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From imaging to clinical outcomes: the role of transperineal ultrasound in pelvic organ prolapse and stress urinary incontinence

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Introduction

Pelvic organ prolapse (POP) and stress urinary incontinence (SUI) are among the most common urogynecological conditions that significantly affect women's quality of life. Transperineal ultrasound (TPUS) has gained importance as a non-invasive imaging tool for evaluating the pelvic floor and planning individualized treatment strategies.

Objective

This study aimed to assess the agreement between clinical staging (POP-Baden-Walker) and TPUS, and to analyze the relationships between morphological parameters measured by TPUS and the presence of SUI or subjective postoperative recurrence. An additional objective was to evaluate preoperative post-void residual (PVR) as a predictor for the risk of postoperative recatheterization.

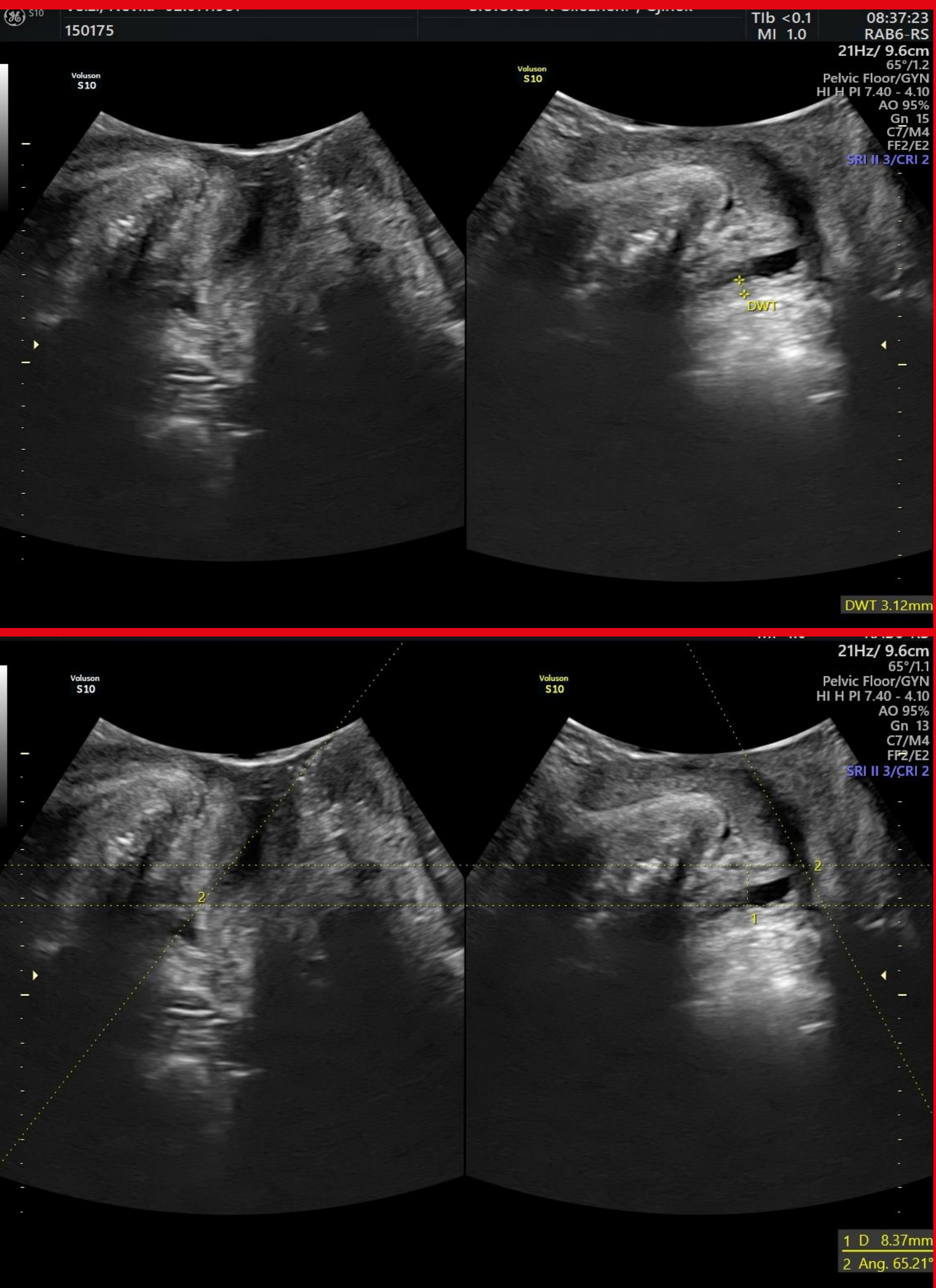
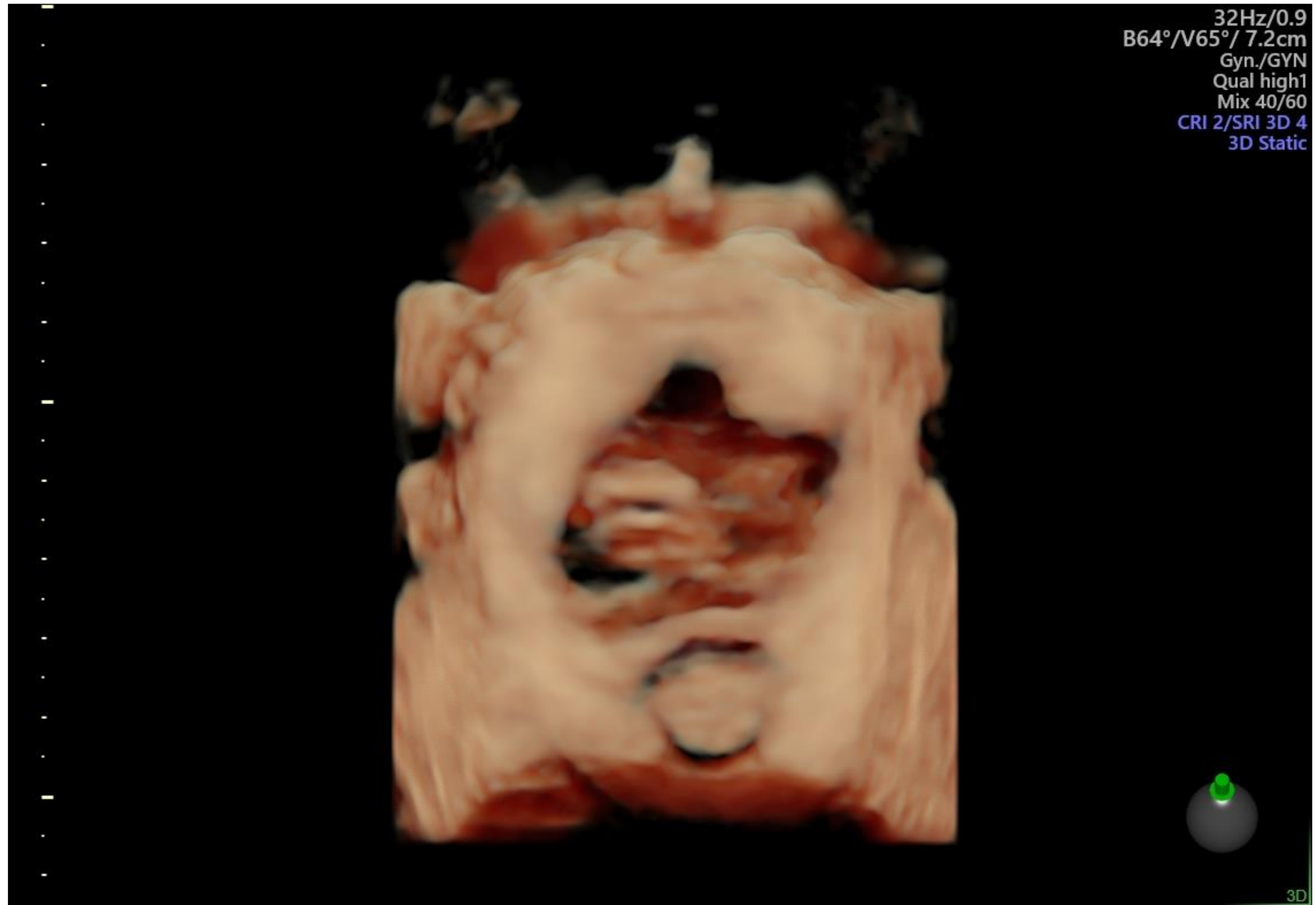
Methodology

