

MAXIMUM URETHRAL CLOSURE PRESSURE AS A SELECTION CRITERION FOR MIDURETHRAL SLING TYPE

Hypothesis / aims of study

The most common complications with the TVT, bladder perforation and blood vessel injury, have been associated with passage of the trocars through the retropubic space. Recently, the trans-obturator tape procedure has been introduced as a theoretically safer but equally effective procedure. The trans-obturator tape may be safer because the introducers pass through the medial obturator membrane and thus avoid the retropubic space. The result is that the trans-obturator tape courses more horizontally under the urethra than the TVT. Whether this difference is clinically significant has not been shown. Possible clinical differences include post-operative voiding dysfunction and/or outcomes in patients with low maximum urethral closure pressure. Prior research showed maximum urethral closure pressure is predictive of stress urinary incontinence outcomes after continence surgery. The purpose of this study was to compare trans-obturator tape to tension-free vaginal tape (TVT) in patients with borderline low maximum urethral closure pressure.

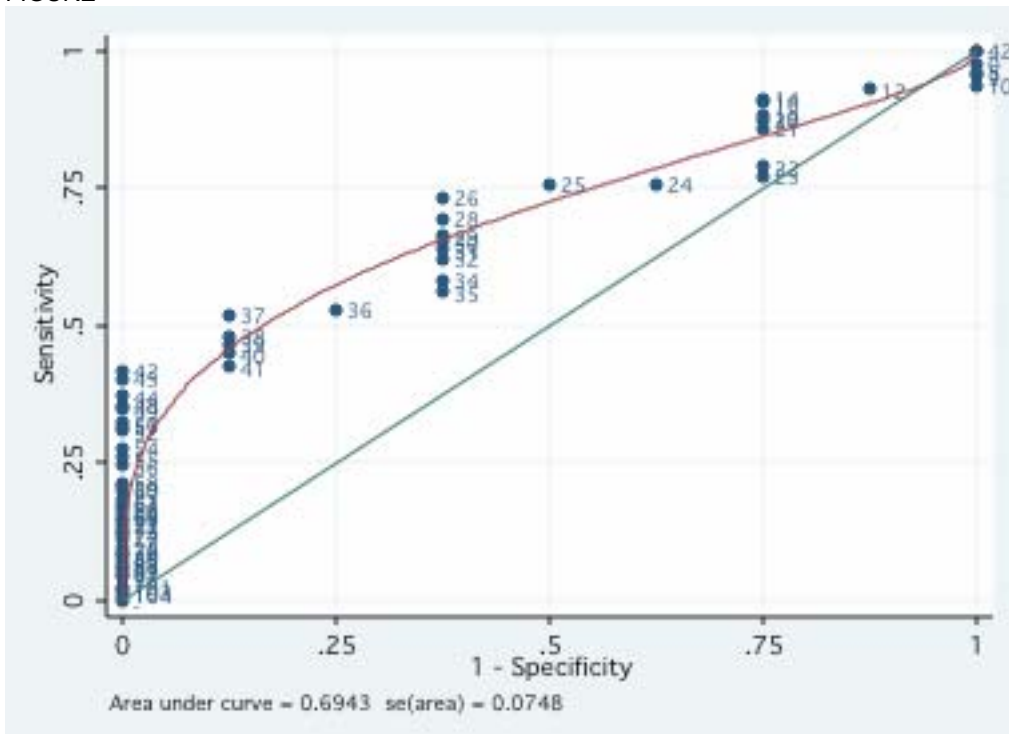
Study design, materials and methods

The study sample included 200 consecutive women who underwent a TVT® and MONARC® in our tertiary care referral facility between January, 2000, and December, 2004. Absolute inclusion criteria were urodynamic stress incontinence and urethral hypermobility. Low pressure urethra (maximum urethral closure pressure ≤ 20 cm H₂O) was an exclusion criterion for trans-obturator tape but not for TVT, and 16 subjects with low pressure urethra underwent TVT placement. Otherwise, no specific criteria were used in selecting one procedure in favour of the other. All patients had identical pre- and post-operative care routines and the slings were tensioned with the same technique. Postoperative urodynamics were routinely performed in all patients 14 weeks after surgery and cohort analysis included outcomes for the 145 subjects (trans-obturator tape=85; TVT=60) who completed postoperative urodynamics. Sample size estimate was 36 per group with a power of 0.80 and alpha of 0.05 based on the effect size for objective stress incontinence in prior research. [1] The cohort was stratified by sling type and analyzed. Subjects with post-operative objective stress incontinence were defined as failures.

Results

Receiver operator characteristic curve analysis of preoperative maximum urethral closure pressure and postoperative urodynamic stress incontinence identified that a cut-off point of 42 cm H₂O discriminated well (Figure). The relative risk of post-operative objective stress incontinence in patients with a pre-operative maximum urethral closure pressure ≤ 42 cm H₂O was 5.89 (1.02-33.90, 95% CI). Subjects in the trans-obturator tape and TVT groups did not differ significantly in baseline characteristics. Overall post-operative objective and subjective stress incontinence were similar. The MUCP did not significantly differ postoperatively between the MONARC and the TVT. Concomitant paravaginal repair, anterior and posterior colporrhaphies were more common in the MONARC group; other concomitant procedures were similar between the groups.

FIGURE



Interpretation of results

This study showed a significantly higher failure rate with the MONARC in subjects with a pre-operative maximum urethral closure pressure ≤ 42 cm H₂O. Other work showed that patients with maximum urethral closure pressures ≤ 40 cm H₂O were more likely to fail trans-obturator tape than were patients with higher closure pressures. [2] This study builds on that by showing that patients with a maximum urethral closure pressure ≤ 42 cm H₂O are nearly six times more likely to fail with MONARC than they do with TVT. The difference in sling axis may explain the higher failure rate with MONARC in subjects with a preoperative maximum urethral closure pressure ≤ 42 cm H₂O. In the TVT, the sling axis is roughly perpendicular to the urethral axis. In contrast, the axis of the MONARC is less acute to the urethral axis thereby creating a "platform" sling with less circumferential compression of the urethra. [3] Some limitations should be considered with regard to this study. There was selection bias regarding low pressure urethra and proportion of anterior colporrhaphy. In both cases, the bias would be expected to dilute the findings of this study. Since the most severe, and thus most difficult to cure, cases received the TVT procedure, the observed failures with TVT may have been greater than expected. A higher proportion of anterior colporrhaphy may have provided patients who underwent MONARC with a better short-term cure of urodynamic stress incontinence and thus the observed failures with MONARC may have been less than expected. Long-term follow-up will reduce the result of bias from anterior colporrhaphy. The study's retrospective design precludes definite conclusions about cause and effect of observed differences. These findings should be further evaluated with randomized controlled trials. Adjustment of slings during placement was similar in both groups, but the MONARC may need to be placed under different tension than the TVT to achieve similar efficacy.

Concluding message

In subjects with maximum urethral closure pressure ≤ 42 cm H₂O, the trans-obturator tape was nearly six times more likely to fail than TVT. Long-term follow-up and randomized controlled trials are needed.

References

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3. Whiteside, J.L. and M.D. Walters, Anatomy of the obturator region: relations to a trans-obturator sling. *Int Urogynecol J Pelvic Floor Dysfunct*, 2004. 15(4): p. 223-6.

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