



Original Article

Clinical Study and Surgical Management of Renal Stone

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ABSTRACT

Background: Renal stone or calculus is one the most common disease of the urinary tract. Sharp, server pain from the kidney stones brings over 4,50,000 people to emergency department every year. The surgical management of renal stone disease have changed dramatically. Here a clinical study of 25 patients of renal calculus has been under taken. An attempt has made to study the ectiopathology of stone formation with clinical features and its surgical management.

Methods: in this study all patients diagnosed as renal calculi and admitted in surgical and urology wards at heritage institute of medical sciences varanasi during the period of October 2016 to june 2017. A detailed history, complete physical examination routine and specific investigation were done.

Inclusion criteria:

- All Cases of renal calculi managed by non operative medical line of treatment.
- Stones below the pelviureteric junction.
- Renal stones in immune compromised patients.
- Associated neoplaisa (Benign, and malignant)
- Associated congenital renal ureteric and urinary bladder anomalies.

Results and Conclusion: 25 cases were studied, incidence is common between 3rd and 5th decase. 14 (56%) were of mixed diet. All the 25 cases have presented with pain in the lumbar region of login. After investigations different surgical procedures were under taken on these patients and there were no operative difficulties encountered. Out of 25 patients only 15 patients turned up for follow up all were symptom free till their last visit, remaining 10 patients did not come for follow up all were symptom free till their last visit, nephrolithiasis, pyelolithotomy, Nephrolithotomy, nephrectomy, PCNL, ESWL;, X- ray KUB, intravenous urography.

INTRODUCTION

Antherological history provides evidence that urinary calculi existed as long as 7000 year ago and perhaps more. The specialty of urologic surgery was even recognized by Hippocrates-who in this famous oath for the physician started

“I will not cut even for the stone but leave such procedures to the practitioners of the craft”. The recognitions of the different variery of stones also resulted in more varities of medical treatment most of which failed during the last decade however many major advances have greatly

improved our understanding of the cause of stone diseases. Although not all calculi can be cured, patients who develop one of the major types of urinary calculi now have at least 50% changes of cure and control with medical therapy alone. Surgery continues to be as one aspect of treatment of urinary calculi, but it is now only one step in the total therapeutic plan for patients with urinary lithiasis.

Urinary stone disease has perplexed the physicians for many centuries. The disorder occurs in tow form endemic bladder stone which occurs in boys in the developing agricultural countries of the world and upper urinary tract stone disease which is becoming increasing more prevalent particularly in men among the more affluent nations. There are much literatures on urinary lithissis that describes crystallization process in urine, and the understanding of urinary stone disease. So it is better review the principles of crystallization in biological systems as they pertain to urinary system. There after I will discuss some specific aspects of diagnosis of urinary calculi and discuss necessary clinical, radiological and laboratory studies. An attempt. Will be made to survery the problem of renal damage caused by stones in the discussion of the pathophysiology of obstruction due to urinary calculi, nephrocalcinosis and urinary tract epithelial changes related to urinary lithiassis, I will next classify the individual patient activity of this disease. Based upon this classification I will discuss specific treatment available for specific types of stone disease.

Even to-day inspite of sophisticated research techniques and expanded understanding of disease process, urinary are major problems. In recent year on average of one in every 1000 resident in the United states has be hospitalized for urinary stones¹. Some authorities have recorded the incidence of renal stones at autopsy as slightly more than one percent. Other authors claim as high as 5% in only about 0.4% renal calculi are responsible for death either directly or indirectly. No age group in spared and calculi can be found

in children² Nevertheless the prime age group in which calculi occurs is between 20 and 50 years of age³.

Renal calculi may be solitary or multiple and may either remain in the pelvis of the kidney or pass down the ureter⁴ (A calculus which remains in the kidney or pass down the ureter). A calculous which remains in the kidney may grow to a large size and eventually from a cast of entire calyceal and pelvic collecting systems. The so called stage horn calculus which in turn may damage the renal parenchyma or obstruct the flow of urine resulting the hydronephrosis or pyonephrosis.⁵

As the incidence of patients suffering form urolithiasis are increasing in the department of surgery heritage institute of medical sciences ,Varanasi.it was felt that a clinicopathological study of nephrolithiases has been undertaken for the purpose of dissertation. An attempt has been made to study the aetiopathology of stone formation with clinical features and its surgical management.

This dissertatin is in two parts. The first part consist of review of literature. The second part consists of summary of 25 cases of renal calculi selected from cases admitted to surgical wards of HIMS, varanasi.

