## CASE REPORT

# Spectrum of Congenital Urinary Tract Anomaly on Antenatal Ultrasound: A Case Series

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## ABSTRACT

Renal malformations are the most common, accounting for 20% of all congenital malformations and are seen in 3-4% of all pregnancy. Fetal urinary tract development is a complex process and therefore it may be associated with congenital defect. Fetal urine is major contributor of amniotic fluid in the second & third trimester of pregnancy. Therefore any defect in fetal urinary tract leads to decrease in amount of amniotic fluid, which in turn lead to fetal pulmonary hypoplasia as well as other major defect. Thus amniotic fluid volume and echogenicity of renal parenchyma have indirect role in diagnosis of urinary tract anamolies. Renal anomalies can be isolated or associated with other congenital anomalies. Therefore, a thorough examination of the other system should be done to rule out possibility of genetic disorders. Accurate diagnosis of fetal congenital urinary tract anamolies are essential for prenatal counseling, appropriate management and proper delievery planning via a multidisciplinary approach in which radiologist play a major role.


## TECHNIQUE

All patients referred to Department of Radiodiagnosis, SMS Hospital, Jaipur for routine antenatal scanning were evaluated for urinary tract anomalies. They were critically evaluated on ultrasound and their imaging features were noted.

### Case Series

All of the following pregnant female patients came to us for routine ultrasound for first time in second trimester.

### Case 1

Fig 1- Axial ultrasound images of 24 week pregnant female showing bilateral enlarged fetal kidneys in which renal parenchyma is replaced by multiple non communicating cyst of varying size. (white arrows). Amniotic fluid was less. Diagnosis of multicystic dysplastic kidneys was made.

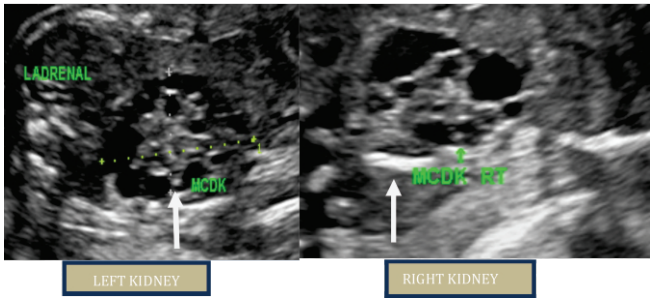


Figure 1

**MULTICYSTIC DYSPLASTIC KIDNEY**- Incidence of the unilateral MCKD is estimated at 1:2500–4000. MCDK develops in utero and the diagnosis is often made either in antenatal or in the early neonatal period. The affected kidney has no functioning renal tissue and is replaced by multiple cysts. Two main types of MCDK- Pelvi-infundibular and Hydronephrotic-obstructive type. Pelvi-infundibular type is most common in which multiple small non-communicating renal cysts are seen on ultrasound[1]. –MeckelGruber syndrome and Zellweger syndrome are associated with multicystic dysplastic kidney.

### Case 2

Fig 2- Axial ultrasound of 20 week pregnant female showing empty right renal fossa infetus (arrow). Right kidney was noted in ipsilateral pelvis (arrow) with normal amniotic fluid suggestive of right ectopic kidney.

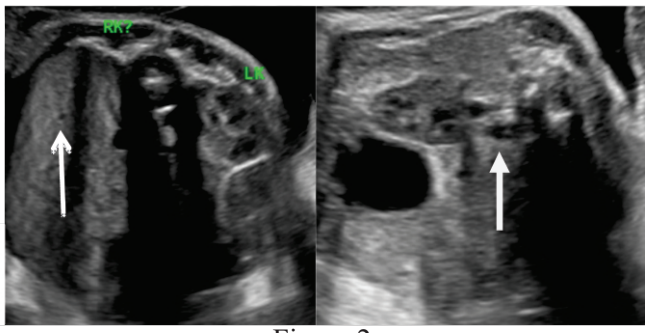


Figure 2

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**ECTOPIC KIDNEY**- Failure of kidney to ascend during embryologic development results in a pelvic kidney. Prevalence is 1 in 724 populations[2]. Ectopic kidneys are of smaller size and rotated abnormally. The blood supply may be derived from regional arteries like the internal iliac artery or the common iliac artery. Whenever a kidney is not identified in renal fossa a search for a pelvic kidney should be done.

**Case 3**

Fig 3- Sagital ultrasound showing bilateral fetal enlarged and hyperechoic kidney without corticomedullary differentiation (arrow) with decreases amniotic fluid suggestive of autosomal recessive polycystic kidney disease.

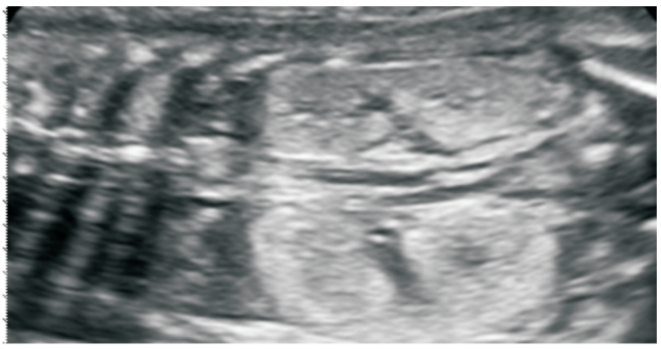

Figure 3

**AUTOSOMAL RECESSIVE POLYCYSTIC KIDNEY DISEASE**- ARPKD is one of the commonest inheritable infantile cystic renal diseases. The incidence is estimated at 1:20,000–50,000[3]. It results from a mutation in the PKHD1 gene located on chromosome 6p. It may be associated with Caroli disease or congenital hepatic fibrosis[4]. Ultrasonography shows reduced amniotic fluid. The fetal kidneys appear enlarged and echogenic and multiple tiny Cysts are seen with loss of corticomedullary differentiation.

**Case 4**

Fig 4- On Axial ultrasound images of 11 week old female shows persistently enlarged Fetal urinary bladder measuring 9 mm in longitudinal diameter (blue arrow). Bilateral kidneys (White arrow) and amniotic fluid were normal. Diagnosis of Megacystis was made.

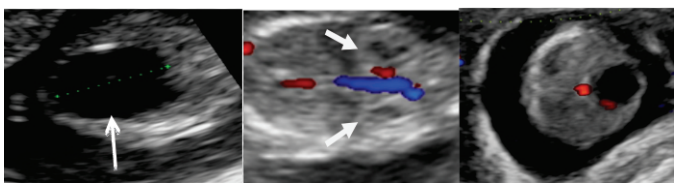

Figure 4

**FETAL MEGACYSTIS** – On ultrasound normal fetal bladder is round anechoic structure in the pelvic region. Longitudinal diameter of the fetal bladder during the first trimester is generally <6mm. If the diameter is ⩾ 7mm or if the bladder in the fetal pelvic region is large without emptying during a continuous observation of 45minutes, then a diagnosis of megacystis may be given[5].

## CONCLUSION

Congenital anomalies of the urinary tract are most common type of anomaly. In many cases they may remain asymptomatic for a long time even up until adulthood, and can be at times the manifestation of a complex systemic disease.

So routine antenatal ultrasound should be performed to diagnose fetal urinary tract anomalies.

## REFERENCES


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