

BLADDER PERFORATION OF THE TENSION-FREE VAGINAL TAPE DETECTED WITH A FLEXIBLE CYSTOSCOPE

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A 67-year-old woman who presented with stress urinary incontinence underwent a tension-free vaginal tape (TVT) operation. Postoperatively, she complained of urgency, gross hematuria and dysuria, which persisted for one week. Cystoscopy with a flexible cystoscope revealed penetration of the bladder wall by the tape, which had been missed during the TVT procedure by rigid cystoscopy. After the penetrating portion of the tape was excised, her symptoms were resolved and continence was preserved.

This case suggests that employment of a flexible cystoscope is useful to detect the placement of tape in the bladder wall, which may be missed with a rigid cystoscope.

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Key words: TVT, Complications, Bladder perforation, Cystoscopy

INTRODUCTION

The use of tension-free vaginal tape (TVT) has become a standard surgical treatment for female stress urinary incontinence. Bladder perforation is known as a common complication, with an incidence of 3.8%¹⁾. It is commonly identified during TVT operation by cystoscopy, and is resolved by withdrawing the tape or needle followed by 1 or 2 days of bladder drainage. There are some reports of bladder perforation by tape or bladder erosion due to tape that were identified 3 months or more after the operation^{2–5)}. Two etiologies have been reported, tape migration from extravesical space due to pressure necrosis of the bladder wall^{2–4)} and missed placement of the tape in the bladder wall⁵⁾. The latter is supported by reports of occult bladder perforation that could not be found by cystoscopy during TVT operation^{6,7)}. We herein present a case of bladder wall penetration that was not recognized during operation in spite of cystoscopy with a 70° lens, which was identified early after operation by flexible cystoscopy and corrected successfully by immediate surgical treatment.

CASE REPORT

A 67-year-old woman presented with a complaint of urinary incontinence during coughing and sudden changes of position. She had not undergone any previous surgical treatment. She had incontinence of 70 g on a 1-hour pad test, normal bladder capacity and no finding of detrusor overactivity on urodynamic study. Cystography revealed type IIB stress incontinence. We performed a TVT operation with her informed consent.

The TVT operation was performed under general anesthesia with intravenous propofol. The patient was placed in the lithotomy position. After 400 thousand-fold epinephrine was injected into the vaginal mucosa,

the vaginal mucosa was incised and dissected to pass the TVT trocar. The bladder was pressed to the side opposite of where the trocar was placed by an 18-French Foley catheter with a stylet. When the trocar was passed through the abdominal wall, rigid cystoscopy with 70° and 12° lenses was performed after filling the bladder with 200 ml of saline to confirm the absence of bladder perforation. Although the tape was placed without any trouble, mild gross hematuria was seen when a Foley catheter was placed at the end of the procedure. Cystoscopy was done again, but revealed no evidence of bladder perforation. Intravesical fluid became clear after repeated irrigation with saline through the catheter; therefore the gross hematuria was considered to be due to urethral mucosal injury by repeated instrumentation.

The catheter was removed on the following day. After removal, the patient exhibited urgency, gross hematuria and dysuria, although she became completely dry. Because the symptoms were not resolved with conservative management, cystoscopy with a flexible endoscope was performed 8 days after operation. Cystoscopy revealed the bladder mucosa with erosion along the tape passing just beneath the mucosa on the left side and crossing to the bladder neck at 3-o'clock (Fig. 1).

The tape was partially removed 15 days after the TVT operation. We made an 8 cm transverse incision over the abdominal wound from the previous TVT operation on the left side. The tape was separated from surrounding adhesive tissue and proved to penetrate the bladder wall. The bladder wall was excised and the left side of the tape was resected. The bladder was closed with interrupted absorbable sutures. The Foley catheter was removed 7 days after the reoperation. The dysuria and gross hematuria were resolved and urgency

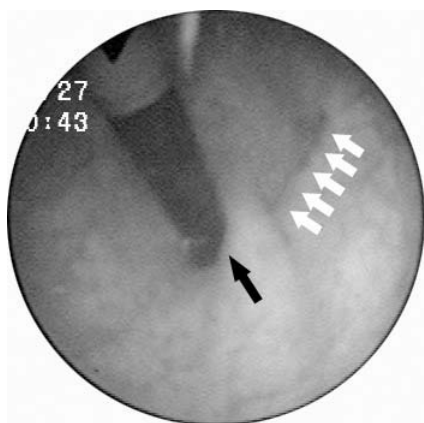


Fig. 1. Cystoscopy with a flexible cystoscope demonstrates bladder erosion along the tape passing just beneath the bladder mucosa on the left side crossing to the bladder neck (white arrows). The cystoscope was turned over, and the black arrow shows 0-o'clock position of the bladder neck.

was relieved. In addition, continence was preserved and the patient was discharged on the following day. At the 6-month follow-up, the patient did not show any sign of recurrence of stress urinary incontinence.

DISCUSSION

Cystoscopy is recommended during the TVT procedure to prevent bladder perforation, as it is considered useful to confirm the absence of penetration of the trocar into the bladder. A rigid cystoscope with a 70° lens is commonly used. However, a rigid cystoscope does not always enable the surgeon to detect bladder wall penetration, as reported by other investigators. Shobeiri et al.⁶⁾ and Buchsbaum et al.⁷⁾ reported occult bladder perforation. In their reports, bladder perforation was not identified by rigid cystoscopy with a 70° lens, but proved by spillage of intravesically injected colored fluid from suprapubic and vaginal incisions. To the best of our knowledge, our case is the first case in which "occult bladder perforation" missed by a rigid cystoscope with a 70° lens was proved visually using a flexible cystoscope. Our finding using the flexible cystoscope supports the speculation of Buchsbaum et al. According to their report, "occult bladder perforation" seemed to be located immediately lateral to the bladder neck, which was considered to be the blind spot of the 70° rigid cystoscope⁷⁾. Unlike the rigid cystoscope, the flexible one provides various angles and a wider visual

field, which allows the operator to follow the line of the trocar or tape even if they are placed intramurally.

