Dear Editor

The abdominal cavity is an enclosed entity and consequently, intra-abdominal pressure (Pabd) persistently engages all intra-abdominal organs, including the bladder and the proximal two-thirds of the urethra. This is true for both continent and incontinent women, both at rest and during stress (Fig. 1).

The urethra and the anterior vaginal wall are conjoined by the endopelvic fascia and by other paraurethral connective tissues wherein the posterior pubourethral ligaments (PUL) are of fundamental importance. The urethra is thus part of the anterior vaginal wall and the pelvic floor. When the pelvic floor is pressed downward during stress, the urethra “follows.” This is devastating for the urethral sphincter mechanism in cases where the bladder neck does not descend to a similar extent. This is the situation for women with stress urinary incontinence (SUI). Instead of being stopped by a backboard effect, the proximal urethra is funneled and displays funneling even at rest. Regardless of hypermobile or hypomobile SUI, the UCP can be low or high, which has minor impact (see the above formulas). A collapsed inner urethra with a low UCP withstands very high valsalva pressures. Conversely, urethral funneling has fundamental significance. If the urethral funnel radius increases from 0.5 to 5 mm, the outflow distending force (Fd) increases 100 times. The inner urethra is the “flow-controlling zone” and the midurethral high-pressure zone/UCP is of relatively lesser significance.

The PUL are broadly attached to the paraurethral tissues at the junction of the upper one-third and distal two-thirds of the urethra. 3 This junction, which corresponds to a vaginal pressure point (v.p.), is likely the optimal position for the tension-free vaginal tape (TVT) to enforce a correct spatial relationship at stress between the proximal urethra and bladder neck. Similarly, the v.p. is also the midpoint of the intra-abdominal urethra.

The distance between the v.p. at rest and the v.p. at aLPP is the “therapeutic window” (t.w.). A TVT located inside the t.w. is curative. Nevertheless, the tape at rest should be set accurately and tension-free to not incriminate the t.w. “safety margin.” In hypermobile SUI, the t.w. is large. In hypomobile SUI the t.w. is small and the correct placement of the TVT is restricted, which

Hypermobile SUI is when the bladder neck is hypermobile and the proximal urethra at stress descends further than the bladder neck. Hypomobile SUI is when the bladder neck is hypomobile and the proximal urethra at stress descends further than the bladder neck. In hypomobile SUI, the urethral downward distance to reach a hanging position is short; in severe cases, the urethra hangs on the bladder neck and displays funneling even at rest. Regardless of hypermobile or hypomobile SUI, the UCP can be low or high, which has minor impact (see the above formulas). A collapsed inner urethra with a low UCP withstands very high valsalva pressures. Conversely, urethral funneling has fundamental significance. If the urethral funnel radius increases from 0.5 to 5 mm, the outflow distending force (Fd) increases 100 times. The inner urethra is the “flow-controlling zone” and the midurethral high-pressure zone/UCP is of relatively lesser significance.

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[This letter was corrected on 16 August 2016 after initial online publication. A sentence describing Figure 1 has been removed, and the article’s third sentence now has the word pubourethral instead of the word paraurethral.]

[The copyright line for this article was changed on May 25, 2016, after original online publication]

Dr. Roger Dmochowski led the peer-review process as the Associate Editor responsible for the paper.

Potential conflicts of interest: Nothing to disclose.

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Received 22 April 2016; Accepted 22 April 2016

Published online 13 May 2016 in Wiley Online Library
(wileyonlinelibrary.com).

DOI 10.1002/nau.23038

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most likely explains the high failure/recurrence rates. The t.w. concept may also explain the even higher failure rate using transobturator tape (TOT) versus TVT in cases with “intrinsic sphincter deficiency,”4–6 if defined as hypomobile SUI ± low UCP. In other words, the TVT is similar to a tight loop and the TOT is more similar to a springy hammock. At stress, the TOT may sway outside a small t.w.

The t.w. can be estimated by holding a fingertip a short distance under the v.p. at rest and asking the patient to make a slow valsalva maneuver. The maximal “curative” distance is the t.w. (Fig. 1).

To minimize the risk for failure/recurrence—in the case of a small t.w.—the surgeon should lift the v.p. above its resting position. Because suburethral lifting with a prolene net involves a high risk of obstructing complications, the surgeon can use the “TVT technique” to insert one tuned prolene net in the paraurethral tissue on each side of the v.p. and create a lift without the risk of obstruction.

The valsalva LPP (VLPP) corresponds to the force needed to press the urethra down to a hanging position ("wheeling") that pulls open the inner urethra. The force needed is related to the status/compliance of the urethral- and bladder-supporting tissues, and to a minor degree, the UCP at rest. The VLPP can be low or high regardless of a low or high UCP7 and the t.w. can be small or large. In cases with a high VLPP, the risk for coexisting hypomobile SUI with a small t.w. is less than in cases with a low VLPP.

These inconsistencies are explained by the fact that there is no absolute covariation between defective support tissues extrinsic to the urethra and deficient urethral intrinsic tissues (ISD) or to defective support of the urethra in relationship to the bladder neck. Vaginal deliveries and other traumas result in a wide range of pelvic floor damage. Likewise, body weight, hormonal status, and age-related changes can also affect pelvic structures. Moreover, without vaginal support the urethra is chronically burdened by withstanding the intra-abdominal pressure and is thereby traumatized and eventually evolves ISD.

There is only one type of genuine SUI; i.e., one in which the proximal urethra is more mobile than the bladder neck. If a descending proximal urethra does not reach a backboard that stops it, then it ends up hanging on the bladder neck. A support of the v.p. enforces, at stress, a correct spatial relationship between the urethra and bladder neck that prevents the urethra from reaching a hanging position. The t.w. concept assists the surgeon in selecting a proper surgical technique.

Yours sincerely,

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