

Management of Urinary Fistulas Due to Midurethral Sling Surgery

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Purpose: We report our experience with the diagnosis and treatment of women with urinary fistula after mid urethral sling surgery.

Materials and Methods: We retrospectively reviewed the records of patients with urinary fistula secondary to mid urethral sling surgery. Electronic medical records and billing records were searched. We analyzed sling type, presenting symptoms and interval from initial sling surgery to 1) symptom appearance, 2) fistula diagnosis and 3) fistula repair. Symptomatic outcomes were assessed by PGI-I. Surgical outcomes were based on history and examination.

Results: We identified 10 women with a mean age of 58 years (range 37 to 70). Mean interval from mid urethral sling surgery to symptom onset, diagnosis and fistula repair was 2, 16 and 18 months, respectively. Mean followup was 26 months (range 4 to 96). There were 1 ureterovaginal, 1 enterovesical, 6 vesicovaginal and 7 urethrovaginal fistulas. Patients presented with stress urinary incontinence (70%), unaware incontinence (50%), overactive bladder (40%), pelvic pain (30%) and voiding symptoms (20%). Nine women underwent fistula repair and 1 underwent continent urinary diversion. A Martius flap was used in 6 of 9 patients, an omental flap and a bladder wall flap were used in 2 each, urethral reconstruction and ureterocolovesicostomy were performed in 1 each and 7 received an autologous pubovaginal sling. Seven patients (78%) underwent successful fistula repair. A successful symptomatic outcome was achieved in 5 of 7 women with stress urinary incontinence, 3 of 5 with unaware incontinence, 3 of 4 with overactive bladder, 2 of 3 with pelvic pain and 2 of 2 with voiding symptoms.

Conclusions: With careful attention to surgical principles and technique, including removal of as much of the adjacent mesh as possible, a successful outcome can be achieved in most patients with a fistula secondary to mid urethral sling surgery.

Key Words: urethra, fistula, suburethral sling, surgical mesh, postoperative complications

In the last 2 decades MUS has become the most commonly performed surgery for SUI in women.¹ More than 1 million TVT procedures were performed between 1996 and 2007, and by now more than 3 million MUS operations have been performed.² Minimally invasive techniques have gained popularity due to efficacy, short operative time and quick

recovery.³ However, complications can arise from MUS surgery, including pelvic organ perforation; urethral obstruction; urinary tract infection; erosion of the bladder, urethra and vagina; chronic pelvic pain; and urinary fistula.^{2,4,5}

Fistulas after MUS surgery have rarely been reported in the peer reviewed literature and to our

Abbreviations and Acronyms

MUS = mid urethral sling
OAB = overactive bladder
PGI-I = Patient Global Impression of Improvement
SUI = stress urinary incontinence
TVT = tension-free vaginal tape

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knowledge there is no single case series.^{6,7} We present our experience with patients referred to our tertiary care center who were found to have a urinary fistula after MUS surgery.

METHODS

We retrospectively reviewed the records of consecutive patients referred due to complications after sling surgery who were found to have urinary fistulas. Electronic medical records and billing records were searched for prior sling surgery and urinary fistulas from 1997 to 2013.

Baseline assessment at presentation included history and physical examination, a validated lower urinary tract symptom score questionnaire and cystourethroscopy. Select patients underwent videourodynamic studies and voiding cystourethrogram. Treatment was individualized based on clinical findings. Postoperative evaluation included history, physical examination, and lower urinary tract symptom score and additional studies on an individual basis. Furthermore, each patient completed the PGI-I questionnaire for each preoperative symptom.

The data analyzed were sling type, symptoms at presentation and the intervals from initial sling surgery to symptom appearance, fistula diagnosis and fistula repair. Symptomatic outcomes were assessed by the PGI-I using the scores 1—success, 2 or 3—improvement and 4 to 7—failure. Success or failure of fistula repair was based on history and examination.

RESULTS

Ten women were found to have genitourinary fistulas. No patient was initially operated on by one of us. Mean age at presentation was 58 years (range 37 to 70). Mean followup was 26 months (range 4 to 96). Mean time from initial sling surgery to symptom appearance, fistula diagnosis and fistula repair was 2 months (range 1 week to 10), 16 months (range 1 to 36) and 18 months (range 4 to 36), respectively. Five patients had undergone elsewhere

prior partial or complete sling removal because of urethral erosion in 3, sling infection in 1 and enterovesical fistula in 1. The original mesh sling was composed of monofilament polypropylene mesh in 6 cases (60%), polytetrafluoroethylene in 2 (20%), polyester in 1 (10%) and cadaveric tissue in 1 (10%). Each sling was placed with a retro-pubic approach.

Table 1 lists presenting symptoms, fistula type, diagnosis, interval from initial surgery to fistula repair, operation performed and surgical outcome. Five patients had 2 synchronous fistulas. The fistula was apparent on physical examination in only 4 patients. The remaining fistulas were identified by cystourethroscopy, by voiding cystourethrography or at surgery (fig. 1). In 2 patients an obvious cherry red granuloma obscured the fistula (fig. 2). The woman in whom the fistula was discovered intra-operatively had undergone 2 prior mesh sling procedures and presented with severe OAB, sphincteric incontinence and vaginal extrusion. At surgery a large urethrovaginal fistula was identified at the bladder neck and proximal urethra that was not previously apparent. Nine patients were treated with fistula repair and 1 underwent continent urinary diversion. In 6 of these 9 patients the relevant adjacent portion of the sling was excised and in 3 it was not identified. Two of the latter 3 patients had undergone complete sling removal elsewhere. The third patient did not know that she had a mesh sling and her previous operative reports did not specifically mention it. Tissue excised during surgery was identified as mesh in the pathology report. Thus, it was not completely removed and the repair failed.

We used a Martius flap in 6 cases, an omental flap in 2 and a bladder wall flap in 2. Urethral reconstruction and ureterocolovesicostomy were done in 1 patient each and an autologous fascial pubovaginal sling was placed in 7. The patient with

Table 1. Presenting symptoms, fistula type, diagnosis, time to repair, treatment and surgical outcomes

Pt No.	Presenting Symptoms	Type	Seen on Physical Examination	Fistula		Surgical Outcome
				Initial Surgery-Repair (mos)	Treatment	
1	SUI, OAB, pain, voiding symptoms	Urethrovaginal	No	12	Primary closure, omental flap + autologous sling	Success
2	SUI	Urethrovaginal	Yes	7	Primary closure, Martius flap + autologous sling	Success
3	SUI, unaware incontinence	Urethrovaginal	Yes	4	Primary closure, Martius flap + autologous sling	Failure
4	SUI, OAB	Urethrovaginal	No	36	Urethral reconstruction, Martius flap + autologous sling	Success
5	SUI, unaware incontinence	Urethrovaginal/vesicovaginal	Yes	24	Primary closure, Martius flap + autologous sling	Success
6	SUI, voiding symptoms	Urethrovaginal/vesicovaginal	No	12	Primary closure, Martius flap + autologous sling	Success
7	SUI, unaware incontinence, OAB	Urethrovaginal/vesicovaginal	No	11	Primary closure, Martius flap + autologous sling	Success
8	Unaware incontinence	Ureterovaginal/vesicovaginal	No	25	Bilat ureterocolovesicostomy, omental flap + bladder wall flap	Failure
9	Unaware incontinence, pain	Vesicovaginal	Yes	24	Primary closure + bladder wall flap	Success
10	OAB, pain	Vesicovaginal/enterovesical	No	24	Continent urinary diversion	Success

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