

# Erbium laser treatment for relief of long-term symptoms related to episiotomy scars - 1-year follow-up

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## ABSTRACT

**Purpose:** The purpose of this study was to evaluate erbium YAG (Er:YAG) laser treatment for long-term symptoms related to episiotomy scars.

**Methods:** This single-arm study included patients with episiotomy scar complaining of at least one of the following: dyspareunia, pain while sitting, pain at pressure, pulling, bumps at perineum, and bleeding after intercourse. 110 patients received three Er:YAG laser treatment sessions in a two-step protocol: full spot cold ablation along the scar, and fractional ablation across the whole episiotomy surface. Improvement and side effects were monitored at every treatment and 3 and 12 months after the last procedure.

**Results:** All patients achieved improvement and 52.7% became symptom free. Average improvement at 12 months was 9.1±1.1 on a 0–10 scale. Average pain during the procedure (without anesthesia) was 5.4/10. Side effects were mild and transient.

**Conclusion:** Laser treatment for episiotomy scars is an excellent candidate as a less invasive alternative to surgery.

## KEYWORDS

Episiotomy scar, Er:YAG laser treatment, symptom improvement, dyspareunia.

## Introduction

Episiotomy has become one of the most commonly performed surgical procedures in the world<sup>[1]</sup>. However, routine use of episiotomy has been questioned due to complications and a lack of evidence that it improves childbirth outcomes<sup>[1]</sup>. Unsatisfactory healing of episiotomies can result in long-term consequences such as wound scarring, skin tags, asymmetry or excessive narrowing of the introitus, pain, persistent dyspareunia, and complications in subsequent vaginal births<sup>[1]</sup>. The patient's sex life and overall quality of life can be significantly affected.

Conservative treatment methods such as vaginal dilators and perineal massage provide relief in a minority of patients<sup>[2]</sup>. Patients who do not respond to conservative management have the option of surgical revision<sup>[2,3]</sup>. There is a need for effective less invasive approaches<sup>[4]</sup>. Lasers are widely used in aesthetics and dermatology for scar revision to reduce the visibility of scars and to improve the functionality of the scarred part of the body<sup>[5]</sup>. Laser light causes controlled damage to the tissue in order to remodel the surface and at the same time exploit dermal and epidermal tissue regeneration capabilities and collagen remodeling<sup>[6,7]</sup>. Different types of lasers are used, but the 2940 nm erbium YAG (Er:YAG) laser is the most suitable for sensitive skin areas due to its high absorption in water which allows for high precision ablation, low thermal effect, faster healing, and a better safety profile compared with other ablative lasers<sup>[8–10]</sup>. Approximately 4 μm are ablated per J/cm<sup>2</sup><sup>[11]</sup>. An even gentler approach can be achieved by fractional laser ablation which removes only columns of the treated area, leaving intervening areas of unharmed skin that help in rapid

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re-epithelization, reducing the chances of adverse effects<sup>[12]</sup>.

