Voiding Dysfunction

Vaginal Mucosal Flap as a Sling Preservation for the Treatment of Vaginal Exposure of Mesh

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Purpose: Tension-free vaginal tape (TVT) procedures are used for the treatment of stress urinary incontinence in women. The procedures with synthetic materials can have a risk of vaginal erosion. We experienced transobturator suburethral sling (TOT) tape-induced vaginal erosion and report the efficacy of a vaginal mucosal covering technique.

Materials and Methods: A total of 560 female patients diagnosed with stress urinary incontinence underwent TOT procedures at our hospital between January 2005 and August 2009. All patients succeeded in follow-ups, among which 8 patients (mean age: 50.5 years) presented with vaginal exposure of the mesh. A vaginal mucosal covering technique was performed under local anesthesia after administration of antibiotics and vaginal wound dressings for 3-4 days.

Results: Seven of the 8 patients complained of persistent vaginal discharge postoperatively. Two of the 8 patients complained of dyspareunia of their male partners. The one remaining patient was otherwise asymptomatic, but mesh erosion was discovered at the routine follow-up visit. Six of the 8 patients showed complete mucosal covering of the mesh after the operation (mean follow-up period: 16 months). Vaginal mucosal erosion recurred in 2 patients, and the mesh was then partially removed. One patient had recurrent stress urinary incontinence.

Conclusions: Vaginal mucosal covering as a sling preservation with continued patient continence may be a feasible and effective option for the treatment of vaginal exposure of mesh after TOT tape procedures.

Key Words: Complications; Suburethral slings; Surgical mesh

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INTRODUCTION

Among the minimally invasive and simple surgical procedures for female stress urinary incontinence, tension-free vaginal tape (TVT), which was developed by Ulmsten et al in 1996, has been documented to be very effective [1]. However, approaching into the posterior pubic cavity may result in bladder perforation and injuries to vessels, nerves, and bowels. To minimize such complications, the tension-free transobturator suburethral sling (TOT) was developed [2]. During this procedure, the use of synthetic tape material (polypropylene monofilament mesh) can decrease the disadvantages of the conventional procedure using fascia graft such as tenderness and increased procedure time, but it may cause rejection, infection, and erosion [3]. Once such complications have occurred, the synthetic mesh must be removed, and the incidence of synthetic mesh-related erosion is reported to be 0.2-22% [4]. When the synthetic tape has been removed due to erosion, the patient becomes anxious about the recurrence of stress incontinence and the economic burden of reoperation [5,6]. Therefore, we performed a conservative surgical procedure by covering the eroded tape with the vaginal mucosa instead of removing it. Here we report the effectiveness of this
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MATERIALS AND METHODS

1. Target patients
The study was conducted on 560 patients who were followed up for more than 3 months among those who had been diagnosed with stress urinary incontinence by urodynamic study and underwent the TOT operation by the same surgeon from January 2005 until August 2009 in our hospital. Outpatient observations were performed at 2 weeks, 1 month, and 3 months after the operation by observing the vaginal mucosa with the use of a speculum. Eight patients developed vaginal mucosal erosion (average age: 50.5 years) and underwent the vaginal mucosal covering technique.

2. Treatment
Patients with tape-induced vaginal erosion were admitted and treated with intravenous antibiotics using second-generation cephalosporins, aminoglycosides, and metronidazole. In addition, we applied vaginal dressings using povidone iodine and hydrogen peroxide (H2O2) and performed irrigation with normal saline with the patient lying in the supine position 2-3 times a day. After 3-4 days of treatment, as the inflammatory findings of the erosion and vaginal mucosa disappeared, we applied local anesthesia on the mucosa surrounding the eroded tape with 2% lidocaine and designed a mucosal flap around the exposed mesh (Fig. 1). We checked for urethral erosion via cystoscope, removed granuloma around the tape, and performed undermining of the submucosal layer until there was no tension on the mucosal flap. After bleeding had been controlled completely by use of a Bovie cautery, we covered the tape with the vaginal wall mucosal advancement flap and sutured tightly with 4-0 chromic gut sutures (Fig. 2).

