CALCULUS ANURIA AND ITS REMEDY

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Background: Urinary lithiases have been a major urological problem. The objective was to determine the out come of treatment for patients with calculus anuria. **Methods:** A descriptive study was conducted at Department of Urology Chandka Medical College Hospital, Larkana from March 2007 to April 2009. All patients with a diagnosis of calculus anuria of all ages and either sex were included in the study. Detailed history, physical examination and examination of genitourinary tract was performed. Investigations included complete blood examination, blood urea, serum creatinine, ultrasonography of KUB area, and X-Ray KUB. **Results:** Among the 66 patients the cause of anuria was bilateral obstruction by the calculi in 46 cases, unilateral obstruction with small/absent/ nephrectomised contralateral kidney in 20 cases. In most of the cases, ureteric catheterisation was done to relieve the obstruction. Five deaths were observed, despite emergency urinary diversion and appropriate treatment. **Conclusion:** Calculus anuria is a urological emergency. Prompt and early intervention can save the life of patient and prevent to develop chronic renal failure.

Keywords: Anuria, calculus, and management

INTRODUCTION

Urinary lithiases have been a major urological problem. A very high incidence is reported in Pakistan, Northern India, Thailand, Afghanistan, Turkey, Egypt, Japan, Indonesia, Middle East, Europe, Netherlands and Scandinavian countries.[1,2] In Pakistan the incidence of calculus renal failure is high.[3] Urolithiasis constitutes about 10% to 25% of the total work load in the urological practice.[4] In about 5% of the patients presenting with acute renal failure, the cause is obstructive uropathy and urolithiasis is the most common cause of obstruction.[5]

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.

After the onset of obstruction, there is increased intrapelvic pressure, resulting in pyelolymphatic and pyelovenous urine back flow as well as fornix rupture and urine extravasation.[6] Therefore, the obstruction of the urinary tract causes significant kidney damage. Prompt and early intervention can save the patient from developing irreversible renal damage.

Retrograde ureteric catheterisation, PCN, haemodialysis and peritoneal dialysis can be used as emergency procedure to manage calculus anuria after which definite treatment of stone can be performed, or an emergency operation can be performed in well equipped centres.

After relief of obstruction, kidney and life of the patient can be saved, results are better if obstruction is relieved earlier. After relieving the obstruction there is improvement in concentrating and acidifying ability of the kidney.[7]

Purpose of this study was to determine the out come of treatment for patients with calculus anuria.

MATERIAL AND METHODS

This study was carried out in the department of Urology Chandka Medical College Hospital, Larkana from March 2007 to April 2009. Sixty-six 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, haematuria, and uremic symptoms with durations were recorded. Urine output between 0–100 ml/24 hours was regarded as anuria. General physical examination and systemic examination with especial reference to genitourinary tract was done and positive findings were recorded. Investigations included complete blood examination, Blood Urea, Serum Creatinine, serum electrolytes. Ultrasonography of KUB area was performed in all cases to see the size of stone, site of stone, degree of hydronephrosis, echogenicity, renal cortical thickness, and presence of either kidneys or solitary kidney. X-Ray KUB was taken for size and site of stone in the urinary tract.

Urinary diversion procedures like ureteric catheterization or percutaneous nephrostomy under ultrasound guidance were done on emergency basis to relieve the obstruction. X-ray retro-/ante-grade pyelography was done according to procedure. Post procedure urine output was recorded; blood urea, serum creatinine, and serum electrolytes were also repeated when required during hospital stay of the patient. Haemodialysis or peritoneal dialysis was done in patients where required, after which definite treatment of calculi done.

RESULTS

Of the 66 patients, 40 (60.6%) were male and 26 (39.3%) were female, with male to female ratio 1.5:1.

