Original Article

Diagnosis and Management of Female Paraurethral Cysts: A Tertiary Hospital Experience

Pat Saksirisampant MD[1,2], Patkawat Ramart MD[1]

[1] Division of Urology, Department of Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

[2] Division of Urology, Department of Surgery, Somdech Phra Pinklao Hospital, Naval Medical Department, Royal Thai Navy, Bangkok, Thailand

Objective: To report a case series of female paraurethral cysts (FPCs) at a tertiary hospital.

Materials and Methods: Sixteen proximal- and distal-FPC cases treated between 2010 and 2019 were retrospectively evaluated. Demographics, clinical presentations, diagnostic methods, treatments, and outcomes were analyzed.

Results: The mean age and BMI of the 11 proximal-FPC patients were significantly higher than those of the five distal-FPC patients [55.6 versus 39.8 years (p=0.008); 27.6 versus 21.5 kg/m^2 (p=0.036)], respectively. Comorbidity and parity statuses did not differ. The most common presenting symptoms were palpable mass (31.3%) and lower urinary tract symptoms (LUTS) (31.3%). There were palpable masses in four distal-FPC cases (80%), significantly more than in proximal-FPC at one case (9.1%) (p=0.013). Normal urinalyses were found in all five distal-FPC cases, significantly higher than in proximal-FPC at two cases (18.2%) (p=0.005). Diagnosis was confirmed solely by pelvic examination in three distal-FPC cases (60%) with palpable masses at the distal urethra, but in only one proximal-FPC case (9.1%) (p=0.063), otherwise, translabial ultrasound, CT, MRI, or VCUG was used. Patients were managed by transvaginal excision and urethral injury occurred in six (42.9%). While the groups' operative times, blood losses, and catheter indwelling times were similar, proximal-FPC hospital stays were longer at three versus two days (p=0.019). Disease recurrence, transient stress urinary incontinence (SUI), and urethral stricture occurred in one, two and one of proximal-FPC cases, respectively. One distal FPC developed overactive bladder. The symptom-free success rate was 64.3%. Two proximal-FPC patients had adenocarcinoma.

Conclusion: The FPC patients had various presentations. Diagnosis of FPC could be made clinically by pelvic examination. Further investigative imaging might be performed in the equivocal cases to confirm the diagnosis. Transvaginal removal was the mainstay treatment.

Keywords: Case series; Management; Paraurethral cyst; Skene's gland cyst; Urethral diverticulum

Received 29 March 2021 | Revised 5 July 2021 | Accepted 6 July 2021

J Med Assoc Thai 2021;104(8):1362-9

Website: http://www.jmatonline.com

Female paraurethral cysts (FPCs) are presented in two forms. First, termed as Skene's gland cysts (SCs), it originates in the periurethral glands located around the urethral meatus. The other subtype, urethral diverticulum (UD), is an outpouching of urethral mucosa or periurethral glands in the surrounding connective tissues[1,2]. Although, the exact incidence of FPCs is unknown, it is estimated to be under 0.02%[1]. As FPCs commonly occur between the ages of 20 and 40 years[2], they may be an acquired condition caused by infection of, or trauma to, the periurethral glands[1,2]. Some patients are asymptomatic, and their FPCs are detected during a routine gynecological examination while other patients may present with lower urinary tract symptoms (LUTS)[2,3]. Moreover, FPCs can be an unrecognized cause of recurrent urinary tract infections or unexplainable LUTS[1-3]. The present study set out to demonstrate the clinical aspects and management of FPCs at a tertiary hospital.

Correspondence to:

Ramart P.

Division of Urology, Department of Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, 2 Wanglang Road, Bangkoknoi, Bangkok 10700, Thailand.

Phone: +66-2-4198010, +66-2-4112011

Email: patkawat.ram@gmail.com, patkawat.ram@mahidol.ac.th

How to cite this article:

Saksirisampant P, Ramart P. Diagnosis and Management of Female Paraurethral Cysts: A Tertiary Hospital Experience. J Med Assoc Thai 2021;104:1362-9.

doi.org/10.35755/jmedassocthai.2021.08.12765

Materials and Methods

The present study was approved by the Ethics Committee of Siriraj Institutional Review Board, Faculty of Medicine, Siriraj Hospital, Mahidol University, Thailand, protocol number 419/2563 (IRB3), certificate of approval number Si 510/2020.