Shobeiri et al. pointed out that the bladder mucosa penetrated by tape had the potential to heal spontaneously by prolonged bladder drainage⁶⁾. Actually, some of the cases with tape penetrating the bladder may result in spontaneous healing. However, the tape will be left in the bladder wall even after mucosal healing, which may cause bladder erosion after several months. In our case, symptoms were resolved immediately and continence was preserved by surgical correction. This result suggests that immediate surgical correction can provide better quality of life for such patients.

In conclusion, employment of a flexible cystoscope is probably effective to detect the placement of tape in the bladder wall, which may be missed by a rigid cystoscope, although the incidence is not high.

REFERENCES

- 1) Kuuva N and Nilsson CG : A nationwide analysis of complications associated with the tension-free vaginal tape (TVT) procedure. *Acta Obstet Gynecol Scand* **81** : 72-77, 2002
- 2) Tsivian A, Kessler O, Mogutin B, et al. : Tape-related complications of the tension-free vaginal tape procedure. *J Urol* **171** : 762-764, 2004
- 3) But I, Bratus D and Faganelj M : Prolene tape in the bladder wall after TVT procedure—intramural tape placement or secondary tape migration ? *Int Urogynecol J* **16** : 75-76, 2005
- 4) Negoro H, Kawakita M and Imai Y : Intravesical tape erosion following the tension-free vaginal tape procedure for stress urinary incontinence. *Int J Urol* **12** : 696-698, 2005
- 5) Volkmer BG, Nesslauler T, Rinnab L, et al. : Surgical intervention for complications of the tension-free vaginal tape procedure. *J Urol* **169** : 570-574, 2003
- 6) Shobeiri SA, Garely AD, Chesson RR, et al. : Recognition of occult bladder injury during the tension-free vaginal tape procedure. *Obstet Gynecol* **99** : 1067-1072, 2002
- 7) Buchsbaum GM, Moll C and Duecy EE : True occult bladder perforation during placement of tension-free vaginal tape. *Int Urogynecol J* **15** : 432-433, 2004

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和文抄録

術中に認識されず術後早期に軟性膀胱鏡を使用し診断した TVT 膀胱貫通の 1 例

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症例は67歳, 女性, 骨盤内手術の既往なし. Type IIb 腹圧性尿失禁に対し TVT 手術を施行. 穿刺時に 70° 硬性膀胱鏡で確認するも, 穿孔は認めなかった. プラスチックカバー除去後に軽度の肉眼的血尿が見られ, 70° 硬性膀胱鏡で再度確認するも, 明らかな膀胱穿孔は認めなかった. 翌日尿道カテーテル抜去後より尿意切迫, 頻尿, 排尿時痛, 肉眼的血尿を呈した. 症状の改善なく, 術後 8 日目に軟性膀胱鏡を施行, 膀胱左側頸部近傍にテープの粘膜下貫通, これに沿った粘膜のびらんが認められた. TVT 手術後15日目に左下

腹部横切開にてテープ部分除去術を行った. 術後尿失禁の再発はなく, 尿意切迫は残存するものの, 頻尿, 排尿時痛, 血尿は消失した. これまでにも 70° 膀胱鏡により TVT 術中の膀胱穿孔が見逃される可能性が報告されており, 本症例では軟性膀胱鏡にてその存在を証明した. 軟性膀胱鏡は, 硬性鏡で見逃されるような膀胱貫通も同定でき, 術中に使用することも有用である可能性がある.

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EDITORIAL COMMENTS

Although gross hematuria does suggest intra-operative bladder penetration of a TVT tape or a needle, the authors failed to identify it somehow during surgery. A flexible cystoscope revealed the tape running beneath the mucosa POD 8, which was removed through an abdominal incision. The referee would like to suggest that the authors not use an 18Fr Foley catheter during passing a needle because it often disturbs free movement of the surgeon's hands. According to the recent questionnaire study the TVT surgery is utilized as often as 80 to 90% of surgery for stress urinary incontinence (SUI) not only in Japan but also internationally (personal communication). The more the TVT is utilized for women having SUI, the more complications will follow in the future. When the tape is located just beneath the mucosa, it is conceivable that one may overlook it because it is milky white in color. In the Occidental countries, however, a blue-colored tape has

now been introduced and has the advantage of better recognition by a cystoscopist.

Intra-operative bladder penetration is not rare, developing in 4 of 1,455 women (4%) in Finland (1) and in 24 of 151 women (16%) in Japan (2). Petri et al. (3) reported that of 328 cases referred for surgical intervention after the TVT 14 (4%) suffered from the tape perforating into urethra or the bladder. Finally the authors are to be congratulated since the woman remained continent 6 months after relieving urethral suspension of the left side.

- 1) Kuuva N. Acta Obstet Gynecol Scand 81 : 72-77, 2002
- 2) Ohkawa A. Int J Urol 13 : 738-742, 2006
- 3) Petri E. Int Urogynecol J 17 : 3-13, 2005

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