Clinical Study of Unilateral or Bilateral Noncalculus Hydronephrosis and or Hydroureter

Kasabe P.[1], R. D. Jaykar[2], Rahul Wagh[3*]

{[1]Assistant Professor,[2] Associate Professor, [3] Resident}

Department of General Surgery, Dr. V. M. Govt. Medical College, Solapur, Maharashtra, INDIA.

*Corresponding Address:

rahul_wagh09@yahoo.co.in

Research Article

Abstract: **Background:** Hydronephrosis is the dilation of the renal pelvis or calyces. Although patients usually presents with some signs and symptoms it can be clinically silent and is diagnosed as an incidental finding during evaluation of an unrelated cause. Although calculus is the commonest cause of hydronephosis and hydroureter there are multiple noncalculus aetiology for the same depending on the age and sex of the patient. This study is aimed towards meticulous implementation of the accurate diagnostic tools for early evaluation of noncalculus hydronephrosis and or hydroureter and to assess the effectiveness of the early treatment towards the renal function sparing. **Methods:** In this prospective clinical study of 50 patients of hydronephrosis and or hydroureter of all age groups and both the genders admitted in the department of surgery over a period of two years from Dec 2011 to Aug 2013 were studied. All the patients were evaluated with detail clinical history followed by thorough clinical examination and relevant investigations were done in each case. All the patients with calculus were excluded from the study. **Results:** Incidence of various condition leading to hydronephrosis was PUJ obstruction 38% BPH 22% Vesicoureteric reflux 16% Neurogenic bladder 2% Stricture urethra 4% Retroperitoneal mass 6% B.O.O. 2% Gravid uterus 8% Ureteric stricture 2%. **Conclusion:** PUJ Obstruction is a most common cause of noncalculus hydronephrosis. Noncalculus hydronephrosis and or hydroureter was most common in 1st decade of life. Incidence noncalculus hydronephrosis and or hydroureter was more common in males than females. In our study unilateral involvement is more common than bilateral. PUJ Obstruction is the most common cause of unilateral noncalculus hydronephrosis while BEP is the most common cause of bilateral noncalculus hydronephrosis and or hydroureter. Dismembered pyeloplasty is a procedure of choice in patients with PUJ Obstruction with good post-operative recovery in renal function. TURP is the gold standard for the surgical management of BPH. Early surgical intervention was associated with improved outcome in all the patients with noncalculus hydronephrosis and or hydroureter. Conservative management of hydronephrosis during pregnancy was associated with good outcome. Ultrasound is the most important baseline investigation in evaluation of patients with hydronephrosis.

Keywords: Clinical study; Noncalculus; Hydronephrosis; Hydroureter

Introduction

Hydronephrosis is defined as a dilatation of the renal pelvis and calyces and hydroureter is defined as dilatation of ureter.[1] although it is a normal physiological response to the interruption of flow of urine, it is often due to an obstructive process. Hydronephrosis is a very common condition and it causes significant pain due to obstruction. Hydronephrosis can result from anatomic or functional process obstructing the flow of urine which can occur anywhere from kidneys to the urethral meatus. Symptoms depend on cause, location and duration of the obstruction. Although patients usually presents with some signs and symptoms it can be clinically silent and is diagnosed as an incidental finding during evaluation of an unrelated cause. Although calculus is the commonest cause of hydronephosis and hydroureter there are multiple noncalculus aetiology for the same depending on the age and sex of the patient e.g. congenital PUJ block and P.U. valves being common causes in children, while BEP and urethral strictures, carcinoma bladder are commonest causes in males. It is also seen as a physiological response to pregnancy in females of child bearing age group while in elderly cancerous infiltration causing obstruction in carcinoma cervix and carcinoma ovary. Experimental studies have shown, if an acute obstruction is corrected within two weeks, full recovery of renal function is possible however, after six weeks function loss is irreversible which is associated with obstructive nephropathy and renal scarring. If unrecognized and or left untreated hydronephrosis and hydroureter secondary to obstruction, can lead to hypertension, sepsis, infection and renal failure. Ultrasonography is the first imaging approach in the evaluation of patients with noncalculus urinary obstruction. Mild grade hydronephrosis can be safely managed non operatively with meticulous follow up and surgery can only be considered when signs of deterioration occurs. Optimal management of patients with hydronephrosis and or hydroureter requires integrated therapy involving both medical and surgical care. The choice of conservative or surgical management of hydronephrosis is based on the results of excretory urography, fluoroscopy of pelvic and ureteral peristalsis, isotope renography and renal clearance studies but symptoms severity was considered greatly important.

Recurrent flank pain still seems to be the best indicator of the need for surgery, however in noncomplicated benign hydronephrosis follow up should be directed mainly towards detection of complications. This study is aimed towards meticulous implementation of the accurate diagnostic tools for early evaluation and to assess the effectiveness of the early treatment towards the renal function sparing.

Material and Methods

In this prospective study, of 50 patients of hydronephrosis and or hydroureter of all age groups and both the genders admitted in the department of surgery over a period of two years from Dec 2011 to Aug 2013 were studied.