A retrospective review was undertaken in FPC patients who underwent surgical treatment between 2010 and 2019 at Siriraj Hospital, a tertiary university hospital in Bangkok, Thailand. Patients who were managed conservatively without surgery were excluded from the study. To date, no definite consensus on FPC classification had been drawn. Therefore, the authors decided to categorize the

patients into two groups, distal FPCs and proximal FPCs. A distal FPC was defined as a cyst located in the distal one-third of the urethra, while a proximal FPC was defined as a cyst located in the proximal two-thirds of the urethra[4-6]. The data collected and analyzed comprised of demographic profiles, clinical presentations, diagnostic methods, treatment details, and outcomes. Continuous data were presented as means for data with a normal distribution and medians for data with a non-normal distribution. The numbers of patients with their percentages were reported for categorical data. For analysis purposes, independent t-test was used to compare means and Mann-Whitney U test to compare medians in continuous data, and chi-square test and Fisher's exact test were used for categorical variables. The statistical analyses were calculated using PASW Statistics for Windows, version 18.0 (SPSS Inc., Chicago, IL, USA). A p-value of less than 0.05 represented statistical significance.

In the present study, the terms LUTS, stress urinary incontinence (SUI), and acute urinary retention were defined according to the 2002 International Continence Society (ICS) definitions[7]. LUTS were divided into storage as increased daytime frequency, nocturia of one or more times per night, urgency, and urinary incontinence, voiding as slow or intermittent stream during micturition, splitting or spraying of the urine stream, hesitancy, straining, and terminal dribble, and postmicturition symptoms as feeling of incomplete emptying and postmicturition dribble. SUI was the observation of involuntary leakage from the urethra synchronous with exertion or effort, sneezing, or coughing. Acute urinary retention was a painful, palpable or percussible bladder, when the patient was unable to pass any urine. Recurrent cystitis was defined as two episodes of bladder infection in the previous six months, or three episodes in the previous twelve months[8].

Results

Demographic profile

Sixteen cases with FPCs that underwent surgical treatment were analyzed. Their demographic data are summarized in Table 1. Five patients had distal FPCs, and eleven had proximal FPCs. The average age of the distal-FPC patients was 39.8 years, and their average body mass index (BMI) was 21.5 kg/m². The corresponding values for the proximal-FPC group were 55.6 years and 27.6 kg/m². The mean age and BMI of the proximal-FPC patients were significantly higher than those of the distal-FPC patients (p=0.008 and 0.036, respectively). Most cases did not have any comorbidities. The American Society of Anesthesiologists Classifications and parity statuses of the two groups were not significantly different.

Clinical presentations

Table 1 lists the clinical presentations. Almost all cases presented with more than one symptom. The most common were palpable masses in five cases (31.3%) and LUTS in five cases (31.3%). Four distal-FPC cases (80%) presented with the complaint of a palpable mass. This proportion was significantly higher than that of the proximal-FPC group that had only one case (9.1%, p=0.013). One patient, who presented with high-grade fever and urethral pain, was diagnosed with infected UD. Interestingly, two patients were histologically confirmed to have malignancy associated with FPC. One of them presented with urinary retention, and the other had hematuria along with bleeding from the meatus. Only three patients (18.8%) were asymptomatic, two of those were found to have persistent pyuria during an annual urine check-up, and the third was detected during an annual pelvic examination.

Urine analyses (UA) were normal in all five cases (100%) of the distal FPC, but only two cases (18.2%) of the proximal FPC had a normal UA. The difference was significant (p=0.005).

Diagnostic methods

Diagnoses were made by physical examination alone for three distal-FPC cases (60%), palpable cystic masses were revealed at the distal urethra or meatus (Figure 1). However, only one proximal-FPC case (9.1%) was identified solely via a physical examination. That patient had a cystic mass in the mid urethra, palpable via the anterior vaginal wall. Without further investigations, all four of these cases proceeded to resection. Although a pelvic examination was able to reveal palpable masses in another 10 cases, including two of distal FPC, and eight of proximal FPC, further investigations were needed to determine the final diagnoses. The additional examinations were magnetic resonance imaging (MRI) in three cases), translabial ultrasonography (USG) in four cases), a computerized tomography (CT) scan in one case), a USG with a CT scan in one case, and voiding cystourethrography (VCUG) with MRI in one case. The finding of FPC on MRI is shown in Figure 2. On the other hand, a pelvic examination did not detect any abnormalities, whatsoever, in two proximal-FPC cases (18.2%). One of these patients was subsequently