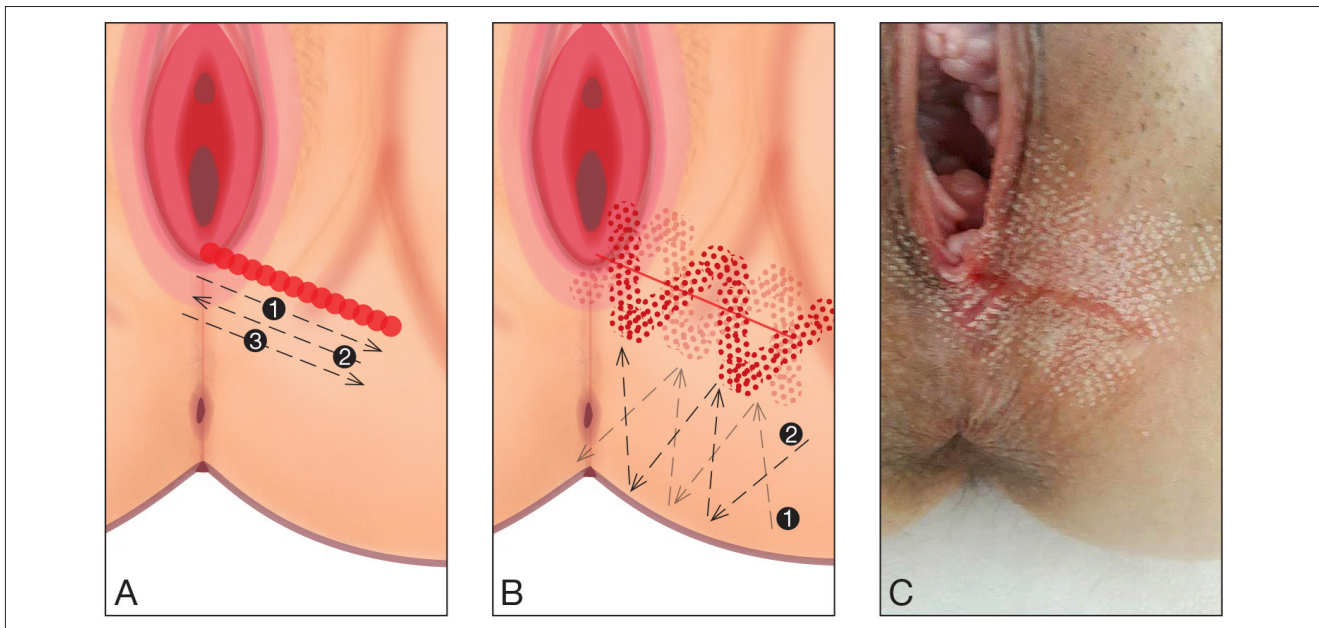
The purpose of this study was to evaluate the efficacy and safety of erbium laser scar revision for relief of symptoms related to episiotomy scars.

## Methods

This single-center study was performed in the period from September 2017 to March 2019. It was approved by the institutional ethics committee. Inclusion criteria were patients with episiotomy scars complaining of at least one of the following symptoms: dyspareunia, pain while sitting, pain at pressure, pulling, bumps at perineum, and/or bleeding after intercourse. Exclusion criteria were: pregnancy, open wound on perineum, infection on perineum, active genital herpes, keloid scar. All patients provided informed consent.

No anesthetic was applied. Cold air cooling (Zimmer cooling system, Zimmer MedizinSysteme GmbH, Neu-Ulm, Germany) was used to increase patient comfort. Patients underwent ablative Er:YAG laser (2940 nm, XS Dynamis, Fotona, Ljubljana, Slovenia) treatment in a two-step protocol; full spot

**Figure 1** Two-step protocol for Er:YAG laser resurfacing of episiotomy scar. A) Full spot cold ablation along the scar with non-overlapping pulses (2 mm spot size, 300 mJ energy and 0.1 ms pulse duration). B) Fractional ablation (5 mm spot size, 800 mJ and 0.6 ms pulse duration) across the whole episiotomy surface with 2 cm margins. C) Immediately after the procedure.



(R11 handpiece, 2 mm spot size) cold ablation along the scar with 300 mJ (Turbo 3) and 0.1 ms non-overlapping pulses, followed by fractional ablation (PS03 handpiece, 5 mm spot size, 800 mJ and 0.6 ms pulse duration, frequency 5-7 Hz) across the whole episiotomy surface with 2 cm margins (Figure 1). Three sessions were performed at three-week intervals. Vaseline cream was applied on the treated area post-operatively. Patients were instructed to refrain from intercourse for seven days after treatment.

Follow-up was performed at each treatment visit and at 3 and 12 months after the last procedure. Patients subjectively assessed improvement on an 11-point Likert scale (0: no improvement, 1-3: mild improvement, 4-6: moderate improvement, 7-9: significant improvement, 10: complete improvement, all symptoms completely resolved). Patients were also asked whether they felt the need for the 3<sup>rd</sup> treatment session after the 2<sup>nd</sup> session and whether they wanted a touch-up treatment at 12 months follow-up. Treatment discomfort was measured using a visual analog scale (VAS; 0-10; 0: no pain; 10: worst possible pain). Potential side effects were recorded at every follow-up.

