Prenatal and Postnatal Hydronephrosis Diagnosis and Management

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Prenatal and Postnatal Hydronephrosis

Overview of Hydronephrosis

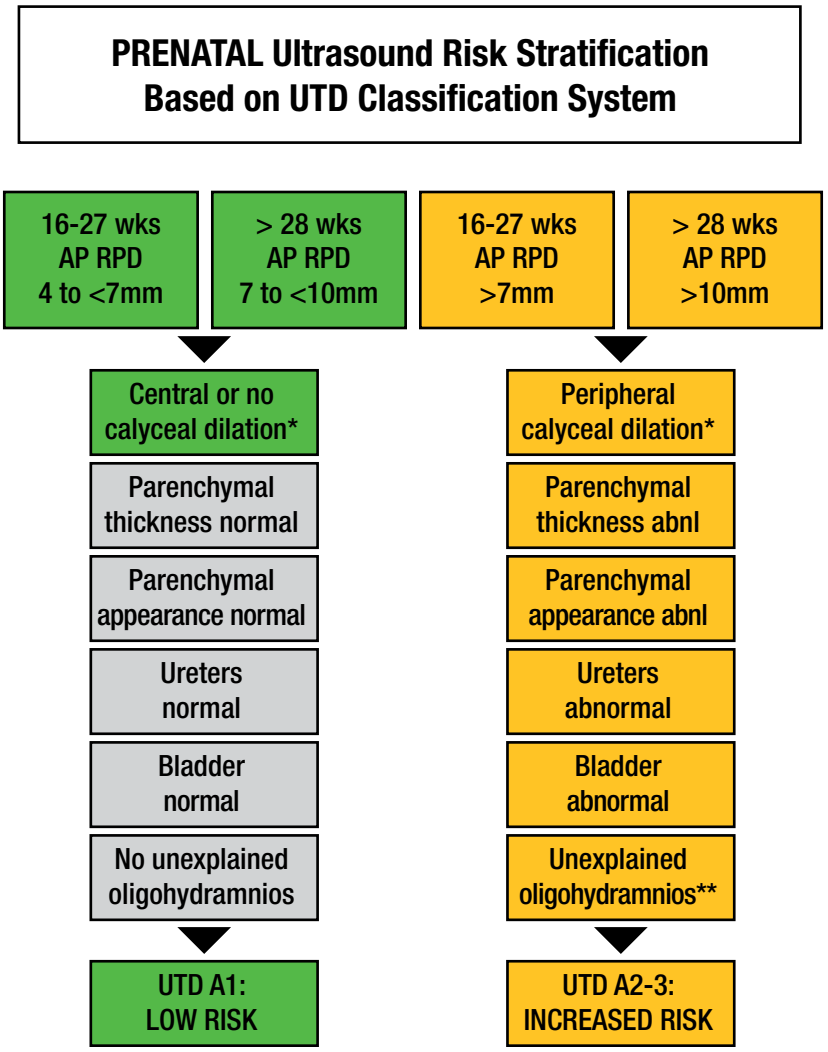
Hydronephrosis, also known as urinary tract dilation (UTD), denotes dilation of the renal collecting system. Hydroureteronephrosis is the term used when the pathology extends to the level of the bladder, suggestive of ureteral dilation also. It can affect fetuses (prenatal) and babies (postnatal) and is the most common abnormality found on prenatal ultrasounds.

Many cases of hydronephrosis are mild and resolve spontaneously. However, in the cases that require medical intervention, imaging and antibiotics may be necessary shortly after birth. The challenge for medical providers is identifying who is at low risk of requiring medical intervention, and who is at high risk. Once that is determined, a plan can be made with the family of high-risk patients, so that they understand what will happen after birth.

An absence of this plan creates a challenge for pediatricians: what to do with a newborn that, according to a family member, presented with hydronephrosis on a prenatal ultrasound, but no other information is available.

Diagnosis of Hydronephrosis

Prenatal hydronephrosis is most often discovered with a routine maternal-fetal ultrasound. Once discovered, the mother should be referred to a fetal medicine specialist or pediatric urologist between 20 and 30 weeks of pregnancy. A urologist will use the following criteria from the prenatal ultrasound to determine the risk category that the neonate falls into. **It is important to note that this classification system cannot be applied to a postnatal ultrasound.** Below is the standard risk stratification system urologists will follow.



Low Risk: A1

When a neonate presents on a prenatal ultrasound with anterior-posterior (AP) renal pelvic dilation (RPD) of 4 to less than 7 mm between 16 and 27 weeks gestation, or 7 to less than 10mm at greater than or equal to 28 weeks gestation, with central or no calyceal dilation, and otherwise normal results, they are considered low risk, and categorized as "A1." Whether the dilation is unilateral or bilateral, there is no need for imaging at the birth hospital, no need for antibiotic prophylaxis, and the patient should follow up with urology and a renal bladder ultrasound (RBUS) at 4 weeks after birth.