All the patients were evaluated with detail clinical history followed by thorough clinical examination and relevant investigations were done in each case.

Photo 1: DTPA Scan

Photo 2: IVP showing moderate hydronephrosis

Aims and Objectives

1. To study the clinical profile of noncalculus unilateral or bilateral hydronephrosis and or hydroureter presenting to our department.
2. To identify the aetiological factors of noncalculus hydronephrosis and or hydroureter.
3. To evaluate the roles of early definitive management in optimizing the renal function.

Criteria of Exclusion

1. Calculus hydronephrosis and or hydroureter.
2. Patient with other severe comorbid condition like CCF, Open kochs, advanced jaundice, malignancy and overt immunocompromised status.

Observation and Results

Table 1: Incidence of various condition leading to hydronephrosis

Diagnosis	No of cases	Percentage
PUJ obstruction	19	38%
BPH	11	22%
Vesicoureteric reflux	8	16%
Neurogenic bladder	1	2%
Stricture urethra	2	4%
Retroperitoneal mass	3	6%
B.O.O.	1	2%
Gravid uterus	4	8%
Ureteric stricture	1	2%
Total	**50**	**100%**

In this study Ureteropelvic junction obstruction is the most common cause of hydronephrosis accounting for 38% cases of hydronephrosis .BPH is the second most common cause (22%) of hydronephrosis in present study.Ureteric stricture is the least common cause of hydronephrosis accounting for 2% of the cases.

Table 2: Showing age incidence in hydronephrosis

Diagnosis	Age in years								
PUJ obstruction	**<2**	**2-5**	**6-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**>60**
BPH	4	2	1	2	6	1	0	1	2
Vesicoureteric reflux	0	0	0	O	0	0	0	4	7
Neurogenic bladder	4	1	0	2	0	1	0	0	0
Stricture urethra	0	0	0	0	O	0	1	0	0
Retroperitoneal mass	0	0	0	0	0	0	0	2	0
B.O.O.	1	0	1	0	1	0	0	0	0
Gravid uterus	0	0	0	0	0	0	0	0	1
Ureteric stricture	0	0	0	0	4	0	0	0	0
Total	0	0	0	1	0	0	0	0	0
Percentage	**9**	**3**	**2**	**5**	**11**	**2**	**1**	**7**	**10**
	18	**6**	**4**	**10**	**22**	**4**	**2**	**14**	**20**

Most common age group for hydronephrosis and or hydroureter was age group of 20-30 years. In the present study youngest person affected was 1 day old and oldest person was 75 yr. Incidence of PUJ Obstruction was most common in first decade of life accounting 36.84% of cases of PUJ obstruction. In the first decade of life most common age group affected is between children <2 years of age. Second most common age group for PUJ Obstruction was between 20-30 years. BPH was the most common cause of hydronephrosis and or hydroureter in adults >60 years of age accounting for 70% cases of hydronephrosis and or hydroureter in that age group. In the present study incidence of hydronephrosis and or hydroureter was more common in males consist of 68% (34 cases).Incidence of PUJ Obstruction was more in males accounts for 68.42% (13 cases) in males and 31.58% (6 cases) in females. Incidence of VUR is equal in both males (50%) and females (50%) with 4 cases each. Vesicoureteric reflux accounts for 11.7% (4 cases) of hydronephrosis and or hydroureter in males and 25% (4 cases) of hydronephrosis and hydroureter in females. Incidence of retroperitoneal mass, neurogenic bladder, ureteric stricture was more in males.

Table 3: Sex incidence in hydronephrosis

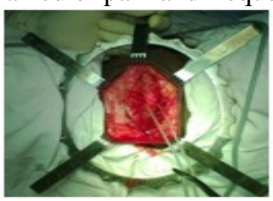
Diagnosis	Total cases	Male		Female	
		No of cases	%	No of cases	%
PUJ obstruction	19	13	68.42%	6	31.58%
BPH	11	11	100%	0	0%
Vesicoureteric reflux	8	4	20%	4	50%
Neurogenic bladder	1	1	100%	0	0%
Stricture urethra	2	2	100%	0	0%
Retroperitoneal mass	3	2	66.67%	1	33.33%
B.O.O.	1	0	0%	1	100%
Gravid uterus	4	0	0%	4	100%
Ureteric stricture	1	1	100%	0	0%
Total	**50**	**34**	**68%**	**16**	**32%**

Table 4

Diagnosis	Pain	Hematuria	Frequency	Dribbling	Burning of micturation	Retention	Fever	Urgency	Nocturia
PUJ obstruction	17	0	5	0	4	0	6	0	0
BPH	2	0	11	5	7	1	2	9	7
Vesicoureteric Reflux	3	0	3	0	4	0	4	2	1
Neurogenic bladder	1	0	1	1	1	0	0	1	1
Stricture urethra	2	1	1	1	2	1	1	0	0
Retroperitoneal mass	2	0	0	0	0	0	1	0	0
B.O.O.	1	0	1	0	1	0	1	0	0
Gravid uterus	3	0	4	0	2	0	1	2	1
Ureteric stricture	1	0	0	0	0	0	0	0	0
Total	**32**	**1**	**26**	**7**	**21**	**2**	**16**	**14**	**10**
Percentage	**64**	**2**	**52**	**14**	**42**	**4**	**32**	**28**	**20**

