

IS IT ALL JUST SMOKE AND MIRRORS?: VAGINAL LASER THERAPY AND ITS ASSESSMENT BY TACTILE IMAGING

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Introduction

The use of fractional CO₂ laser for the treatment of vulvovaginal conditions is a new therapy with limited data to support its mechanism of action or efficacy [1]. Vaginal tactile imaging, translating the sense of touch into a computer image, allows biomechanical assessment of vaginal tissues and pelvic floor muscles and carries a potential to evaluate and monitor the effects vaginal laser treatments [2].

Objective

To explore changes in vaginal tissue elasticity, pelvic floor support and muscle strength after applied vaginal laser treatments.

Methods

Fractional CO₂ laser procedures were performed in 6 week intervals for 3 consecutive treatments. The Vaginal Tactile Imager (VTI) was used to assess the vaginal walls, pelvic floor support structures and pelvic floor muscle (PFM) contractions before and after each of the 3 laser treatments. The VTI probe allows for an estimation of: a) vaginal tissue elasticity as a pressure gradient under vaginal wall deformation, b) pelvic floor support conditions as a pressure gradient under a deformation of the posterior compartment, and c) PFM strength as a pressure feedback under voluntary and involuntary (cough) contractions. We enrolled 12 subjects into an observational case-controlled sub-study.

Results

The average enrolled patient age was 59 y.o. (35 to 74). All patients were successfully treated 3 consecutive CO₂ laser treatments and examined with the VTI before each laser treatment and 6-8 weeks after the final treatment. We found:

- 1) The vaginal tissues elasticity improved in 8 of 12 patients (ranging from 50% - 1,400% difference); 2 patients had unchanged measurements, 2 patients had decreased elasticity by 75% and 60%, however they both had conditions pre-treatment other than vaginal atrophy and demonstrated clinical improvement in their conditions (resolved pain from perineal scar tissues and levator ani syndrome). Greater improvements were seen in patients that were not using a vaginal estrogen compared to those using a vaginal estrogen immediately prior to the laser treatments (mean: 1,123% versus 165%, median: 675% versus 70%).
- 2) The pelvic floor support, as a measurement of elasticity of the underlying tissues surrounding the vagina, improved in 8 of 12 patients (75% - 480%). 4 patients had unchanged measurements.
- 3) The PFM strength for voluntary muscle contractions increased in the majority of patients (7) with increases ranging from 63% - 233%. Involuntary contractions (contraction with a cough) increased in 5 of 12 patients, ranging from 84% - 330%. No patients enrolled were engaged in a formal or at home program for pelvic floor muscle training during the study period.
- 4) Vaginal and pelvic floor improvements of $\geq 50\%$ documented by VTI were reported after single laser procedure in 6 cases; after 2 laser procedures in 4 cases and after 3 procedures in 2 cases.
- 5) Of the 9 patients that were sexually active before and after treatments, 8 experienced complete

resolution in pain with intercourse and 1 experienced improvement. All patients reported an increase in lubrication. No dissatisfaction or adverse events were reported.

- 6) Comfort level of the VTI examination procedure by 78% of patients was classified as more comfortable or the same as manual palpation; and 22% as less comfortable. 0% reported the VTI exam as painful or severely painful.

Conclusions

Vaginal CO₂ laser treatment not only seems to hold promising results clinically in treating dyspareunia and dryness due to vaginal atrophy, but also seems to improve tissue elasticity, pelvic floor support and PFM strength upon assessment with tactile imaging. The VTI allows monitoring of biomechanical transformation of tissues before and after the laser treatment and may predict the effectiveness the therapy for individual patients.

References

1. *Curr Opin Obstet Gynecol.* 2015; 27(6):504-8
2. *Int. Urogynecology J.* 2015; 26(4):607-9.

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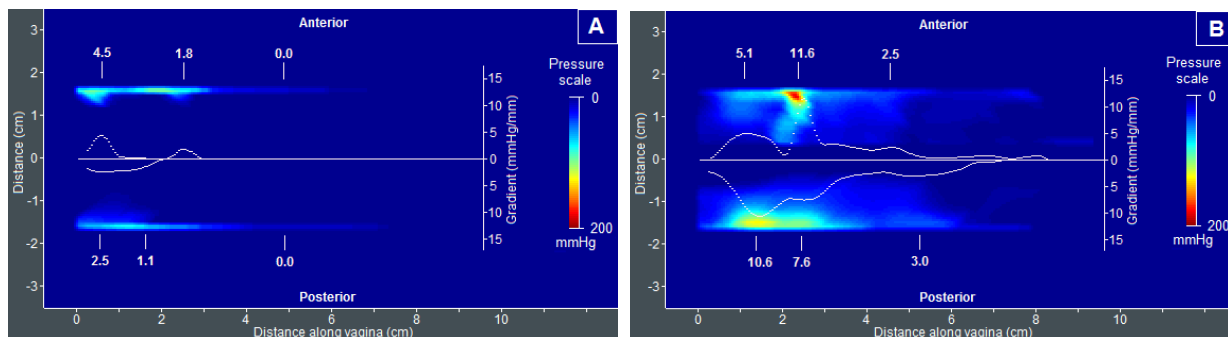


Figure 1. Pressure patterns for vaginal tactile imaging probe insertion (test 1) and calculated pressure gradients along anterior and posterior compartments before (A) and after (B) the 1st laser treatment.