Increased Risk: A2-A3

Alternatively, when a neonate presents with greater than or equal to 7mm AP RPD between 16 and 27 weeks gestation, or greater than or equal to 10mm AP RPD at greater than or equal to 28 weeks gestation, and peripheral calyceal dilation, abnormal parenchymal thickness, abnormal parenchymal appearance, abnormal ureters, abnormal bladder, or unexplained oligohydramnios, they are considered at increased risk, and categorized as A2 or A3. There are varying factors that determine the best postnatal management.

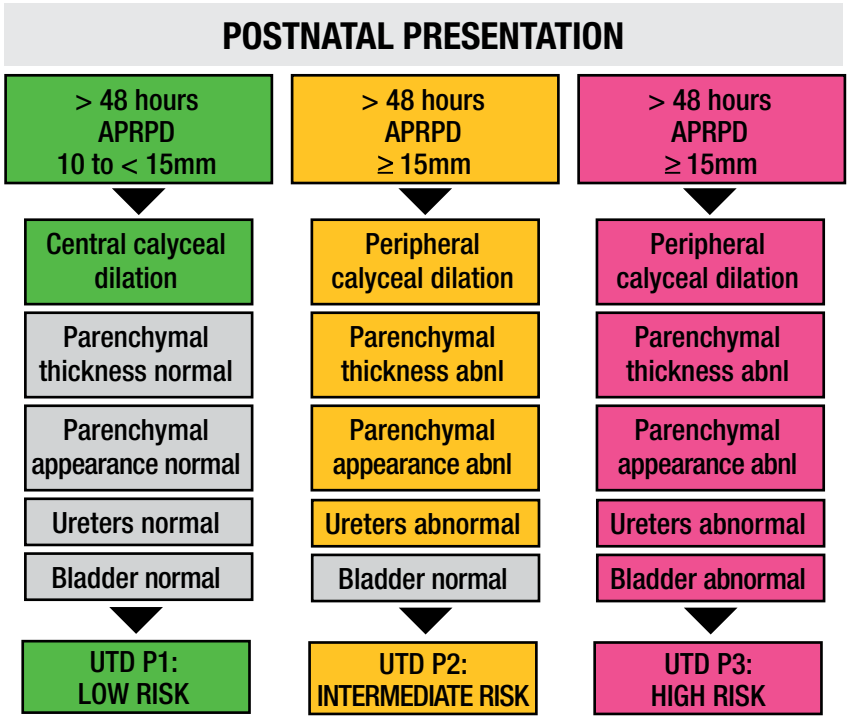
- Unilateral A2-A3 hydronephrosis with normal ureter, bladder, and amniotic fluid:
  - No need for imaging at the birth hospital
  - No need for antibiotic prophylaxis
  - Follow up with urology and RBUS at 4 weeks after birth
- Bilateral hydronephrosis (if A1 on one side, follow unilateral A2-A3 recommendations):
  - Obtain RBUS at greater than or equal to 24-48 hours of age, or before discharge
  - Consult urology immediately
- Unilateral ureteral dilation or ureterocele
  - No need for imaging at birth hospital
  - Discharge on antibiotic prophylaxis
  - Follow up with urology with RBUS at 4 weeks after birth
- Concern for bladder outlet obstruction (BOO):
  - RBUS at birth
  - Start antibiotic prophylaxis
  - Consult urology immediately

This clinical pathway solves the problem of determining who should have an RBUS or antibiotics at the time of birth, and also empowers pediatricians with patients that arrive in their office with a detailed prenatal ultrasound report.

Postnatal Hydronephrosis

As previously mentioned, many pediatricians see newborn patients with family-reported prenatal hydronephrosis, but no report from a fetal center or prenatal urologist. In these instances, if there had not been a concern for a major abnormality, an RBUS within 3-4 weeks of birth is reasonable.

As with a prenatal ultrasound, the findings on the postnatal RBUS will determine how urgently a newborn should be seen by a urologist. The following classification system is used to determine risk categorization:



Low Risk: P1 These children have little likelihood of ever requiring surgery or developing renal injury. They can safely be observed off of prophylactic antibiotics with serial sonography. Invasive studies such as VCUGs are not indicated. A referral to urology is recommended to plan the frequency of imaging that may be required.

Intermediate Risk: P2 These children have a higher likelihood of having significant issues and may benefit from not only prophylactic antibiotics, but also a VCUG. The VCUG should be scheduled as soon as practicable, followed by a referral to urology.

High Risk: P3 Urgent evaluation with urology is needed. These children are at greatest risk of renal injury and a thorough evaluation of the urinary tract is necessary. They likewise are at an increased risk of urinary tract infections and so prophylactic antibiotics are important.

The preferred antibiotic for urinary prophylaxis is amoxicillin; dosage for neonates is 20 mg/kg once a day, daily.

Referrals and Consultations

Urology Phone: **(419) 251-8027**
Urology Fax: **(419) 251-7766**

Physician Direct Connect Line for 24-hour urgent physician consultations:
(614) 355-0221 or (877) 355-0221

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