

Characteristic of Urethral Stone Patients in Tertiary Hospital, East Java

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Objectives. Urethral stone is uncommon with proportion < 2% of all urinary tract stones. The common symptom is urinary retention. Urethral stone therapy depends on the stone location and size. The aim from this research is to find out characteristic urethral stone patients.

Methods. The study was conducted retrospectively by collecting data from Saiful Anwar General Hospital and urology medical records from January 2014-August 2017. There were a total of 59 patients with urethral stones.

Results. Fifty nine patients were obtained with mean age 52±13.66 years old. The most common chief complaint is urinary retention in 47 patients (80%) with duration of retention between 1 hour and 3 days. Stone size is 1-2 cm in 36 patients (61%) and the largest stone is 6 cm. Anterior urethral stones were located in naviculare fossa in 24 patients (41%) and treated by dorsal meatotomy and meatoplasty. Posterior urethral stones were in 12 patients (20%) and treated by vesicolithotripsy. Anterior and posterior lubrication procedures have 33% and 60% successful rate. There were 27 patients who underwent vesicolithotripsy for further management. Urethrolithotomy and repair urethra was performed for 6 cm stone size.

Conclusions. The most chief complaints are urinary retention in urethral stone patients. Most urethral stones were located in naviculare fossa with dorsal meatotomy and meatoplasty as the leading management of choice.

Keywords: incident, management, urethral stone

Introduction

Urethral stone is a urinary tract stone located in the urethra. The urethral stone originated from kidney stones or ureters that descend into the bladder, then enter to the urethra or formed in the urethra itself. Primary urethral stones are very rare, unless they form inside the urethra diverticle. This incidence of urethral stone is <2% of all urinary tract stones [1]. The symptoms in patients can vary. Acute urinary retention occurs due to Impacted urethral stones. Another symptom that is often felt by the patients is weak stream and also can cause urinary tract infection. The pain is also often felt on the glans penis or on the place of the stone [2].

For urethral stone therapy alone, based on the size, shape and location of urethral stones, and anatomic abnormalities in the urethra. For stones that can be pushed back into the bladder, can be continued with minimally invasive surgery. Whereas in stone the anterior urethra can be performed with meatotomy and urethrolithotomy. If stones cannot be pushed, a temporary cystostomy can be placed on patients with urinary retention

before definitive measures are taken [2]. This study aims to determine the rate of urethral stone and our experience in case management.

Materials and Methods

The type of research is descriptive retrospective. The samples were all patients with a diagnosis of urethral stones who were treated at Dr. Saiful Anwar Malang.

The inclusion criteria in this study were all patients with a diagnosis of urethral stones and exclusion criteria were incomplete demographic data and surgical reports.

Data retrieval was obtained from medical records of patients in Dr. Saiful Anwar Malang General Hospital and from the medical record of Malang Urology in January 2014 - December 2017. The data recorded are patient identity consisting of name, age, complaint, length of complaint, location of urethral stones, action, size of stone and results of stone analysis.

After the data is collected, they will be processed and analyzed descriptively (percentage) and the analysis is done using cross tabulation, between the variables of age and number of patients, variables of main complaint and number of patients, variable size of stone and number of patients, variable results of stone analysis and number of patients, stone location variables and number of patients, variables of management and number of patients, variables of anterior lubrication and number of patients, variable posterior lubrication and number of patients.

Results

The results of research that has been carried out on medical records of patients at Dr. Saiful Anwar Malang and from the medical record of Malang Urology SMF in January 2014 - December 2017 (Figure 1). There were 59 patients with urethral stones. The highest age is 51-60 years with 15 patients. Based on gender, there were mostly males with 58 patients and 1 female patient. Based on the patient's main complaint, most of them came for treatment due to 47 urinary retention.

