

Christl Reisenauer · Diethelm Wallwiener ·
Arnulf Stenzl · Franz-Erich Solomayer ·
Karl-Dietrich Sievert

Urethrovaginal fistula—a rare complication after the placement of a suburethral sling (IVS)

Received: 12 December 2005 / Accepted: 2 April 2006 / Published online: 4 May 2006
© International Urogynecology Journal 2006

Abstract A sixty-year-old woman with stress urinary incontinence had undergone a placement of an IVS (Tyco Health Care UK) in another hospital in February 2003. Seventeen months after the procedure, she complained about a suppurative discharge from the vagina and a recurrent severe stress urinary incontinence. The gynecological examination revealed an erosion of the sling into the vagina and a large urethrovaginal fistula bordered by granuloma. After removal of the sling, the urethrovaginal fistula was closed using a vaginal flap. A subsequent conservative treatment regime with duloxetine and pelvic floor training improved the stress urinary incontinence to the patient's satisfaction.

Keywords Vaginal erosion · Urethral fistula · Suburethral synthetic sling · Stress urinary incontinence · Duloxetine

Introduction

The intravaginal sling (IVS Tyco Health Care UK) for treatment of stress urinary incontinence was introduced into the clinical praxis by Ulmsten and Petros [1] in 1995. Postoperative complications, e.g., erosions are described, caused by the fact that multifilament material is used for the sling's confectioning [2–6]. Erosions into the urethra or vagina are described after using monofilament material as well [7–13]. Statistically significant differences in erosion between the monofilament (TVT) and multifilament (IVS) suburethral slings were found in favor of monofilament tapes [14, 15]. This is the first reported case of developing a

urethrovaginal fistula after surgical treatment of primary stress urinary incontinence using a suburethral sling (after PubMed search using the following terms: urethrovaginal fistula, intravaginal sling, multifilament suburethral tape).

Case report

A sixty-year-old multiparous woman was referred with suppurate vaginal discharge, severe urinary incontinence grade III [16], and vague, diffuse vaginal pain seventeen months after she had undergone an IVS procedure. Her medical history showed obesity. She denied having any allergies.

The pelvic examination revealed an erosion of the sling into the vagina and a large urethrovaginal fistula bordered by granuloma (Figs. 1, 2, and 3). The urethrovaginal fistula began 0.4 cm from the external urinary meatus and extended to the bladder neck with an intact urethral sphincter. During Valsalva, a leakage of urine and after filling the bladder with a solution of indigo carmine also a leakage of the latter through the fistula appeared. The cystoscopy showed no pathological changes.

The sling was removed and a biopsy from the border of the granuloma was taken to exclude malignancy. After primary wound healing, in a second operation, the fistula was repaired by using a vaginal flap in the following manner. First, a U-shaped anterior vaginal flap was marked so that its basis was located near the bladder neck and its tip located in the direction of the apex of the vagina. The granulosomatous tissue at the edges of the urethral defect was trimmed. After that, the vaginal wall was incised at the markings. The vaginal wall and the edges of the urethra were mobilized and the vaginal flap was prepared and placed over the fistula. Using a monofilament continuous suture, the edges of the vaginal flap were sutured to the edges of the urethra. Finally, the vaginal wall was closed. The recovery period was uneventful. Three months after the corrective surgery, the patient complained about stress urinary incontinence only, confirmed by Valsalva and urodynamics (Fig. 4). A subsequent conservative treatment

C. Reisenauer (✉) · D. Wallwiener · F.-E. Solomayer
Department of Obstetrics and Gynecology,
University of Tuebingen,
Calwerstrasse 7,
72076 Tuebingen, Germany
e-mail: christl.reisenauer@med.uni-tuebingen.de

A. Stenzl · K.-D. Sievert
Department of Urology, University of Tuebingen,
Calwerstrasse 7,
72076 Tuebingen, Germany

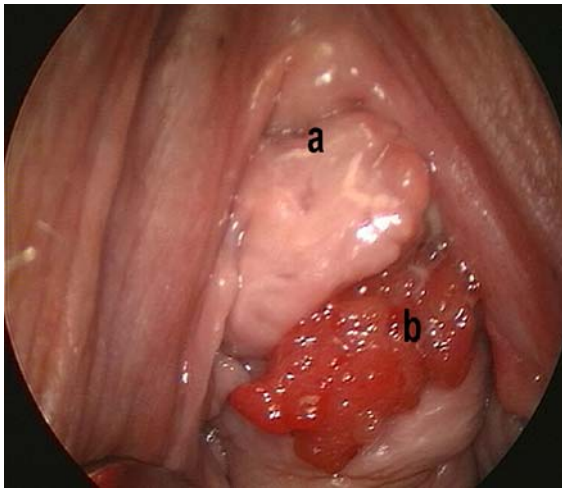


Fig. 1 Urethrovaginal fistula after IVS placement. **a** Meatus urethrae externus; **b** urethrovaginal fistula with granuloma