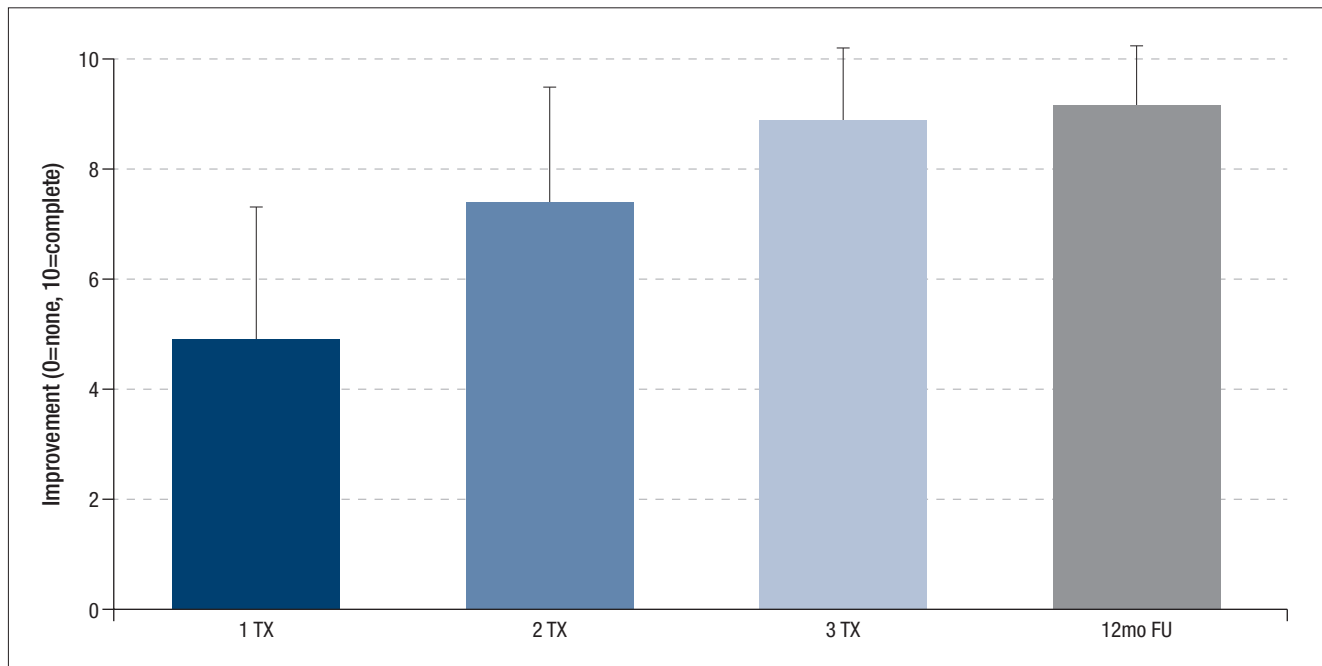
## Results

This study was conducted in a sample of 110 female patients, aged 22-50 years (mean age 33 years). Mean gravidity was 2.0 (range 1-4) and mean parity 1.7 (1-3). The patients had undergone episiotomy on average 3.7 (1-15) years previously. Table 1 presents detailed demographic data and effects on improvement 1 year after treatment. Symptom improvement was achieved in all patients (Table 1). Average improvement increased with each treatment session and was maintained during 12 months of follow-up (Figure 2).