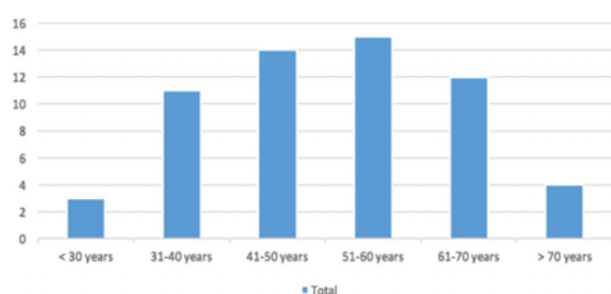


Figure 1. Distribution of urethral stone patients based on age

Based on the patient's chief complaints, came due to urinary retention in 47 patients (80%). In addition, other symptoms were weak stream in 5 patients (9%). Patients also felt pain in the tip of the penis, suprapubic and when urinate was 2 patients (3%). In 1 patient (2%) felt an abscess on the scrotum (Table 1).

The most urethral stones located on the navicular in 24 patients (41%) followed by bulbar urethral stones in 19 patients (32%), membranacea urethral stones in 12 patients (20%) and pendulare urethral stone in 4 patients (7%) (Table 2).

The most stone size is 1-2 cm in 36 patients (61%). Stone size <1 cm was obtained in 18 patients (31%). While stones with a size > 2 cm were found in 5 patients (8%). The largest urethral stone in this study was 6 cm in size (Table 3).

The most management for urethral stone in this study was dorsal meatotomy and meatoplasty in 24 patients (41%). Posterior lubrication followed by vesicolithotripsy was carried out in 20 patients (33.95%). Cystostomy followed by vesicolithotripsy was performed in 10 patients (16.8%) (Table 4).

Table 1. Distribution of urethral stone patients based on treatment complaints

Chief Complain	Total	Percentage
Urinary retention	47	80%
Weak stream	5	9%
Penile pain	2	3%
Suprapubic pain	2	3%
Dysuria	2	3%
Scrotal Abscess	1	2%

Table 2. Distribution of urethral stone patients based on the location of the stone

Location	Total	Percentage
Navicular urethral stone	24	41%
Bulbar urethral stone	19	32%
Membranacea urethral stone	12	20%
Pendulare urethral stone	4	7%
Prostatic urethral stone	0	0%

Table 3. Distribution of urethral stone patients based on stone size

Size	Total	Percentage
< 1 cm	18	31%
1-2 cm	36	61%
> 2 cm	5	8%

Table 4. Distribution of urethral stone patients based on therapy

Therapy	Total	Percentage
Dorsal meatotomy and meatoplasty	24	41%
Posterior lubrication followed by vesicolithotripsy	20	33,95%
Cystostomy followed by vesicolithotripsy	10	16,8%
Anterior lubrication followed by dorsal meatotomy and meatotomy	3	4,95%
Posterior lubrication followed by vesicolithotripsy	1	1,65%
Debridement and Ureterotomy	1	1,65%

Table 5. Distribution of urethral stone patients based on stone composition

Composition	Total	Percentage
Calcium oxalate	40	68%
Uric acid	14	24%
Struvite	5	8%

Based on the composition of urethral stones, calcium oxalate stones occurred in 40 patients. In addition, stone types of uric acid were found in 14 patients and struvite stones in 5 patients (Table 5).

In this study, anterior lubrication was performed 6 times. Anterior lubrication was successfully performed in 2 patients (33%) and failed in 4 patients (67%). In 2 successful anterior urethral stone patients, lubrication of stones was located on the pendulare of penile with <1 cm in size. Whereas in the anterior urethral stones that failed to perform, anterior lubrication of all stones was located in the bulbar urethra with a stone size of 1-2 cm in 2 patients (50%) and > 2 cm (50%) (Table 6).

