

Clearing Genital Human Papillomavirus with the Combination of Ablative and Non-ablative Mode of Er:YAG Laser

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Persistent high-risk human papillomavirus (HR-HPV) infection is considered essential for the progression of cervical pre-cancer, even invasive cervical cancer. Currently, there is no effective treatment for HPV persistence, including immunotherapy (interferon-alpha), cryotherapy, photodynamic therapy (PDT) and laser, etc, as all methods have not achieved a satisfactory clearance rate. HPV-related cervical cancer prevention relies on costly HPV vaccines and repeated cervical screenings. However, the multivalent vaccines cannot completely cover all the major types of HPV infections; in addition, all commercially available vaccines are prophylactic, and have no therapeutic effects on existing infections. For unvaccinated HPV-infected patients who are still at risk for cervical cancer, repeated screenings and colposcopy-directed biopsies are performed. Consequently, these interventions have given rise to potential over-treatment, additional costs, patient anxiety, and adverse effects (e.g., vaginal bleeding and impaired sexual function).

The efficacy of PDT has been reported in some studies with an HPV clearance rate of about 79-83% for infected cervix, which is a popular method used worldwide. The higher clearance rate with PDT is achieved because it can be treated through a wire inside the cervical canal. However, PDT treatment is time consuming: five hours will be spent for each treatment, and 5 consecutive-day treatment cycles are necessary for good results.

The ablative lasers, both CO₂ and Er:YAG, have proven to be effective for cervical intraepithelial neoplasia (CIN)1/2, but the HPV clearance rate is not higher since the ablative laser can only work on the cervical surface and not the migration zone (inside the cervical tube), a location where the HPV lives.

HPV replicates in the basal cell of the cervix and gradually migrates upward to the surface epithelium. HPV has been found to not survive in a high-temperature (55-60 degree) for 3-5 minutes, and HPV will be dead in several seconds when it is 100 °C.

Therefore, if we could find a method to destroy the cervical epithelium in the migration zone (inside cervical tube) and then raise the temperature of the basal layer of the cervical epithelium to 60-70 degree for several minutes, the HPV could be cleared totally. With this theory and thinking, I attempted to treat 67 patients of cervical HPV infection with Er:YAG laser, both ablative and non-ablative, and with both R09-2G and R11 handpieces, with some specific parameters. A really good cervical HPV clearance rate was achieved: 70-95% from one to four treatment cycles with or without CIN1/2. The treatment is safe and the duration is about 30 minutes.

The combination of the R09-2G and R11 handpiece, with ablative and non-ablative mode of Er:YAG laser, is a really novel and promising method for HPV clearance. Further studies are necessary for obtaining more information about the recurrence and persistence rate after treatment, the long-term results, side-effects, etc.

Effects of Sub-ablative Er:YAG Laser on Vaginal Microbiota for the Management of Vaginal Dysbiosis

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To determine if Er:YAG laser treatment is an effective and safe tool for the improvement of vaginal microbiota in post-menopausal patients with vaginal dysbiosis.

20 post-menopausal patients between 50 to 70 years of age with vaginal dysbiosis, diagnosed with vaginal culture, were included in this prospective study to determine if the local microbiota could be improved through the use of trains of long sub-ablative pulses of Er:YAG laser treatment, using the so called SMOOTH mode technology, applied in three monthly sessions.

A significant improvement in the microbiota was observed in the 20 patients after the treatment at both 3 and 6 months follow-up. The objective evaluation was done using vaginal cultures and cytology, both performed at 3 and 6 months.

The use of trains of long sub-ablative pulses of Er:YAG laser treatment using the so called SMOOTH mode technology, applied in three monthly sessions, seems to be a safe and effective method to improve vaginal microbiota in order to diminish the possibility of recurrent vaginitis.