RESULTS
None of the patients experienced complications during the operation and it took an average of 8 months (range, 1-16 months) until the vaginal mucosal erosion was found. There was no erosion on the urinary bladder or urethra. Seven patients complained of sustained vaginal discharge and 2 patients complained of dyspareunia of their partners. None of the patients suffered from systemic inflammation or surgical wound tenderness. The average size of the erosions was 10 mm (range, 5-15 mm), and after an average of 17 months (range, 6-40 months) of follow-up, 6 patients were successfully treated, whereas 2 patients experienced recurrence of vaginal erosion and underwent partial tape removal. Among the 2 patients who underwent tape removal, stress urinary incontinence recurred in 1 patient (Table 1).

DISCUSSION
Among the surgical treatments for female stress urinary incontinence, TVT is widely used as a noninvasive techni-


The symptoms of vaginal mucosal erosion include sustained vaginal discharge, vaginal bleeding, dyspareunia of the patient or her partner, and recurrent urinary tract infection [8]. The patients in our hospital complained of sustained vaginal discharge (7 patients) and dyspareunia of their male partners (2 patients), and 1 patient was asymptomatic. Because there were patients who had been asymptomatic for 16 months and in whom vaginal erosion was diagnosed during screening for cervical cancer, careful vaginal examination is required for patients who have sustained vaginal discharge after operation. Once vaginal mucosal erosion has been found, the urethra and bladder must also be examined via cystoscope for possible erosion.

The recommended treatment for vaginal erosion is partial or complete removal of the tape, which should be decided upon according to the size of the erosion, symptoms of localized or systemic infection, and the type of tape. However, removal of the tape may result in recurrence of stress incontinence [4,7]. In our hospital, 1 of the 2 patients who underwent tape removal experienced recurrence of stress urinary incontinence.

Kobashi and Govier reported complete mucosal recovery after 6 weeks of prohibition of sexual intercourse without any antibiotics or hormone administration in 4 patients who had mucosal defects of less than 1 cm after receiving SPARC [9]. Al-Wadi et al treated a 43-year-old patient having a 1x2 cm sized vaginal erosion with intravaginal estrogen for 2 months. However, because conservative management failed, they covered the t-tape with a bulbocavernous fat pad graft [10]. Conservative treatment consumes much time and martius grafting has the disadvantage of leaving an incision wound on the labia majora. Domingo et al insisted that the tape must be completely removed because conservative treatment and observation has a poor outcome [11]. Lee et al conserved the tape and covered the mucosal defect with a randomized mucosal flap in 3 patients but failed in all 3 [12]. The presence of a foreign body as well as an inflammatory response on the tape increases the failure rate of the flap operation.

In our hospital, we did not remove the tape and to shorten the duration of treatment we concentrated on improving the inflammation through meticulous vaginal dressing (2-3 times per day) and the administration of triple antibiotics. As soon as the inflammation had regressed, we built a mucosal flap by using the mucosa below and above the defect (vertical to the tape) with sufficient thickness for better circulation. In addition, we reduced the possibility of vessel injury by forming the flap bilaterally and thereby achieved a higher success rate.

**CONCLUSIONS**

According to this research, the mucosal flap operation is considered to be a simple treatment option for tape erosion that conserves the tape and thereby prevents the recurrence of stress incontinence.

**Conflicts of Interest**
The authors have nothing to disclose.

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**TABLE 1. Patient characteristics**

| Patient number | Age | Time to erosion | Size of erosion | Symptoms | Erosion repair | SUI recur |
|----------------|-----|-----------------|----------------|----------|----------------|----------|
| 1              | 42  | 3               | 5              | Discharge| Success        | -        |
| 2              | 45  | 1               | 8              | Discharge| Success        | -        |
| 3              | 65  | 3               | 15             | Discharge| Success        | -        |
| 4              | 55  | 16              | 13             |          | -              | Fail     |
| 5              | 54  | 14              | 8              | Discharge, partner pain | Success | -        |
| 6              | 55  | 1               | 10             | Discharge| Success        | -        |
| 7              | 43  | 3               | 12             | Discharge| Fail           | Recur    |
| 8              | 45  | 7               | 10             | Discharge, partner pain | Success | -        |

SUI: stress urinary incontinence
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