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Case Report

Biomechanical characterization using Tactile Imaging and Interpretation of Female Pelvic Floor Conditions before a Treatment

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Abstract

Introduction: Biomechanical and functional evaluations of vaginal conditions facilitate outcome assessment, leading to improved patient satisfaction. In case of pelvic floor issues, a patient could undergo medical imaging and biomechanical diagnostic tests. The results of these tests may help to analyse options of treatment and suggest the optimal for one patient.

Case Report: Vaginal tactile imaging (VTI) allows assessment of the soft tissue of the vaginal walls at rest, with manually applied deflection pressures and with voluntary and involuntary muscle contraction, and relaxation, and Valsalva maneuver. During a patient examination, data collected from the probe sensors are displayed on the VTI computer display in real time. VTI allows acquisition of the pressure patterns along the entire vagina to visualize tissue elasticity, muscle tone and strength at contraction. That provides evaluation of individual variations in tissue elasticity, support defects, as well as pelvic muscle function. Interpretation of the acquired VTI data for normal pelvic floor support and prolapse conditions is proposed based on biomechanical assessment of the functional anatomy.

Conclusion: Vaginal tactile imaging allows biomechanical characterization of female pelvic floor structures and tissues in vivo, which may help to optimize treatment of the local conditions such as pelvic organ prolapse, urinary incontinence and atrophy.

Keywords: *Vaginal Tactile Imaging; Radiofrequency; Vaginal Conditions; Pelvic Floor; Stress Urinary Incontinence; Pelvic Organ Prolapse*

Introduction

The use of quadripolar dynamic radiofrequency for the treatment of vulvovaginal conditions is a new therapy. Vaginal tactile imaging allows biomechanical assessment of vaginal tissues and pelvic floor muscles.

The purpose of this study is to explore changes in vaginal tissue elasticity, pelvic floor support and muscle strength after applied vaginal radiofrequency treatments.

Biomechanical characterization using tactile imaging and interpretation of female pelvic floor conditions before a treatment.

Case Report

Vaginal tactile imaging (VTI) allows assessment of the soft tissue of the vaginal walls at rest, with manually applied deflection pressures and with voluntary and involuntary muscle contraction, and relaxation, and Valsalva maneuver. During a patient examination, data collected from the probe sensors are displayed on the VTI computer display in real time. VTI allows acquisition of the pressure patterns

along the entire vagina to visualize tissue elasticity, muscle tone and strength at contraction. That provides evaluation of individual variations in tissue elasticity, support defects, as well as pelvic muscle function.

Results and Discussion

The patients have had normal pelvic support or pelvic organ prolapse. We transposed a set of 31 VTI parameters into a quantitative characterization of pelvic muscles and ligamentous structures. The VTI probe allows compression of vaginal tissues in the orthogonal direction to the tissue surface during probe insertion (Figure 1); pelvic floor tissue displacement during the probe elevation (Figure 2); vaginal wall deformation and pressure pattern acquisition during the probe rotation (Figure 3); and acquisition of pressure patterns for pelvic muscle contraction along the vagina (Figure 4). Interpretation of the acquired VTI data for normal pelvic floor support and prolapse conditions is proposed based on biomechanical assessment of the functional anatomy.

