



MANAGEMENT OF CALCULUS ANURIA-OUR EXPERIENCE IN A TERTIARY CARE CENTRE

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ABSTRACT

Introduction : Urinary lithiasis have been a major urological problem. The incidence of calculus renal failure is very high in India. Calculus anuria is a urological emergency and needs early emergency intervention (double J stenting, PCN and dialysis) to manage calculus anuria after which definite treatment of stone can be performed. **Methods :** The Prospective study is carried out in Government General Hospital, Guntur from January 2021 to June 2022. 30 patients with calculus anuria of all ages and either sex were included in the study. USG KUB, X-ray KUB and CT KUB were taken for size and site of stone in the urinary tract. Urinary diversion procedures like double J stenting or percutaneous nephrostomy were done on emergency basis to relieve the obstruction. After stabilisation of the patient, definite treatment was planned. **Results:** Among 30 patients who presented with anuria, dialysis was done in 21 patients. Bilateral DJ stenting was done in 21 cases. Unilateral DJ stenting was done in 3 patients with single kidney or single functioning kidney. Unilateral DJ stenting and contralateral PCN for pyonephrosis done in 6 patients. After relief of obstruction and stabilizing patient, definitive treatment of calculi like-URSL, pushback PCNL, PCNL, ureterolithotomy and pyelolithotomy done. **Conclusion:** Calculus anuria is a urological emergency. Dialysis is required in most of cases. Early intervention with DJ stenting/ PCN is initial treatment of choice. After stabilization, majority of the patients can be managed with endo-urological procedures like ureteroscopic-pneumatic/ laser lithotripsy, PCNL.

KEYWORDS : Double J stenting, PCN , calculus anuria , URSL, PCNL, dialysis

INTRODUCTION

Urinary lithiasis have been a major urological problem. A very high incidence of urolithiasis is reported in India, Afghanistan, Indonesia, Middle East, Europe, Netherlands and Scandinavian countries. The lifetime prevalence of stone disease is around 1% to 15%, and it varies according to age, gender, race and geographic location. Urolithiasis disease is more common in males than females. Urolithiasis constitutes about 10% to 25% of the total work load in the urological practice. Urolithiasis is the major cause of obstructive uropathy and 5% of patients presenting with acute renal failure has obstructive uropathy.

Calculus anuria is a urological emergency and anuria can be due to bilateral ureteric calculus impaction or unilateral ureteric calculus impaction of solitary kidney or the only functioning kidney. Prompt and early intervention can save the patient from developing irreversible renal damage. Double J stenting, PCN and dialysis can be used as emergency procedure to manage calculus anuria after which definite treatment of stone can be performed. After relieving the obstruction there is improvement in concentrating and acidifying ability of the kidney and results are better if obstruction relieved earlier.

MATERIAL AND METHODS

The Prospective study is carried out in Government General Hospital, Guntur from January 2021 to June 2022. 30 patients with calculus anuria of all ages and either sex were included in the study. Patients were admitted through emergency and OPD. On admission detailed history of pain, urinary output, fever, hematuria and uremic symptoms with durations were recorded. Urine output between 0-100ml for 24 hours was regarded as anuria.

General physical examination and systemic examination findings were recorded. Blood investigations like blood urea, serum creatinine, serum electrolytes were recorded.

Ultrasonography of KUB area was performed in all cases to note the size and site of stone, presence of unilateral or bilateral kidneys, cortical thickness, echogenicity and degree of hydronephrosis. X-Ray KUB and CT KUB were taken for size and site of stone in the urinary tract.

Urinary diversion procedures like double J stenting or percutaneous nephrostomy were done on emergency basis to relieve the obstruction. Post procedure urine output was recorded. Blood urea, serum creatinine and serum electrolytes were also repeated when required during hospital stay of the patient. Prophylactic antibiotics were administered before any procedure. Once urine culture report was obtained, culture specific antibiotics were started. Hemodialysis was done in patients when required in patients with raised renal parameters. After stabilisation of the patient, depending upon the size and location of the stone, definite treatment was planned. Intra-operative and post-operative complications, time for normalization of RFT and electrolytes were noted.

Inclusion Criteria

All patients who are diagnosed with calculus anuria admitted in Urology wards GGH, Guntur during January 2021 to June 2022.

Exclusion Criteria

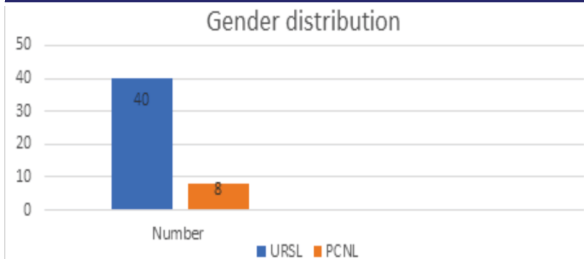
Anuria due to other causes like retroperitoneal fibrosis, malignancy, trauma, TB, schistosomiasis are excluded.