**Table 1** Patient demographics and improvement 1 year after treatment within subgroups.

	No.	%	Improvement (mean±SD)
<b>Age</b>			
22-30	42	38	9.1±1.1
31-40	51	46	9.2±1.1
41-50	17	15	9.1±1.2
<b>Parity</b>			
1	48	44	9.1±1.1
2	49	45	9.0±1.2
3	13	12	9.7±0.6
<b>Years after episiotomy</b>			
1	19	17	9.4±1.0
2	17	15	8.7±1.4
3	28	25	9.0±1.1
4	19	17	9.4±0.9
5	10	9	9.4±0.8
6-15	17	15	9.0±1.2
<b>Symptom</b>			
Pain while sitting	16	15	9.7±0.6
Pulling	40	36	8.9±1.2
Dyspareunia	76	69	9.4±0.8
Bleeding at intercourse	3	3	9.7±0.6
Pain at pressure	87	79	9.2±1.0
Bumps	38	35	8.5±1.4
<b>No. of symptoms</b>			
1	14	13	9.1±1.5
2	53	48	9.2±1.1
3	34	31	9.0±1.1
4	7	6	9.1±1.2
5	2	2	10
<b>Improvement at 12 months</b>			
None	0	0	
Mild	0	0	
Moderate	2	2	
Significant	50	45	
Complete	58	53	
<b>Total</b>	<b>110</b>	<b>100</b>	<b>9.1±1.1</b>

**Figure 2** Mean improvement in episiotomy scar symptoms (error bars represent standard deviation) after each of three laser treatment sessions (TX) and at follow-up 12 months after the last laser treatment (12 mo FU).



45.5% of patients no longer had complaints 3 months after 3<sup>rd</sup> treatment session and 52.7% of patients were free of complaints at 1-year follow-up. 54/110 (49.1%) patients were satisfied with the results after the 2<sup>nd</sup> session and only 21/110 (19.1%) patients expressed a need for maintenance 4<sup>th</sup> session.

No particular trend in improvement was observed with respect to age, parity, time since episiotomy, or number of symptoms (Table 1). While mean improvement differed somewhat with different symptoms, all showed significant improvement (Table 1).

Average pain rating during the procedure (without anesthesia) was 5.4/10 (range 3–8). Considering the short duration of the treatment (around 2 minutes), all patients tolerated it very well. All reported side effects were mild and transient: spotting, light bleeding from the vagina in the treated area, discomfort on the day of the procedure. All side effects resolved within a day.

## Discussion

According to a Cochrane systematic review between 10 and 20% of women suffer from long-term dyspareunia after childbirth, related to perineal damage<sup>[1]</sup>. This was also one of the most common complaints in this study, together with pain at pressure. Most of our patients reported more than one symptom related to their episiotomy scar.

Conservative treatment methods such as vaginal dilators and perineal massage<sup>[2]</sup> are usually the first line of management, with more invasive methods reserved for patients for whom they provide insufficient relief.

There are few treatment recommendations to be found in the literature. A review from 2016 concluded that it is important to deal with the condition earlier to avoid long-term consequences of sexual dysfunction and that modified Fenton's

procedure should be discussed and offered to all women who have superficial dyspareunia after delivery<sup>[2]</sup>.

There is limited evidence in the literature regarding the efficacy of Fenton's procedure or the modified method for treating superficial dyspareunia<sup>[2]</sup>.

The most relevant study evaluated the outcome 6 months after the procedure in 24 patients. 61% reported complete relief, while moderate relief was reported in the remaining 39%<sup>[3]</sup>. In one case, surgery was repeated three times and only managed to achieve moderate relief<sup>[3]</sup>. None of the patients encountered any intra- or postoperative complications<sup>[3]</sup>, 29% of the procedures were conducted under general anesthesia<sup>[3]</sup>. In comparison, Er:YAG laser treatment of episiotomy scars in our 110 patients resulted in complete improvement in 53% of patients, maintained for at least 12 months after treatment, and significant improvement in an additional 45%.

No anesthesia was required, and no serious side effects were noted. Laser revision of episiotomy scars thus represents a valid alternative to surgical re-treatment. There are few other alternatives to surgery. One short study in 20 patients used autologous free fat transplantation for correction of scars following childbirth; this produced relief from pain 6 months after treatment<sup>[4]</sup>, however the number of patients who became symptom free was not reported.

## Conclusion

In conclusion, laser resurfacing is a safe and promising alternative to surgical retreatment to alleviate the long-term symptoms of episiotomy scars. There is a need for further randomized controlled studies of this method, which has the potential to improve the quality of life of a significant number of women.

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**Declarations:** ANM and FP have no interest to declare, ZV is an employee of Fotona. No funding was received for this study. The study was approved by the institutional ethics committee.