DJOG Danish Journal of Obstetrics and Gynaecology

Urethral diverticulum and periurethral cyst: symptoms, diagnostics, treatment and outcome.

Topp M.W. [1], Sander P.[1]

[1] *Department of Obstetrics and Gynecology, Herlev and Gentofte Hospital, Denmark*

Corresponding author: Monica Wedell Topp; monicatopp40@gmail.com

ABSTRACT

Objective: In order to contribute to better diagnostic and treatment, we compared the symptomatology, diagnostics, treatment and outcome in women with a urethral diverticulum or a periurethral cyst.

Methods: We performed a retrospective extraction of data from medical records including 70 women with a urethral diverticulum or a periurethral cyst, operated at our department from January 2010 until December 2013. Fischer's exact test and t-test were used for statistical analyses.

Results: In total, 31 women were diagnosed with a diverticulum and 39 with a periurethral cyst. Women with a diverticulum had significantly more often voiding pain (45 % vs 8 %, p=0.001), urethral/vaginal pain (45% vs 15 %, p=0.01), recurrent urinary tract infection (23 % vs. 5 %, p=0.01), urinary incontinence (45 % vs. 21 %, p=0.04), and urethral discharge (39 % vs. 15 %, p=0.03) compared to women with a periurethral cyst. The only symptom less frequent in the diverticulum group was a bulky feeling (42 % vs. 74 %, p=0.01). In the diverticulum group, 87% had resections and 13% marsupialization, while in the cyst group 59 % had resections and 41 % marsupialization (p=0.02). In the diverticulum group four (13%) experienced recurrence compared to none in the cyst group (p=0.03). Furthermore, one patient referred as a diverticulum had urethral cancer.

Conclusion: Urethral diverticula and periurethral cysts should be considered in women with lower urinary tract symptoms and pain. Urethral diverticula are more complicated to diagnose and to treat.

Keywords: Urethral diseases

Received: 27.July 2022
Accepted: 8.December 2022
Date of publication: 13. December 2022
DOI: https://doi.org/10.56182/djog.v1i1.22

INTRODUCTION

Urethral diverticulum is defined as a protrusion of the urethra through the periurethral fascia, and the annual incidence varies from < 0.01% of women having surgical treatment to 4.7 % in asymptomatic women admitted for other causes (1). There are no specific symptoms related to a diverticulum: ie feeling of a bulk, dyspareunia, pain, recurrent urinary tract infection, vaginal discharge, urinary urgency, urinary incontinence and bladder emptying difficulties. Consequently, the condition is often overlooked. Clinically, it is difficult to distinguish between a urethral diverticulum and a periurethral cyst, both presenting by a mass close to the urethra. Diverticula are often described by the patient as diverging in size, painful with voiding symptoms and

sometimes with urethral discharge. Objectively, the diverticula are often observed at mid urethra, and sometimes fluid can be expressed from urethra. It is often not as superficial as periurethral cysts.

Periurethral cysts are associated with few symptoms, mostly only mechanic, and no urethral discharge. The patients describe unchanging or increasing size of the cysts. Objectively, the cysts are easy to identify, often placed near the distal urethra, and it is not possible to express fluid.

Different diagnostic tools have been used; previously double balloon positive pressure urethrography was the primary choice. However, in most cases this examination has been replaced by magnetic resonance imaging (MRI) and/or ultrasound (US)(2). Ultrasound evaluation of urethral diverticula disclose no distance between the urethra and the cystic structure, which can be horseshoe or J shaped, and sometimes a fistula to the urethra can be identified. Periurethral cysts, however, are simple cysts sometimes with more than one chamber without a fistula. MRI is more detailed and precise in the description.

The treatment of choice for both diverticula and cysts is excision, but also marsupialization and puncture have been used (2,3). In Denmark, the treatment of urethral diverticula is specialized to a few departments, often in collaboration between urogynecologists and urologists.

In this study, we present data from a cohort of women undergoing surgery for periurethral cysts or diverticula at our department. The aim was to compare the symptomatology and the surgical procedures in relation to the two procedures.

MATERIALS AND METHODS

We performed a retrospective extraction of data from medical records including 70 women, with a urethral diverticulum or a periurethral cyst operated at our department, from January 2010 until December 2013.

Before surgical excision of a urethral diverticulum, cystourethroscopy was performed to visualize the ostium of the duct. An indwelling catheter was used, and local anesthesia injected under the vaginal skin, which was incised in an inverse U-shape. The periurethral fascia was incised transversely and the diverticulum dissected sharp and blunt including the ostium in the urethra with intention not to leave any of the diverticulum. The defect in the urethra was closed with interrupted absorbable sutures 4-0, hereafter 3 layers with 3-0 sutures to avoid fistula. The cavity after the diverticulum was obliterated by sutures, and the fascia and vaginal skin were closed continuously. Vaginal gaze was placed for 2-4 hours, and the indwelling catheter was removed after 5-10 days. Prophylactic antibiotics (aminoglycoside or cefuroxime in combination with metronidazole) were given during surgery.

