

## URETHRAL CLOSURE PRESSURE; DOES THE VALUE INFLUENCE OUTCOME IN STRESS INCONTINENCE SURGERY IN THE LONG-TERM?

### Hypothesis / aims of study

Urethral pressure measurements can form part of the investigation of women prior to surgery for stress incontinence. Some studies<sup>1,2</sup> have suggested that women with a urethral closure pressure of <20 cm H<sub>2</sub>O do not fare so well after surgery, and it has been suggested that women with low urethral closure pressures may benefit from a more obstructive type of surgery. However there is little published data that compares the more commonly performed types of surgery and involves long-term follow up. This study aims to determine whether low urethral closure pressure adversely affects the outcome of surgery for stress incontinence in the long-term.

### Study design, materials and methods

All women who had a colposuspension or TVT performed in any of the three hospitals in a large city between 1998 and 2002, for stress urinary incontinence (SUI), were included in the study, following Ethics approval. All women had undergone urodynamics prior to surgery, including urethral pressure profiles by the Brown Wickham method. All women had answered a questionnaire prior to surgery and were sent a further questionnaire by post in 2005 to allow at least 3 years follow-up after surgery. The study period was chosen to allow an adequate sample size (66 for each operation) for statistical analysis. Urodynamic data, including maximum urethral closure pressure (MUCP) and functional urethral length, were analysed to see whether any particular value was predictive of poor outcome from surgery, and also to compare the results between the two types of surgery. Surgical outcome was measured in terms of whether responders still had SUI after surgery, defined by whether they described leakage after coughing and exercise in the questionnaire. Responders were assigned to one of three SUI groups, depending on the amount of postoperative incontinence reported. Group 1 (*No incontinence*), Group 2 (*< 1 incontinence episode per day*), Group 3 (*> 1 incontinence episode per day*). Analysis was performed using STATA<sup>®</sup> software. Independent statistical analysis was undertaken, using a two-way ANOVA (Analysis of Variance) test to determine the relationship between pre-operative MUCP and post-operative SUI group.

### Results

A total of 463 postal questionnaires were sent out; 265 completed questionnaires were returned giving a response rate of 59%, allowing for 16 who had died or moved away. Of the 265 responders, 212 had undergone colposuspension and 53 TVT. 241 women, (194 colposuspension, 47 TVT), had complete data for analysis. The larger number of women who underwent colposuspension reflected the popularity of that operation in the period studied. Age range of responders was 23 - 81 years (median 54). Median follow up from date of surgery to completion of questionnaire was 77 months (interquartile range 47 to 107).

The range of preoperative maximum MUCP was 5 and 105 cmH<sub>2</sub>O (mean 45). Functional urethral length measured between 1.6 and 4.8 cm (median 3.1). The differences in preoperative MUCP between the operation groups (colposuspension and TVT) was not significantly different (t-test,  $t=1.30$ ,  $p>0.19$ ).

Significant differences between the SUI groups were demonstrated, confirming that the patients with higher pre-operative MUCP were less likely to be in the SUI group with the most frequent leakage ( $F(2, 237) = 3.42$ ,  $p<0.04$ ). There was no significant difference in the outcome of surgery in relation to MUCP between TVT and colposuspension ( $p>0.19$ ). Further statistical testing, using Pearson's Chi squared test, confirmed these findings with women with MUCP >40 cm H<sub>2</sub>O being less likely to experience SUI >1 leak a day postoperatively after either TVT or colposuspension  $p<0.02$ .

Table 1 shows the mean value of MUCP (cm H<sub>2</sub>O) (SD) and degree of stress incontinence occurring after surgery.

	Colposuspension (SD) n=194	TVT (SD) n=47	Total (TVT & Colpo)
No leakage	50.2 (+/- 17)	54.2 (+/- 18)	51.1 (+/- 17)
<1 leak/day	44 (+/- 15)	56.9 (+/-18)	45.6 (+/- 16)
>1 leak/day	46 (+/- 20)	39.9 (+/- 11)	44.7 (+/- 19)

Interpretation of results Although the response rate was not ideal, there was no clear bias in terms of urethral pressures. Responders in post-operative SUI Group 1 (no incontinence) had a mean pre-operative MUCP of 51.1 cmH<sub>2</sub>O, compared to those in Groups 2 and 3, who had MUCP of 45.6 and 44.7 cmH<sub>2</sub>O respectively. These differences were significantly different ( $p<0.04$ ). There was no significant difference in the outcome of surgery in relation to MUCP between colposuspension and TVT.

#### Concluding message

This study has shown a relationship between MUCP and outcome of surgery for SUI regardless of whether colposuspension or TVT is performed. Although there may not be an exact level for MUCP which will predict a good outcome, women with lower MUCP at preoperative urodynamics have a poorer outcome in the long-term and, arguably, should be informed of this possibility.

- 1        Obstet Gynecol 69: 399-402. 1987
- 2        Int Urogynecol J Suppl 2: S12-S14 2003

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**HUMAN SUBJECTS:**        This study was approved by the Frenchay Research Ethics Committee Bristol and followed the Declaration of Helsinki Informed consent was obtained from the patients.