

THE RELATIONSHIP OF MAXIMAL URETHRAL CLOSURE PRESSURE TO OUTCOME FOLLOWING INCONTINENCE SURGERY.

Hypothesis / aims of study

Assessment of urethral function by the measurement of urethral pressure has been undertaken for over 80 years. It is widely assumed that low urethral pressure values are associated with more severe urethral sphincter incompetence (intrinsic sphincter deficiency: ISD) and poorer outcomes with treatment. In many centres the type of surgery recommended for stress urinary incontinence (SUI) is influenced by the urethral pressure value. It is surprising that few studies exist evaluating the relationship of urethral pressure and surgical outcome (1). The advent of the urethral retro-resistance pressure (URP) measurement will refocus attention on the relevance of measuring urethral pressure (2).

This study aimed to explore the relationship of pre-operative maximal urethral closure pressure (MUCP) to outcome following incontinence surgery. In order to control for potential confounders, the subjects' age and BMI and the presence of pre-operative urodynamic detrusor over-activity were also assessed as risk factors for surgical failure.

Study design, materials and methods

Over a two-year period, 200 women with urodynamic stress incontinence underwent either a laparoscopic or open Burch colposuspension. Exclusions included previous retropubic incontinence surgery, maximum urethral closure pressure of 20 cm H₂O or less, significant pelvic organ prolapse and medically unsuitable for laparoscopic surgery. The mean age of the whole group was 51 years and the mean parity was 2.7 with only 3% of the study population being nulliparous. Ninety-six women underwent laparoscopic colposuspension and 104 an open colposuspension. Data was collected on pre-operative MUCP, age, BMI and urodynamic detrusor over-activity, which was then compared to the outcome of surgery. Multichannel urodynamic assessment was performed prior to surgery and at 6 months following surgery. MUCP measurements were performed with the bladder empty and at bladder capacity. Ethics committee approval for the study was obtained.

The primary outcome measure following surgery was the absence or presence of urodynamic stress incontinence at 6 months post-operatively. Success was defined as absence of urodynamic stress incontinence and failure as the presence of urodynamic stress incontinence 6 months after surgery.

Results

Logistic regression was used to model urodynamic stress incontinence at 6 months post-operatively. Taking into account that there were 25 missing observations for this variable, 175 cases were assessed. Urodynamic assessment 6 months following surgery demonstrated a success rate of 75.5% (132/175) and a failure rate of 24.5% (43/175). Lower values of pre-operative MUCP were associated with a significantly higher chance of surgical failure ($P=0.001$) and this was independent of the subjects' age. A greater age at time of operation was associated with a significantly higher chance of surgical failure ($P=0.017$) independent of the pre-operative MUCP value.

Neither the presence of urodynamic detrusor over-activity pre-operatively or increasing BMI was associated with a significantly higher chance of surgical failure. Method of operation, open or laparoscopic route, was included in the statistical analysis and was shown to have no statistically significant bearing on the success of surgery relative to the pre-operative variables considered.

Interpretation of results

Lower pre-operative MUCP values were shown to be associated with a higher chance of recurrent urodynamic stress incontinence at 6 months following incontinence surgery. Whereas other authors have demonstrated that an MUCP of 20 cm H₂O or less was associated with a higher risk of surgical failure, in our study lower MUCP values above 20 cm H₂O were also associated with a higher chance of surgical failure (1). It may be inappropriate to have a cut-off value of 20 cm H₂O or less as the defining value for ISD.

Previous reports have shown low MUCP to be a risk factor for surgical failure but not independent of age for subjects over 50 years. In our study, both increasing age and low MUCP values were independently associated with a significantly higher chance of surgical failure.

Further studies are required to assess the usefulness of the various measures of urethral function as risk factors for failed incontinence surgery.

Concluding message

Increasing age and lower pre-operative MUCP values are both independent risk factors for recurrence of SUI following colposuspension. Choosing an arbitrary cut-off value of 20 cm H₂O to define low-pressure urethra (ISD) may be inappropriate as all subjects in this study had MUCP values greater than 20 cm H₂O. Assessment of urethral function prior to surgery may provide valuable information to help with pre-operative patient counselling and decision making with treatment.

Reference

1. The Low Pressure Urethra as a Factor in Failed Retropubic Urethropexy. *Obstet Gynecol* 1987; 69: 399-402.
2. Relationship of urethral retro-resistance pressure to urodynamic measurements and incontinence severity. *Neurourol Urodynam* 2004; 23: 109-114.