Most common complaint in patients with noncalculus hydronephrosis and or hydroureter was pain followed by frequency. In patients with PUJ Obstruction 89.47% patients complained of pain, 31.57% patients complained of fever and 26.31% patients complained of frequency. In patients with BPH all patients complained of frequency while, 81.8% complained of urgency and 63.6% cases complained of burning of micturition. In patients VUR 50% cases complained of burning of micturation and fever while 37.5% cases complained of pain and frequency.

Photograph 3: Narrowed pelvi-ureteric



Photograph 4: Urethroplasty junction

Table 5: Urine culture

Diagnosis	Total cases	Culture Positive		Culture Negative	
		No	%	No	%
PUJ obstruction	19	3	15.79	16	84.21
BPH	11	3	27.28	8	72.72
Vesicoureteric reflux	8	3	37.5	5	62.5
Neurogenic bladder	1	0	0	1	100
Stricture urethra	2	1	50	1	50
Retroperitoneal mass	3	0	0	3	100
B.O.O.	1	1	100	0	0

Gravid uterus	4	0	0	4	100
Ureteric stricture	1	0	0	1	100
Total	**50**	**11**	**22**	**39**	**78**

Urine culture was positive in 22% (11 cases).Total 15.79% cases of PUJ Obstruction were culture positive. Most common organism isolated from culture was E. coli. 37.5% cases were culture positive in VUR.

Table 6: Side affected

Diagnosis	No. of Cases	Right		Left		Bilateral	
		No	%	No.	%	No.	%
PUJ obstruction	19	9	47.37	9	47.37	1	5.26
BPH	11	0	0	0	0	11	100
Vesicoureteric reflux	8	0	0	2	25	6	75
Neurogenic bladder	1	0	0	0	0	1	100
Stricture urethra	2	0	0	0	0	2	100
Retroperitoneal mass	3	2	66.67	1	33.33	0	0
B.O.O.	1	0	0	0	0	1	100
Gravid uterus	4	2	50	0	0	2	50
Ureteric stricture	1	0	0	1	100	0	0
Total	**50**	**13**	**26**	**13**	**26**	**24**	**48**

In the present study 52% (26 cases) had unilateral hydronephrosis. Incidence of unilateral hydronephrosis was equal on both right and left side.PUJ obstruction was the most common cause of unilateral hydronephrosis consisting of 64.28% (18cases). Incidence of bilateral hydronephrosis was 48% (24 cases).BPH was the most common cause for bilateral hydronephrosis consisting of 45.80% cases of bilateral hydronephrosis.

Table 7: Derranged KFT's

Diagnosis	No of cases with deranged KFT's	Percentage
PUJ obstruction	0	0%
BPH	4	36.3%
Vesicoureteric reflux	0	0%
Neurogenic bladder	1	100%
Stricture urethra	2	100%
Retroperitoneal mass	0	0
B.O.O.	1	100%
Gravid uterus	0	0
Ureteric stricture	0	0
Total	**8**	**16%**

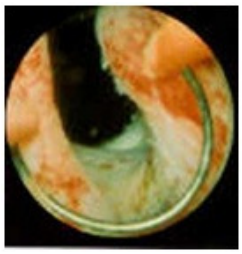
In the present series blood urea and serum creatinine was done in all cases and was found to be within normal limits except for 8 cases where in both the levels of blood urea and serum creatinine were raised.BPH was the most common cause of derranged KFT's in patients with noncalculus hydronephrosis and or hydroureter.

Table 8: Types of surgical treatment

Type of surgery	No. of cases	Percentage
Andersons hynes pyeloplasty	9	25.71%
Nephrectomy	7	20%
Ureteric reimplantation	4	11.42%
TURP	9	25.71%
Urethroplasty	2	5.71%
Ureteric dilatation	1	2.85%
Excision of retroperitoneal mass	3	8.57%
Total	**35**	**100%**

In case of PUJ obstruction Anderson Hyne's dismembered pyeloplasty was the procedure done which constituted 25.71% of the operative procedures. D-J Stenting was done with surgery in all cases of pyeloplasty and ureteric reimplantation. In all cases kidney was approached through a lumbar incision. In cases of BPH, TURP was the procedure performed, which constituted about 25.71% of all the operative procedure. Ureteric reimplantation by Lich-Gregoir

ureterovesical reimplantation technique constituted 11.43% of the operative procedures. Anastomosing urethroplasty was the procedure performed for patient with stricture urethra and it constituted about 5.71% of the operative procedures. Endoscopic ureteric dilatation was performed in a case of ureteric stricture.



