

URETHRAL PRESSURE REFLECTOMETRY PREDICTS STRESS URINARY INCONTINENCE AFTER ANTERIOR COLPORRHAPHY.

Hypothesis / aims of study

Postoperative de novo stress urinary incontinence (SUI) remains an unsolved puzzle after pelvic organ prolapse (POP) surgery. In women with anterior vaginal wall prolapse, the sunken bladder may mask SUI (occult SUI) by kinking and/or compressing the urethra. The most common test for occult SUI is a stress test with POP reduction. The presence of occult SUI is thought to predict a higher risk for postoperative de novo SUI, but regardless of the method used for POP reduction, stress tests have disappointing predictive values. Therefore, the presence of occult SUI in a single woman does not predict her need for SUI treatment after POP surgery (1).

Urethral pressure reflectometry (UPR) (2) measures urethral opening pressure at rest, during squeezing and straining.

Principles of UPR:

UPR allows for simultaneous measurements of pressure and cross-sectional area in the urethra, using a polyurethane bag, connected to a 45 cm long PVC tube, inserted into the urethra. The cross-sectional area along the entire length of the urethra is measured continuously by means of acoustic reflectometry. As a result, the opening pressure, which is the pressure needed to open the collapsed urethra, is measured.

Measurements during straining are evaluated by assessing the opening pressure at a standardized abdominal pressure of 50 cmH₂O, P_{O-Abd 50}. P_{O-Abd 50} has proven highly reproducible in women with POP and to decrease significantly after anterior colporrhaphy.

We hypothesized that P_{O-Abd 50} may be used as a prognostic parameter for de novo SUI in women undergoing anterior colporrhaphy.

Study design, materials and methods

We conducted a prospective, observational study where women with anterior vaginal wall prolapse were recruited from our outpatient clinic. The women were examined before and after anterior colporrhaphy. Both visits included POP staging according to POP-Q, UPR measurements and a standardized stress test with 300 ml saline; all tests were performed with the patient in a supine position. UPR was conducted at rest, during squeezing and straining with simultaneous recordings of abdominal pressure.

Results

Our study group consisted of 28 women with anterior vaginal wall prolapse with POP-Q grade ≥ 2 . The women had a mean age of 64 (37-80) years, all but two were postmenopausal and 15 women used local estrogen therapy. Median parity was two (1-4). The women were examined at a median of 30 (1-113) days before surgery and 52 (38-84) days after surgery. All women underwent anterior colporrhaphy: nine had concomitant cervical amputations. There were no other concomitant procedures.

Five women had positive stress tests before surgery; four of them had positive stress tests after surgery, and an additional six had positive stress tests after surgery. The ten women with positive postoperative stress tests, had significantly lower P_{O-Abd 50} in their preoperative examinations, compared to the 18 women who had negative postoperative stress tests (68 cmH₂O vs. 83 cmH₂O, p-value=0.02). Based on these results, the women were divided into three groups, see table I.

Table I. Percentage of women with positive postoperative stress tests stratified by preoperative P_{O-Abd 50}, p-value=0.01.

Groups	Preoperative P _{O-Abd 50} , cmH ₂ O	Positive postoperative stress tests
1, n=5	>94	0%
2, n=13	75-94	23%
3, n=10	<75	70%

P_{O-Abd 50}: opening pressure at an abdominal pressure of 50 cmH₂O.

Interpretation of results

We have been able to divide our study population into three groups based on their preoperative P_{O-Abd 50}, demonstrating that the risk of having a positive postoperative stress test increases significantly with decreasing preoperative P_{O-Abd 50}. P_{O-Abd 50} expresses the permanent and adjunctive closure forces that act on urethra, striving to keep it closed during stress. The parameter can be considered a severity measure of incontinence, much like leak point pressure (LPP) has been in the literature. There is, however, a crucial difference between the two: LPP can only be measured in women with incontinence whereas P_{O-Abd 50} assesses urethral function regardless of diagnoses. P_{O-Abd 50} can separate between continent women and women with SUI (3) and now, this study clearly demonstrates its role as a prognostic indicator for postoperative de novo SUI in women undergoing POP surgery. This is of great importance in the preoperative consultation of these women, where fear of de novo SUI may lead to unnecessary sling surgery at the time of POP surgery. The cut-off values presented in this study must be confirmed in future studies with greater sample sizes.

Concluding message

This is the first study where women with POP have been evaluated with UPR, before and after anterior colporrhaphy. It has shown that a preoperative cut-off for the urodynamic parameter $P_{O-Abd} 50$ is indicative of a woman's risk of developing postoperative de novo SUI.

References

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Disclosures

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Registration Number: ClinicalTrials.gov, NCT02050568 **RCT:** No **Subjects:** HUMAN **Ethics Committee:** The National Committee on Health Research Ethics **Helsinki:** Yes **Informed Consent:** Yes