RESULTS

In our study, out of 30 patients, 6 patients were female (20%) and 24 were male (80%), with male to female ratio 4 : 1.

Table no 1. Gender distribution of the cases

Gender	Numbers	Percentage
Male	24	80
Female	06	20
Total	30	100

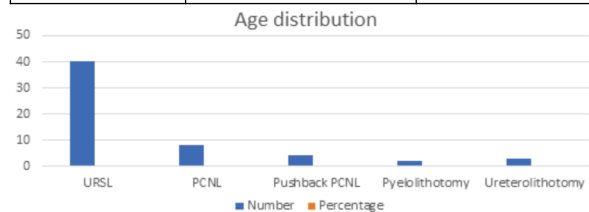


Bar chart-1 Showing Gender Distribution Of The Cases

The age of these 30 patients ranged from 4 years to 72 years with a mean age of 34.8 years.

Table no 2. Age distribution of the cases

Age (years)	Number of patients	Percentage
0-15	03	10
16-30	06	20
31-45	10	66.66
46-60	08	33.33
>60	03	10
Total	30	100



Bar chart-2 showing age distribution of the cases

The duration of anuria varied from 1 to 10 days.

Among 30 patients, 21 of them presented with ureteric colic and 9 of them presented with loin pain. 5 of them had fever at presentation and 16 patients had uremic symptom like vomiting, drowsiness, apathy, muscle twitching and shortness of breath. 8 patients had prior history of treatment for stone disease. 4 patients had hypotension (systolic BP <100 mm of Hg). Serum creatinine at presentation ranged from 4 - 20 mg % with mean creatinine of 10.8. mg%. Hyperkalemia was present in 13 patients ranging from 5.8 to 7.2 mEq/l, who are managed by Inj. calcium gluconate, Sodium bicarbonate, dextrose - insulin infusion along with dialysis. Comorbidities are seen in 9 cases with diabetes mellitus in 4 cases, hypertension in 3 cases, diabetes and hypertension in 1 case and CAD in 1 case. Ultrasonography KUB was performed in all cases; USG detected ureteric calculi in 22 renal units, of which 12 were upper ureteric calculi and 5 were PUJ calculi and 5 were distal ureteric calculi. In 35 renal units ultrasound showed only hydronephrosis or hydroureteronephrosis.

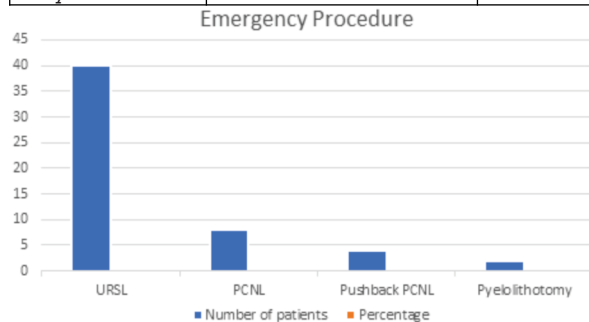
In all patients X-ray KUB was done, of which 15 renal systems showed ROD and 42 systems did not show any ROD. In all the patients NCCT KUB was done. Bilateral ureteric obstruction was present in 17 patients, among these 10 showed bilateral lower ureteric stones and 3 of them showed bilateral upper ureteric stones, 4 of them showed one in upper ureter and one in lower ureter. In unilateral cases of 3 patients, contra-lateral pelvi-ureteric junction obstruction (with thinned out cortex) was present in 1 patient; congenital absent kidney was observed in 1 cases and the other patient had underwent contra-lateral nephrectomy, the stone were present in lower ureter in all 3 cases. The remaining 10 patients showed PUJ stones and lower ureteral stones in contra-lateral kidney. The size of the stone in the study ranged from 0.6cm to 3.5cm. Associated renal calculi in 7 renal units.

Early Management

Among 30 patients who presented with anuria, dialysis was done in 21 patients. Bilateral DJ stenting was done in 21 cases. Unilateral DJ stenting was done in 3 patients with single kidney or single functioning kidney. Unilateral DJ stenting and contralateral PCN for pyonephrosis done in 6 patients.