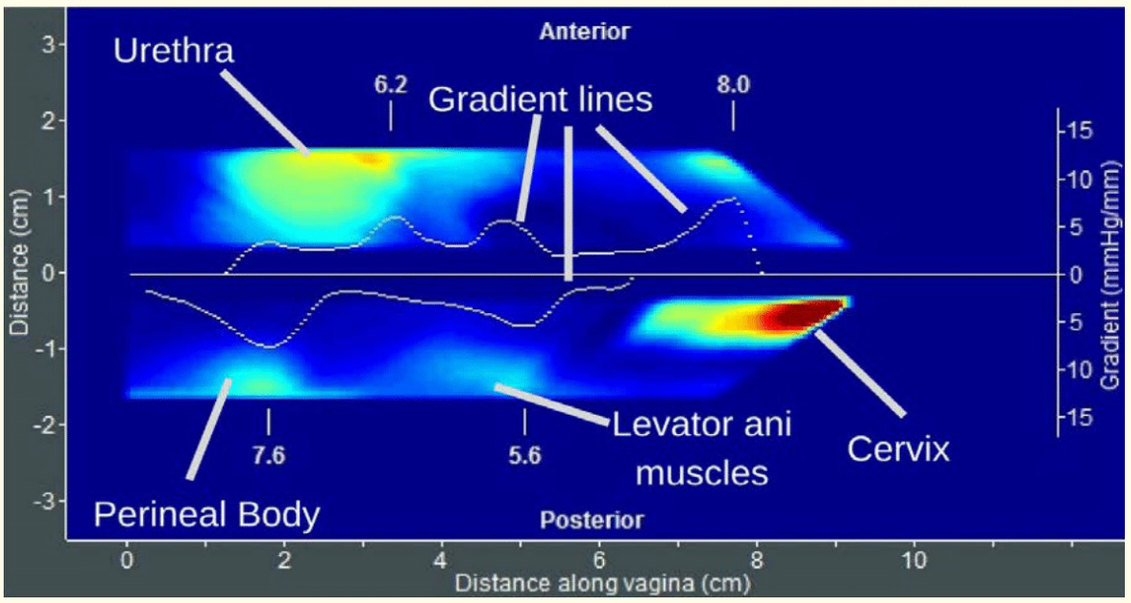

Figure 1: *Vaginal tissue elasticity.*

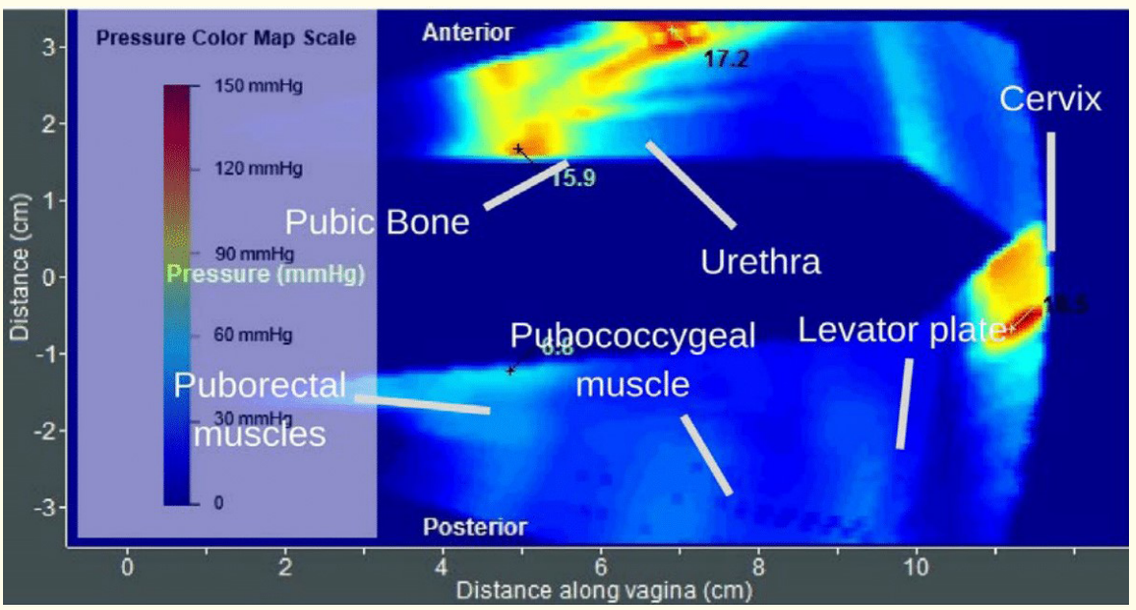

Figure 2: *Pelvic floor support conditions.*

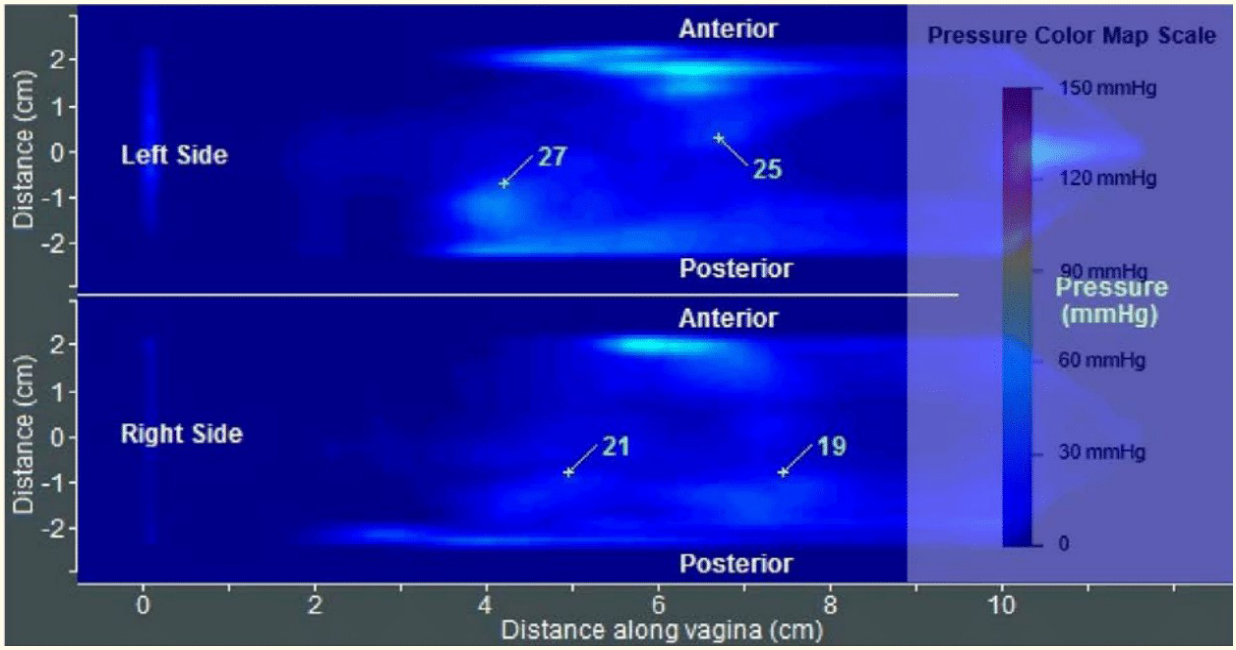

Figure 3: *Condition of vaginal walls.*

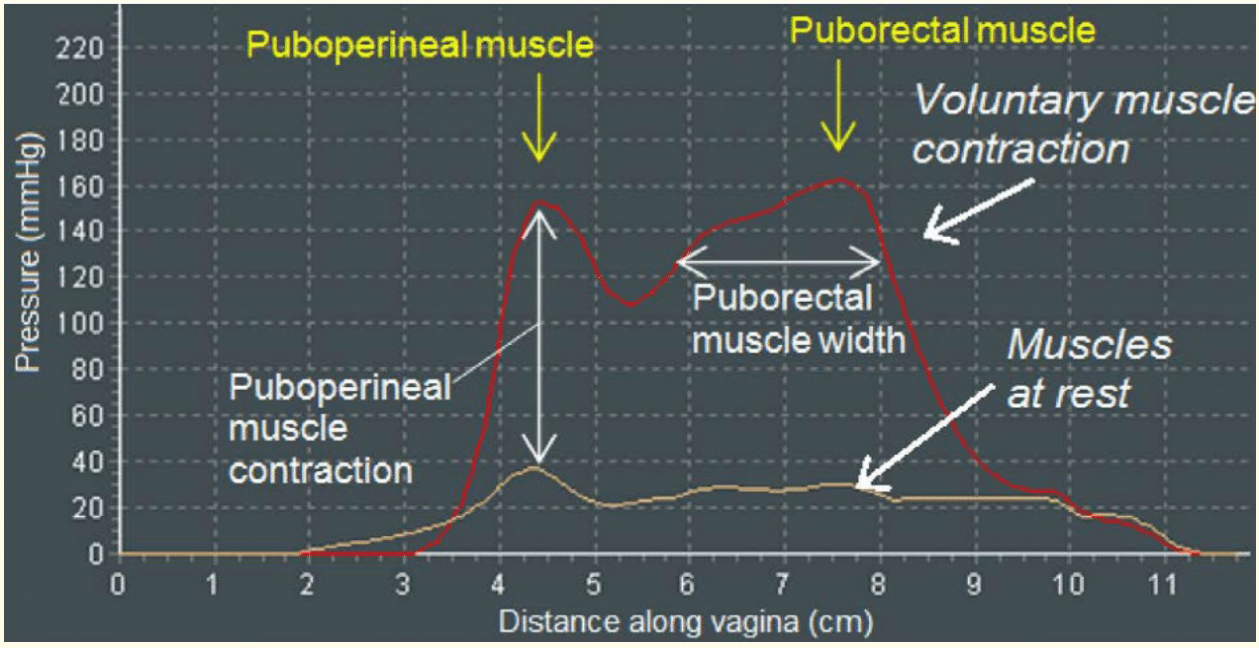

Figure 4: *Pelvic muscle strength at contraction.*

Source: Advanced tactile imaging

Then we processed to VTI data acquisition for four patients with different pelvic floor conditions (Figure 5), Vaginal laxity, Stress Urinary Incontinence (SUI), Pelvic Organ Prolapse (POP) [1-4].

