Erbium Laser Treatment for early stages of Stress Urinary Incontinence (SUI) in Women

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Introduction

Approximately 40% of women suffer from urine leakage, since only about one fourth of women address their symptoms to their medical providers. Frequent deliveries and the process of ageing distend vaginal musculature irreversibly, reducing the level of pelvic floor muscle contraction. This effect significantly deteriorates their quality of life. The same number of women report dissatisfaction concerning their ability to achieve sexual gratification due to vaginal relaxation, which interferes with the intensity of contact during sexual intercourse, thus significantly impairing one of the most important domains of quality of life.

Aim of the study

The hypothesis that laser therapy can be effectively used in the gynecological practice for the treatment of genitourinary disorders was researched to prove the efficacy of the laser photo thermal effect in the treatment of static urinary incontinence and pelvic diaphragm distention of the 1st and 2nd grades in women.

Methods

92 female patients suffering from slight-to-severe stress urinary incontinence were included in the study. 81 patients underwent treatment with a 2940 nm Er:YAG laser (XS Spectro, Fotona, Slovenia) and a control group of 11 patients were scheduled for Kegel exercises.
• Inclusion criteria: history of vaginal delivery; pelvic organ prolapse of the 1st or 2nd grade; Q-tip test over 30°; low score of PISQ12 and positive score of ICIQ-UI questionnaires; low perineometry values assessing pelvic floor muscle strength and endurance
• Quality of life in the area of sexuality was examined with a validated Pelvic Organ Prolapse / Urinary Incontinence Sexual Questionnaire (PISQ-12).
• Q-tip measurement was used for the quantification of urethrovesical junction mobility and the urethral axis.
• Degree of incontinence and its impact on the quality of life was assessed with the International Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form (ICIQ-UI SF).
• For the measurement of muscle strength and vaginal perineal perineometry, Aimpeds (EXT-T101, Korea) was used.

The cotton-tipped swab (Q-tip) test for the assessment of urethral and bladder support

Treatment procedure

• Ambulatory procedure was performed with the Er:YAG laser XS Dynamis® (Fotona, Slovenia).
• The vaginal wall and introitus were treated by Er:YAG laser (2940 nm) in non-ablative thermal mode in a special, laser manufacturer’s (Fotona, Slovenia) proprietary sequence, producing a non-ablative, precisely controlled, thermal only effect on the tissue.
• The circular adapter enables 360 degree laser irradiation of the vaginal canal. Laser energy is applied to the vaginal walls in 360° belt-shaped patterns, deposited successively along the vaginal canal.
• Laser energy of approximately 90 J is delivered to each irradiation location (belt) producing a non-ablative precisely controlled, thermal only effect on the vaginal wall that causes immediate tissue shrinkage and initiates collagen remodeling and new collagen synthesis in the vaginal mucosa.
• The IncontiLase treatment procedure is composed of three steps (Fig.1).
• The treatment consisted of two treatment sessions with an interval time between the sessions of 15 to 30 days. No anesthesia was applied.

Preliminary results showed significant improvement with the treated patients (p< 0.05) in all the domains tested, while in the control group there was no significant change observed.
• ICIO-UI scores decreased by more than 3 points at all follow-ups (Fig.2).
• A mean duration of muscle contraction measured with perineometry at 1 month increased by 3.8 s, at 3 months by 7.2 s and at 6 months by 10.5 s (Fig.1A).
• Q-tip angle decreased by 10.3˚ at the 1 month follow-up, by 16.7˚ at 3 months and by 14.1˚ at 6 months.
• PISQ-12 score increases show statistically significant improvement of sexual gratification in the intervention group (p=0.014). The change in the control group was not statistically significant (p=0.445). (Fig.3)

Laser treatment of the early stages of SUI and vaginal distension effectively improves relevant parameters of pelvic floor muscles strength and quality of life as well. This is the first study that objectively confirms an exclusively erbium laser photo effect on vaginal tightening without using any kind of surgical adjuvant techniques. The results after the intervention show significant improvement in reducing SUI episodes, empowering vaginal and pelvic wall strength, simultaneously enhancing better sexual response. By employing this new method based on the photo-thermal effect of laser waves, it is possible for women with early-stage prolapse or stress incontinence, to avoid minor (sling) or major surgical interventions (vaginal hysterectomy with colpoprothesis).

Literature