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UNILATERAL HYDRONEPHROSIS- A CLINICAL STUDY

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ABSTRACT

Background: Unilateral obstructions of ureter either due to extramural, or intramural, and or intraluminal lead to unilateral hydronephrosis. Ureteral obstruction, partial or complete, produces a progressive disease in excretory functions of the kidneys with subsequent destruction of renal parenchyma. **Material and Methods:** 30 cases of unilateral hydronephrosis who fulfilled the inclusion and exclusion criteria were admitted to our hospital, investigated and treated thoroughly. **Results:** 60% of patients had ureteric calculi and 30% with Pelviureteric junction obstruction. More than 85% patients presented with pain abdomen and mass was palpable in 13.3%. Ultrasound abdomen was diagnostic in 20 cases with ureteric calculi and 10 cases with Pelviureteric junction obstruction. Among 20 cases of ureteric calculi, open procedure was done in 4 cases and endoscopic surgery in 16 cases. Pyeloplasty was performed in 10 cases of Pelviureteric junction obstruction. **Conclusion:** Males from lower socio-economic status affected during their third decade. Tenderness was prominent clinical sign with pain abdomen, hematuria, frequency and painful micturition as common symptoms. Surgical management turned out to be most effective while few cases were managed by endoscopic intervention.

Keywords: Hydronephrosis; Ureteric calculi; Ureteral obstruction; Ultrasonography; Diagnostic techniques

INTRODUCTION

Hydronephrosis is a descriptive term referring simply to the presence of dilation of the renal pelvis and calyces proximal to the point of narrowing in the urine outflow tract associated with or without the architectural changes in the renal parenchyma and not to the cause of that dilation. Site of obstruction to the urine flow determines the hydronephrosis as unilateral or bilateral [1]. Unilateral hydronephrosis occurs when the obstruction is above the level of the bladder. Causes may be either outside the ureter, in the wall of the ureter or in its lumen .

The incidence of hydronephrosis was found to be 1:100 ranging in age from birth to 80 years.

Condition affecting more in female with preponderance to right side [2].

Ureteral obstruction with subsequent hydronephrosis is a common clinical occurrence. Ureteral obstruction, partial or complete, produces a progressive disease in excretory functions of the kidneys. Infection sometimes superimposed and various lesions such as calculus pyelonephritis, calculus pyohydronephrosis and perinephritis may develop. With the introduction of infection multiple stones may form, renal function rapidly impaired and renal parenchyma destroyed [3].

This study was undertaken to gain insight into complete clinical profile of unilateral hydronephrosis regarding various causes, modes

of clinical presentations, diagnostic and treatment modalities, and postoperative outcomes.

MATERIAL AND METHODS

This clinical study was made at Urology, General Surgery, and Paediatric Surgery wards of General Hospital affiliated to our Institution in Southern India region.

This is a randomized and prospective based study which includes 30 patients with clinical suspicion of hydronephrosis. Patients with hydronephrosis related to PUJ obstruction, ureteric calculus and ureteric stricture were included but hydronephrosis related to benign prostatic hypertrophy and lower abdominal malignancy were excluded from the study.

Patients were subjected to detailed history and methodological examination. Relevant and routine investigations were done to establish the diagnosis. Depending on the severity of symptoms and findings on ultrasound and intravenous uroterogram, moderate to severe grade were considered for surgical treatment.

In patients with pelviureteric junction(PUJ) obstruction leading to severe hydronephrosis, reconstructive surgery was considered. Patients with hydronephrosis of long duration and non functioning kidney were considered for nephrectomy. Patients with non-removable and larger stones were considered for open surgeries, and cases with grade II and removable stones were selected for endoscopic surgeries with stent insertions.

RESULTS

Present study shows stones in the ureter causes hydronephrosis in more than 65% of patients and PUJ obstruction in more than 30%. Youngest person affected was of age 1 year with peak age being 3rd decade accounting for 9 cases (45%). Among 20 cases of ureteric calculus as a cause of unilateral hydronephrosis, 14 cases (70%) accounted in males and 6 cases in females. with PUJ obstruction, it was seen in 6 cases in males

and 4 cases in females. More than 35% cases were coolies and agriculturists belong to low socio-economic status and students constituted second highest sufferers.

All patients with ureteric calculi complained of pain abdomen either localized to lumbar region or radiating to loin while 45% of cases had frequency. 30% of patients presented pain within 1 month but majority cases (40%) presented between 1-3 months, 26.6% noticed pain between 3-6 months, and 3.4% presented 6 months after the onset of other symptoms.

On examination, 90% of patients complain of tenderness in lumbar region. In 13.3% cases mass was palpable, firm to cystic in consistency and in 16.7% cases tenderness was present in renal angle with fullness in the renal angle. 57% of patients who had unilateral hydronephrosis were right sided and ureteric stones contributed for majority of cases compared to PUJ obstruction.

Investigations pertaining to urology cases like ultrasonography, KUB X-ray, Blood Urea and Serum Creatinine were done.