Table 1. Demographic data and clinical presentations

Characteristics	Overall (n=16); n (%)	Distal FPC (n=5); n (%)	Proximal FPC (n=11); n (%)	p-value
Age (years); mean±SD	50.7±11.8	39.8±7.1	55.6±10.1	0.010
BMI (kg/m^2); mean±SD	25.7±6.7	21.5±2.6	27.6±7.1	0.035
ASA class				0.308
I	9 (56.3)	4 (80.0)	5 (45.5)	
II	7 (43.8)	1 (20.0)	6 (54.5)	
Parity status				1.000
0	5 (31.3)	2 (40.0)	3 (27.3)	
1	4 (25.0)	3 (60.0)	1 (9.1)	
≥2	7 (43.8)	0	7 (63.6)	
Clinical presentation				
Asymptomatic	3 (18.8)	1 (20.0)	2 (18.2)	1.000
Palpable mass	5 (31.3)	4 (80.0)	1 (9.1)	0.013
LUTS	5 (31.3)	1 (20.0)	4 (36.4)	1.000
SUI	3 (18.8)	0 (0.0)	3 (27.3)	0.509
Recurrent cystitis	4 (25.0)	0 (0.0)	4 (36.4)	0.245
Retention	2 (12.5)	0 (0.0)	2 (18.2)	1.000
Bleeding/hematuria	1 (6.3)	0 (0.0)	1 (9.1)	1.000
Urethral discharge	1 (6.3)	1 (20.0)	0 (0.0)	0.313
Urine analysis				0.005
Normal	7	5 (100)	2 (18.2)	
Abnormal	9	0 (0.0)	9 (81.8)	
Pyuria (WBC >10)	8	0 (0.0)	8 (72.7)	
Hematuria (RBC >3)	3	0 (0.0)	3 (27.3)	

ASA=American Society of Anesthesiologists score; BMI=body mass index; FPC=female paraurethral cyst; LUTS=lower urinary tract symptoms; RBC=red blood cell; SUI=stress urinary incontinence; WBC=white blood cell

Figure 1. This picture demonstrates a case of 49-year-old woman who presented with a palpable mass for 2 years. The diagnosis of distal FPC was made by a physical examination revealing a palpable cystic mass at the distal urethra to meatus.

sent for a CT scan, and the other underwent MRI with VCUG. Both were diagnosed with proximal-FPC by their respective imaging studies. Table 2 presents the diagnostic modalities.

Treatment

Every FPC patient in the present study series was managed by transvaginal excision, which was an inclusion criterion of the study (Figure 3). Significant urethral injury occurred in six patients (42.9%), required urethral repair. Malignancy was suspected intraoperatively with two proximal-FPC cases. One was treated with a diverticulectomy with a distal urethrectomy, and the other by an incisional biopsy at the mass. Histopathological reports of adenocarcinoma were confirmed in both cases. After their operations, the two patients were treated with chemotherapy and radiation. Three months later, however, one was diagnosed with multiple organ metastasis and died within 10 months of the surgery and the other was given neoadjuvant chemotherapy, and a pelvic exenteration was performed later. Excluding the two cases of cancer, case management details are shown in Table 3. The average cystic diameters were 3.4±0.5 cm and 2.7±1.2 cm for the distal- and proximal-FPC groups, respectively. There

Table 2. Diagnostic methods

Methods	Overall (n=16); n (%)	Distal FPC (n=5); n (%)	Proximal FPC (n=11); n (%)	p-value
Physical examination alone	4 (25.0)	3 (60.0)	1 (9.1)	0.063
Translabial ultrasound	5 (31.3)	1 (20.0)	4 (36.4)	1.000
CT	3 (18.8)	0 (0.0)	3 (27.3)	0.509
MRI	5 (31.3)	1 (20.0)	4 (36.4)	1.000
VCUG	2 (12.5)	0 (0.0)	2 (18.2)	1.000

CT=computerized tomography; FPC=female paraurethral cyst; MRI=magnetic resonance imaging; VCUG=voiding cystourethrography

