

## ANATOMIC URETHRAL LENGTH INCREASES AFTER APICAL SUSPENSION TO TREAT PELVIC ORGAN PROLAPSE

### Hypothesis / aims of study

The location of a mid-urethral sling (MUS) and its relationship to urethral length have been the subjects of ongoing investigation. MUS is often combined with pelvic organ prolapse (POP) surgery given the concomitance of POP and urinary incontinence (UI) in women. Little information exists on the impact of POP surgery, specifically apical suspensions, on anatomic urethral length (AUL) and functional urethral length (FUL). A prior study indicated that both FUL and AUL increase with urethral stretch. Given the elasticity of the urethra, apical suspensions used to treat POP may increase AUL and/or FUL given force vectors mundane to these procedures. An increase in AUL and/or FUL may account for continence rates observed in prior studies of POP surgery alone. In theory, a procedure often performed concomitantly with MUS and one that may alter urethral length should be performed prior to the MUS in order for the MUS to maintain its position along the urethra after placement. We sought to determine if a change in AUL occurs after apical suspension.

### Study design, materials and methods

This study was a retrospective analysis of 20 consecutive women undergoing surgery for POP that included an apical suspension. Apical suspensions included sacrocolpopexy, sacrospinous fixation, and uterosacral ligament suspension. A 20-French urethral catheter was routinely placed at the outset of the procedure, inflated with 10 cc of sterile water, and removed at the conclusion of the procedure. The catheter was marked at the posterior urethral meatus both at the beginning of the procedure and after completion of the procedure and the urethral lengths measured with a straight ruler. Urethral length was measured from the bottom of the balloon inflated to 10 cc to the mark that had been placed on the catheter. Descriptive data included mean pre- and post-procedure urethral lengths, standard deviations, and confidence intervals. A paired, two-tailed t test was performed to compare the means before and after the total procedure. A smaller cohort of 8 women undergoing POP surgery without any of the above apical suspensions and/or MUS was included for comparison.

### Results

In the primary cohort of 20 women, 9 sacrocolpopexies, 10 uterosacral ligament suspensions, and one sacrospinous fixation were included. Concomitant anterior and/or posterior colporrhaphy occurred each in 11 women and 15 women had concomitant MUS. All 20 women had stress urinary incontinence preoperatively. Mean (SD) (95% CI) AUL pre- and postoperatively were 3.15 cm (0.46) (95% CI, 2.95, 3.35) and 3.88 cm (0.44) (95% CI, 3.69, 4.07), respectively,  $P < 0.00001$ . The comparison group included 7 MUS, 2 anterior repairs, 3 posterior repairs, 1 LeFort colpocleisis, and 1 colpectomy. Mean (SD) AUL pre- and postoperatively were 3.22 cm (0.45) for both groups and there were no changes in AUL recorded for any woman in this cohort.

### Interpretation of results

These data indicate that AUL measured by an indwelling catheter is increased by apical suspensions and does not appear to be increased in MUS and/or other POP surgery alone.

### Concluding message

These data indicate that AUL measured by an indwelling catheter is increased by apical suspensions and does not appear to be increased in MUS and/or other POP surgery alone. The ultimate location of MUS may depend on the order of procedures when apical suspensions and MUS are performed together. Whether this information has clinical significance is the subject of ongoing study. Increase in AUL may account for continence rates observed in prior studies of POP surgery alone.

### References

1. Kujansuu E, Teisala K, Punnonen R. Urethral closure function after total and subtotal hysterectomy measured by urethrocytometry. *Gynecol Obstet Invest.* 1989;27(2):105-6.
2. Bruschini H, Schmidt A, Tanagho EA. Effect of urethral stretch on urethral pressure profile. *Invest Urol.* 1977 Sep;15(2):107-11.
3. Bai SW, Cho JM, Kwon HS, et al. The Relationship between Maximal Urethral Closure Pressure and Functional Urethral Length in Anterior Vaginal Wall Prolapse Patients According to Stage and Age. *Yonsei Medical Journal* 2005, 46(3): 408 - 413.

### Disclosures

**Funding:** none **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Queens Medical Center **Helsinki not Req'd:** The study is a retrospective analysis of intraoperative measurements and we applied for a waiver of informed consent. No protected health information was recorded for the purpose of the study therefore in this manner the spirit of the Declaration of Helsinki was followed.

**Informed Consent:** No