The age ranged from 1 year to 65 years. Mean age was 31 years (Table-1). The duration of anuria varied between 1 to 8 days. Ultrasonography was performed in all cases; stone was detected in 38 (57.5%) cases and in 28 (42.4%) cases only hydronephrosis was observed. In 62 patients X-Ray KUB was performed to confirm the stones, among these in 30 cases stone was not seen on X-Ray KUB may be because of radiolucent stone, in 27 cases stones were visualised, in 5 cases there was suspicious shadow of stone, and in 4 cases X-ray was not done. Level of blood urea and serum creatinine was done in all cases which ranged from 68 to 310 mg%, and 1.8 to 16.7 mg%, respectively. Bilateral obstruction was present in 46 (69.6%) cases and unilateral in 20 (30.3%) cases. In unilateral cases contra lateral smaller kidney was present in 10 patients; congenital absent kidney was observed in 1 case, where as in 9 cases already nephrectomy had been done due to non-functioning diseased kidney (Table-2).

Ureteric catheterization as an emergency urinary diversion was done in 54 (81.8%) patients to relieve the obstruction (Figure-1). Percutaneous nephrostomy (PCN) was performed in 8 (12.1%) cases. Hemodialysis Peritoneal dialysis was done in 4 (6.0%) cases.

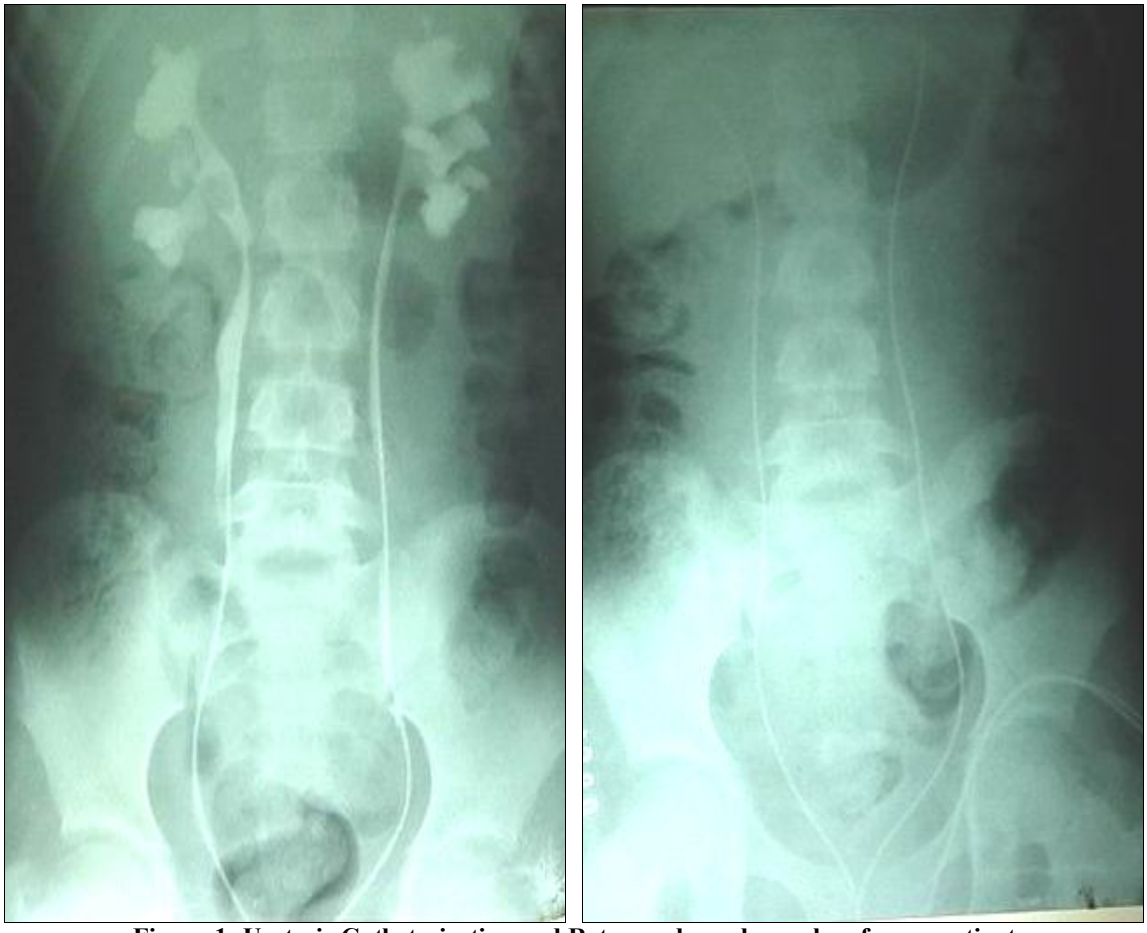

Figure-1: Ureteric Catheterisation and Retrograde pyelography of same patient

After relief of obstruction and stabilising patient, definite treatment of calculi was done. Pyelolithotomy was performed in 35 (53.0%) patients, because stones were present at pelviureteric junction. Ureterolithotomy was done in 19 (28.7%) cases, Ureterorenoscopy (URS) and lithoclast (Pneumatic) in 5 (7.5%) cases. Double J stent and Extracorporeal Shock Wave Lithotripsy was done in 2 (3.0%) patients, 5 (7.5%) patients expired, despite emergency urinary diversion and appropriate treatment (Table-3).

Table-1: Age distribution of calculus anuric patients

Age (years)	No. of Patients	Percentage
1–9	32	48.48
10–19	4	6.06
20–29	3	4.54
30–39	3	4.54
40–49	9	13.63
50–59	7	10.60
60–69	8	12.12

Table-2: Obstruction and cause of single kidney

Obstruction	No. of Patients	Percentage
Bilateral	46	69.6
Unilateral	20	30.3
Unilateral		
Small Kidneys	10	
Congenital absent Kidney	1	
Nephrectomy	9	

Table-3: Definite Treatment

Treatment	No. of Patients	Percentage
Pyelolithotomy	35	53.0
Ureterolithotomy	19	28.7
URS & Lithoclast	5	7.5
DJ & ESWL	2	3.0
Patients Expired	5	7.5

DISCUSSION

