# IS THE URETHRA MORE MOBILE IN WOMEN WITH STRESS URINARY INCONTINENCE?

# Hypothesis / aims of study

The compare the mobility of urethra at five points along its length in women with urodynamic stress incontinence (USI) and stress continent women to discriminate between hypermobility or sphincter competence as a cause for urodynamic stress incontinence

# Study design, materials and methods

It is a case control study conducted at a tertiary referral teaching hospital for urogynaecology. Women above 18 years of age undergoing urodynamic investigations for lower urinary tract symptoms or pelvic organ prolapse were recruited for the study. Women who had continent surgery, pelvic malignancy or radio therapy were excluded from the study. 2D transperineal ultrasound scan of the urethra was performed with women in supine recumbent position with their legs abducted and bladder volume of less than 100ml. A GE Volluson-I machine with a 4-8 MHz transperineal transducer was used for the study. The depth is adjusted to include the urethrovesical junction, periurethral tissue and the pubic symphysis.

#### Imaging at rest and on stress

An image without stress or straining was stored as 'resting image'. The patient was then asked to cough with maximum force 3 times. Any pressure by the probe over the perineum was avoided allowing free movement of organs. The image with maximum displacement of the bladder neck from its original position was saved as the 'stress image'.

## **Urethral mobility**

To measure the urethral mobility, the urethra was divided into four equal segments by five equidistant points. The point on the posterior margin of the urethra at the external urethral meatus was termed as point 1. The points were then numbered serially with the point on the posterior margin of the urethra at the urethrovesical junction numbered as point 5. The posteroinferior point of the public symphysis was fixed and considered as the reference point. The distances of the 5 points along urethra were measured from this point at rest and on stress. The movement of each point was calculated by subtracting distance at rest from the distance at stress. If a point was coming closer to the public symphysis on stress, this difference was negative. On the other hand, if a point was moving away from the symphysis on the stress, the movement was positive.

Statistical analysis was performed using SPSS software version 23 by IBM Company. Kruskal-Wallis test was used to calculate statistical significance. P value of less than 0.05 is considered to be statistically significant.

Mobility at point	Continent on stress	Urodynamic stress incontinent	P value
	Mean (SD)	Mean (SD)	
1	-0.11 (0.31)	-0.12 (0.37)	0.694
2	-0.10 (0.29)	-0.13 (0.40)	0.939
3	0.02 (0.31)	-0.04 (0.42)	0.416
4	0.16 (0.37)	0.09 (0.46)	0.179
5	0.29 (0.44)	0.23 (0.49)	0.288

Table 1. Urethral mobility in women with and without urodynamic stress incontinence

Figure 1: Midurethral mobility in stress continent women and women with USI .00 = Stress continent women, 2.00 = Stress incontinent women



#### **Results**

135 women were included in the study. 52 women were diagnosed to have urodynamic stress incontinence and 83 women were continent on stress. There was no relationship between the urodynamic diagnosis and age or pelvic organ prolapse in this group.

The average distance between pubic symphysis and urethrovesical junction in all women was 2.28 cm. This distance was increased by 0.27 cm on stress. The distance at midurethra was 1.62 cm and it almost remained the same on stress. The mobility of urethra in both the groups was as shown in table 1. Figure 1 shows the mobility of midurethral point in women with and without USI.

# Interpretation of results

The urethral mobility was not significantly different in women with and without urodynamic stress incontinence. The urethrovesical junction moved away from the pubic symphysis on stress. There was minimal mobility of midurethra in both the groups.

Pubourethral ligaments and the lateral attachment of the urethra and anterior vaginal wall are considered to be responsible for holding the urethra in place (1). A defect in the pubourethral ligament or vaginal wall support results in hypermobility of the urethra and leakage of urine on stress. Midurethral tapes are developed to create an artificial pubourethral ligament to support the urethra. They are successful in treating USI in 62% to 98% of cases (2). They are shown to compress the urethra by bringing it closer to the pubic symphysis (3).

Our study did not find a causative link of urethral mobility with the stress incontinence. The midurethral tape may be getting pulled laterally on stress creating a kink in the urethra and preventing leakage of urine.

#### Concluding message

The urethral mobility is similar in women with or without stress incontinence. There is no causative link of mobility of five points along the urethra with USI.

## **References**

- 1. Obs and gyn 1977; 50: 1
- 2. Cochrane Database of Systematic Reviews 2015, 7: CD006375.
- 3. Ultrasound Obstet Gynecol 2004; 23: 267-271

#### **Disclosures**

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