AIMS AND OBJECTIVES

- To study the patients with renal stones with regards to various variables like age, sex, and occupation.
- To study the mode of presentation of renal stone.
- To study various predisposing factors of renal calculi.
- To study the different surgical methods for management of renal stones at HIMS Varanasi.
- To study the analysis of the stone.

MATHEIALS AND METHODS

The material for clinical study of renal lithiasis was selected from the cases admitted to surgical and Urological wards of Heritage Institute of Medical Sciences, Varanasi from October 2016 to June 2017. The selection of cases was based on clinical symptoms and radiological findings.

The cases studied were of all the groups and both sex. The number of cases studied is not so big as to draw definite conclusions. However an attempt has been made towards it.

The patients were first seen at outpatient departments. A detailed history, physical examination, urine examination and plain x-ray (KUB- region) was done. Before the patient was admitted to the hospital A case history was recorded in detail as per the proforma and any salient feature and summary, of the cases were recorded.

General questions regarding the patients habits (appetite, sleep and bowel) were enquired. A note was recorded regarding the previous history of urolithiasis prolonged illness previous operations or any instruction, urinary infection, colic and treatment.

General physical examination was done then detailed systemic examinations were done and the signs observed were recorded in proforma case sheets, with due importance to genitourinary system.

Rectal examination was done in males, vaginal examination in case of females.

The following necessary investigations were after a thorough clinical examination of the patient.

Urine: A clean specimen of urine (in males midstream and females catheter specimen) were sent for a detailed examination for macroscopic, microscopic, biochemical and bacteriological examinations).

Blood: A routine blood examination was done such as R.B.C. count, Hb%, W.B.C. count. Blood urea, special investigations like serum calcium, serum phosphate were done and noted.

Radiological findings : A routine plain x-ray KUB region. Ultrasound abdomen and I.V.U. in the patients were done.

In pre-operative period treatment was given to correct anaemia malnutrition and infection (A preoperative radiography of KUB was taken for all patients prepared for operation on the day of surgery).

Then the patients were submitted for surgery under general anaesthesia/ SAB/ Epidural depending upon the general condition of the patients. The stones removed were sent for biochemical analysis.

Analysis of data and Discussion

The incidence of renal calculus and aetiological factor are studied from the cases admitted in the surgical wards of HIMS, Varanasi.

Data as regards to age, sex, clinical presentation and investigation of 25, hence it may not be ideal representative sample for comparative study regarding incidence and aetiological factors of renal calculus, However, and attempt has been made towards it.

Results and Discussion

Age incidence

The age incidence in my series is 2.5 to 55 years.

Table No. 1 Age distribution

Age (yrs)	No. of cases	Percentage
	1	4
11-20	1	4
21-30	5	20
31-40	7	28
41-50	8	32
51-60	3	12
Total	25	100

