Tape Shortening for Recurrent Stress Urinary Incontinence After Transobturator Tape Sling: 3-Year Follow-up Results

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Purpose: Recently, as the number of transobturator tape (TOT) procedures has increased, recurrence after this procedure has been frequently reported. However, there are no standard guidelines for treatment. We describe our experience with shortening the previously implanted tape in patients with recurrent stress urinary incontinence after the TOT procedure.

Materials and Methods: We enrolled 10 women who underwent shortening of the previously implanted tape and were followed up for 3 years. Shortening of the previously implanted tape was done by a figure-eight suture with 1-0 Prolene. One year after TOT shortening, we investigated continence status, patient satisfaction by means of a questionnaire, maximal flow rate (Qmax), and postvoid residual urine volume. Three years after TOT shortening, we evaluated continence status and patient satisfaction.

Results: The mean period of TOT shortening was 4.2 months (range, 1-12 months) after the TOT procedure. One year after TOT shortening, 7 patients showed complete dryness, 2 patients showed improvement, and 1 patient reported failure. Eight patients were very satisfied or satisfied with the 1-year result after TOT shortening. The mean preoperative and postoperative Qmax were 23.8 and 26.7ml/s, respectively, and there was no significant difference. Three years after TOT shortening, 6 patients showed complete dryness, 2 patients showed improvement, and 2 patients reported failure. Among them, 1 had failed from 1 year after TOT shortening and the other had shown 1 year of complete dryness. Eight patients were very satisfied or satisfied and 2 patients were dissatisfied with the 3-year result after TOT shortening.

Conclusion: Most of the patients who underwent TOT shortening reported satisfaction as well as improvement of incontinence after a 3-year follow up. Therefore, we suggest that TOT shortening may be recommended primarily in patients with recurrent stress urinary incontinence after the TOT sling procedure. Int Neurourol J 2010;14:164-9.

Key words: Urinary stress incontinence, Suburethral sling, Transobturator tape

Introduction

Stress urinary incontinence is defined as the involuntary leakage of urine without the contraction of the detrusor muscle but only with the increased abdominal pressure caused by sneezing or coughing during Urodynic study. Studies have shown a prevalence rate of about 40-45% in Korean women above the age of 18, and surgical correction is known to be the most effective treatment [1-5].
Since the tension-free vaginal tape (TVT) procedure was described by Ulmsten et al in 1995, more than 1,200,000 cases have been performed worldwide with a high success rate of 84% to 95%. Owing to complications such as bladder, bowel, and nerve injuries, although they are rarely reported, and the fact that TVT is done through the retropubic route, in 2001 a new technique in which the tape is placed through the transobturator route was described by Delorme et al [6].

Compared to TVT, the success rate of the transobturator tape (TOT) procedure is similar, but complications such as inguinal or thigh pain, vaginal injury, and mesh erosion are known to be more common [7]. As the number of cases undergoing the TOT procedure increases, recurrence after the procedure has been reported. To manage recurrent incontinence, many groups have suggested colpocystourethropexy, repeating the sling, a peri-urethral bulking method, and an artificial sphincter. Recently, the method of shortening the previously implanted tape by use of a suture-tie or clip to enforce the tensile strength has been reported. Tape shortening is simple, is cost-effective, and can be done under local anesthesia. Furthermore, many authors have reported that this shortening method is relatively effective when the tape is well maintained and positioned at the midurethra.

Here we describe the changes in incontinence and patient satisfaction during a 3-year follow-up period for patients with recurrent incontinence who underwent tape shortening after MONARC, which is one of the TOT procedures.

Materials and Methods

Patients

The medical records of 10 female patients who had undergone TOT shortening with follow-up of 3 years were reviewed. TOT shortening was performed owing to recurrent stress urinary incontinence or dissatisfaction despite improvement of stress urinary incontinence.

Preoperatively, all 10 patients underwent a full history-taking, physical examination, urine analysis and culture, Q-tip test, stress test, and Urodynamic study including Valsalva leak-point pressure.

Surgical technique

Shortening of the tape was carried out in patients in the lithotomy position with local anesthesia. A 2 cm sagittal incision was made in the anterior vaginal wall, starting 1 cm below the external urethral meatus. A bilateral dissection was done by using Metzenbaum scissors and the tape was held by 2 forceps each 1 cm away from the center. Then using 1-0 Prolene, a figure-eight suture was done. After closing the vaginal incision with 2-0 Vicryl, we finished the surgery.

Follow-up and outcome measures

One year following the surgery, the patients' incontinence status, satisfaction rate, maximum flow rate (Qmax), and postvoid residual (PVR) volume were checked. After 3 years, the analysis was done by detailed telephone interviews to all patients about changes in incontinence status and their satisfaction.