Table 6. Distribution of urethral stone patients based on the success of anterior lubrication

Anterior Lubrication	Total	Percentage
Success	2	33%
Fail	4	67%
The location of urethral stone which successfully performs lubrication procedure		
Pendulare	2	100%
The size of urethral stone which successfully performs lubrication procedure		
< 1 cm	2	100%
The location of urethral stone which fail performs lubrication procedure		
Bulbar	4	100%
The size of urethral stone which fail performs lubrication procedure		
1-2 cm	2	50%
> 2 cm	2	50%

Posterior lubrication was performed 34 times. Posterior lubrication was successful in 18 patients (60%) and failed in 16 patients (40%). In all patients who had posterior lubrication both successful and failed, stones were located in the membranous urethra. Stone size in successful patients who performed posterior lubrication was 1-2 cm in 10 patients (56%) and > 2 cm in 8 patients (44%). Stone size in patients who failed performed posterior lubrication was 1-2 cm in 4 patients (25%) and > 2 cm in 12 patients (75%) (Table 7).

Table 7. Distribution of urethral stone patients based on the success of posterior lubrication

Posterior Lubrication	Total	Percentage
Sukses	18	60%
Gagal	16	40%
The location of urethral stone which successfully performs lubrication procedure		
Membranacea	18	100%
The size of urethral stone which successfully performs lubrication procedure		
1-2 cm	10	56%
> 2 cm	8	44%
The location of urethral stone which fail performs lubrication procedure		
Membranacea	16	100%
The size of urethral stone which fail performs lubrication procedure		
1-2 cm	4	25%
> 2 cm	12	75%

Discussion

The highest prevalence of urethral stones in this study was at the age of 51-60 years in 15 patients. According to Kamal et al, many studies of urethral stones occur at the age of 30-39 years with 18 patients.¹ Urethral stones occur most often in early childhood and at age 40 and above. Increasing the flow of voiding emission can prevent the occurrence of urethral stones at the age of 20-30 years by increasing the likelihood of stones that migrate out spontaneously when urinating [3].

In this study based on the patient's chief complaint, most of the treatment was because of urinary retention in 47 patients. Patients also complained of weak stream in 5 patients, suprapubic pain 2 patients, scrotal pain in 2 patients, penile pain in 2 patients and scrotal abscess 1 patient. Symptoms of urethral stones depend on their anatomical location. In ordinary anterior urethral stones accompanied by symptoms of dysuria. Whereas posterior urethral stones cause pain in the rectum and perineum. Impacted urethral stones often cause acute urinary retention and hydronephrosis [4]. If the stone is in the anterior urethra, we can also feel stones. Whereas those with urethra de novo stones and those who formed in diverticula often present with more dangerous symptoms, one of which is a urinary tract infection. In women, urinary tract stones can be associated with chronic pelvic pain [2-3].

Acute urinary retention is the most chief complaint that occurs in 78% of all patients with calculus stones, while an additional 22% report a weak stream. Pain associated with the place of stone is: if the pain is in glands, the stone was in the navicular fossa, if the pain is anterior urethra, the stone was in bulbar or pendulare urethra, and if the pain is in perineum and rectum, the stone was in the prostatic urethra [2-3].

Most Urethral stones were located in the anterior urethra in 47 patients with details of 23 patients in the navicular fossa, 19 patients in the bulbar urethra, and 5 patients in the pendulare urethra. For posterior urethral stones there were 12 patients and all of them were located in membranous urethra. In the study conducted by kamal et al, urethral stones were located in the posterior urethra in 45 patients (88%), in the penile urethra 4 patients (8%) and in the navicular fossa 2 patients (4%) [1].

