# Female Urethral Diverticulum: 26-Year Followup of a Large Series

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**Purpose:** Female urethral diverticulum is an acquired condition associated with distressing and chronic symptoms. Surgery sometimes represents a technical challenge and various complications may follow treatment. We present the results of a retrospective analysis in a large personal series operated on during a 26-year period.

**Materials and Methods:** A total of 68 women underwent surgery. The medical records of all women were reviewed and a followup telephone interview was conducted by an investigator not involved in the care of the patients. There were 64 women available for the interview who were questioned using a standard questionnaire.

**Results:** In the majority of patients the postoperative course was uneventful and no complications were encountered. However, a relative stricture of the urethra developed in 1 woman and fistulas developed in 4. In 1 patient the fistula was small and distal, and was left without further surgery. Although diverticulum recurred in 11 patients and urinary incontinence of varying degrees was rather common, as was dyspareunia, 59 patients (92%) would still recommend surgery to a friend having symptoms of the severity they had experienced themselves.

**Conclusions:** Residual symptoms were surprisingly common in the long term. However, most of them were tolerable and it is noteworthy that almost all patients found the operation quite worthwhile when looking back to their preoperative situation. It was evident that repeated surgery frequently resulted in various sequela. The first operation is the golden opportunity for long-term success and a lesson to be learned is that operations for female urethral diverticulum would preferably be centralized to a limited number of surgeons.

*Key Words: diverticulum, urethra, surgical flaps, pain, urinary incontinence*

Female urethral diverticulum is an acquired condition considered quite rare. However, there is an increasing incidence rate, probably due to the increased awareness of urologists and gynecologists. Irritative symptoms like dysuria, dyspareunia and dribbling are common. Sometimes pain may be dominating and intolerable. According to Huffman the formation of a diverticulum starts by obliteration and infection of some part of the complicated system of the paraurethral glands with abscess cavity formation and rupture into the lumen.[1] Surgery remains the only way to eliminate a diverticulum but may be technically demanding. The female urethra is a delicate organ situated in a narrow space, with a sophisticated innervation and a limited mass of musculature, and is equipped with a complicated arrangement of supportive structures. The risk of incontinence, fistula formation or retention must always be considered, especially if the procedure is locally extensive, if tissue quality is severely compromised because of infection and/or repeated surgery, or if previous reconstruction has failed in any aspect. There are several surgical approaches to the problem including supplementary techniques such as bladder flaps, vaginal flaps or fat tissue flaps. We report on our experience with a variety of techniques in a consecutive, personal series of 68 women who underwent surgery for urethral diverticulum during a 26-year period.

## PATIENTS AND METHODS

A total of 68 women underwent surgical repair between January 1979 and June 2005. At surgery the patients were 21 to 85 years old (median 44) (fig. 1). In 35 women the operation was primary. Ten women had been operated on for urethral diverticulum once before and 5 women twice or more. There was no history of surgery in 45 patients (table 1). Preoperative evaluation included a detailed medical history, physical examination, urinalysis and culture. In women who had previously undergone urethral surgery a urodynamic examination was performed including cystometry and urethral pressure profile. Urethral pressure profiles were obtained in the 4 quadrants of the urethra to visualize any sectorial defect,[2] with the objective to reconstruct such a defect, if possible.

Urethrocystoscopy was the mainstay diagnostic procedure and included simultaneous inspection and palpation of the urethral lesion with exprimation of diverticulum contents (if possible and applicable) for localization of the diverticulum orifice. To visualize the extension and site of the lesion and relations to surrounding tissue, voiding urethrocystography was the most frequent examination. In the later part of the series vaginal ultrasound exami-

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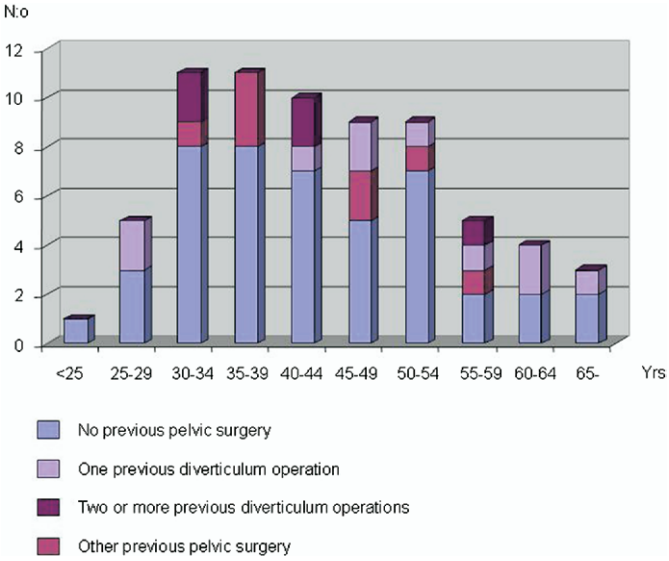