Excision of a periurethral cyst was performed in a similar way, although we did not perform cystourethrography, there was no fascia over the cyst to close, and the urethra was intact. In these patients, the indwelling catheter was removed at the end of surgery.

If the urethral diverticulum or periurethral cyst was located at the external end of the urethra, some of the patients had a marsupialization performed via the vagina.

There was no standard follow-up after the surgery. The women with a simple urethral diverticulum or periurethral cyst were told to contact the outpatient clinic if they had any symptoms in the next 6 months. If the urethral diverticulum was more complicated, ie. high, multiple, or horseshoe shaped, the woman was seen after 3 months. All medical records were reviewed in 2017 resulting in a follow-up time of three to seven years.

Statistical analyses

Due to the relatively small number of cases we used Fischer's exact test (VassarStats), and continuous data by t-test (Excel).

Ethical approval

Permission to retrieve information from medical records was given by the Danish Health and Medicines Authority (HEH- 2015-004/03438).

Permission to publish picture of periurethral cyst was given by the patient.

RESULTS

In total, 31 women with a urethral diverticulum and 39 with a periurethral cyst. Demographic data are shown in table 1. The women with a urethral diverticulum have a significantly higher median age than those with a periurethral cyst (44 vs. 32 years, p=0.01). There was no difference between the two groups in medical history.

To differentiate between urethral diverticulum and periurethral cyst we used clinical findings, and transvaginal ultrasound in respectively 97% vs. 93% (p=0.62). We find ultrasound a very easy and available method, but in more difficult cases MRI was used (29 % vs. 5 %, p=0.009). Sixteen percent of the women with urethral diverticulum had been examined by cystography, cystoscopy, or CT-scan at the referring department. Table 2 shows the frequency of symptoms in the two groups. Women with a urethral diverticulum had significantly more often voiding pain (45% vs 8%, p=0.001), urethral/vaginal pain (45% vs 15%, p=0.01), recurrent urinary tract infection (23% vs. 5%, p=0.01), urinary incontinence (45% vs. 21%, p=0.04), and urethral discharge (39% vs. 15%, p=0.03) compared to women with a periurethral cyst. The only symptom less frequent in the diverticulum group was a bulky feeling (42% vs. 74%, p=0.01). The type of urinary incontinence is indicated in table 2.

One patient referred with a urethral diverticulum had urethral cancer. She had bladder emptying problems and used intermittent catheterization for two years before referral. She was referred because of difficulties with catheterization. After biopsies she was operated in a urology department, but eventually died.

The method of surgery differed significantly (p=0.02) between the two groups; in the urethral diverticulum group, 27 (87%) were excised and 4 (13%) marsupialized. Among the 27 excisions, a connection to the urethra was identified in 20 (74%). In the periurethral cyst group, 23 (59%) excisions and 16 (41%) marsupializations were performed.

In the urethral diverticulum group four (13%) recurred: two had a reoperation, one woman became pregnant and has postponed intervention and the fourth woman had three recurrences treated by surgery due to a small residual of the diverticulum. In the periurethral cyst group, none recurred.

Among the urinary incontinent women in the urethral diverticulum group, 10 out of 14 were subjectively cured or very much improved according to the medical records. Three women had de novo urinary incontinence postoperatively. One of these had severe symptoms and a urinary incontinence procedure (retropubic Trans Vaginal Tape) was performed subsequently. Among the eight incontinent women with a periurethral cyst, one woman was subjectively cured while the others are unknown. We are not aware of any de novo urinary incontinence among those with a periurethral cyst, although the women were encouraged to contact the department if they had any problems.

	Urethral diverticula (n=31)	**Periurethral cysts (n=39)**	**p-values**
Age, years (median, range)	44 (20-68)	32* (18-85)	0.01
Body Mass Index, weight/hight^2 (median, range)	26 (19-36)	29 (18-39)	0.15
Nullipara, n (median, range)	8 (0-4)	11 (0-4)	1.0
No comorbidity, n (%)	19 (61 %)	31 (80 %)	0.12

Table 1. Demographic in patients with urethral diverticula compared to patients with periurethral cysts.

	Urethral diverticula (n=31) n (%)	Periurethral cysts (n=39) n (%)	p-values
Dyspareunia	9 (29 %)	16 (41 %)	0.33
Voiding pain	14 (45 %)	3 (7.7 %)	0.001
Other pains	14 (45 %)	6 (15 %)	0.01
Recurrent urinary tract infection	7 (23 %)	2 (5.1 %)	0.01
Urethral discharge	12 (39 %)	6 (15 %)	0.03
Feeling of a bulk	13 (42 %)	29 (74 %)	0.01
Urinary incontinence **Stress** **Urgency** **Mixed**	14 (45 %) 9 0 5	8 (21 %) 4 1 3	0.04
Frequent voiding	9 (29 %)	7 (18 %)	0.39
Bladder emptying difficulty	7 (23 %)	3 (7.7 %)	0.10
Dribbling	1(3.2 %)	3 (7.7 %)	0.62

Table 2. Symptoms in patients with urethral diverticula compared to patients with periurethral cysts.