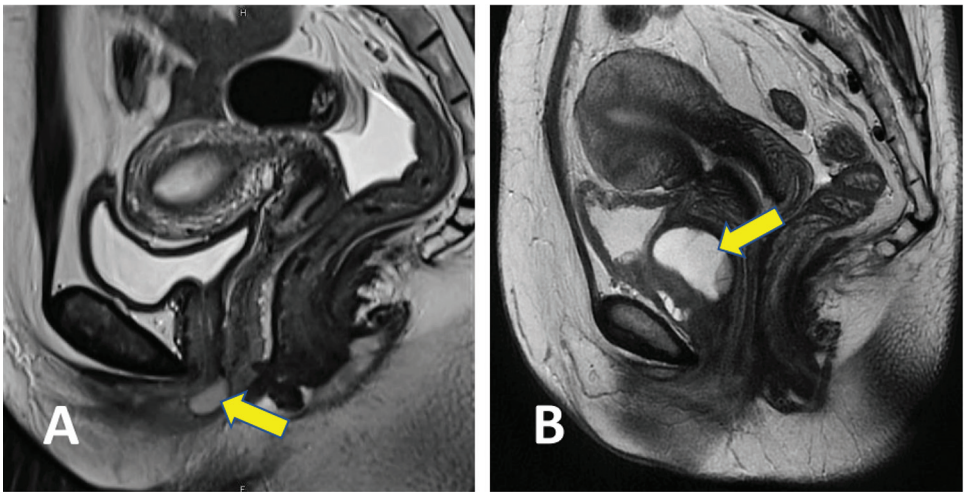

Figure 2. The finding of FPC on MRI (T2-weighted sagittal images). (A) A distal FPC (arrow) was demonstrated by MRI in a 33-year-old woman with urinary frequency. (B) A large proximal FPC (arrow) was revealed by MRI in a 44-year-old woman who presented with a complaint of multiple LUTS.

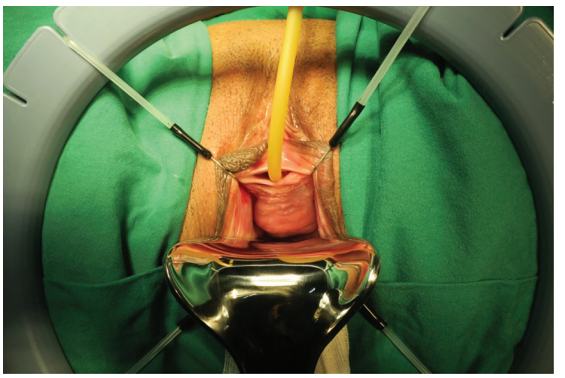

Figure 3. Transvaginal excision was performed in a 44-year-old case of proximal FPC (urethral diverticulum). The picture shows how to prepare for the surgery and the operative finding.

were no statistically significant differences between the operative times, blood losses, and catheter indwelling times of the two groups, but the median length of hospital stay was somewhat longer for the proximal-FPC than the distal-FPC patients at three versus two days (p=0.019). The histological findings of the surgical specimens confirmed SCs in all five cases of distal-FPC, urethral diverticula in nine cases, and adenocarcinoma in two cases of proximal FPC.

Outcomes

The median follow-up time from the operations to the last visit was 6.5 months with a range between 1 and 22 months. Excluding the two malignancy cases, the treatment outcomes are listed in Table 3. Four patients (80%) in the distal-FPC group were cured without further treatment. Only one (20%) distal-FPC patient developed de novo overactive bladder, which improved after commencing a course of an antimuscarinic agent. Meanwhile, in the proximal-FPC group, five cases (55.5%) had a symptom-free complete resolution. However, sequela also developed in this group with one recurrence (11.1%) of FPC, two cases (22.2%) of transient SUI, and one incident (11.1%) of urethral stricture. The overall symptom-free success rate was 64.3% with nine out of 14 cases.

Table 3. Management details, operative findings and outcomes (2 cases of cancer were excluded)

