
PEDIATRIC BLADDER STONE IN SECONDARY HOSPITAL CARE SETTING: A CASE REPORT

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Abstract. Bladder Stone is a rare disease accounting for 5% of all urinary calculi. It more common in middle and low-income countries due to nutritional obstacles, water sanitation, and warm climates. Prompt diagnosis and management of pediatric bladder stones are essential for preventing recurrence stones and improving quality of life. It has several surgical approaches. The objective is reporting a child with a bladder stone that came to secondary hospital setting and the best management based on it. This report is qualitative observational study. Material came from direct interview and from medical record. The stone successfully managed with open cystolithotomy.

Keywords: pediatric; bladder stone.

INTRODUCTION

Bladder Stone is a rare disease accounting for 5% of all urinary calculi (Cicione et al., 2017). It more common in middle and low-income countries due to nutritional obstacles, water sanitation, and warm climates (Mohamed et al., 2021). Bladder stone in children is common in West Sumatra, with an incidence of 8.3/100,000 population, and the peak age of 2–4 years seen in families with a diet low in protein and phosphates. Many children suffer from diarrhea (Soliman & Rizvi, 2017).

Bladder stones classify as primary, secondary, and migratory. Primary or endemic bladder stone occurs without other urinary tract pathologies. Secondary bladder stone involving other urinary tract abnormalities. A migratory bladder stone is from the upper tract (Donaldson et al., 2019). There is different management of bladder stones between pediatric and adult. It has several surgical approaches: Open cystolithotomy, percutaneous cystolithotomy and transurethral cytolithotripsy (Rezk-Allah et al., 2019). Our objective was to report a pediatric bladder stone case that come to secondary hospital setting.

MATERIALS AND METHODS

This case report method is qualitative observational study with retrospective approach. We got one case as the sample and population of this study that came to Doris Sylvanus General Hospital Palangkaraya, a secondary hospital. The material collected through direct interview

and medical record then discussed qualitative with recent literature.

RESULTS AND DISCUSSION

Case Report

We present a pediatric bladder stone case: A six-year-old Boy came to our Urology clinic in Doris Sylvanus General Hospital complaining of lower abdominal pain and intermittent painful voiding without hematuria, aggravated by movement, one month before admission. Sometimes he experienced micturition difficulties and pulled his penile on occasion. There was a history of Colostomy in his early life due to Hirschsprung disease, multiple admission to the hospital due to diarrhea with moderate dehydration, and circumcised due to phimosis. There was no family history of stone disease. On physical examination, there were two surgical scars in the right lower quadrant. Mass in the suprapubic region that painful on palpation. The laboratory investigation found a slight Anemia (Hb: 9,5g/dl), Leukocyturia (More than 5 Leucocytes on a microscopic level), and hematuria (2-5 erythrocytes on a microscopic level). There were normal blood Urea and creatine serum level, and other laboratory results were also. Ultrasonography showed a bladder stone with 2, 4 x 1, 8cm size. We performed open cystolithotomy with the stone completely extracted. The patient has an indwelling catheter for seven days without complication noted during those days after the operation. Three months follow up after surgery patient was symptom-free. The best management in our hospital setting was open

cystolithotomy.

Discussion

A Pediatric bladder stone is a rare disease. In the last five years, there are few reports about this condition. (Mohamed et al., 2021) reported a giant bladder stone with 152 grams and 7 cm in diameter (Mohamed et al., 2021). (Palinrungi et al., 2020) reported a giant bladder stone in a seven-year-old girl forming around a sewing needle. (Patodia et al., 2017) reported bladder stone in a ten-year-old girl that lead to Acute renal failure. Dharma et al reported bladder and urethral stone in 12-year-old child (Sharma et al., 2018). We report bladder stones in a six-year-old boy with 2,5 cm in diameter.