Photograph 5: TURP

Photograph 6: Submucosal tunnel created in bladder wall prior to ureteric reimplantation

Table 9

Diagnosis	Treatment			
	Conservative therapy		Operative therapy	
	No.	%	No.	%
PUJ obstruction	3	15.79	16	84.21
BPH	2	18.18	9	81.82
Vesicoureteric reflux	4	50	4	50
Neurogenic bladder	1	100	0	0
Stricture urethra	0	0	2	100
Retroperitoneal mass	0	0	3	100
B.O.O.	1	100	0	0
Gravid uterus	4	100	0	0
Ureteric stricture	0	0	1	100
Total	**15**	**30**	**35**	**70**

In this study 35 cases (70%) were treated surgically while 15 cases (30%) were treated conservatively. All the patients were apparently normal in follow up studies.

Table 10: Showing follow up of the patients

Diagnosis	Treatment			
	Conservative with deranged renal function		Operative with deranged renal function	
	No.	%	No.	%
PUJ obstruction	0	0	0	0
BPH	2	18.1	0	0
Vesicoureteric reflux	0	0	0	0
Neurogenic bladder	1	100	0	0
Stricture urethra	0	0	0	0
Retroperitoneal mass	0	0	0	0
B.O.O.	0	0	0	0
Gravid uterus	0	0	0	0
Ureteric stricture	0	0	0	0
Total	**3**	**20**	**0**	**0**

In this study follow up of the patient was done with ultrasonography to see the regression of hydronephrosis and KFT's.20% of the patients which were managed conservatively had persistently deranged renal function in follow up period, while none of the patient with operative treatment had deranged renal function.Patients with BPH who were managed conservatively and had deranged renal function in follow up period, were offered operative treatment (TURP).

Discussion

The clinical study of noncalculus hydronephrosis and or hydroureter was made at, general surgery wards. 50 cases of noncalculus hydronephrosis and or hydroureter were studied.

PUJ Obstruction Hydronephrosis due to PUJ obstruction formed 30% of cases in present study. Most of these patients came to the hospital for pain in abdomen of 1-3 months duration. Pain was dull aching in nature and located in lumbar region. Some patients had associated symptoms like lump in abdomen, frequency of

micturation, hematuria and painful micturation.According to Fowler CG the male : female ratio of hydronephrosis is 2 : 1 and the right side is most commonly affected.[38]In 1997 C.G.EDEN suggested that PUJ obstruction occurs more often in males than females (5:2 ratio) and, when unilateral, more commonly affects the left side (5:2ratio). Bilateral obstruction occurs in 10–15% of cases and is commoner in infants.[39]In present study male: female ratio was 2:1 maximum age recorded was 75 years. Incidence of PUJ Obstruction was most common in first decade of life, of which children <2 years of age affected most commonly suggestive of congenital origin of PUJ obstruction. In present study in cases of hydronephrosis due to PUJ obstruction both sides were affected equally.Braga LH suggested that ureteral catheters helps in aligning the anastomosis, allowing to heal in straight, dependent position and, thus avoiding the risk of ureteral kinking and late recurrent obstruction. Furthermore, the combination of ureteral stent placement and indwelling catheter drainage for 24 to 48 hours after surgery may prevent urine leakage at the anastomotic site and potentially avoid a local inflammatory reaction.[40]In the present study D-J stenting was done in all the operated cases of dismembered pyeloplasty.Joao Moreira-Pinto has done retrospective analysis of clinical records of 230 patients submitted to dismembered pyeloplasty in an 8-year period, from 1999 until 2007, pre-operative and post-operative results were compared and it was found that 89% had normal renal function, 7% diminished but better than before and 2% had function equal as before surgery. Most common presenting symptom in patients with puj obstruction was pain in abdomen.[41]In the present study 9 patients of puj obstruction underwent dismembered pyeloplasty, of which 8 patients (88.8%) had postoperative normal renal function, while (11.1%) had function equal as before surgery. In patients with PUJ Obstruction 89.47% patients complained of pain in abdomen.

BPH Using histologic evidence, Randall and Harbitz and Haugen found the incidence of definite or probable BPH to exceed 50% in men older than 50 years. This occurrence rises to 75% as men enter their eighth decade.[42]In the present study BPH was the most common cause of hydronephrosis and or hydroureter in adults >60 years of age accounting for 70% cases of hydronephrosis and or hydroureter in that age group.Jepsen and Bruskewitz reviewed patients' bother from LUTS and found that nocturia was the most bothersome, and urgency the second most bothersome urinary symptom, confirming a long-standing urologic dictum.[42]In the present study all patients with BPH complained of frequency of micturation while, 81.8% complained of urgency and 63.6% cases complained of burning of micturation.Over the years, TURP, as a treatment modality for obstructing BPH, gained popularity throughout the world. It is now considered the gold standard for the surgical management of BPH. It was the BPH Guideline Panel's recommendation that patients with minimal symptoms should undergo watchful waiting and that if intervention was to be considered in patients who were more symptomatic the patient should be informed of the harms and benefits of each therapeutic modality and participate actively in making the decision, not only whether to intervene but which treatment modality would be his choice.[37]In the present study in cases of BPH, TURP was the procedure performed in 9 patients out of 11 cases of BPH with hydronephrosis.