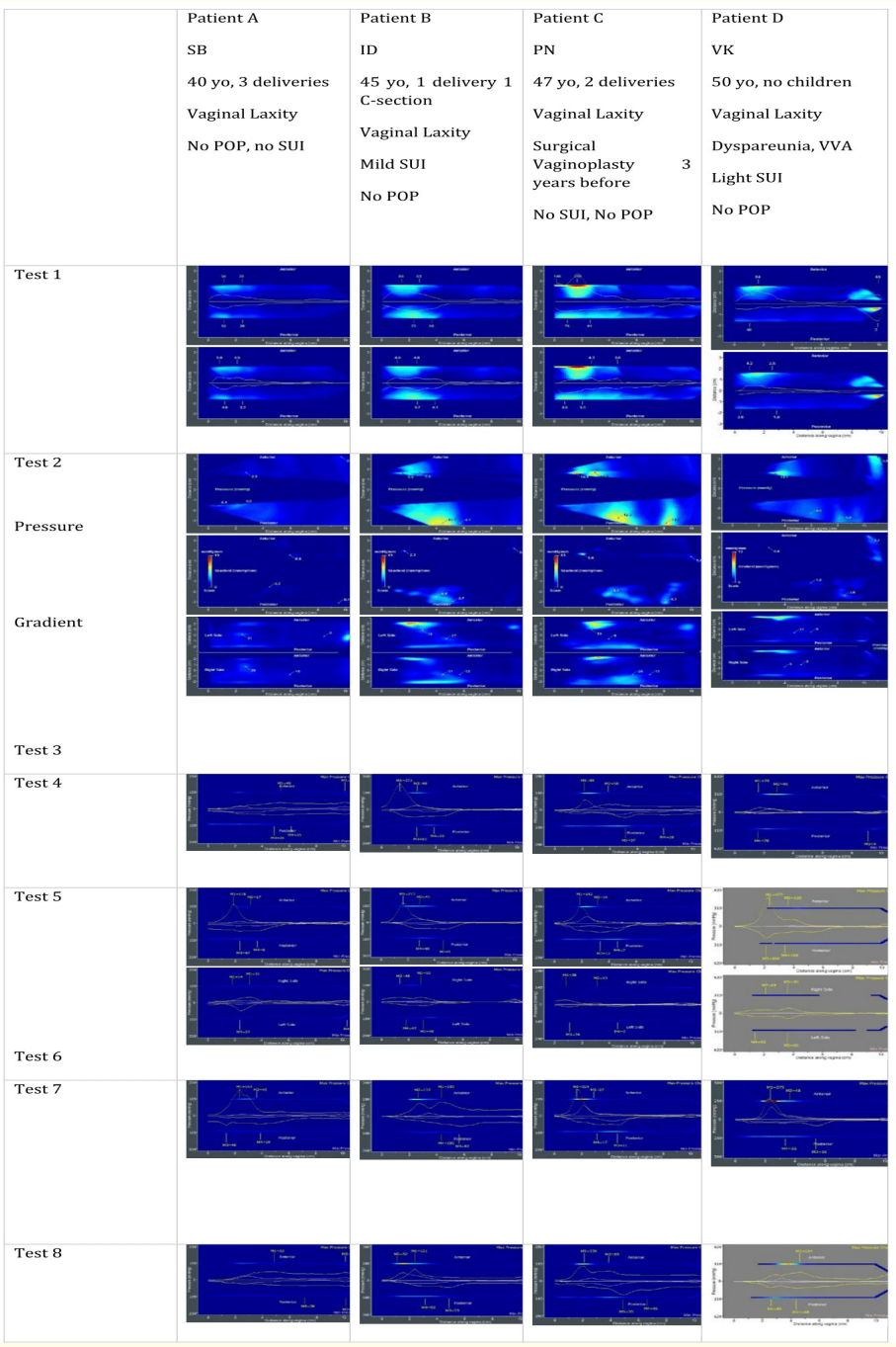

Figure 5: *VTI Data acquisition for 4 patients with different pelvic floor conditions.*

Conclusion

Vaginal tactile imaging allows biomechanical characterization of female pelvic floor structures and tissues in vivo, which may help to optimize treatment of the local conditions such as pelvic organ prolapse, urinary incontinence and atrophy.

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