



## Application of vaginal CO<sub>2</sub> laser therapy to treat symptoms associated with vulvodynia and vulvar vestibulitis syndrome - *A case series*

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#### **Introduction:**

Generalized vulvodynia is a condition characterized by unexplained chronic or spastic, provoked or unprovoked, localized or widespread vulvar pain and burning sensation, frequently limiting daily activities and sexual function and incurring significant psychological distress.<sup>1,2</sup>

The condition has an impact on the lives of up to 16% of the adult female population, with no racial clustering, but incidence rates may be highly underreported due to failure of many women to seek medical help.<sup>3</sup> Vulvar vestibulitis syndrome (VVS) is a subset of vulvodynia, characterized by idiopathic, localized, low tactile, pain and pressure thresholds, and is a common cause of entry dyspareunia in premenopausal women. While the cause remains elusive, increased blood vessel and nerve density is commonly observed.

Topical and systemic medicinal treatment options include regular use of local anesthetics, estrogen creams, anticonvulsants, pudendal nerve blocks, tricyclic antidepressants or interferon injections, all of which have shown limited long-term efficacy.<sup>4</sup> Physiotherapy using biofeedback techniques train patients to both strengthen and relax pelvic floor muscles, in efforts to reduce muscle spasms and associated pain.<sup>5</sup> However, these approaches demand patient compliance and adherence, and only yield

improvements after months of rigorous treatment.

Surgical intervention has a reported success rate ranging between 65-90%, but is associated with a relatively high complication rate, prolonged a wound pain and downtime and can require weeks for full recovery.<sup>6,7</sup> Thus far, no single treatment option has demonstrated broad success among vulvodynia patients, and clinical resolution is typically partial and slow to develop.

Laser-based interventions for vulvodynia and VVS management have been gaining popularity, due to their minimally invasive nature and marked efficacy. In fact, laser therapy has reportedly been as effective as vestibulectomy, with complete responses reported in >60% of patients and symptomatic improvement in >90% of patients.<sup>8,9</sup>

The specific absorption of long-wavelength lasers by vascular-borne chromophores, is thought to lead to disruption of the highly dense vascular bed and to promote collagen remodeling without inducing macroscopic anatomic alterations. In contrast, the non-ablative CO<sub>2</sub> laser energy is heavily absorbed by water, thereby inducing a deep thermal effect, without causing aggressive ablation, and has been successfully integrated in dermatological, gynecological and dental disciplines. A case series of deployment of non-ablative CO<sub>2</sub> laser energy to manage typical vulvodynia symptoms is presented below.

### Method:

Women with vulvar or vaginal infection were not treated. Approximately three minutes before the procedure, a full ampule of lidocaine was topically applied to the introitus, to provide anesthetic relief. Note: EMLA cream was not used to avoid creation of an oily barrier and to allow for moderate anesthesia, which then enables intraprocedural patient feedback to prevent burns.



**Figure 1:**  
FemiLift handpiece with a single-use hygienic probe

Each pass involved insertion of the FemiLift probe (Figure 1) into the internal part of the vestibule, and activation (25 mJ/pixel, high laser mode, 0.5 Hz) at three consecutive key clock positions, where the affected area is the middle position (e.g. 3, 6 and 9 o'clock), followed by activation at the same positions in the external part of the vestibule (15 mJ/pixel, high laser mode, 0.5 Hz). One or two more passes were then performed at the same positions; if patient reported intolerable pain, the treatment session was terminated. The total duration of the treatment session was approximately 10 minutes. Patients were advised to avoid sexual intercourse for 48 hours. When necessary, the same protocol was repeated at a second and third treatment session, conducted at four-weeks intervals. VVS symptoms were assessed before and after treatment, using a 10-point visual analog scale (VAS).

### Case Presentaion:

**Patient 1:** A 45-year old, healthy woman with a history of three pregnancies and two deliveries complained of introital pain (VAS score: 9) at the 12 o'clock position, impacting work and sex life. The condition had failed to respond to numerous previous local treatment regimens. A physical examination showed no sign of infection, normal colposcopy and ruled out diverticula. A three-course FemiLift treatment regimen led to immediate symptomatic relief, with patient-reported VAS scores of 6 and 4 after the first and second treatment sessions, respectively. A further reduction in pain levels was noted after the third treatment session (VAS: 1-2), and was maintained over the ensuing 5-month period. In

addition, the patient reportedly resumed sexual activity after the treatment.

**Patient 2:** A 32-year-old woman, gravida 1, para 1, complaining of vulvodynia (VAS score: 10) since delivery, with normal colposcopy findings and no signs of infection, and who had attempted to achieve improvement by way of local, behavioral and physiotherapeutic techniques, underwent a three-course FemiLift treatment series. A gradual improvement in symptoms was reported over the treatment period, with VAS scores of 7-8, 5 and 3 reported after treatment sessions 1, 2 and 3, respectively.

**Patient 3:** A 36-year-old women, gravida 2, para 2, presented with a two-year history of dyspareunia and pain when sitting (VAS score: 9). The patient was otherwise healthy and had no history of operations, and showed no signs of infection of colposcopic abnormalities. A two-course FemiLift regimen brought to significant symptomatic relief (VAS scores: 7 and 4, after treatment sessions 1 and 2, respectively).

**Patient 4:** A 28-year-old, healthy women with no gestational history, no signs of infection and normal colposcopy test results reported introital pain that had started 5 years earlier. She had attempted various local and physiotherapeutic therapy options, but saw no improvement. A single FemiLift treatment session was sufficient to reduce patient VAS score from 9 to 3. No further treatment sessions were requested.

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### Conclusion:

The nonablative CO<sub>2</sub> Laser FemiLift procedure for management of vulvodynia and VVS was highly efficacious, and provided immediate relief, that progressively increased with subsequent treatment sessions. No downtime was reported and no patient adherence was required. The treatment method presents a promising means of treating a highly distressing clinical issue which significantly impacts the lives of a high percentage of adult women.

### Consent:

A Written informed consent was obtained from the patients for publication of this case report. A copy of this consent is available for review if needed.

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### References:

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