Characteristics	Overall (n=14); n (%)	Distal FPC (n=5); n (%)	Proximal FPC (n=9); n (%)	p-value
Management details and operative findings				
Cystic diameter (cm); mean±SD	3.0±1.0	3.4±0.5	2.7±1.2	0.209
Urethra repair	6 (42.9)	2 (40 (0.0))	4 (44.4)	1.000
Operative time (minute); median (P_{25}, P_{75})	40 (30, 52.5)	30 (25, 65)	46 (40, 55)	0.103
Blood loss (mL); median (P_{25}, P_{75})	30 (13.75, 50)	20 (10, 35)	30 (20, 75)	0.157
Length of stay (days); mean±SD	3.1±2.2	1.6±0.5	4±2.3	0.019
Catheter time (days); median (P_{25}, P_{75})	5 (1, 8)	1 (0.5, 7.5)	6 (3.5, 8)	0.090
Follow-up time (months); median (P_{25}, P_{75})	6.5 (2, 11.25)	3 (1.5, 8.5)	9 (3, 15)	0.230
Outcomes				1.000
Cure without further treatment	9 (64.3)	4 (80.0)	5 (55.5)	
Recurrence	1 (7.1)	0 (0.0)	1 (11.1)	
Transient SUI	2 (14.3)	0 (0.0)	2 (22.2)	
Urethral stricture	1 (7.1)	0 (0.0)	1 (11.1)	
OAB	1 (7.1)	1 (20.0)	0	

FPC=female paraurethral cyst; OAB=overactive bladder; SUI=stress urinary incontinence

Discussion

FPC, an uncommon condition in the form of a cyst-like dilatation of the urethral mucosa, is believed to be acquired rather than congenital since it is infrequently found in childhood[2,9]. The mean age of 50.7 years with a range between 33 and 75 years. The present study series supports this theory. According to some reports, however, it could start at a young age[9,10].

Proximal FPC is commonly known as UD. It is an outpouching of urethral mucosa or periurethral glands in the encircling connective tissues[1,2] of the proximal and mid urethra[4]. The condition is believed to be acquired following an infection of the periurethral glands and cysts, or after trauma of the urethra[1,2]. Proximal FPC might develop once the infected glands or cysts rupture[5]. Its incidence is not clearly known, but it has been estimated to range from 1% to 6% in adult females[11]. The age at presentation also varies greatly, between 30 and 80 years, with a median of 40 years[11]. This is comparable with the average age of 55.6±10.1 years in the present study series. The classic triad of dysuria, dyspareunia, and post-void dribbling as the presenting symptoms of UD[12,13] might be infrequently reported by modern studies. Baradaran et al reported that only 5% of their patients complained of this triad[14]. In the current study, the most common proximal-FPC presentations were various LUTS (36.4%) and recurrent cystitis (36.4%), both of which were consistent with a recent systematic review[11]. In addition, a diagnosis of proximal FPC could be confirmed solely by pelvic examination in only one case (9.1%) of the present cohort, with the remainder needing further investigative studies. In the literatures, the finding of a palpable mass has varied among studies, for example, ranging from 13% in work by Kochakarn et al[15] to as high as 52% in a study by Romanzi et al[3]. These prior studies have suggested that further investigations might be needed before a definitive diagnosis of UD or proximal FPC can be made.

According to the literature, the distal paraurethral glands, also known as Skene's glands in females, are homologous structures of the prostate gland in males. Skene's glands are located at the floor of the distal urethra[16,17]. When they are obstructed due to an infection or inflammation, they might become dilated and form cysts such as distal FPCs or SCs[16]. A distal FPC usually appears as a small cystic lesion located at the lateral or inferolateral aspect of the distal urethra, including the meatus[4]. Distal FPC is not commonly found during childhood. It might take time for a cyst or abscess to develop, resulting in the disease mostly occurring among females in their thirties to forties[18]. From a report of a large series, the mean age at presentation was 33.2 years[4], close to the 39.8±7.1 years found by the present study. As in prior studies, most patients with distal FPC are asymptomatic. It has been reported that asymptomatic patients often discover a cystic lesion at the meatus incidentally by palpation or sight[5,19], and the diagnosis of distal FPC can be readily made by a clinical examination

alone[5]. Besides, additional cystourethroscopy could be considered[20]. This is consistent with the finding of the present study. In most cases, further investigative imaging does not appear to be necessary to confirm diagnoses. However, USG, CT, MRI, or VCUG should be performed if there was uncertainty in diagnosis. Cysts were located more proximally in the urethra, or in complicated cases[5,20].

In the present series, it was found that proximal-FPC patients had a significantly higher mean age and BMI than the distal-FPC patients (Table 1). As to the age at diagnosis, the distal-FPC patients were younger than the proximal-FPC patients. This might be due to the clinical presentations of the distal FPCs mostly being palpable masses. Such masses are easy to detect, either through pelvic examinations by doctors, or from incidental discovery by the patients themselves. Hence, diagnoses can be confirmed sooner. Distal FPCs were more likely to get diagnosed early. By contrast, most of the proximal-FPC patients in the current series presented with various LUTS, and only one case had a detectable palpable mass (Table 1). The unrecognized cause of these LUTS with a negative examination might delay the diagnosis, and, consequently, women with proximal FPC were more likely to have longer time between the start of the symptoms and establishing the diagnosis of FPC.