The study included 160 patients diagnosed with POP and/or SUI. Clinical examination (POP-Baden-Walker classification) and TPUS were performed independently. Evaluated parameters included: levator hiatus size, bladder neck descent (BND), urethral funneling, α and β angles, detrusor muscle thickness, and PVR.

Results

The overall agreement between POP-Q and TPUS was moderate (Cohen's Kappa = 0.412, $p < 0.001$), with higher agreement in the anterior compartment (Kappa = 0.656) compared to apical (Kappa = 0.171) and posterior (Kappa = 0.158). Levator hiatus size did not show a statistically significant correlation with subjective recurrence of POP after surgery ($p = 0.3135$), although the mean value was slightly higher in patients with recurrence.

Urethral funneling was present in 69.2% of patients with SUI versus only 40.6% without SUI, with a statistically significant association ($\chi^2 = 10.35$, $p = 0.0013$). BND, α/β angles, and urethral mobility were significantly different in SUI patients. However, these parameters did not correlate significantly with UDI-6 symptom scores ($p = 0.1442$). Detrusor thickness did not differ significantly between groups with and without SUI ($p = 0.87$), excluding its value as a diagnostic marker. Patients with PVR >100 ml had a recatheterization rate of 60.9%, while no cases occurred in the lower PVR groups. The Chi-square test demonstrated a strong statistical association ($\chi^2 = 28.86$, $df = 2$, $p < 0.001$).



Conclusion

TPUS is a reliable tool for evaluating POP, with the highest agreement in the anterior compartment. Urethral funneling and α/β angles help identify SUI, while preoperative PVR predicts postoperative complications. Its integration may improve risk stratification and individualized management.