Stricture Urethra In a study done by Ehab A. Eltahawy patients From July 1986 to May 2006 the charts of 260 patients who underwent excision with primary anastomosis for bulbar urethral stricture were reviewed. After a mean follow up of 50 months 257 patients (98.8%) were symptom-free and required no further procedures. Recurrent stricture occurred early in 2 patients and late in 1 patient. Two patients opted for intermittent dilations, and a single direct visual internal urethrotomy was performed in 1 patient 4 years postoperatively. One of the patients who elected dilation subsequently elected urethral reconstruction, which was done successfully. Complications encountered were position related neuropraxia in 9 (3.4%), early urinary tract infection in 13 (5%), chest related in 5 (1.9%), scrotalgia in 4 (1.5%) and wound related in 4 (1.5%). All resolved within the early postoperative period. Erectile dysfunction was encountered in 6 (2.3%) patients, of whom 4 had a history of significant straddle trauma, 4 responded well to oral pharmacotherapy and 1 elected to not have the erectile dysfunction treated. They have concluded that excision with primary anastomosis for anterior urethral stricture has a high success rate of 98.8% with durable long-term results in most patients. Complications are few, of short duration and self-limited. Where applicable, we believe that the procedure clearly is the choice for short anterior urethral strictures.[43]In the present study anastomosing urethroplasty was the procedure performed for all the patients with stricture urethra, all the patients were apparently normal in the postoperative period without any postoperative complications.

Gravid Uterus During pregnancy, mild hydronephrosis is considered a normal phenomenon and may be present in up to 90% of pregnancies. Dilation is usually more pronounced on the right kidney in primigravidas and after mid pregnancy. This dilation disappears a few weeks after birth. Conservative treatment led to resolution in 52 women (92.9%), whereas four women (7.1%) failed to respond and were treated successfully and without

complications by pigtail insertion. Early induction of labour was unnecessary and good perinatal outcome was the rule.[44]In the present study all the patients with hydronephrosis due to gravid uterus were in 3rd trimester of the pregnancy. All the patients with hydronephrosis during pregnancy were managed conservatively. There was spontaneous regression of hydronephrosis in all the patients in postpartum period after few weeks.

VUR The reference standard test for VUR is voiding cystourethrogram (VCUG), which has excellent inter reader reliability in the setting of childhood urinary tract infection. About 30% of children with urinary tract infections will be diagnosed with VUR after a voiding cystourethrogram.[45]In the present study voiding cystourethrography was done in all the patients with VUR. Urine culture was positive in 37.5% of patients with VUR. In patients VUR 50% cases complained of burning of micturation and fever while 37.5% cases complained of pain and frequency.Two trials of 247 children have demonstrated no significant difference in risk of UTI, or in renal parenchymal abnormality, between children randomized to low-dose antibiotic and those randomized to surveillance/no treatment.Six trials have compared open surgical ureteric reimplantation plus antibiotic prophylaxis with antibiotic prophylaxis alone, and two trials have compared subureteric injection plus antibiotics with antibiotics alone. Combining these studies demonstrates that risk of UTI at 1to 2 and 5 yr and new or progressive renal parenchymal abnormality at 5 yr is not significantly different between the surgical/antibiotic groups compared with antibiotics alone. The only difference was a lower risk of febrile UTI in the surgical/antibiotic group such that about 15 children would need to be re-implanted to prevent one febrile UTI over 5 yr. Given that this outcome was unblinded and no difference in upper tract outcomes was shown, this result is probably an overestimate of effect. In 2006, 10-yr follow-up data on 252 of an original group of 306 trial participants were published. These data showed that renal growth, UTI recurrence, somatic growth, and renal function did not differ between the surgery plus antibiotic and antibiotic alone groups. The only difference was a greater number of febrile infections in the antibiotic group.[45]In the present study 50% patients with VUR were managed conservatively and remaining 50% patients with VUR were managed with ureteric reimplantation and both groups of patients were apparently normal in follow up studies.

Ureteric Stricture Although balloon dilation and endoureterotomy for ureteral strictures have impressive success rates, these do not duplicate the very high (91%-97%) rates achieved with open surgical repair. There may be several reasons for the discrepancies noted in these comparisons. The success of any treatment modality may depend on the length of the ureteral stricture, the cause of the stenosis, and the location of the stricture; until now, strictures of similar nature have not been studied in an effort to cut from the general category of "ureteral stricture" those that would best respond to an endourologic approach.[46]In the present study there was only one patient of ureteric stricture which was managed with endourological intervention using balloon dilation and patient was apparently normal in postoperative period. With the exception of primary UPJ obstruction, most ureteral strictures are acquired and usually are iatrogenic.[46]In the present study in case of hydronephrosis due to ureteric stricture, cause of stricture was secondary to iatrogenic injury.