Although proximal-FPC patients tended to be more symptomatic than the distal FPC group, the difference of presenting clinical characteristics between both groups was not statistically significant (Table 1), probably because of the study limitation, which was a small number of cases in present cohort due to low incidence of this rare disease.

As to the patients who were found on pelvic examination to have a palpable mass at the distal urethra or meatus, the diagnoses of distal FPC were straightforward, and no additional investigations were required[4]. In contrast, even though most of the patients with proximal FPCs presented with more symptoms, they had a negative finding on examination. Therefore, further diagnostic investigations such as USG, CT, MRI, or VCUG, were justified. Importantly, the differentiation between proximal and distal FPCs is found mainly via a pelvic examination. A proximal FPC or UD is commonly located in the proximal to mid urethra, whereas a distal FPC or SC is in the distal urethra or meatus[4].

The UAs of the two groups differed significantly. All five distal-FPC cases (100%) had a normal UA, whereas only two of eleven proximal-FPC cases (18.2%) did. The abnormal UA results for the proximal-FPC group were probably due to an increased risk of infection of urine resulting from the location of proximal FPCs. These more proximally located cysts have a greater likelihood of becoming infected or inflamed than distal FPCs, which are located distally just at the open-end outlet of the meatus.

In the present study, there were two cases (11.8%) of adenocarcinoma. Both patients had tumors located within proximal FPCs. The authors found that the eleven patients with proximal FPCs were older than the mean age of the distal-FPC patients at presentation; thus, cancer, a disease of the elderly, might develop more frequently in the proximal-FPC patients than the distal-FPC patients, who tend to be younger. According to a report on urethral diverticular carcinoma in females, the median age of patients is 53 years with a range between 14 and 81 years[21]. One patient presented with recurrent urinary retention and failed to void without a catheter at the age of 66. This patient had a 4 cm anterior vaginal wall mass on physical exam. The other, a 53-year-old woman had problems of gross hematuria, vaginal and meatal bleeding with a urethral mass of 5 cm discovered on pelvic exam. According to prior literatures, malignant neoplasm has been reported in 6% to 9% of patients with urethral diverticula[2,12], and the most common type of cancer is adenocarcinoma, accounting for 75% of the cases[21]. Most patients usually present with gross hematuria or urethral bleeding for 55% and urethral obstruction or voiding dysfunction for 16%[21]. Most patients are found to have an anterior vaginal wall mass on examination[21]. The data in the present study are consistent with the mentioned reports. Thus, malignancy should be suspected in a patient with unusual presentation, such as bleeding, retention, or with a solid mass on examination.

The FPC patients in the present study were treated with surgical excision. This is the mainstay of management and is recommended by most literature[11,22-24].

There might be some limitations in the present study. For one thing, as it was a retrospective study, it had inherent bias. Moreover, due to both the rarity of FPC and the difficulties of diagnosing this disease, only a small number of patients were available for the current investigation.

Conclusion

FPCs can be a hidden cause of recurrent urinary tract infections or various LUTS in female patients not responding to conservative management

using medications such as alpha-receptor blocking agents, antimuscarinics, or long-term antimicrobial medicines. Patients who are suspected of the disease should be thoroughly assessed and diagnosed by clinical examination and proper imaging. Differentiation between proximal and distal FPCs is mainly determined via a pelvic examination. Distal FPCs, or SCs, are found in the distal urethra or meatus, and they can be simply diagnosed by a pelvic examination. Since proximal FPCs, or UDs, are located in the proximal to mid urethra, further investigations are likely to be required for a definite diagnosis. With both FPC types, the mainstay of treatment is surgical excision, which provides excellent outcomes.

What is already known on this topic?

FPCs are rare urologic abnormalities that present in two forms. There have been studies on female urethral diverticula, or proximal FPCs, and Skene's gland cysts or distal FPCs. The natural history, prognosis, presentations, diagnosis, and treatment of the diseases have been reported. However, none of those prior studies did compare or demonstrate the difference between both conditions. Thus, this study was created.

What this study adds?