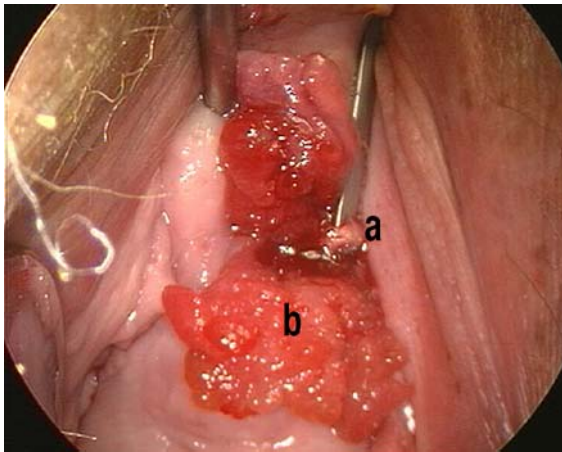


Fig. 2 Urethrovaginal fistula after IVS placement. **a** tape; **b** urethrovaginal fistula bordered by granuloma

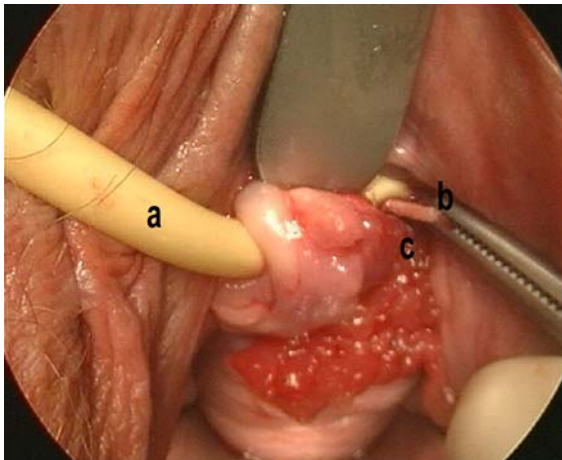


Fig. 3 Urethrovaginal fistula after IVS placement. **a** Foley catheter in place; **b** tape; **c** urethrovaginal fistula with granuloma

regime with noradrenalin–serotonin reuptake blocker (duloxetine) and pelvic floor training improved the stress

urinary incontinence from grade III to grade I to the patient's satisfaction.

Discussion

In the past decade, polypropylene slings have gained in popularity and have become the preferred technique for the treatment of stress urinary incontinence in various centers [17]. Sling tapes differ according to the type of polymer, the nature of the fibers, the weight, pore size, and porosity [18]. These differences may result in varied combinations of in vivo reactions and differences in the propensity for infection, erosion, and rejection.

