of fractional resurfacing, or the possibility of damage to the tissue surrounding the papules, in the case of CO₂ laser treatment. Radiofrequency surgery offers quicker recovery, a lower chance of accidental damage, and full treatment in just one session.

For the surgeon, the cost of lasers* both CO₂ and fractional photothermolysis* is high and those costs are

Key points

- Pearly penile papules are benign angiofibromas. The main reason for treatment is cosmetic and psychological discomfort
- Published methods of removal include that with CO₂, Fraxel 1550™ and 2940 nm Er:YAG lasers
- A new, more cost-effective method of treatment for PPP is radiofrequency ablation
- Radiofrequency ablation is safe, fast and produces excellent results in a single treatment
- Advanced surgeon's training is required to achieve optimum results

Figure 3 The patient 2 weeks after treatment. The patient reported no loss of sensation, no discolouration and no destruction to the surrounding tissue



passed on to the patient, limiting the number of patients who can afford treatment. Radiofrequency surgery is inexpensive by comparison, costing a fraction of treatment with a laser. The major advantage of using a radiofrequency device such as that described by the author, is its cost. The Dento-Surg RF device costs approximately \$3000 when purchased new from the manufacturer. In comparison, new CO₂ or 2940nm Er:YAG lasers cost between \$60 000 to over \$100 000, for example. Radiofrequency devices have very limited maintenance, if any. Laser devices require regular calibration and maintenance of expensive parts.

The author has performed over 100 radiofrequency surgeries for the removal of PPP to date, with no history of any significant side-effects, such as scarring, skin discolouration, or a change of sensation in the treatment area. Since the described procedure is operator-dependent, it requires advanced skills in order to avoid the removal of tissue beyond the papules. Inexperience of working with radiofrequency devices in dermatologic surgery may be a barrier to some surgeons to use this method with confidence. One might want to start using radiofrequency surgical devices first for less advanced dermatologic procedures, such as the removal of larger skin lesions, in order to develop the necessary skills.

Conclusions

Radiofrequency surgery for the treatment of PPP is a convenient and moderately easy to perform method of treatment, which has many potential advantages over CO₂ laser treatment.

This procedure is proving time and again to provide a painless, one-time treatment option for patients displaying PPP. Unlike other treatments, it is relatively inexpensive, allows for quick healing and does not require extensive follow-up care or treatment.

► **Declaration of interest** The author reports no conflicts of interest. The author alone is responsible for the content and writing of this article.

► **All figure images** Yuriy Yagudin.

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