Urethral Catheterization for Urinary Retention in Women

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Abstract

Introduction: Urinary retention is the inability to voluntarily pass urine with female:male ratio of 1:13. It may result from obstruction, infection, stenosis, etc. Urinary tract infection (UTI) causes inflammation and swelling of the urethra resulting in compression of the urethra and urinary retention.

Objectives: Urinary retention in women is a rare occurrence and thus needs further evaluation.

Case Presentation: 54 years old female were admitted to the ER with urinary retention and dull suprapubic pain, she had the history of diabetes and difficulty to urinate since 3 months ago. The bladder was quite distended. Insertion of 16-Fr foley catheter was attempted, and the output was around 20 ml of cloudy-yellowish fluid, with the second attempt of 24-Fr three-way foley catheter, around 1000ml of urine -suggestive of pyuria- was drained. Abdominal USG reported bilateral hydronephrosis, sludge debris in the bladder, and chronic cystitis.

Discussion: The etiology of obstruction in this patient is cystitis that associates with diabetic bladder dysfunction. Risk factors for cystitis which we found in this patient are female, post menopause, old age, previous UTI, and diabetes. Diabetes may lead to diabetic bladder dysfunction with impaired detrusor contractility resulting in impaired bladder emptying and elevated residual urine. These conditions may result in chronic cystitis and the buildup of sludge debris on the bladder obstructing the hole of the urethral catheter. Thus, a larger size with a larger hole catheter that can evacuate the sludge debris is needed.

Conclusion: In female patients with urinary retention and UTI and failure of urethral catheterization without resistance and contraindications, we recommend using larger size of urethral catheter before suprapubic catheter.
Keyword: Urinary Retention, Cystitis.

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INTRODUCTION

Urinary retention, one of the most prevalent emergency urological complaints, is the inability to voluntarily pass urine completely or inadequately and can be acute or chronic etiologies (Juma, 2014; Serlin et al, 2018; Dougherty et al., 2021).[1,2,3,4] The inability to urinate may be combined with suprapubic pain, bloating, urgency, distress, or mild incontinence (Serlin et al., 2018).[2] It is much more common in men rather than women due to benign prostatic hyperplasia (BPH). There are estimated 3 cases per 100000 women every year with female to male ratio 1 to 13 (Marshall et al., 2014).[5] Thus, urinary retention in women is a rare occurrence that needs further evaluation.

A blockage may result from mechanical obstruction by masses or stones, infection, stenosis, neurological dysfunction, drugs, psychogenics and iatrogenics/ other (Juma, 2014; Serlin et al, 2018; Chern et al., 2017; Hernandez et al., 2013).[1,2,6,7] Two of the most common causes of chronic urinary retention in women are obstruction and bladder muscle dysfunction. An urinary tract infection (UTI) causes inflammation and swelling of the urethra resulting in compression of the urethra and urinary retention (Dougherty et al., 2021).[4] The emergency treatment for urinary retention with a distended bladder is urethral catheterization. In case of failure or contraindication like stricture, recent urethral/bladder surgery, pelvic/ perineal trauma or bloody discharge, the next procedure is suprapubic catheterization and urology consultation. Physicians should be aware that high volume urinary retention may cause hydronephrosis and acute renal failure (Serlin et al., 2018).[2]

CASE PRESENTATION

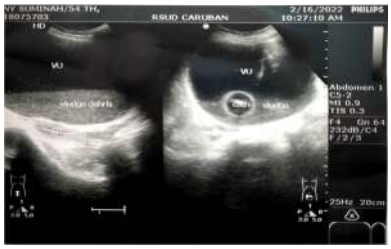
A 54-year-old female patient was admitted to the emergency department with chief complaint of being unable to urinate since two days ago. The patient also complained about dull supra-pubic pain and slight abdominal distention since the chief complaint started. She has the history of admission in our hospital 3 weeks before with the same problem. She was hospitalized and had been catheterized for 6 days, she was also diagnosed with diabetes type II with HbA1C level of 9,1%. Other

complaints like fever were denied, but the patient had difficulties to urinate since 3 months ago. On the vital sign exam, her blood pressure was 140/90 mmHg, with pulse rate-110x/min, respiratory rate-20x/min, and her body temperature was 36,3°C. General physical examination showed a palpable bladder up to the middle between the umbilical and pubic symphysis. Insertion of 16-Fr urine catheter was attempted, there were no resistance and bloody discharge during the insertion. The output was around 20 ml of cloudy-yellowish-color fluid, and the bladder distention still has not been reduced in physical examination. Laboratory examination showed slight anemia (Hb-12 g/dL) with leukocytosis (total leukocyte count-35.200/mm3), her creatinine serum was normal, with severe hyponatremia (Na-110 mmol/L).

