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Translabial Ultrasonography to Evaluate the Integrity of the Pelvic Floor in Patients with Urogenital Prolapse

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ABSTRACT

Translabial ultrasonography (TLUS) is a non-invasive imaging modality that provides detailed evaluation of the pelvic floor, making it an essential diagnostic tool in patients with urogenital prolapse (UGP). This technique allows real-time visualization of the pelvic floor structures, including the levator ani, urethra, bladder, and rectum, to assess anatomical abnormalities, muscle defects, and organ descent. TLUS offers a safer, cost-effective alternative to other imaging methods, contributing to better understanding and management of UGP. This study focuses on the application of TLUS in evaluating pelvic floor integrity in patients with urogenital prolapse.

Keywords: Translabial ultrasonography, pelvic floor, urogenital prolapse, levator ani, pelvic organ descent

INTRODUCTION

Pelvic organ prolapse (POP) is a common condition in women, characterized by the descent of pelvic organs due to weakened pelvic floor muscles and connective tissues. Factors such as aging, childbirth, obesity, and connective tissue disorders increase the risk of POP, affecting quality of life and leading to urinary, bowel, and sexual dysfunction (1,2).

The pelvic floor's integrity is crucial in maintaining organ support. Traditional diagnostic tools include physical examination and imaging modalities like magnetic resonance imaging (MRI) and computed tomography (CT). However, these techniques may be limited by cost, accessibility, and invasiveness (3). Translabial ultrasonography (TLUS) has emerged as a reliable alternative, offering dynamic and detailed imaging of pelvic floor structures with minimal patient discomfort (4,5).

TLUS evaluates pelvic floor integrity by assessing the levator hiatus, urethral mobility, bladder neck descent, and the presence of levator ani muscle avulsion. It also enables quantification of organ descent under Valsalva maneuvers, aiding in the diagnosis and grading of prolapse severity (6,7). Compared to MRI, TLUS is cost-effective, widely available, and provides real-time functional imaging (8).

This study investigates the utility of TLUS in evaluating pelvic floor integrity in patients with UGP, highlighting its clinical relevance, diagnostic capabilities, and role in treatment planning.

Aim

To evaluate the role of translabial ultrasonography in assessing pelvic floor integrity in patients with urogenital prolapse.

Objectives

1. To analyze the anatomical and functional parameters of the pelvic floor using TLUS.
2. To determine the correlation between TLUS findings and the severity of urogenital prolapse.

Materials and Methods

This prospective study included 150 women with clinical evidence of urogenital prolapse, classified based on the POP-Q system. TLUS was performed using a 4–6 MHz transducer in supine position. Measurements included levator hiatus dimensions, bladder neck descent, and organ mobility under Valsalva maneuver.

Inclusion criteria:

- Women aged 30–70 years with clinically diagnosed UGP
- No history of pelvic surgery in the past year

Exclusion criteria:

- Active urinary tract infection
- Previous pelvic irradiation or malignancy

Collected data were analyzed for the correlation between TLUS parameters and prolapse severity.

Results

Table 1: Patient Demographics and Clinical Characteristics

Parameter	Value (n=150)
Mean age (years)	52 ± 10
Parity (mean)	3 ± 1
BMI (kg/m²)	26 ± 4
Prolapse stage (POP-Q)	Stage II: 70%
	Stage III: 30%

Table 2: TLUS Findings in UGP Patients

TLUS Parameter	Mean Value	Abnormal Cases (%)
Levator hiatus area (cm²)	25 ± 5	65%
Bladder neck descent (mm)	15 ± 3	60%
Levator ani avulsion	-	40%
Urethral mobility (>30° rotation)	-	50%

TLUS demonstrated significant abnormalities in pelvic floor anatomy, with 40% of patients showing levator ani avulsion. Bladder neck descent was observed in 60% of cases, correlating with increased prolapse severity.

Discussion

TLUS is a valuable imaging modality for evaluating pelvic floor integrity in women with urogenital prolapse. This study highlighted the high prevalence of pelvic floor defects, such as levator ani avulsion and increased bladder neck descent, among patients with UGP, consistent with previous research (1,3).

Levator ani avulsion, identified in 40% of patients, is strongly associated with vaginal delivery and contributes to pelvic organ descent. TLUS offers high accuracy in detecting this defect compared to MRI, providing a practical option in clinical settings (6,8). Additionally, measurements of bladder neck descent and urethral mobility under Valsalva maneuver facilitate functional assessment of the anterior compartment, aiding in treatment planning.

The non-invasive nature of TLUS and its ability to provide dynamic imaging make it superior to static imaging methods like CT and MRI for assessing pelvic organ prolapse (4,7). Moreover, TLUS findings correlate well with the severity of prolapse, supporting its role in evaluating treatment outcomes and guiding surgical interventions.(9, 10)

Limitations of this study include its cross-sectional design and the reliance on operator expertise, which may introduce variability in measurements. Future studies should focus on standardizing TLUS parameters and exploring its utility in predicting postoperative outcomes.

Conclusion

Translabial ultrasonography is an effective, non-invasive tool for evaluating pelvic floor integrity in patients with urogenital prolapse. It provides detailed imaging of anatomical and functional parameters, aiding in the diagnosis, severity assessment, and management of UGP. The findings underscore the clinical relevance of TLUS in modern urogynecological practice, particularly as a cost-effective alternative to other imaging

modalities. Standardized protocols and further research are needed to enhance its diagnostic utility and reproducibility.

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