The initial treatment on anterior urethral stones was anterior lubrication and 2 patients were successful and 4 patients failed performed anterior lubrication. For posterior urethral stones, posterior lubrication was performed and 18 patients were successful and 16 patients failed. In 8 patients

performed Percutaneous cystostomy to relieve symptoms of acute urinary retention in patients. The most definitive treatments were dorsal meatotomy and meatoplasty in 24 patients. Based on Akhtar et al.'s report, treatment of stones in the external urethral meatus was performed meatotomy on 3 patients (15.7%). In 6 patients (31.5%) with impacted urethral shaft stones a suprapubic catheter was placed to relieve symptoms of acute urinary retention. Then proceed with Urethrolithotomy with general anesthesia. Before urethrolithotomy is attempted lubrication is done with lubricant so that the stone is pushed distally, but if the procedure is failed, urethrolithotomy was performed [2]. In the case reported by Asli et al., women with 1,4 cm urethral stones performed endoscopic treatment to push the stone into the bladder. and continued with vesicolithotripsy [4].

The largest size urethral stone in this study was 6 cm and the treatment was urethrolithotomy. Urethrolithotomy requires special attention when closing urethrotomy. The use of fine suture material, urethral stents, and sutures must be watertight without sacrificing the supply of blood vessels. The urethra must be met when the procedure is performed. That way, the possibility of narrowing of the urethra and urethrocutaneous fistula can be avoided. In the study conducted by Akhtar et al, no complications were found. Interrupted sutures are more effective for getting good results and no complications are found as noted in the study of Akhtar et al. If edema of the tissue is found at the location of the impacted urethral stone, continuous sutures are easy to detach [2].

Whereas in the cases reported by kaczmarek et al. with large urethral stones, the patient presented with suprapubic pain symptoms and found urethrocutan fistule in the scrotum. From the results of Non Contrast Computerized Tomography (NCCT), an anterior urethral stone measuring 7.5x6.5 cm was obtained and a urethrotomy was performed to extract stones [5]. In another reported case, Demir et al. successfully managed patients with prostatic urethral stones measuring 7 x 6.5 cm with endoscopic procedures such as laser and pneumatic lithotripter [6]. Prabhuswamy et al reported that a 10.2x45 cm dumbbell-shaped vesico-prostatic urethral stone was taken using an open transvesical procedure [7]. Large urethra has been reported in women and children. Susco et al. reported female patients with large stones localized to the urethral diverticulum that were treated with litholapaxy. The shorter length of the urethra in women gives easier access to stones in women. and continued small incisions in the bladder [8]. In rare

cases reported by Rivilla et al, a 6-year-old girl with urethral stones 5.8x2.5 cm was permormed suprapubic approach and followed by a small incision in the bladder [9].

Calcium oxalate stones were found in 40 patients followed by uric acid stones in 14 types of patients and 5 patients with struvite stones. According to the research of Alaya et al. from the results of stone analysis, it was found that the most urethral stones are calcium oxalate stones. Calcium oxalate stones are generally reported to be the most common type in urinary tract stones and are found mostly in developed countries [10]. Based on research from Kamal et al., the calcium oxalate stones were found in 44 patients (86%), struvite stones were found in 3 patients (6 %), calcium phosphate and uric acid 1 patient (2%) [1]. Calcium oxalate stones are the most component in 86-100% of migrating urethral stones, components that are primarily related to upper urinary tract stones and rarely found in bladder stones that are dominated by components of struvite and uric acid. Furthermore, one study showed that only 2% of patients with migrating urethral stones had associated bladder stones, while 18% were found to have other diseases, that was upper urinary tract stones [3]. Based on the results of stone analysis in this study, urethral stones are those from the upper urinary tract stones that migrate to the urethra.

Conclusion

From this study it was found that urethral stones occur mostly in men aged 51-60 years. Patients present with complaints of urinary retention. The most urethral stones are located in the naviculare fossa of 1-2 cm in size. The most common treatments are Dorsal meatotomy and meatoplasty. From the results of stone analysis, the most are calcium oxalate stones.

Acknowledgment

We thank the Department of Urology, Faculty of Medicine Universitas Brawijaya, Saiful Anwar General Hospital and all the stakeholders who made this publication possible.

Conflict of Interest

The authors declare that they have no conflict of interests.

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