Retroperitoneal Mass Heyns in "Pelvic lipomatosis: a review of its diagnosis and management" reviewed a series of 130 patients and reported a mean patient age of 48 years, a male-to-female ratio of 18:1, and a racial predilection that favored blacks (67% of cases). Nearly half of their patients complained of urinary tract symptoms (eg, frequency, dysuria, hematuria, urgency, and the sensation of incomplete emptying), whereas a fifth complained of gastrointestinal tract symptoms (eg, constipation, nausea, vomiting). More generalized but nonspecific symptoms included lower abdominal pain, back-ache, and flank pain. They observed that early mass effect by these lesions caused compression of ureteres with development of hydronephrosis and hydroureter as the disease progressed. They further observed that though the mildly symptomatic cases without impairment of renal function could be monitored and managed conservatively but the more severe cases with symptoms of urinary outflow obstruction that impacted renal function can be managed temporarily with ureteric stenting however the definite treatment was in the form of fat excision and some cases may even require urinary diversion.[47]Campbell writes tubo-ovarian abscess, occurring in approximately 15% of those afflicted with PID, may cause extrinsic ureteral obstruction, which may even lead to anuria. Tubo-ovarian abscess, occurring in approximately 15%of those afflicted with PID, may cause extrinsic ureteral obstruction, which may even lead to anuria. Uterine fibroids, the most common tumor of the upper female genital tract, are also the most common, benign gynecologic neoplasm causing ureteral obstruction. The most common site of extrinsic ureteral obstruction is at the level of the pelvic brim. Surgical resection or ablation of the leiomyomas should be considered in this setting.[33] The treatment of choice is complete surgical excision. The long-term prognosis is excellent if complete excision has been achieved.In the present study two patients had retroperitoneal lipomatosis

while one patient had cystic lymphangioma and all the cases were treated with excision of the mass.

Neurogenic Bladder Wyndaele JJ in "Conservative Treatment of Patients with Neurogenic Bladder"states that the conservative treatment is in almost all cases the first to give and will remain the primary choice in the majority of patients with neurogenic bladder. A good review and listing of conservative treatment for neurogenic incontinence can be found in the report of ICI 2004.[48]In the present study patient with neurogenic bladder was treated conservatively with intermittent catheterization and bladder relaxants.

Bladder Outlet Obstruction Kumar A, Mandhani A, Gogoi S, Srivastava A in "Management of functional bladder neck obstruction in women: use of alpha-blockers and pediatric resectoscope for bladder neck incision" concluded that clean intermittent self-catheterization and alpha-blockers are the initial treatment options for functional bladder neck obstruction. The alpha-blockers were successful in 50% of our patients. Bladder neck incision should be offered judiciously with minimal risk of curable stress incontinence. The pediatric resectoscope is useful to make a well controlled incision safely in the female urethra.[49]Victor W Nitti in"Primary Bladder Neck Obstruction in Men and Women" concluded that treatment options for men and women with PBNO are the same and include watchful waiting, pharmacotherapy, and surgical intervention. Watchful waiting is an option for patients who are not bothered much by their symptoms and have no clinical or urodynamic evidence of upper and/or lower urinary tract decompensation.[50]In the present study patient with bladder outlet obstruction was managed conservatively with alfa-blockers and intermittent catherization.

Conclusion

PUJ Obstruction is a most common cause of noncalculus hydronephrosis. Noncalculus hydronephrosis and or hydroureter was most common in 3rd decade of life. PUJ Obstruction is the most common cause of noncalculus hydronephrosis in 3rd decade, while BEP is the most common cause of noncalculus hydronephrosis and or hydroureter in 7th decade of life.Incidence noncalculus hydronephrosis and or hydroureterwas more common in males than females.Most common complaint in patients with noncalculus hydronephrosis and or hydroureter was pain followed by frequency.PUJ Obstruction is the most common cause of unilateral noncalculus hydronephrosis ,while BEP is the most common cause of bilateral noncalculus hydronephrosis and or hydroureter. Dismembered pyeloplasty is a procedure of choice in patients with PUJ Obstruction with good post-operative recovery in renal function.TURP is the gold standard for thesurgical management of BPH.Early surgical intervention was associated with improved outcome in all the patients with noncalculus hydronephrosis and or hydroureter.Conservative management of hydronephrosis during pregnancy was associated with good outcome.Ultrasound is the most important baseline investigation in evaluation of patients with hydronephrosis.

