A rare case of pyonephrosis resulting from tension-free vaginal tape procedure

Xi-gao Liu*, Yao-feng Zhu, Zun-lin Zhou, Ben-kang Shi

Department of Urology, Qilu Hospital of Shandong University, Jinan, China

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Introduction

Complication rates following placement of TVT are usually low and mainly occur in the lower urinary tract. Neither ICI nor AUA guidelines recommend considering the possibility of urethra problems and upper urinary tract abnormalities before TVT. Here, we report a case of pyonephrosis after TVT.

Case presentation

A 54-yr-old woman was admitted to our department because of intermittent urinary tract infection, fever and right flank pain for 2 months after having been performed a tension-free vaginal tape (TVT) for stress urinary incontinence in local hospital. 2 weeks before admission, the fever exceeded 38°C and the right flank tenderness became severe. The patient had had involuntary leakage of urine associated with physical activities such as coughing and laughing since a vaginal delivery 20 years prior. Ruling out the clinical indication of urinary tract infection according to the laboratory data, the tension-free vaginal tape (TVT) was performed after which the symptom of incontinence was alleviated. However, physical examination revealed a body temperature fluctuating between 38°C and 39°C, with right flank tenderness 5 days later. The leukocyte count was >200/hpf and the erythrocyte count was 5–10/hpf in urine and leukocyte count 14 × 10⁹/L in blood. Pseudomonas aeruginosa was isolated from the blood culture.

On admission to our department, sufficient nutritional support and targeted antibiotics were initiated promptly. 1 week later, renal ultrasonography showed bilateral duplex collecting systems. Then a retrograde pyelography was performed showing the two ureteral orifices to the left duplicated kidney both locating in the bladder, whereas only one ureteral orifice to the right lower pole moiety was detected (Fig. 1). Further CT scan showed complete duplicated upper urinary tracts and pyonephrosis of the right upper pole moiety with its dilated ureter, the ectopic orifice of which most probably locating to the distal urethra on the right (Fig. 2, Fig. 3).

A percutaneous upper pole nephrostomy was performed to keep the serious infection under control. As the symptom of incontinence was alleviated without recurrence, we avoided performing anything further to the previous tape inserting segment. After the patient's physical condition had been stabilized for 3 months, a right upper pole nephroureterectomy was performed. She tolerated the procedure well and was discharged home 2 weeks later. Follow-up revealed complete eliminations of the continuous urinary incontinence and urinary infection symptoms.

Discussion

The TVT procedure has long been considered the golden standard for female stress urinary incontinence and has been rapidly adopted in clinical practice. Complication rates following placement of TVT are usually low and mainly occur in the lower urinary tract. Here, we report a case of pyonephrosis after TVT.

The TVT procedure mainly focuses on the midway urethra. Its principle is through increasing the resistance of the midway urethra to improve the stress urinary incontinence symptom. Therefore, TVT requires a urethra of good condition. Besides EAU guidelines, neither ICI nor AUA guidelines recommend considering the possibility of urethra problems and upper urinary tract abnormalities before TVT. as to complications, chronic pain (33%) and vaginal mesh erosion (26%) were the most common concerns...
But pyonephrosis after TVT has never been reported before. The patient was admitted to our department because of intermittent urinary tract infection and pyonephrosis after a TVT procedure. CT and retrograde pyelography revealed complete duplicated upper urinary tracts, with the right upper pole moiety's orifice draining ectopically, which might be located in the distal posterior urethra. Since the patient had no symptoms indicating urinary tract infection before TVT procedure, and the upper urinary tract inspection was non-routine to patients with stress urinary incontinence, it ruled out the possibility of discovering its complicated urinary deformity before TVT procedure. In addition, because it was rather difficult to clearly expose the posterior urethra of female patients, the cystoscopy before TVT hadn’t noticed the ectopic orifice which most probably locating to the distal urethra either. It indicates that the urethra should be dissociated clearly during a TVT procedure. Otherwise the ectopic ureteral orifice locating to the posterior urethra might most probably be destroyed by the tape, leading to recurrent urinary infection and severe hydronephrosis to female patients diagnosed as the stress urinary incontinence coexisting with the upper urinary tract abnormalities. If such abnormalities could be revealed before the TVT procedure, the subsequent complications should have been avoided. Clinicians should have a high index of suspicion in diagnosing an ectopic ureteral orifice before TVT procedure. Traditionally, the diagnoses of duplicated renal collecting system and delineation of ectopic ureral orifices are made with ultrasound, IVP, CT, cystoscopy and retrograde imaging. Percutaneous nephrostomy combining CT might be useful in difficult cases. If the ectopic ureteral orifice was destroyed by the TVT procedure, the upper urinary tract abnormalities should be managed timely.

As to our limitation, the patient should have been re-performed a cystoscopy to confirm the exact location of the ectopic ureteral orifice and the exact condition of the midway urethra after the TVT procedure.

**Conclusion**

We described the rare case of a female patient diagnosed as stress urinary incontinence with a bilateral duplicated collecting systems accompanied by right ectopic ureteral orifice. So for patients with stress urinary incontinence, conventional Imaging was indicated to discover upper urinary tract malformations that might be influenced by the TVT procedure and should be managed timely.
References

1. Angioli R, Plotti F, Muzii L, et al. Tension-free vaginal tape versus transobturator suburethral tape: five-year follow-up results of a prospective, randomised trial. *Eur Urol*. 2010;58:671–677.

2. Dmochowski RR, Blaivas JM, Gormley EA, et al. Update of AUA guideline on the surgical management of female stress urinary incontinence. *J Urol*. 2010;183:1906–1914.

3. Burkhard FC, Lucas MG, Berghmans LC, et al. EAU Guidelines on Urinary Incontinence Arnhem The Netherlands. European Association of Urology; 2016.

4. Viktrup L, Summers KH, Dennett SL. Clinical practice guidelines on the initial assessment and treatment of urinary incontinence in women: a US focused review. *Int J Gynaecol Obstet Suppl*. 2004;1:25–37.

5. Croitoru S, Gross M, Barmeir E. Duplicated ectopic ureter with vaginal insertion: 3D CT urography with i.v. and percutaneous contrast administration. *AJR*. 2013;189:272–274.