Endemic bladder calculi form as a result of two factors that are Dietary and nutritional deficiency promoting crystalluria and chronic dehydration related to diarrheal diseases, high ambient temperature, and limited water supply, with the subsequent reduction in urine volume leading to urinary supersaturation. Most endemic bladder calculi composed of ammonium acid urate (AAU) or mixtures of ammonium acid urate (AAU), CaOX, and calcium phosphate (CaP) (Soliman & Rizvi, 2017). A previous study identified metabolic risk factors in 248 (98 %) patients. Majority of pediatric bladder stone were less than 5 years old. Low protein diet, dehydration, use of goat milk and poor socio-economic conditions were major risk factors identified for development of bladder stones (Lal et al., 2015). The common risk factors were hypocitraturia in 83 %, hyperoxaluria in 40 %, hyperuricosuria in 33 %, hypocalciuric

in 33 % and low urinary volume in 29 % (Imran et al., 2017). A detailed metabolic work of children can identify risk factors in a majority of the patients. It can help not only to modify the treatment but also prevent strategies for recurrence (Imran et al., 2017). A substitutive feeding in newborns with high carbohydrate diet can become the root cause or precipitating event in initiation of primary bladder stones (Halstead, 2016).

Bladder stones can classify as primary, secondary, and migratory (Donaldson et al., 2019). In our case, besides the hot temperature in Borneo Island, the patient also experienced dehydration due to diarrheal episodes and previous urinary tract infections that promoted stone formation. Our case is likely endemic pediatric bladder stone/primary bladder stone, though stone and metabolic analysis are not available in our facility. Curing metabolic disorder, prevention of dehydration and treatment of urinary tract infection can reduce the incidence of pediatric bladder stones.

The disease is common in male children, with a male to female ratio of 10:1. Presenting features include persistent discomfort or pain in the suprapubic or hypogastric area, frequency, urgency, turbid sandy urine, nocturnal enuresis, dribbling of urine, terminal dysuria, hematuria, strangury, and possibly retention of urine as a result of stone impaction at the bladder neck. The male children usually grab their penis because of the radiating pain by the 2, 3 and 4th sacral nerves. A local examination may reveal a palpable bladder and rectal prolapse (Donaldson et al., 2019). The sign and

symptoms in our case are classical findings in pediatric bladder stones. Laboratory findings are suggesting slight anemia and Urinary tract infection present.

Bladder ultrasound is the first test to detect bladder stones. It is cheap and highly available. Cystoscopy is the most accurate to confirm bladder stone presence. An x-ray may show the presence of stones in the bladder. However, uric acid stones may not be visible on x-ray unless they contain calcium. A CT scan can also detect stones in the bladder but usually not used for this purpose because there are cheaper imaging techniques (Cicione et al., 2017). We ruled Ultrasonography, which showed the size of bladder stone 2.5x1.8cm. The volume of the bladder stone in pediatric population can be estimated and compare with their respected bladder volume. (Husein & Sigumonrong, 2021) propose that the term giant bladder stone in children should refer to the Estimated Bladder Volume to Estimated Bladder Capacity ratio above 0.028.

Perineal lithotomy may be the oldest elective surgery in children and was the first operation in a body cavity. With the advent of antisepsis, a supra-pubic cystotomy became the operation of choice (Raffensperger & Raveenthiran, 2019). Modern management of pediatric bladder stones is Open cystolithotomy, Percutaneous Cystolithotomy and Transurethral Cystolithotripsy (Javanmard et al., 2018). Endoscopic, transurethral and percutaneous treatments are associated with comparable stone-free rates but offer a shorter operation, a shorter catheterization duration and a shorter length of hospital stay compared with open

cystolithotomy in both adults and children. Shockwave lithotripsy appears to offer a lower stone-free rate when compared with other procedures but has the shortest duration of hospital stay (Donaldson et al., 2019).

Based on (Yadav et al., 2019) that had complete clearance of pediatric bladder stone using the percutaneous approach in their study. Similar with (Salah et al., 2005). Percutaneous cystolithotomy is a safe and effective method for treatment of endemic bladder stones in children. Open cystolithotomy is considered the gold standard with a high stone-free rate (Javanmard et al., 2018). Due to the Covid 19 Pandemic era and lockdown policy, every district or Secondary care hospital should overcome the challenge and give the best available treatment for the patient. In our hospital, percutaneous and transurethral approaches not available. Open cystolithotomy is the best approach in secondary hospital setting besides the size of the stone and the previous history before. The stone has completely extracted without complication was noted. Three months follow up patient is symptom-free.

CONCLUSIONS

The strategy for lowering the incidence of pediatric bladder stones are curing metabolic disorders, prevention of dehydration, and effective treatment of Urinary tract infection. Prompt diagnosis and management of pediatric bladder stones are essential for preventing recurrence stones and improving quality of life. The best surgery approach is depending on the condition of the patient

and the available option, open cystolithotomy is still the best choice in our secondary hospital setting.

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