In our case series, 14 cases were managed surgically and 16 cases by endoscopically. All cases of Grade II to III hydronephrosis due to ureteric stones were given a trail of conservative treatment in the form of analgesics, antispasmodics and diuretics before surgery. In cases of PUJ obstruction (47%) as a cause of unilateral hydronephrosis, Anderson Hyne's Dismembered Pyeloplasty procedure was done and in 53% cases endoscopic intervention was undertaken which includes uretero-lithotomy and renoscopy with distal junction stenting. During the course of postoperative follow up, out of 30 cases no cases showed any signs of wound infection, 2 cases developed leakage from drain site and persistent urinary fistula for 15-30 days. Both cases healed spontaneously. Discussion Unilateral obstructions of ureter either due to extramural, or intramural, and or intraluminal lead to unilateral hydronephrosis. *Extramural obstructions* by tumours from adjacent

structures like carcinoma Prostate, Cervix, Rectum, Colon, Caecum, and retrocaval ureter. *Intramural obstructions* from Congenital stenosis, ureterocele, congenital small ureteric orifice, repair of damaged ureteric segment, neoplasms of ureter and bladder cancer involving ureteric orifice, and inflammatory stricture following removal of calculus. *Intraluminal obstruction* due to calculus in renal pelvis and ureter, and sloughed out papilla in papillary necrosis especially in diabetic, analgesic abuse and sickle cell disease [4].

Mechanical impairment to urine flow results in alterations of both glomerular hemodynamics and tubular function caused by interaction of a variety of vasoactive factors and cytokines that are activated in response to urinary obstruction [5]

The appearance of the kidney after ureteral obstruction varies with the presence of an intra-renal versus extra-renal collecting systems, length and degree of obstruction, and the presence or absence of infection. The intra-renal system although obstructed to the same degree and duration as the extra-renal system, it may not exhibit the same degree of hydronephrosis; however the degree of renal damage may be worse. If left untreated, unilateral hydronephrosis may lead to complications like Hypertension, pyonephrosis, urinary ascitis, erythrocytosis, and metabolic changes which includes shift towards anaerobic metabolism [1,3,6]

Megener reported that incidence of hydronephrosis in women is likely to occur in younger age as a result of pregnancy or uterine cancer and in men, prostate is a major cause. In childrens 2.5% were found to have urinary tract abnormalities of which 35% were hydronephrosis or hydroureter. Taking a detailed history and timely abdominal imaging are the keys to diagnose the hydronephrosis. [7]

Unilateral hydronephrosis due to ureteric calculus constituted 67% of cases with male to female ratio being 2:1. Majority of patients presented within 1-3 months of onset of symptoms. Most

cases presented with pain abdomen. Sigman DB *et al.*, opined that retrograde stenting of hydronephrotic renal allograft can be achieved with high success rate and minimal morbidity[8]. In our study, endoscopic retrograde stenting was considered as treatment of choice in 90% cases and surgery was attempted in 20% cases due to complications. Ringel A *et.al*, stated that indications for stent insertion should be carefully considered in each patients as late complications of ureteric stones are more frequent[9]. We observed no such complications in our cases. Although ureteral stenting is an undoubtedly important procedure for the release of ureteral obstruction, late complications of are frequent and seen in one third of patients. Close follow up of stented patients is valuable in early detection of morbidity or complications. Saxby MF *et al.*, reported that Extra Corporeal Shock Wave Lithotripsy is the treatment of choice for most stones in clearing hydronephrosis though percutaneous nephrolithotomy is more effective[10].

Hydronephrosis due to PUJ obstruction formed 30% cases of our study. Most of the patients who came with symptoms were in pediatric age group. On examination 90% of patients had tenderness in the lumbar region and renal angle tenderness with fullness was found in 17%. O'Reilly PH *et al.*, carry out Andersons pyeloplasty in 56 cases over a period of 13 years and came to conclusion that the procedure is an excellent for PUJ obstruction and produces a lasting improvement in function and drainage[11]. They quote it is the gold standard against which no techniques should be compared. Houben CH *et al.*, observed that pyeloplasty in infants is a low risk procedure and Poulsen EU confirmed the minimal invasive surgery, an acceptable alternative to traditional dismembered pyeloplasty[12].

PUJ obstruction had an unusual presentation of early satiety and secondary weight loss due to gastric compression by the dilated renal pelvis [13]. With attention to prognostic factors like

grade of hydronephrosis and the level of renal function and appropriate patient selection, results are good with dismembered pyeloplasty [14]. .

Pinter AB *et al.*, support the practice of non-operative management of congenital PUJ obstruction potentially reducing the number of early or unnecessary intervention[15]. Lewis JM *et al.*, concluded that Retrospective Ballon Dilation is effective treatment modality for PUJ obstruction and its success is maintained in long term[16].

CONCLUSION

We compared, analysed our study with previous workers and concluded that unilateral hydronephrosis seen more in males with peak age of incidence in third decade. Ureteric calculus forms the main cause for the clinical condition, tenderness in the lumbar region is the sign, and pain abdomen, hematuria, frequency and painful micturition are the presenting symptoms. Ultrasound abdomen considered to be the diagnostic modality of choice with abdomen X-ray as primary investigation. Surgery is the common treatment modality with endoscopic interventions an alternative.

Conflict of Interest: Nil

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Table 1. Common symptoms encountered in present series

Diagnosis	No. of cases	Pain abdomen	Mass abdomen	Hematuria	Frequency
Ureteric calculus	20	20	0	6	9
PUJ obstruction	10	10	2	2	5
Ureteric stricture	0	0	0	0	0
total	30	30	2	8	14

Table 2. Variations of Biochemical parameters noted in the present study

Diagnosis	No of cases	Hb%		Urine culture		Side affected	
		< 10	>10	+	-	Right	Left
Ureteric calculus	20	4	16	6	14	11	9
PUJ obstruction	10	5	5	3	7	6	4