

# CASE REPORT: Successful Intra-anal Non-ablative Er:YAG Laser Treatment for the Symptoms of Rectal Prolapse

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## ABSTRACT

**Objectives:** To evaluate the effects of non-ablative Er:YAG laser with SMOOTH® modality on rectal prolapse symptoms of a female patient with severe fecal incontinence and other symptoms.

**Materials and methods:** An 84-year old woman had previously in her life undergone a multitude of pelvic organ prolapse operations, and finally a rectal prolapse with severe symptoms of anal incontinence was developed. Sacral neuromodulator could not be used because of side effects. We treated her intravaginally and intra-anally using the non-ablative Er:YAG laser (SP Dynamis, Fotona, Slovenia) with SMOOTH® modality. Patient received 3 treatments, with 2–3 months in-between the sessions. During each visit quality of life (QoL) and severity of symptoms of rectal bulging, fecal incontinence and frequency of defecation were monitored with simple questions.

**Results:** The sensation of rectal prolapse disappeared after first treatment. Fecal incontinence improved after first treatment and was cured after second treatment. Overall negative impact of the symptoms on QoL diminished from 10 to 7. The only side effect was a transient burning sensation in the treated areas.

**Conclusion:** We demonstrate a case of the positive effects of Er:YAG SMOOTH® laser on severe symptoms of rectal prolapse, including fecal incontinence, sensation of anal bulging and frequent defecation. Due to easy outpatient setting of the procedure and well tolerated transient side-effect of burning sensation, the treatment is safe and comfortable for both the patient and the physician. The mechanism of action could be via photothermal laser-tissue interaction causing new vessel formation, activation of fibroblasts, ultimately leading to neocollagenesis. Increased collagen amount in the sphincter area, lamina propria of the bowel wall and in the supporting pelvic structures might explain the relieve of symptoms.

**Key words:** fecal incontinence, rectal prolapse, minimally invasive proctology, non-ablative Er:YAG laser therapy.

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## I. INTRODUCTION

The incidence of rectal prolapse is 2.5 per 100,000 people. The disorder may debilitate a patient severely, the most unpleasant symptom being fecal incontinence (FI). Conservative treatments for less severe stages include pelvic and biofeedback training as well as dietary changes towards fiber-rich foods and adequate liquid intake. Standard treatment for more severe stages is surgical sacropexy, usually done under general anesthesia via laparoscopy, using a mesh [1]. In some patients a minimally invasive radiofrequency-based (RF) method called SECCA® may be tried [2].

Non-ablative Er:YAG laser has proven to be a safe and effective method for symptoms of female genital problems, such as vaginal laxity, stress urinary incontinence, genitourinary symptoms of menopause and cystocele [3–5]. Laser therapy has a restorative function on the paravaginal tissues, subsequently increasing the support of the pelvic organs [6,7]. We hypothesized that the non-invasive Er:YAG SMOOTH® laser photothermal tissue interaction causes a similar effect to the RF-method on the anal sphincter, ultimately improving the symptoms.

## II. CASE

An 84-year-old woman presented with symptoms of frequent defecating, sensations of rectal prolapse and fecal incontinence, combined with frequently appearing perianal pain. She had undergone one vaginal breech presentation delivery. The number of gynecological operations during her previous 30 years was high, including vaginal hysterectomy, tension-free-vaginal tape (TVT), anterior and posterior colporrhaphy (KA and KP), mini-KA, KA with Pelvicol mesh, colpocleisis and bilateral salpingo-oophorectomy. A sacral neuromodulator was inserted for fecal incontinence, and it was removed as her most

**Table 1. The effect of non-ablative Er:YAG laser on the improvement of symptoms of fecal incontinence and rectal prolapse.**

Symptom	First appointment	After the 1 <sup>st</sup> treatment	After the 2 <sup>nd</sup> treatment	After the 3 <sup>rd</sup> treatment
Fecal incontinence	++	+	-	-
Frequent defecating	++	+	+	+
Perianal pain	++	- / ++ (†)	- / ++ (†)	- / ++ (†)
Sensation of a rectal prolapse	+	-	-	-
Overall negative impact on QoL (VAS 0-10) ‡	10	7	7	7

(†) Perianal pain vanished almost immediately after each treatment, however, it returned after 2–4 weeks following each treatment.