References

1. Ware EW Jr. A brief history of urology at Baylor University Medical Center. Proc (Bayl Univ Med Cent). 2003 Oct; 16(4):430-4.
2. Frank Hinman JR (ed). Pyeloureteroplasty. In Atlas of pediatric urologic surgery, 1st ed,chapter 22 philadelphia wb saunders,1994:123-134.
3. Drach GW. Urinary lithiasis. In: Walsh, Gittes, Perlmutter and Stamey (eds). Cambell's urology. 5th ed. Philadelphia, WB Saunders Publications; 1986:1124-25.
4. Nakada SY, Hsu THS. Management of Upper Urinary Tract Obstruction. In: Wein AJ, Kavoussi LR, Novick AC, Peters CA, Partin AW, eds. Campbell-Walsh Urology.10th ed. Philadelphia, Saunders Elsevier Publishing; 2012:1122-1168.
5. Stein R, Ikama F, Salge S,Miyanaga T,and Mari Y.Pyeloplasty in hydronephrosis ,examination of surgical results from morphologic point of view. Int J.Urology, 1996;3(5):348-55.
6. Sorrentino M. Treatment of giant hydronephrosis.Br J Urol. 1966 Jun; 38(3):255-61.
7. Zwergel T, Lindenmeir T and Wullich B. Management of hydronephrosis in pregnancy by ureteral stenting.Eur-Urology,1996;3(5):348-55.
8. Hussain A, Whelan P, Piercey K, Kapoor A.McMaster experience with laparoscopic pyeloplasty. Can J Urol. 2004 Jun; 11(3):2299-302.
9. Calvert RC, Morsy MM, Zelhof B, Rhodes M, Burgess NA. Comparison of laparoscopic and open pyeloplasty in 100 patients with pelvi-ureteric junction obstruction. Surg Endosc. 2008 Feb; 22(2):411-4.
10. Soulié M, Thoulouzan M, Seguin P, Mouly P, Vazzoler N, Pontonnier F, Plante P. Retroperitoneal laparoscopic versus open pyeloplasty with a minimal incision: comparison of two surgical approaches. Urology. 2001 Mar; 57(3): 443-7.
11. Madi R, Roberts WW, Wolf JS Jr. Late failures after laparoscopic pyeloplasty. Urology. 2008 Apr; 71(4):677-80.
12. Nguan C, Girvan A, Luke PP. Robotic surgery vs. laparoscopy: a comparison between two robotic systems and laparoscopy. J Robot Surg. 2008; 1:263–8.
13. Menon M, Shrivastava A, Tewari A, Sarle R, Hemal A, Peabody JO, Vallancien G. Laparoscopic and robot assisted radical prostatectomy: establishment of a structured program and preliminary analysis of outcomes. J Urol. 2002 Sep;168(3):945-9.
14. Ahlering TE, Skarecky D, Lee D, Clayman RV. Successful transfer of open surgical skills to a laparoscopic environment using a robotic interface: initial experience with laparoscopic radical prostatectomy. J Urol. 2003 Nov; 170(5):1738-41.
15. Chin JL, Luke PP, Pautler SE.Initial experience with robotic-assisted laparoscopic radical prostatectomy in the Canadian health care system. Can Urol Assoc J. 2007 Jun; 1(2):97-101.