(**Figure 1**. Slight suprapubic distention)

Patient was admitted to the inpatient room, and after further evaluation, the insertion of 24-Fr three-way Foley catheter was attempted, and around 800 ml of cloudy-yellowish urine was drained. From the microscopic urinalysis report full of leukocytes, 4-6 of erythrocytes, and +1 bacterial (suggesting infection), and broad-spectrum antibiotics therapy (Meropenem 1 gram IV, bid) was started. **Figure 2** shows the abdominal ultrasound examination showed bilateral grade I

hydronephrosis, and static urine due



to sludge debris in bladder, suggestive of chronic cystitis. Patient showed improvement on the follow up period after 3 days of admission with increasing appetite and decreased level of leukocytes.

(**Figure 2**. Abdominal ultrasonography examination showed bilateral grade I hydronephrosis and static urine due to sludge debris in the bladder)

(Figure 3. Urine product)

DISCUSSION

Urine retention algorithm

As stated on the introduction, urinary retention is much more rarely found in woman, this is due to BPH as the most common causes, an estimated female to male ratio in urinary retention case is 1 to 13 and just 3 cases per 100000 women every year, however, not many literature has discussed about urinary retention in woman. Around 37.5% of cases in woman presented with acute urinary retention and came with no apparent causes, these make general practitioners used various treatment modalities to treat, thus the outcomes are more difficult to predict when compared to male patient. Most common causes of urinary retention in woman is due to neurogenic bladder and obstruction. In patient with the suspicion of neurogenic bladder, the physician should examine the history of neurologic diseases and diabetic neuropathy. A urinary tract infection also can cause swelling in the urinary tract such as urethra and the bladder, this condition can lead to compression of the urinary tract and caused urinary retention. Urinalysis, other imaging and lab test should be examined for all patient with urinary retention, post-void residual volume is also necessary to diagnose the the urinary retention and the necessity of catheterization (Billet, 2019; Yenli et al., 2015).

In acute urinary retention, after confirming palpable bladder and assess the urethral access, the immediate treatment is to attempt catheterization using 16 Fr catheter to decompress the bladder, if catheterization is not successful, consider do the suprapubic tube or

urethral catheter placement. For general use, size 12-16 Fr catheter are used for drain clear, dilute urine, meanwhile size 16-18 are used for urine containing debris, and size excess of 18 are reserved for patient with hematuria and clots which may occlude the smaller lumens. Size 20 catheter also usually used for patient with moderate to heavy clots, very cloudy urine, and very heavy debris (Dougherty, 2021; Pomfret, 1996; Robinson, 2006).

Pathophysiology and risk factor of cystitis

Cystitis, an infection of the urinary bladder, mostly caused by Escherecia coli either uncomplicated or complicated cystitis. The spectrum of microbial pathogens is broader on complicated cystitis that may include organisms such as Enterobacter, Citrobacter, Serratia, Pseudomonas, Enterococci, Staphylococci, and fungi. Appr NJoximately the incidence of UTI in women is 12% and bacteriuria is more common on diabetic women than non-diabetic (Li and Leslie, 2022).

Some risk factors associated with cystitis are woman, pregnancy, frequent sexual intercourse (4-5 times a week), lack of post-coital urination, changes in bacterial flora, previous UTI, post-menopausal state, old age, diabetes mellitus (DM), chronic kidney disease (CKD), hypertension, cerebrovascular accident (CVA), neurogenic bladder (NB), and intermittent or permanent urinary catheterization (Li and Leslie, 2022; Storme et al., 2019; Choi et al., 2021)

History of DM, CKD, and NB were significant risk factors of emphysematous cystitis that have poor prognosis (Choi et al., 2021).

Diabetes is associated with diabetic bladder dysfunction with a triad of decreased bladder sensation, increased bladder compliance and capacity, and impaired detrusor contractility. It affects roughly 50% of patients with long standing and poorly controlled diabetes. These result in impaired bladder emptying with resultant elevated post-voiding residual urine. Polyuria causes significant bladder hypertrophy in the early stage of diabetes, meanwhile Chronic hyperglycemia causes oxidative stress that plays an important role in the late stage of bladder dysfunction (Liu et al, 2014; Wittig et al., 2019). These conditions may result in chronic cystitis and the

buildup of sludge debris on the bladder obstructing the hole of the urethral catheter. Thus, a larger size with a larger hole that can evacuate the sludge debris is needed.

CONCLUSION

In female patients with urinary retention suspected urinary tract infection and failure of urethral catheterization without resistance and contraindications, we recommended to try larger size urethral catheterization before suprapubic catheter.

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