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Hydronephrosis –correlation between Excretory Urography (IVU) and Ultrasonography (USG)

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Hydronephrosis means dilatation of calyces resulting from impairment to the flow of urine.

Common causes of Hydronephrosis.

A. Congenital
1.Ureteropelvic junction narrowing
2.Post urethral value

B. Acquired
1. Calculi
2. Benign prostatic hypertrophy
3. Trauma
4. Urethral stricture

USG shows anatomical obstruction causing hydronephrosis, cannot show functional capability.
IVU gives functional and anatomical information.
Urinary system comprises of kidney, ureter, bladder and urethra.

I. Materials and Method

Cases for IVU or USG investigation are regularly sent from wards and OPD to Radiology Department. 50 cases were selected for this study randomly without age and sex discrimination.
Contrast material adverse reaction rarely occurs.

Aims and adjectives
1. To detect- Hydronephrosis by either of the methods (USG or IVU)
2. To detect level of obstruction
3. To determine causes

Thus to help further management.

II. Discussion

During the last few decades, many investigations have developed in renal imaging e.g. CT Urography, MR Urography etc.

Yet excretory urography and USG remains most important diagnostic tools in renal imaging. In this study both have been used.

Efficacy depends on proper technique of IVU and USG and most importantly proper interpretation.

The result and observation of 50 cases studied with USG and IVU will be discussed under following headings.

a) Age and sex incidence
b) Relative distribution for different etiology
c) Clinical presentation and examination
d) Laboratory investigation
e) Features in IVU
f) Features in USG
g) Other imaging modalities e.g. urodynamic study, C.T. Scan, Retrograde pyelography, antegrade pyelography, Color Doppler study, Angiography, MRI .

Age and Sex

There is male preponderance- 32 males (64%) and 18 females (36%) . Maximum number of cases is between 31-40 year of age (11 cases).

Relative distribution of different etiology

Congenital cases are more common in younger age group- PUV, Neurogenic bladder and PUJ obstruction.

SOL and prostatomegaly are common in elderly patients

PUJ obstruction confirmed by Frusemide challenged excretory Urography and dynamic ultrasound using diuretics.

Retrocaval ureter is a developmental defeat.

Urothelial SOL was found in 6 cases. All the cases presented with hematuria.

Urothelial SOL was seen in 4 cases- 3 male and one female- 2 cases presented with lower abdominal mass.

Urethral stricture was seen in 2 female patients.

Ureterocele was found in one case.

Prostatomegaly was seen in 3 patients with bilateral hydronephrosis.

Calculus was the most-common cause.

Clinical presentation and examination

Commonest complaint was pain abdomen. Few complained of hematuria. In few cases lump was found.

Laboratory investigation

Routine urine and blood examination, serum urea , creatinine and P.P. sugar. Only 5 patients showed 50 mg% blood urea.

No diabetic was found.

Pus cells in 24 cases and RBC in 14 cases were seen.

IVU

4 patient showed one kidney.

USG

Both TAS and TVS were used to diagnose Hydronephrosis in all 50 cases.

MCU

MCU is used for vesicoureteric reflux, study of urethra during micturition, stress incontinence.

Acute UTI is a contraindication.

Retrograde pyelography

Two cases were done.

C.T. Scan

Very helpful.

Reaction to contrast agent

Reaction to contrast agent was seen in 6 cases

III. Conclusion

All the 50 cases studied here are chronic cases. In the study of Hydronephrosis, USG and IVU are complementary to each other. USG is not to judge functional capability. USG is cheap, easily available, can be done is seriously ill patient and better to detect SOL. All patients suspected of having Hydronephrosis should have undergone USG first.

Table-I

Age in Years	No of Cases	percentage
0-10	5	10%
11-20	8	16%
21-30	9	18%
31-40	11	22%
41-50	8	16%
51-60	3	6%
61-70	4	8%
71-80	2	4%
Total	50	100%

Table-II

Etiology	No of Cases	Percentage
Puj obstruction	10	20%
Calculi	17	34%
Urothelial S.O.L.	6	12%
Non Urothelial S.O.L.	4	8%

Post. Urethral valve	3	6%
Retrocaval ureter	1	2%
Ureterocele	1	2%
Ureteral stricture	2	4%
Neurogenic bladder	2	4%
Prostatomegaly	3	6%
Meatal stenosis	1	2%
total	50	100%

Table-III

Unilateral and Bilateral involvement in Male & Female

sex	No. of Cases	Unilateral	Bilateral
Male	32	17	15
Female	18	13	5

Table-IV

Unilateral and Bilateral involvement in diff age group in both sexes

Age in years	Total cases	bilateral	Unilateral
0-1 yr.	5	5	X
11-20 yr.	8	5	3
21-30 yr.	9	1	8
31-40 yr.	11	X	11
41-50 yr.	8	3	5
51-60 yr.	3	1	2
61-70 yr.	4	3	1
71-80 yr.	2	2	X

Table-V

Etiology	No of cases	Percentage
PUJ obstruction	4	20%
Calculi	2	10%
Post urethral value	3	15%
Neurogenic bladder	2	10%
Bladder SOL	2	10%
Non Urothelial SOL	3	15%
Prostatomegaly	3	15%
Meatal Stenosis	1	5%
Total	20	100%

Table-VI

Level of obstruction	No. of cases
Supravesical	8
Vesical	5
Infravesical	7

Table-VII

Etiology	No of cases	Percentage
PUJ obstruction	6	20%
Calculi	15	50%
Urothelial neoplasm	4	13.33%
Retrocaval Ureter	1	3.33%
Ureterocele	1	3.33%
Ureteral stricture	2	3.33%
Carcinoma Cervix	1	3.33%
Total	30	100%

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