16. Link RE, Bhayani SB, Kavoussi LR. A prospective comparison of robotic and laparoscopic pyeloplasty. Ann Surg. 2006 Apr; 243(4):486-91.
17. Gettman MT, Peschel R, Neururer R, Bartsch G.A comparison of laparoscopic pyeloplasty performed with the daVinci robotic system versus standard laparoscopic techniques: initial clinical results. Eur Urol. 2002 Nov; 42(5): 453-7.
18. HN.Whitefield. The management of ureteric stones. Part 1; Diagnosis. British journal of urology. International vol, 84; 1994:911-15.
19. Ben H. Chew, John D. Denstedt Access. Stents, and Urinary Drainage. Advanced Endourology Current Clinical Urology 2006, pp.19-42.
20. Rauf Taner Divrik, Ali Sahin, Muammer Altok, Nuri Unlu and Ferruh Zorlu. The frequency of hydronephrosis at initial diagnosis and its effect on recurrence and progression in patients with superficial bladder cancer. The Journal Of Urology; Volume 178, Issue 3, pp.802-6.
21. Kim DS, Cho KS, Lee YH, Cho NH, Oh YT, Hong SJ. High-grade hydronephrosis predicts poor outcomes after radical cystectomy in patients with bladder cancer. *J Korean Med Sci. 2010 Mar; 25(3):369-73.*
22. Hodges SJ, Patel B, McLorie G, Atala A. Posterior urethral valves. *Scientific World Journal. 2009 Oct 14;9:1119-26.*
23. Beer E. Value of ureteral reimplantation in the bladder. AmJ Surg 1933; 20:8-27.
24. Sampson JA. Ascending infection: with special reference to reflux of urine from the bladder into the ureters as an etiological factor in its causation and maintenance. Johns Hopkins Med J 1903; 14:344-52.
25. Politano VA, Lead better WF. An operative technique for the correction of vesicoureteral reflux. J Urol. 1958 Jun;79(6):932-41.
26. Gil-Vernet JM. A new technique for surgical correction of vesicoureteral reflux. J Urol. 1984 Mar; 131(3):456-8.
27. Anderson JK, Cadeddu JA. Surgical anatomy of the retroperitoneum, adrenals, kidneys, and ureters. In: Wein AJ, Kavoussi LR, Novick AC, Peters CA, Partin AW, editors. Campbell-Walsh Urology. 10th ed. Philadelphia, Saunders Elsevier Publishing; 2012: 3-32.
28. Alpers CE. The kidney. In: Kumar V, Abbas AK, Fausto N, Aster JC, eds. Robbins and Cotran Pathologic Basis of Disease. 8th ed. Philadelphia, Saunders Elsevier publications; 2010:960-62.
29. Walsh PC. Pathophysiology of urinary tract obstruction. In: Walsh, Retik Vaughan and Wein (eds). Campbell's urology. 8th ed. Philadelphia, WB Saunders Publications; 2002:412-40.
30. Alpers CE. The kidney. In: Kumar, Abbas, Fausto, eds. Robbins and Cotran Pathologic basis of disease.7th ed. Philadelphia, Saunders; 2004:960-1017.
31. Koelliker SL, Cronan JJ. Acute urinary tract obstruction. Imaging update. Urol Clin North Am. 1997 Aug; 24(3):571-82.
32. Nayyar R, Sarda AK, Kaza RCM, Anand VJ. The obstructed kidney. Indian J Surg 2005;67:21-8.
33. Singh I, Strandhoy JW. Pathophysiology of Urinary Tract Obstruction. In: Wein AJ, Kavoussi LR, Novick AC, Peters CA, Partin AW, editors. Campbell-Walsh Urology. 10th ed. Philadelphia, Saunders Elsevier Publishing; 2012:19-20; p.1087-1121.
34. Smith RC, Rosenfield AT, Choe KA, Essenmacher KR, Verga M, Glickman MG, Lange RC. Acute flank pain: comparison of non-contrast-enhanced CT and intravenous urography. Radiology. 1995 Mar; 194(3):789-94.
35. Zielonko J, Studniarek M, Markuszewski M. MR urography of obstructive uropathy: diagnostic value of the method in selected clinical groups. Eur Radiol. 2003 Apr; 13(4):802-9.
36. Kim CA, Babayan RK. Endopyelotomy and pyeloplasty. In: Krane RJ, Stroky MB, FitzPatrick JM, (eds). Operative urology, Chapter 11 New York, Living Stone 2000:73-78.
37. Fitzpatrick JM. Minimally invasive and endoscopic management of benign prostatic hyperplasia. In: Wein AJ, Kavoussi LR, Novick AC, Peters CA, Partin AW, eds. Campbell-Walsh Urology. 10th ed. Philadelphia, Saunders Elsevier Publishing; 2012:2655-2694.
38. Fowler CG, The kidneys and ureters. In: Russell RCG, Williams NS, Bestrode CJK (eds). Baily and Loves short practice of surgery, 24th ed. London, Arnold 2004:1313-14.
39. Eden CG. Treatment options for pelvi-ureteric junction obstruction: implications for practice and training. Br J Urol. 1997 Sep; 80(3):365-72.
40. Braga LH, Lorenzo AJ, Bägli DJ, Keays M, Farhat WA, Khoury AE, Salle JL. Risk factors for recurrent ureteropelvic junction obstruction after open pyeloplasty in a large pediatric cohort. J Urol. 2008 Oct; 180(4 Suppl):1684-7.
41. Moreira-Pinto J, Osório A, Vila F, de Castro JL, Réis ADismembered pyeloplasty for ureteropelvic junction syndrome treatment in children. Afr J Paediatr Surg. 2012 May-Aug;9(2):98-101.
42. McVary KT. Clinical evaluation of benign prostatic hyperplasia. Rev Urol. 2003; 5 Suppl 4:S3-S11.
43. Eltahawy EA, Virasoro R, Schlossberg SM, McCammon KA, Jordan GH. Long-term followup for excision and primary anastomosis for anterior urethral strictures. J Urol. 2007 May; 177(5):1803-6.
44. Fainaru O, Almog B, Gamzu R, Lessing JB, Kupferminc M. The management of symptomatic hydronephrosis in pregnancy. BJOG. 2002 Dec; 109(12):1385-7.
45. Williams G, Fletcher JT, Alexander SI, Craig JC. Vesicoureteral reflux. J Am Soc Nephrol. 2008 May; 19(5):847-62.
46. Hafez KS, Wolf JS Jr. Update on minimally invasive management of ureteral strictures. J Endourol. 2003 Sep; 17(7):453-64.
47. Heyns CF. Pelvic lipomatosis: a review of its diagnosis and management.J Urol 1991; 146:267–273.
48. Wyndaele JJ. Conservative treatment of patients with neurogenic bladder. european urology supplements 2008;7: 557–565.
49. Kumar A, Mandhani A, Gogoi S, Srivastava A. Management of functional bladder neck obstruction in women: use of alpha-blockers and pediatric resectoscope for bladder neck incision. J Urol. 1999 Dec;162(6):2061-5.
50. Victor W Nitti. Primary Bladder Neck Obstruction in Men and Women. Rev Urol. 2005; 7(Suppl 8): S12–S17.