Postoperative outcome was classified into cure, improvement, and failure according to Stamey [8] grade. Cure was defined as the absence of any episode of involuntary urine leakage. Improvement was defined as a significant reduction of urine leakage that did not need to be treated. No change or even worsening of the urine leakage was defined as a failure. Postoperative patient satisfaction was assessed by using a questionnaire and was classified into 5 categories: very unsatisfied, unsatisfied, equivocal, satisfied, and very satisfied.

Results

The mean patient age was 66.9 (range, 55-74) years, and the mean follow-up period was 36.4 (range, 33-44) months. The mean time interval of TOT tape shortening was 4.2 (range, 1-12) months, and the mean operation time of the tape shortening procedure was 21 (range, 16-37) minutes. There were no complications during the tape shortening procedures (table 1).

One year after tape shortening, 7 patients showed complete dryness, 2 patients showed improvement, and 1 patient reported failure (fig. 1). Severe intrinsic sphincter deficiencies were observed in 2 of the 3 patients without complete
dryness; the preoperative Valsalva leak point pressures of these patients were 13 and 15 cmH₂O. Eight patients were very satisfied or satisfied with the 1-year result after TOT tape shortening (fig. 2). The mean pre- and post-tape shortening Qmax was 23.8 (range, 13-20) and 26.7 (range, 14-30) ml/s, respectively, and PVR was 26 (range, 0-55) and 36 (range, 0-150) ml, respectively. There were no significant differences between the 2 groups (table 2). One year after tape shortening, de novo urgency and voiding difficulty were observed in 2 patients.

Three years after tape shortening, 6 patients showed complete dryness, 2 patients showed improvement, and 2 patients reported failure. The 2 failed patients reported slightly wetting their underwear due to incontinence. Among them, 1 had failed from 1 year after tape shortening and the other had shown 1 year of complete dryness (fig. 1). In the 6 patients with complete dryness, 1 patient underwent a repeat TOT sling procedure because of worsening incontinence despite the 1-year improvement after tape shortening. Eight patients were very satisfied or satisfied and 2 patients were dissatisfied with the 3-year result after tape shortening. One of the dissatisfied patients failed from 1 year after TOT shortening and the other experienced recurrent stress urinary incontinence even though complete dryness had been achieved at 1 year after tape shortening (fig. 2). De novo urgency and voiding difficulty at 1 year after the shortening were improved in each patient at 3 years after tape shortening.

**Discussion**

The TVT procedure for surgical correction of female urinary incontinence was described by

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**Table 1.** Characteristics of the patients.

<table>
<thead>
<tr>
<th>Characteristics (n=10)</th>
<th>Mean (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>66.9 (55-75)</td>
</tr>
<tr>
<td>Follow-up (months)</td>
<td>36.4 (33-44)</td>
</tr>
<tr>
<td>Mean periods of TOT tape shortening (months)</td>
<td>4.2 (1-12)</td>
</tr>
<tr>
<td>Operation time (min)</td>
<td>21 (16-37)</td>
</tr>
<tr>
<td>Complication</td>
<td>None</td>
</tr>
</tbody>
</table>

min: minutes, TOT: transobturator tape

**Table 2.** Comparison of maximum flow rate and postvoid residual before TOT tape shortening and after 1 year follow up.

<table>
<thead>
<tr>
<th></th>
<th>Before tape shortening</th>
<th>1 year after tape shortening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qmax (ml/sec)</td>
<td>21.2 (13-30)</td>
<td>22.3 (14-30)</td>
</tr>
<tr>
<td>Postvoid residual (ml)</td>
<td>26.0 (0-55)</td>
<td>36.0 (0-150)</td>
</tr>
</tbody>
</table>

TOT: transobturator tape, Qmax: maximum flow rate

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**Figure 1.** Clinical outcome of tape shortening after one and three years.

**Figure 2.** Patient satisfaction of tape shortening after one and three years.
Ulmsten in 1995 and has become one of the most popular surgical corrections worldwide. Because the TVT procedure supports the midurethra without any tension, short-term and even long-term outcomes have been very successful. However, major complications such as bladder perforation, movement of the tape into the bladder or urethra caused by urethral erosion, injury to vessels such as the external iliac artery, and bowel perforation have been reported, although rarely.

In 2001, the TOT procedure was first described by Delorme [6]. Because the tape does not pass through the Retzius space like it does in the TVT procedure, complications such as bladder perforation, bowel injury, and vascular injury are thought to occur less frequently. As a result, the TOT procedure has been more widely used than the TVT. Long-term studies are lacking, but the short-term success rate of TOT is reported to be as high as that of TVT. However, recurrence of urinary incontinence is also reported with TOT.

The reasons for surgical failure include the presence of detrusor overactivity or internal sphincter dysfunction (ISD), failure of controlling the tension of the tape, failure of fixing the tape in the midurethra postoperatively, or changes in the pelvic muscle and anterior vaginal wall caused by pelvic surgery or delivery. ISD, reported by McGuire [9] to describe the failure of the sling procedure in patients with decreased sphincter function, could be considered as one of the reasons for failure. It has been reported that 75% of patients who underwent more than 2 sling procedures had coexistent ISD.