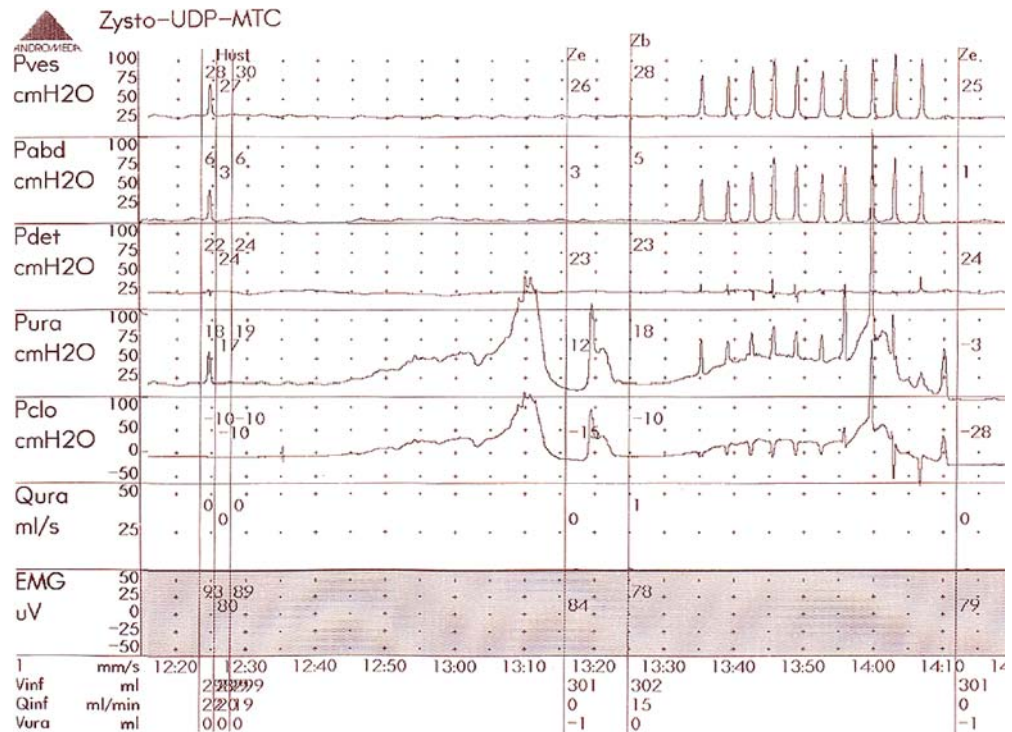
The IVS Tunneller mesh is a type III material [18]. Slack et al. [19] compared the in vivo tissue responses of three available polypropylene suburethral slings that differ in fabric structure and in the size of the resulting interstices and pores. The presence of numerous, closely spaced filaments with a small diameter prevented the formation of extensive fibrous connective tissue at two slings (Obtape and IVS). Peripheral encapsulation with minimal fibrous in growth increases the risk of infection and erosion. This thesis is supported by Falconer et al. [20]. Furthermore, vaginal extrusion of the tape may be related to the surgical technique including factors related to the incision or hemostasis [19]. There are probably multiple factors in addition to the mesh material that can result in urethral erosion, e.g., forceful urethral dilatation in attempts to loosen the sling [21]. This was not the case in our patient.

Bafghi et al. [22] described in their study that among 149 patients operated with a multifilament polypropylene mesh sling (IVS), eleven patients (7.4%) had an infection in the area of the tape. The interval between the mesh implantation and the onset of the first functional signs of infection was an average of 10 months. Lim and Rane [3] reported a case of suburethral vaginal erosion and pyogenic granuloma formation 14 months after intravaginal slingplasty (IVS).

The histological examination of the granulomatous tissue surrounding the urethra–vaginal fistula showed an extensive proliferation of capillary vessels and fibroblasts with inflammatory infiltration of lymphocytes, plasmacytes, macrophages, and segmented granulocytes. It might be possible that in this case the described inflammatory reaction has led to the erosion of the suburethral sling (IVS) into the urethra and vagina during the 17 postoperative months, followed by the development of urethra–vaginal fistula. As there is no literature regarding the development of urethra–vaginal fistulas after IVS placement, this remains speculative.

After the final surgery, the patient denied any further surgical approach. In spite of the situation, duloxetine was added to the pelvic floor exercise. Although duloxetine is suggested as the first step for the management of stress urinary incontinence [23–26], it is the first time to our knowledge that with the intake of this medication, the stress urinary incontinence improved significantly after urethral reconstruction.

Fig. 4 Urethral pressure profile at rest and under stress. Functional length of the urethra, 21.2 mm; maximum urethral closure pressure, 115.9 cm H₂O; transmission ratio in the proximal urethra, 52%; in the mid-urethra, 55%; and in the distal urethra, 151.0%