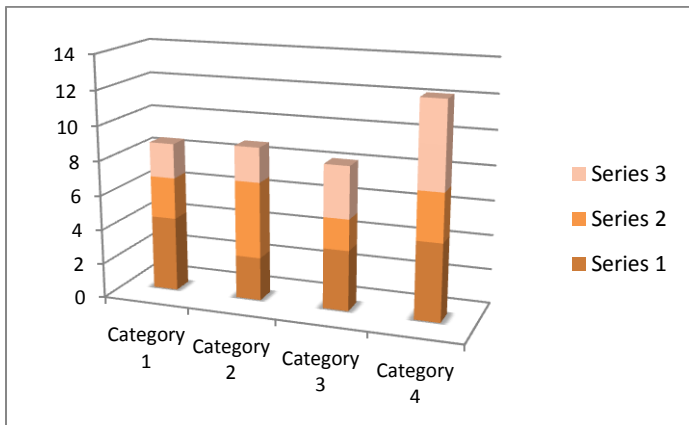


Table No-2 : Sex distribution

Sex	No. of cases	Percentage
Male	14	56
Female	11	44
Total	25	100

Incidence of male is 56% and female 44% respectively

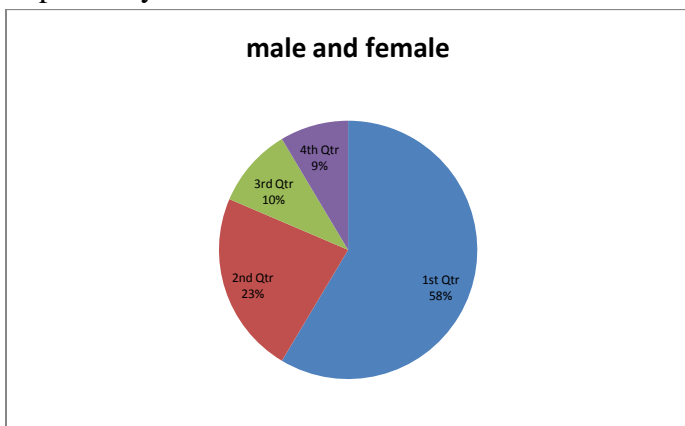
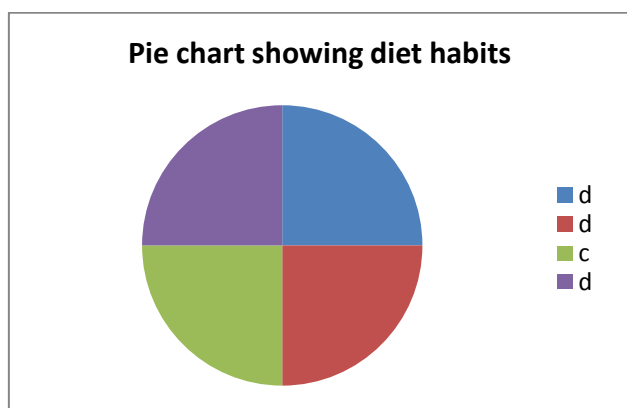


Table No-3 : Diet Habits

Diet	No. of cases	Percentage
Veg	10	40
Mixed	15	60
Total	25	100



Incidence of mixed diet (60%) is more of above patients were using more of green vegetables, 8 patients were using excess of spices, 7 person were using milk 2 persons were using excess of fat.

Water relation to renal calculi

In all the 25 cases that I have studied used to drink Borewell water and this could be due to stone forming substance like calcium, magnesium, etc. in addition to using borewell water their working condition also make them to perspire more and it may predispose concentration of urine and stone formation.

Table No-4 : Pain

Duration	No. of cases	Percentage
<10	1	4
11-30 days	1	4
1 m- 6 m	15	60
7 m – 1 y	3	12
1 yr – 5 yrs	4	16
6 yrs – 10 yrs	1	4
Total	25	100

Duration of pain ranges from <10 days to 10 years. The highest incidence was found 1 month to 6 months 15 (60%) of patients were presented.

Table No- 5 : Sites

	No. of cases	Percentage
Both login	3	12
Left login	10	40
Right login	12	48
Total	25	100

The site of pain in all the patients with renal calculus presented with loin pain as a predominant symptom. Higgen series (1952) 85% of the patients had history of attack of pain varying in severity and duration.

Character: The character of pain in 9 patient was colicky in nature. In remaining 16 patients it was dull aching.

Radiation: In 8 patients the pain was radiation to groin, in another 9 patients it was radiating to the back. In 2 patients it was both groin and back and in 6 patients there was no radiation.

Burning micturation: Out of 25 patients 15 were complaining of burning micturation.

Fever with chills and rigors: 4 patients were complaining of fever with and rigors. Suggestive of urinary tract infection.

Haematuria: Only two patients were complaining of gross haematuria. Out of 15 patients who were complaining burning micturation, 4 were complaining of fever with chills and rigors which indicates urinary tract infection.

The frank haematuria in 2 patients may be due to irritation of the mucosal wall.

Hirman reported moderate haematuria in 57% cases in adults and 47% in children suffering from Nephrolithiasis.

Physical signs: Renal angle tenderness, tenderness in lumbar region were predominant physical signs.

In JEA Wickmans series 57% of patients presented with renal angle tenderness 28% of the patients had hydronephrosis which was palpable per abdomen.

The following investigation were done in my series

1. Urine analysis
2. Hemoglobin percentage
3. Blood urea
4. Serum creatinine
5. Serum calcium
6. Serum phosphate
7. Ultrasound abdomen scan
8. X ray KUB (Plain)
9. Intravenous urogram

Table No- 6 : Urine analysis

	No. of cases	Percentage
Colour	14	56
Light yellow	9	36
Dark yellow	1	4
Dark Red	1	4
Total	25	100
Albumin +	10	40
Sugar +	2	8
PH Acidic	20	80
Alkaline	5	20
RBC +	10	40
WBC +	10	40
Pus Cells +	15	60
Cystals -Oxalate	2	8
Cystals - Phosphate	3	12

Table No- 7 : Blood analysis

Investigations	Range	Mean \pm SD
Colour	2.4-44	22.2 \pm 7.7
Serum calcium	8-11.6	9.6 \pm 0.7
Serum Phosphate	2.3-7	4.1 \pm 1.1
Serum Uric acid	0.1-5.0	3.9 \pm 1.0
Serum Creatinine	0.1-1.8	0.8 \pm 0.4

Table No- 8 : Uroradiology

Radiological diagnosis	No of cases	Percentage
Ultrasound	25	100
Plain X ray KUB	25	100
IVU	25	100

Treatment: This is divided into pre-operative, operative and post – operative.