DISCUSSION

Our study has clearly shown that urethral diverticulum is a much more complicated disease compared to periurethral cysts in relation to symptoms, surgery, and outcome.

The higher median age in the women with urethral diverticula was expected, as periurethral cysts can be congenital and therefore will develop early in life. The urinary incontinence rate is higher in the urethral diverticulum group, which can be explained by the placement of the diverticulum, and the higher age in this group.

One woman was diagnosed with urethral cancer, which always should be considered as a differential diagnosis in women with a urethral diverticulum or a periurethral cyst.

Although MRI is considered to be the best method to diagnose a urethral diverticulum, we prefer vaginal US; cystic processes are very easy to localize, it is available in the outpatient clinic, and examination and decision of surgery can be done at one visit. A disadvantage of US is that the result is more user-dependent and distinguishing between a cyst and a diverticulum is not always easy. However, combined with clinical findings and cystourethroscopy, nearly all our patients could be managed without MRI. In addition, we have restricted the diagnosis and treatment to a few physicians (the authors) in our department to assure routine and expertise.

A recent review (5) evaluated the different surgical managements of urethral diverticula in 108 studies with 1947 women but found the studies too inconsistent to reach any conclusion regarding recommendation. Furthermore, there is no consensus on how to treat periurethral cysts; some recommend complete excision, while other surgeons prefer marsupialization (6).

The rate of urethral diverticulum recurrence in our study is about 13 %, which is in concordance with other studies (2,7). We did not see any urethral fistula after surgery, which can be seen in up to 6 % after resections, especially in high diverticula (2). The rate of de novo urinary incontinence in our study (10%) is also comparable to others (10-33%) (8,9).

The strength of our study was that we have a consecutive cohort of all patients in a large region. However, it was a weakness that there were no routine follow-ups of our patients. Randomized studies to evaluate diagnostic and operative methods are missing but may not be possible due to the rarity of these conditions. Multicenter studies or an international database could improve knowledge and give better indications on the best clinical handling of urethral diverticula and periurethral cysts.

CONCLUSION

A urethral diverticulum and a periurethral cyst must be considered in women with lower urinary tract symptoms and pain. The patients with urethral diverticula are more complicated to treat. Due to the low incidence, we recommend surgical treatment to be restricted to specialized centers to maintain routine and expertise.

Acknowledgements: The authors want to thank Professor Gunnar Lose for reviewing the manuscript and Dr., Ph.D. Lea Laird Andersen for proofreading.

Author contributions: Both authors adhere to the 4 ICMJE criteria for authorship.
Conflict of interest: None.
Funding information: None.

Figure 1. Periurethral cyst, 3 x 2 cm in 40 year old woman with feeling of a bulk; no voiding symptoms.

REFERENCES

1. El-Nashar SA, Bacon MM, Kim-Fine S, Weaver AL, Gebhart JB, Klingele CJ. Incidence of female urethral diverticulum: a population-based analysis and literature review. Int Urogynecol J. 2014;25:73-9. DOI: 10.1007/s00192-013-2155-2

2. Crescenze IM, Goldman HB. Female Urethral Diverticulum: Current Diagnosis and Management. Curr Urol Rep. 2015;16:71. DOI: 10.1007/s11934-015-0540-8

3. Lucioni A, Rapp DE, Gong EM, Fedunok P, Bales GT. Diagnosis and Management of Periurethral Cysts. Urol int. 2007;78:121-5. DOI: 10.1159/000098068

4. Antosh DD, Gutman RE. Diagnosis and Management of Female Urethral Diverticulum. Female Pelvic Med Reconstr Surg. 2011;17:264-71

5. Bodner-Adler B, Halpern K, Hanzal E. Surgical management of urethral diverticula in women: a systematic review. Int Urogynecol J. 2015; DOI 10.1007/s00192-015-2862-y.

6. Laudano MA, Jamzadeh AE, Dunphy C et al. Pathologic Outcomes following Urethral diverticulectomy in Women. Advances in Urology. 2014; ID861940. doi: 10.1155/2014/8611940

7. Ingber MS, Firoozi F, Vasavada SP et al. Surgically Corrected Urethral Diverticula: Long-term Voiding Dysfunction and Reoperation Rates. Urology. 2011;77(1):65-9

8. Bennett SJ. Urethral diverticula. Eu J Obs Gyn Rep Bio. 2000;89:135-9.

9. Reeves FA, Inman RD, Chapple CR. Management of Symptomatic Urethral Diverticula in Women: A Single-centre Experience. Eur Urol. 2014;66:164-72