References

- Ulmsten U, Petros P (1995) Intravaginal slingplasty (IVS): an ambulatory surgical procedure for treatment of female urinary incontinence. *Scand J Urol Nephrol* 29(1):75–82 (Mar)
- Glavind K, Sander P (2004) Erosion, defective healing and extrusion after tension-free urethropexy for the treatment of stress urinary incontinence. *Int Urogynecol J* 15(3):179–182 (May–Jun)
- Lim YN, Rane A (2004) Suburethral vaginal erosion and pyogenic granuloma formation: an unusual complication of intravaginal slingplasty (IVS). *Int Urogynecol* 15(1):56–58 (Jan–Feb)
- Biertho I, Dallemagne B, Dewandre JM, Markiewicz S, Monami B, Wahlen C, Weerts J, Jehaes C (2004) Intravaginal slingplasty: short term results. *Acta Chir Belg* 104(6):700–704 (Nov–Dec)
- Baessler K, Hewson AD, Tunn R, Schuessler B, Maher CF (2005) Severe mesh complications following intravaginal slingplasty. *Obstet Gynecol* 106(4):713–716 (Oct)
- Siegel AL, Kim M, Goldstein M, Levey S, Ilbeigi P (2005) High incidence of vaginal mesh extrusion using the intravaginal slingplasty sling. *J Urol* 174(4.1):1175–1176 (Oct)
- Kuuvva N, Nilsson CG (2002) A nationwide analysis of complications associated with the tension-free vaginal tape (TVT) procedure. *Acta Obstet Gynecol Scand* 81:72–7713
- Lohse C, Weil A (2002) A rare complication with TVT: vaginal protrusion of the tape. *Int Urogynecol J* 13:330–331
- McLennan MT (2004) Transurethral resection of transvaginal tape. *Int Urogynecol J* 15:360–362
- Madjar S, Tchetgen M-B, Antwerp AV, Abdelmalak J, Rackley RR (2002) *Urology* 59:601
- Lieb J, Das AK (2003) Urethral erosion of tension-free vaginal tape. *Scand J Urol Nephrol* 37(2):184–185
- Haferkamp A, Steiner G, Müller SC, Schumacher S (2002) Urethral erosion of tension-free vaginal tape. *J Urol* 167:250
- Vassallo BJ, Kleemann SD, Segal J, Karram MM (2003) Urethral erosion of a tension-free vaginal tape. *Obstet Gynecol* 101:1055–1058
- Wai CY, Atnip SD, Williams KN, Schaffer JI (2004) Urethral erosion of tension-free vaginal tape presenting as recurrent stress urinary incontinence. *Int Urogynecol J* 15:353–355
- Merlin T, Arnold E, Petros P, MacTaggart P, Tulloch A, Faulkner K, Maddern G (2001) A systematic review of tension-free urethropexy for stress urinary incontinence: intravaginal slingplasty and tension-free vaginal tape procedures. *BJU Int* 88:871–880
- Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, van Kerrebroeck P, Victor A, Wein A (2002) Standardisation Sub-committee of the International Continence Society. The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn* 21(2):167–178
- Niknejad K, Plazak LS III, Staskin DR, Loughlin KR (2002) Autologous and synthetic urethral slings for female incontinence. *Urol Clin North Am* 29:597–6112
- Amid PK (1997) Classification of biomaterials and their related complications in abdominal wall hernia surgery. *Hernia* 1:15–21
- Slack M, Sandhu JS, Staskin DR, Grant RC (2006) In vivo comparison of suburethral sling materials. *Int Urogynecol J Pelvic Floor Dysfunct* 17(2):106–110
- Falconer C, Soderberg M, Blomgren B, Ulmsten U (2001) Influence of different sling materials on connective tissue metabolism in stress urinary incontinent women. *Int Urogynecol J* 12(Suppl 2):19–23
- Amundsen CL, Flynn BJ, Webster GD (2003) Urethral erosion after synthetic and nonsynthetic pubovaginal slings: differences in management and continence outcome. *J Urol* 170:134–137
- Bafghi A, Benizri EI, Trastour C, Benizri EJ, Michiels J-F, Bongain A (2005) Multifilament polypropylene mesh for urinary incontinence: 10 cases of infections requiring removal of the sling. *BJOG* 112(3):376–378
- Sievert KD, Stenzl A (2005) A randomized controlled trial of duloxetine alone, pelvic floor muscle training alone, combined treatment and no active treatment in women with urinary stress incontinence. *Int Braz J Urol* 31(2):175–177 (Mar–April)

24. van Kerrebroeck P, Abrams P, Lange R, Slack M, Wyndaele JJ, Yalcin I, Bump RC (2004) Duloxetine Urinary Incontinence Study Group. Duloxetine versus placebo in the treatment of European and Canadian women with stress urinary incontinence. *BJOG* 111(3):249–257 (Mar)
25. Anderson K-E, Appel R, Cardozo L, Chappel C, Drutz H, Fourcroy J, Nishizawa O, Vela Navarette R, Wein A (2005) Pharmacological treatment of urinary incontinence. In: Abrams P, Cardozo L, Khoury S, Wein A (eds) *Incontinence*. Health Publication, Plymouth, Massachusetts, pp 809–854
26. Abrams P et al and The Members of the Committees (2005) 3rd International Consultation on Incontinence. Recommendations of the International, Scientific Committee: evaluation and treatment of urinary incontinence, pelvic organ prolapse and faecal incontinence. In: Abrams P, Cardozo L, Khoury S, Wein A (eds) *Incontinence*. Health Publication, Plymouth, Massachusetts, pp 1589–1630