In the present series 100% of the patients presented with lumbar or renal angle pain which were treated with analgesics and antispasmodic. Proper antibiotics were started according to organisms growth in 30% of the patient pre-operatively, 2 patients were transfused 1 bottle of blood each as they were severely anemic.

Operative: Patients were operated under general, endotracheal anaesthesia with relaxant techniques and stent insertion done under spinal anaesthesia and for all the patients I.V. ciprofloxacin 100 ml given intraoperatively.

Table No- 9 : Operative Procedure

Procedure	No of cases	Percentage
Pyelolithotomy	16	64
Extended pyelolithotomy	1	4
Nephrolithotomy	2	8
PCNL	6	24
ESWL	0	0
Nephrectomy	0	0
Total	25	100

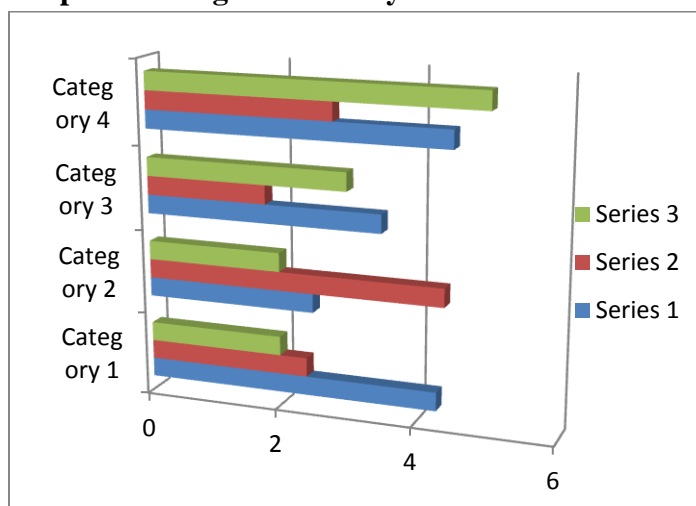
The above table shows 16 (64%) patients underwent pyelolithotomy, 1 patient extended pyelolithotomy procedure, and 6 (24%) patients underwent PCNL and 2 patients underwent nephrolithotomy. ESWL is not done as the facility is not available at HIMS.

Chemical analysis

Table No- 10 : Qualitative analysis:

	No of cases	Percentage
Calcium phosphate	3	12
Calcium oxalate + calcium phosphate	10	40
Caclium oxalate	2	8
Uric acid	1	4
Caclium oxalate + calcium phosphate + uric acid	4	16
Triple phosphate	5	20
Total	25	100

Graphs showing stones analysis



SUMMARY AND CONCLUSION

The summary and conclusion regarding clinopathological study of 25 cases of Nephrolithiasis treated in Department of Surgery and Urology of Heritage Institute of Medical Sciences, varanasi, during the period of October 2016 to june 2017are as follows.

In the present series 25 patients with renal calculi have been studied in detail. In urinary lithiasis nephrolithiasis is common as compared with the other, next to it was a vesicle calculi and last was urethra! Calculi.

The highest incidence seen in the people from rural area. The incidence is common between 3rd and 5th decades. Male to female ratio is approximately 3:1. The incidence is more in Hindus than any other community. This may be due to the proportionate ratio of population in this locality. No family history of urolithiasis was found in the present series.

In this series about 40% were vegetarians and these persons were using excess of milk product which is one of the ectiological factors in the formation of stones. In all the 25 cases that I have studied were used to drink bore well water contain salts of calcium and magnesium and this would be the ectiological factors in stone formation.

In all the 25 cases the presenting complaint was pain in the lumbar region or loin. The character of the pain was colicky in nature in 9 patients and remaining 16 it was dull aching. 2 patients complained vomitingin association with pain. In these 2 patients pain was relieved after vomiting 4 patient of fever with chills a rigors which is one of the signs of urinary tract infection which favours stone.

Formation. These was frank haematuria in 2 patients which is due to irritation of mucosal wall. There was renal angle tenderness in 95% of the patients. The preliminary investigation done in all the cases were urine analysis followed by plain x ray KUB which revealed radio-opaque shadow in renal area in all the cases. IVU was very useful in determining the function of the kidney.

Ultrasound was useful in knowing size, shape and number of calculus associated with hydronephrosis.

There were no operative difficulties encountered. Out of 25 patients only 15 patients turned up for follow up. All the 5 were symptom free till their last visit up to june 2017. Remaining 10 patients did not come for follow up.

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