To treat patients with recurrent urinary incontinence, detailed history taking, physical examination, and Urodynic study to uncover coexistent detrusor overactivity or ISD are necessary. Furthermore, if irritative symptoms persist, cystoscopic examination should be done to see whether exposure of the sutures or tape into the bladder exists.

Treatment of recurrent incontinence includes colpocystourethropexy, repeated sling surgery, injection of peri-urethral bulking agents, and artificial urinary sphincter. Nitahara [10] et al reported that colpocystourethropexy for recurrent incontinence after trans-abdominal or trans-vaginal sling was not effective long-term. Schulz and Drutz [11] reported that the injection of peri-urethral bulking agents has a low morbidity rate but that the long-term result is not satisfactory. Elliot and Barrett [12] reported that artificial urinary sphincter is effective for only limited patients. In 2002, Riachi [13] et al reported 2 successful cases of persistent incontinence after TVT procedures by repeat TVT, and Azam [14] et al reported a success rate of 78% by repeat TVT for 67 patients with recurrent incontinence.

As an alternative to repeating the TVT procedure, readjustment methods such as shortening the tape by using nylon or polypropylene sutures or clips have been described [15-19]. Villet [16] et al reported that for his 3 patients with recurrent incontinence, he used 4-0 polypropylene sutures to readjust the tensile strength for 1 patient and repeated TVT for the other 2, and all of them remained continent. Paick [17] et al reported that 2 patients with recurrent incontinence following TVT procedures gained urinary continence by readjusting the tape with a clip without any complications. Lo [19] et al reported that after a shortening method without any complications, 10 patients (71.4%) were cured and 4 (28.6%) failed. Of the 4 failed patients, 2 had ISD, and the other 2 had fixed urethra. They also reported that ISD and fixed urethra are risk factors for the shortening method following TVT procedures. Nam [20] et al compared the repeat midurethral sling procedure with the shortening method, and reported a 71.4% cure rate and a 28.6% improvement rate for the repeat method and 66.6% cure, 16.7% improvement, and 16.7% failure rates for the shortening method. They concluded that both methods were effective; however, the shortening method is better when the tape is well maintained and positioned at the midurethra, whereas the repeat method is better when the tape is elongated, adhered to nearby tissues, or moved into the bladder neck. Koh [21] et al compared the tape-shortening method with the repeat TVT method for patients with recurrent incontinence following trans-obturator sling procedures. With the tape-shortening method, 70% (7/10) were cured and 30% (3/10) failed, and all 3 failed patients showed ISD in the preoperative Urodynic
study. They mentioned that ISD must be considered as a risk factor for recurrence of incontinence after the tape-shortening method, and that because all the patients who underwent repeat TVT methods were cured, the repeat TVT procedure is more appropriate for patients with ISD.

All the recent studies were focused on the short-term results from repeat TVT or tape shortening for recurrent incontinence following the TVT procedure, or repeat TVT or tape shortening following TOT procedures. However, our study is distinguished from the other studies in that we followed up the patients with recurrent urinary incontinence after TOT shortening for a long time and checked their incontinence status and patient satisfaction after 3 years.

In our study, we enrolled 10 women with post-TOT incontinence or dissatisfied results. After 1 year, the cure rate was 70% (7/10), the improvement rate was 20% (2/10), and the failure rate was 10% (1/10). Among the 3 patients who were not cured, 2 had ISD. After 3 years, the cure rate was 60% (6/10), the improvement rate was 20% (2/10), and the failure rate was 20% (2/10). One of the 2 failure patients had been classified as cured at the 1-year follow-up, and she then developed recurrent incontinence and underwent a repeat TOT procedure. There was no significant difference between the results from the first and the second follow-up. Regarding patient satisfaction, 80% (8/10) of patients were very satisfied or satisfied after 1 year of follow-up and the percentage was the same at the 3-year follow-up. Therefore, the tape-shortening method, which is simple, relatively effective as proven in our 3-year follow-up study, cost-effective, and can be done under local anesthesia, might be considered as the treatment for a patient with recurrent urinary incontinence without ISD who had previously undergone a transobturator midurethral sling procedure.

Conclusions

Most of the patients who underwent TOT tape shortening showed satisfaction as well as improvement of incontinence after 3 years of follow-up. Moreover, we consider that tape shortening for patients with recurrent stress urinary incontinence after the TOT sling procedure is relatively easy to perform and is cost-effective. Therefore, we suggest that tape shortening may be recommended primarily in patients with recurrent stress urinary incontinence after a TOT sling procedure.

Conflicts of Interest:

The authors have nothing to disclose.

References

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Rane A. The tension-free vaginal tape procedure in women with previous failed stress incontinence surgery. J Urol 2001;166:554-6