# FETAL DIAGNOSIS OF RENAL ABNORMALITIES

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## SUMMARY

**Renal malformations were diagnosed in 7 out of 283 cases by ultrasound (hydronephrosis -5, renal agenesis -1 and polycystic kidneys -1) and the findings were confirmed after birth. Single umbilical artery was found in 3 cases. Ultrasound evaluation for renal abnormalities can be done early in the 2nd trimester of pregnancy for optimal fetal management.**


## *INTRODUCTION*

With the decline in the incidence of preventable diseases, congenital abnormalities are coming higher up on the list of fetal mortality and morbidity. The diagnosis of fetal renal abnormalities can be made accurately with high resolution ultra sonography (u/s). A thorough sonographic evaluation should be performed to rule out any other fetal abnormality and cordocentesis should be done to rule out a chromosomal abnormality (Frydman et al, 1983).

## *MATERIAL AND METHODS*

Fetal renal evaluation by u/s of 283 high risk fetuses over the last one and half years was done at 14 weeks of pregnancy onwards at the All India Institute of Medical Sciences, New Delhi. The fetal kidneys were first visualised in longitudinal posterior sagittal and frontal sections, and then in several transverse scans below the plane of the liver and stomach in the paravertebral area. Texture of the kidneys, cysts, dilation of calyces or ureters were looked for. The fetal kidney circumference (FKC) and fetal abdominal circumference (FAC) were measured and the ratio calculated. An FAC/FKC > 0.5 at 16-20 weeks was taken as abnormal. The bladder was next examined for overdistention or nonvisualisation. The amniotic fluid volume is an index of kidney function and this was measured.

## *RESULTS AND OBSERVATIONS*

Fetal diagnosis of renal malformations were made in 7 cases of which there were 5 cases of hydronephrosis, one case each of renal agenesis

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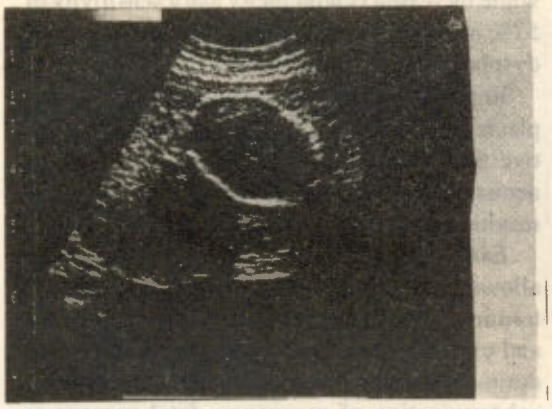

Fig. 1 : U/S Showing B/L hydronephrosis.

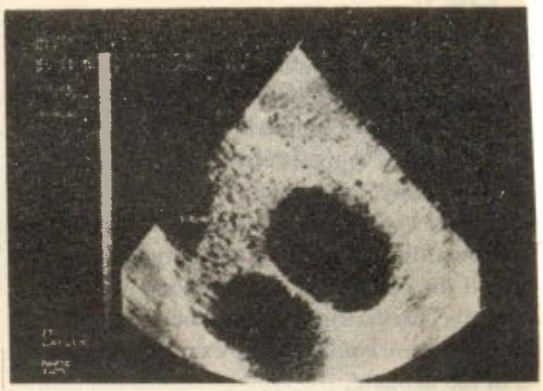

Fig. 2 : Showing severe oligo-hydramnios.

and polycystic kidneys (Fig. 1,2)

Hydronephrosis was diagnosed by the presence of cystic distention of renal calyces and ureters and the bladder. One case had pelviureteric junction obstruction while four had posterior urethral valves with distended bladder. Renal agenesis was diagnosed by absence of kidneys on either side and associated anhydramnios. Polycystic kidneys were diagnosed by presence of large hyperechoic masses (FKC/FAC >0.7) and severe oligohydramnios.

Case 1:

S.K. G3P2+0 with severe Pregnancy Induced Hypertention (PIH). She was detected to have mild hydronephrosis at 34 weeks, while doing Manning's score for fetal wellbeing. Pregnancy was terminated at 36 weeks by caesarean section for PIH and hydronephrosis.

Case 2:

R.S., G2 P1+0 was referred to AIIMS at 37 weeks pregnancy as u/s detected dilated intestinal loops. U/S done at AIIMS showed B/L hydronephrosis and distended bladder. She delivered normally after 3 days.

Case 3:

R.K., G3 P 0+2 was diagnosed at 36 weeks to have moderate hydronephrotic changes and dilated ureter on the right side and mild dilation of the renal pelvis with normal ureter on the left side, and a diagnosis of pelvi-ureteric junction obstruction was made.

Case 4:

I.G., G 1 P0+0 was referred at 36 weeks as a case of duodenal atresia. U/S at AIIMS showed B/L hydronephrosis, single umbilical artery and oligohydramnios. Cordocentesis for karyotyping and aspiration of 270 ml of urine from hydronephrosis for biochemical analysis was done. Karyotype was 46XY and urine analysis showed Na/Cl of 137/79 meg/ml indicating normal renal function. The patient had a spontaneous vaginal delivery after 2 days.

Case 5:

U.D., G 2P1+0 was referred at 37 weeks to AIIMS as a case of distended bladder with oligohydramnios. U/S at AIIMS showed B/L hydronephrosis, distended bladder, severe oligohydramnios and single umbilical artery. Cordocentesis of aspiration of hydronephrosis was done. LSCS was done at 38 weeks for breech presentation.

Case 6:

C.D., G 2 P 0+1 was referred at 31 weeks as a case of spina bifida and anhydramnios. U/S at AIIMS showed single live fetus with normal spine, anhydramnios, single umbilical artery. Kidneys and bladder could not be visualised. Cordocentesis was done for karyotype.

Case 7:

S.B., G4 P3+0+0+0 was detected at 18 weeks to have polycystic kidneys and hydrocephalus. M.T.P. was advised but the patient refused and came at 39 weeks pregnancy in labour. She had a spontaneous vaginal delivery after decompression of the hydrocephalus.

Cordocentesis done on 3 cases with fetal renal abnormalities showed normal karyotype.

All the cases were managed in consultation with the paediatric surgeon and the fetal U/S findings were confirmed by examination and U/S of the neonate.

## *DISCUSSION :*

Fetal urine is produced by the 13th week of gestation and is a hypotonic ultrafiltrate of fetal serum (M c grorg 1972). Antenatal diagnosis of fetal urinary tract obstruction has been reported at 16 weeks gestation. (Hobbins, 1984), while early U/S appearance of fetal bladder outlet obstruction was reported by Stiller (1989) at 13 weeks gestation. Visible cortical cysts on U/S had a sensitivity of 44% and specificity of 100% while increased echogenicity had a sensitivity of 57% and specificity of89% in predicting renal dysplasia (Appleman, 1986).

Renal diseases such as agenesis, cystic dysplasia are incompatible with life, while obstructive uropathies cause renal damage as well as neonatal death due to hypoplasia of the lungs resulting from severe oligohydramnios.

Early U/S screening for renal abnormality allows appropriate work-up, which includes determination of fetal renal function, karyotype and exclusion of other anomalies, so as to plan optimal fetal therapy either in the form of medical termination of pregnancy, fetal surgery or planned delivery with neonatal surgical management.

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