(‡) VAS 0 = no negative effect; VAS 10 = the worst possible effect

recent surgical procedure one year later due to severe sciatic pain. No more treatment options were available for her in the university hospital. Our clinical examination revealed a high perineum, but it only consisted of skin with no remaining supporting structures after intensive and repetitive pelvic surgery; small bowel movements were palpable through the perineal skin in rectovaginal examination. The anal sphincter tone was weak. A small 5–10 mm rectal prolapse was observed during the Valsalva maneuver behind the ridge that is observable in Figure 1 at twelve o'clock in the anus.



Fig. 1: A resting photograph (non Valsalva) of the anus and vulva of the patient during the first visit of the patient.

Prior to each laser treatment the patient received lidocaine cream in the vagina, anus and around the perineum. Before applying the laser light, the cream was removed and an anoscopy was performed. The patient was treated intravaginally and intra-anally with 2940 nm Er:YAG laser (SP Dynamis, Fotona, Slovenia) using the non-ablative Fotona SMOOTH® modality. The parameters used followed the RenovaLase® protocol, explained in detail elsewhere [3]. The patient received 3 treatments with 2-3 months in-between the treatments. The primary outcome measures were subjective assessment of the severity of symptoms and the overall impact on quality of life

(QoL) according to the visual analogue scale (VAS). Except for a burning sensation near the anus, which was transient, no other side effects were noted. The data, as expressed in Table 1, shows that the patient's fecal incontinence had already improved significantly after the first treatment and the symptoms were no longer observed after the second treatment. The subjective sensation of a rectal prolapse was no longer present after the first treatment. One of the patient's worst symptoms was the frequency of defecation, which also improved after the treatments. Perianal pain reduced significantly but returned four weeks after each treatment. The QoL improvement was only from 10 to 7, and according to the patient it would have been more if the effect on perianal pain had also been better. However, we believe that the pain is most probably associated with some other condition rather than the rectal prolapse itself.

### III. DISCUSSION

A semi-invasive radiofrequency method known as SECCA® has been shown to alleviate the symptoms of patients with fecal incontinence. The effect is assumed to be due to collagen formation and constriction of the anal sphincter muscle due to microscopic connective tissue scars in between the muscle fibrils [2]. The procedure is performed under spinal anesthesia and includes several millimeter-long sharp pins penetrating through the mucosal wall inside the anal sphincter muscle. SMOOTH® laser similarly enhances the formation of collagen in the lamina propria layer of the vaginal wall, and possibly also in deeper pelvic floor structures [6,7]. Furthermore, the thermal effects of laser light have been shown to induce neovascularization [6,7], which here would be important for the delivery of oxygen and substrates to the fibroblasts of the lamina propria layer of the gut wall and anal sphincter muscle. We hypothesized that the vaginal Er:YAG SMOOTH® laser causes tissue alterations similar to RF, but in a less invasive medical procedure. The impact of three laser treatments in this female patient is encouraging, however, a recent

controlled trial with SECCA® led to only minor clinically relevant subjective changes in the patients' Vaizey scores of QoL, as compared with a sham group [8]. Laser-tissue thermal interactions can cause more intense collagen formation than RF, as well as the formation of new vessels that are important for delivering oxygen and substrates to the aged and damaged pelvic structures. The different tissue interactions of laser (photothermal interaction) and RF (ablative effect) could explain the better outcome with laser. Surgical procedures are effective but associated with a higher complication rate and increased downtime after the procedure. A more detailed controlled study is necessary in order to find out whether the positive effect noticed here is reproducible.

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