This study provides additional information about the difference between proximal and distal FPCs in terms of patients' demographics, clinical presentations, diagnostic methods, treatments, and outcomes at a tertiary care center.

Acknowledgement

The authors would like to thank all participants, staff, and residents at Siriraj Hospital, Mahidol University, involved in this research.

Conflicts of interest

The authors have no conflicts of interest to declare. There are no funding sources, or any commercial or other associations supporting this study.

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.
2. Foley CL, Greenwell TJ, Gardiner RA. Urethral diverticula in females. BJU Int 2011;108 Suppl 2:20-3.
3. Romanzi LJ, Groutz A, Blaivas JG. Urethral diverticulum in women: diverse presentations resulting in diagnostic delay and mismanagement. J Urol 2000;164:428-33.
4. Sharifiaghdas F, Daneshpajooh A, Mirzaei M. Paraurethral cyst in adult women: experience with 85 cases. Urol J 2014;11:1896-9.
5. Köse O, Aydemir H, Metin O, Budak S, Sonbahar A, Adsan O. Experiences with the management of paraurethral cysts in adult women. Cent European J Urol 2014;66:477-80.
6. Cox L, Rovner ES. Bladder and female urethral diverticula. In: Partin AW, Dmochowski RR, Kavoussi LR, Peters CA, Wein AJ, editors. Campbell-Walsh-Wein urology. 12th ed. Philadelphia: Saunders; 2020. p. 2964-92.
7. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society. Urology 2003;61:37-49.
8. Sen A. Recurrent cystitis in non-pregnant women. BMJ Clin Evid 2008;2008.
9. Kadian YS, Rattan KN, Singh M, Kajal P. Congenital anterior urethral diverticulum in children: a case report and review. ISRN Surg 2011;2011:120307.
10. Marshall S. Urethral diverticula in young girls. Urology 1981;17:243-5.
11. Greiman AK, Rolef J, Rovner ES. Urethral diverticulum: A systematic review. Arab J Urol 2019;17:49-57.
12. Thomas AA, Rackley RR, Lee U, Goldman HB, Vasavada SP, Hansel DE. Urethral diverticula in 90 female patients: a study with emphasis on neoplastic alterations. J Urol 2008;180:2463-7.
13. Aspera AM, Rackley RR, Vasavada SP. Contemporary evaluation and management of the female urethral diverticulum. Urol Clin North Am 2002;29:617-24.
14. Baradaran N, Chiles LR, Freilich DA, Rames RA, Cox L, Rovner ES. Female urethral diverticula in the contemporary era: Is the classic triad of the "3Ds" still relevant? Urology 2016;94:53-6.
15. Kochakarn W, Ratana-Olarn K, Viseshsindh V, Leenanupunth C, Muangman V. Urethral diverticulum in females: 25 years experience at Ramathibodi Hospital. J Med Assoc Thai 2000;83:1437-41.
16. Eilber KS, Raz S. Benign cystic lesions of the vagina: a literature review. J Urol 2003;170:717-22.
17. Flamini MA, Barbeito CG, Gimeno EJ, Portiansky EL. Morphological characterization of the female prostate (Skene's gland or paraurethral gland) of Lagostomus maximus maximus. Ann Anat 2002;184:341-5.
18. Nickles SW, Burgis JT, Menon S, Bacon JL. Prepubertal Skene's abscess. J Pediatr Adolesc Gynecol 2009;22:e21-2.
19. Stovall TG, Muram D, Long DM. Paraurethral cyst as an unusual cause of acute urinary retention. A case report. J Reprod Med 1989;34:423-5.

20. Isen K, Utku V, Atilgan I, Kutun Y. Experience with the diagnosis and management of paraurethral cysts in adult women. Can J Urol 2008;15:4169-73.
21. O'Connor E, Iatropoulou D, Hashimoto S, Takahashi S, Ho DH, Greenwell T. Urethral diverticulum carcinoma in females-a case series and review of the English and Japanese literature. Transl Androl Urol 2018;7:703-29.
22. Reeves FA, Inman RD, Chapple CR. Management of symptomatic urethral diverticula in women: a single-centre experience. Eur Urol 2014;66:164-72.
23. Crescenze IM, Goldman HB. Female urethral diverticulum: Current diagnosis and management. Curr Urol Rep 2015;16:71.
24. Centonze A, Salerno D, Capillo S, Mazzei A, Stranieri G. Skene gland cyst in post puberal girl. JPS case reports 2019;42:9-11.