Table no 3. Emergency procedure done to the cases

Procedure	Number of patients	Percentage
DJ stenting	Bilateral-21 Unilateral-3 (single kidney or single functioning kidney)	80%
DJ stenting + PCN	6	20%
Dialysis	21	70%



Bar chart-3 Showing emergency procedure done to the cases

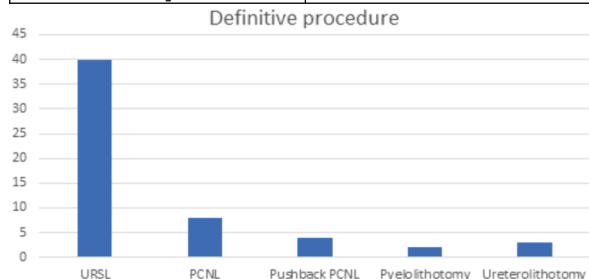
Post obstructive diuresis was observed in 18 patients after early management these patients were managed meticulously so as to maintain euvoalaemia. Serum creatinine was normalized (normal creatinine according to age) in 25 patients after 7- 10 days. In 5 patients, whose creatinine was stabilized between 2-7mg at the end of 10days, were discharged and observed for one month. In those patients who reviewed after one month, the repeated creatinine level normalized in 3 patients, creatinine level decreased but not normalized in 2 patient (2-5mg%). In these patients 4 had comorbid illness like diabetes. Normalized level of creatinine does not depended on initial creatinine. 4 patients with septicemia were managed with higher antibiotics, dialysis and ventilator care, all of them were recovered from the sepsis.

Definitive Treatment

After relief of obstruction and stabilizing patient, definitive treatment of calculi was done.

Table no 4. Definitive procedure done to the renal units

Procedure	Number of renal units
URSL	40
PCNL	08
Pushback PCNL	04
Pyelolithotomy	02
Ureterolithotomy	03



Bar chart-4 showing definitive procedure done to the renal units

DISCUSSION

In the present study, majority of the patients with anuria (70%) have features of ureteric colic. They presented with history of

lack of urine output and vague symptoms of malaise, weakness and loss of appetite or uremic symptoms. This led to delayed presentation and permanent renal damage with poor prognosis. Although ultrasound is highly accurate in diagnosing in renal calculi, it is not very sensitive for ureteric calculi. In the present study sensitivity of ultrasound in diagnosing ureteric calculi was 35%. However sonography was quite sensitive in detecting sequelae of ureteric calculi in the form of hydronephrosis, infected hydronephrosis/pyonephrosis. Internal echoes suggestive of infection were seen in 3 out of 3 patients with pyonephrosis (100%).

X-ray KUB was done in all 30 patients and it shows calculi in 15 renal units with sensitivity of 26.3%. In the present study NCCT KUB scan with thin sections (5mm) was highly sensitive in detecting bilateral ureteric calculi. MDCT can readily diagnose radiolucent stones which may not have been seen on IVU, as well as small stones even in the distal ureter. In the workup of urolithiasis, the unenhanced CT has a sensitivity ranging between 96% to 100% and specificity ranging between 92% to 100%. In our study NCCT has shown all stones with sensitivity and specificity of 100%.

Infection associated with ureteric stone is potentially life threatening urologic emergency. Urgent drainage of obstruction by stenting or PCN is essential. In the present study emergency intervention done by DJ stenting/ PCN in patients with anuria has improved the outcome. Dialysis was required in 21 patients.

Definitive stone therapy should be delayed until urine is sterile and patient has recovered completely. In the present study 6 patients who had associated infection along with anuria. Emergency PCN was done in all. In the present study the factors taken into consideration in choosing treatment modality include size of the stone, location, presence of nephrostomy and associated comorbidity. URSL was the primary treatment modality in the present study. URSL was done in 40 renal units. The energy source used are Pneumatic lithotripsy for lower stones and laser lithotripsy for upper ureteric stones.

Unilateral pushback PCNL was done for 4 patients with upper ureteric calculi. In an about 8 patients who have PUJ stone was managed by PCNL. Open surgery done in 5 patients (pyelolithotomy in 2 patients, ureterolithotomy in 3 patients) depending on stone burden. Our study showed minimal postoperative complications like mild hematuria which lasted for 1 to 2 days following URSL and PCNL which were managed conservatively. In our study post-obstructive diuresis was seen in 18 patients after emergency treatment.

Serum creatinine was normalized (normal creatinine according to age) in 25 patients after 7- 10 days. 5 patients reviewed after one month, the repeated creatinine level normalized in 3 patients, creatinine level decreased but not normalized in 2 patients (2-5mg%). Initial serum creatinine level and level of obstruction had no influence on the reversibility of renal failure. Sepsis is the main cause of morbidity and mortality (5.4%). 4 patients needed ventilatory support (critical care). All patients improved with supportive care. No mortality noted in the present study.

CONCLUSION

Calculus anuria is a urological emergency and outcomes are excellent when diagnosis is made early and prompt treatment given. Dialysis is required in most of cases. Early intervention with DJ stenting/ PCN is initial treatment of choice. The factors influencing the reversibility of renal failure include age, associated comorbidities (DM, HTN), duration of obstruction, associated sepsis, cortical thickness, diuresis after relieving obstruction. Initial creatinine or level of obstruction had no influence on the reversibility of renal failure. Majority of the

patients with calculus anuria can be managed with endourological procedures like ureteroscopy and pneumatic/ laser lithotripsy, PCNL which represents a safe and effective treatment modality with high stone free rate and minimal postoperative complications.

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