Calculus anuria occurs in patients with ureteric obstruction in a solitary kidney, obstruction in the only functioning kidney or in bilateral obstructed kidneys. The mechanism of renal damage in obstruction is not well understood. However possible mechanism is high intrapelvic pressure and decrease renal blood flow. Reversibility of renal function depends upon the duration and degree of obstruction. In one experimental study where there was severe partial obstruction of the ureters for 60 days the reversibility of renal function was only 8% over a period of one month after the relief of obstruction.[8] In an other clinical study it was proved that prolonged obstruction caused irreversible renal damage.[9] Return of renal function depends upon many factors other than the duration and degree of obstruction, such as absence of infection, presence of intra-renal or extra renal pelvis in obstructed kidneys.[10]

About 92% of patients with calculus anuria were cured in our study, and only 7% of patients were expired. There fore results of our study are comparable with the results of Zhonghua *et al*, but difference is that we did emergency urinary diversion first, and after stabilizing the patient definite procedure was performed, where as in the study by Zhonghua *et al* they did emergency operation in majority of cases.[11]

The Jiang H *et al*, in their study they performed Ureteroscopy and Holmium Yag Laser lithotripsy as emergency treatment in patients with acute renal failure caused by impacted ureteral calculi[12], such type of management only be performed in a well equipped centre. In our cases we performed emergency urinary diversion first.

In our study majority of patients were children, Mohammed A. Elgammal *et al*, they had conducted a study on 54 children of calculus anuria, and concluded that formal surgery in compensated children is associated with good out come and early recovery.[13] They are of opinion that urinary diversion in children is associated with high complication rate while dialysis is highly effective. We did urinary diversion in 62 (93.9%) patients in our study and dialysis only in 4 (6.0%) patients with promising results.

Calculus anuria is a urological emergency. Management in form of urinary diversion and definite surgical treatment can save the patient from developing chronic renal failure.[14]

CONCLUSION

Out come of patients with calculus anuria is good, if early diagnosis is made and prompt treatment should be given on emergency basis.

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