FIG. 1. Age distribution and previous operations at surgery

nation, computerized tomography or MRT were added as diagnostic tools (table 2). After surgery no additional imaging investigation was performed routinely, before removal of the suprapubic tube. On the other hand, at the time of catheter removal all patients were subjected to urethroscopy as well as vaginal inspection and palpation of the reconstructed area. In cases of incomplete healing, the suprapubic tube was retained. In 16 women primary repair was performed. If opened, the urethra was meticulously reconstructed around a 16Fr metal catheter and watertight closure was checked by the urethroscope. Muscles and fascial layers were used to cover the urethral suture line as carefully as possible.[3] In 40 patients a bipedicular vaginal wall flap was used to reinforce the urethral reconstruction (fig. 2), a technique that was preferred if the urethra was opened during the procedure. If severely impaired tissue quality following previous surgery was found, a Martius fat flap was used (2 women).[4] Postoperative drainage was achieved by a suprapubic tube. In none of these cases a urethral catheter was used. Ten patients with distal lesions were treated with transurethral division and marsupialization of the diverticular sac.[5] They had a urethral catheter overnight. All patients who underwent such an endoscopic operation returned after 2 to 3 months for final inspection. Patients undergoing more advanced reconstructions were reinvestigated half a year after the operation to record their continence and voiding status and the endoscopic appearance of the urethra. In no case was any surgery performed to correct incontinence at the time of urethral diverticulum surgery.

TABLE 1. *Surgery before index operation*

| | No. Pts |
|---|---|
| No. diverticulum surgery: | |
| 6 | 2 |
| 4 | 1 |
| 3 | 1 |
| 2 | 1 |
| 1 | 10 |
| Other vaginal/urethral surgery | 8 |
| No previous surgery | 45 |
| Total | 68 |

TABLE 2. *Imaging methods*

| | No. Pts | No. Successful Imaging |
|---|---|---|
| Voiding cystourethrography | 18 | 16 |
| Positive pressure urethrography | 7 | 6 |
| Vaginal ultrasound | 6 | 5 |
| MRT | 2 | 2 |
| Combination of techniques | 29 | 19 |
| No imaging | 6 | — |
| Totals | 68 | 48 |

In 5 women suspected tumors of the diverticular sac were revealed, in all but 2 not until the time of operation. One woman admitted with recurrent diverticulum at reoperation was found to have a mesonephric adenocarcinoma. She was subsequently treated with preoperative irradiation, radical cystourethrectomy with extensive lymph node dissection and urinary diversion. She has remained tumor-free for 2 years.

Subsequently the medical records of all the 68 women were reviewed by an investigator not involved either in the operations or the postoperative followup (LL). Attempts were made to contact all patients by telephone. Two patients were dead at the time of the survey and for further 2 no available telephone number was found. Those 4 therefore had to be excluded from the telephone followup. After giving their consent, the 64 women available for an interview were questioned 6 months to 22 years after the operation (mean 7 years) using a standard questionnaire (see Appendix).

## RESULTS

### Review of Medical Records

Patients presented with various symptoms present for 2 months to 25 years as seen in figure 3. Symptoms lasted for less than 1 year in 10 patients, 1 to 2 years in 18 and longer than 2 years in 40. Six patients were on continuous systemic antibiotic treatment, 1 had continuous local an-

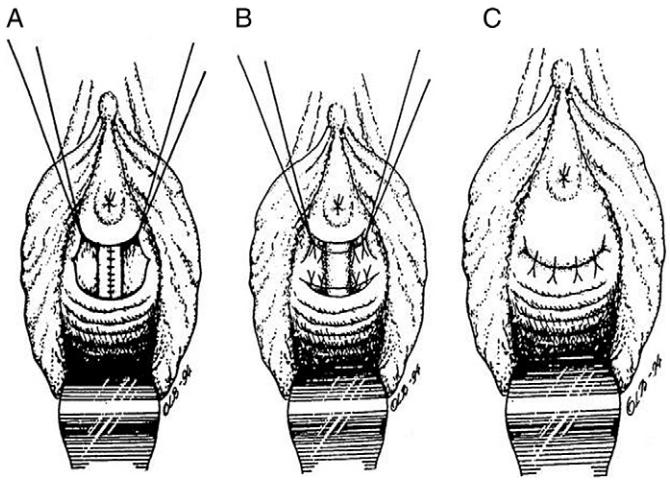


FIG. 2. Construction of bipedicled vaginal wall flap. *A*, initial incision line in urethra. *B*, bipedicled vaginal flap adapted. *C*, final closure of vagina. Reprinted with permission.[3]