Hydronephrosis

Prenatal and Postnatal Evaluation and Management

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KEYWORDS

• Hydronephrosis • Radiology • Antenatal diagnosis • Vesicoureteral reflux
• Obstructive uropathy • Urinary tract infections

KEY POINTS

- An anterior-posterior diameter (APD) of greater than or equal to 4 mm at less than 33 weeks gestation and 7 mm at greater than 33 weeks gestation most commonly define antenatal hydronephrosis.
- The likelihood of significant postnatal urologic pathologic abnormality correlates with the grade of APD and the gestational age at the time of measurement.
- Prenatal management is predominately expectant. Fetal intervention is rarely needed and remains controversial.
- Ureteropelvic junction obstruction and vesicoureteral reflux are the 2 most common postnatal diagnoses.
- The renal and bladder ultrasound is the mainstay of the postnatal evaluation and helps guide further testing with voiding cystourethrography and diuretic renography.

INTRODUCTION

The widespread use of routine second-trimester ultrasounds has increased the detection of congenital anomalies. One of the most frequently detected abnormalities is the dilation of the fetal renal collecting system, affecting 1% to 4.5% of all pregnancies.[1–4] This finding, however, is of uncertain clinical significance as this may be due to a wide spectrum of causes, ranging from insignificant transient physiologic development to

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significant uropathies, such as urinary obstruction to vesicoureteral reflux (VUR) with the potential for renal compromise. Detection of urologic anomalies prenatally permits interventions that avoid complications (eg, pyelonephritis, flank or abdominal pain, renal calculi, hypertension, and renal failure); however, upwards of 64% to 94% of affected patients will ultimately not have significant urologic pathologic abnormality.[3–7] The clinical challenge, therefore, exists to differentiate those cases with significant pathologic abnormalities, which would benefit from early detection from those who would not, thereby reducing the performance of prenatal and postnatal testing to those who really benefit.

This review summarizes the current literature on the topic of prenatal diagnosis and postnatal assessment and management. The review highlights controversies that stem from a lack of consensus on the definition of antenatal hydronephrosis (ANH) and of evidence-based data to guide both prenatal and postnatal management.

PRENATAL DIAGNOSIS AND MANAGEMENT

Defining ANH

Terms such as "pyelectasis" and hydronephrosis are often used interchangeably and thus have become associated with implied pathologic abnormality, whereby these findings may instead reflect normal physiology. Therefore, the prefered term is SERP (sonographically evident renal pelvis) instead of pyelectasis to connote a neutral position.[8] The term hydronephrosis is reserved for dilation of the renal pelvis and calices.

Anterior-Posterior Diameter

The measurement of the anterior-posterior diameter (APD) of the renal pelvis in a transverse plane is currently the most widely accepted parameter to define SERP (**Fig. 1**).[9] Although there is a lack of uniformity in cutoff values for significant APD, the most commonly accepted values are those described initially by Corteville and colleagues.[10] In their study, an APD greater than or equal to 4 mm before 33 weeks gestation or 7 mm after 33 weeks gestation allowed for identification of 100% of fetuses that ultimately had impaired renal function or require surgery.

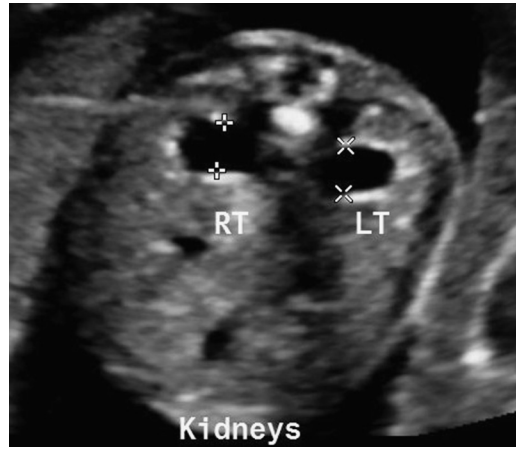

Fig. 1. Prenatal diagnosis of SERP. 20-week prenatal ultrasound depicting a transverse image of the fetal kidneys. APD measurements of the renal pelvis are 6.2 mm on the right (*RT*) and 6.1 mm on the left (*LT*). Postnatal ultrasound revealed SFU grade 1 on the right and SFU grade 2 on the left.