**Q.** A 32-year-old gravida 1 para 0 presents for a routine ultrasound at 21 weeks’ gestation. Ultrasound examination demonstrates unilateral pelviectasis (Figure 1). What is the definition of fetal pelviectasis and how frequently is it present during midtrimester?

**A.** Fetal pelviectasis (also called pyelectasis or renal pelvis dilation) is a common finding on midtrimester ultrasound, occurring in 0.5% to 4.5% of fetuses.\(^1,3\) It can be unilateral or bilateral, and is more common in male fetuses. Carbone and colleagues recently reported the frequency of fetal pelviectasis in 62,103 women undergoing midtrimester ultrasound.\(^5\) There were 1,248 cases of pelviectasis (2% incidence) and in 84.5% of these cases (n=1,055) it was an isolated finding.

![Ultrasound demonstrating measurement of AP diameter of fetal kidneys at 21 weeks' gestation.](image)

*The right renal pelvis is normal (single arrow) while the left renal pelvis demonstrates mild pelviectasis of 4.8 mm (double arrows). Abbreviation: AP, anteroposterior.*

The most commonly used criteria for diagnosis of pelviectasis are an anteroposterior measurement in a transverse scanning plane of 4 mm or larger in the second trimester (up to 27.9 weeks) and/or 7 mm or larger in the third trimester. Pelviectasis is defined as a renal pelvic diameter 4 mm to 9.9 mm, and hydronephrosis as 10 mm or larger.\(^4\)

Pelviectasis in a midtrimester fetus is usually self-limited, and most commonly represents a transient, physiologic state. However, in some cases pelviectasis can occur because of true renal pathology and may be associated with other fetal anomalies.

**What other ultrasound findings are important to assess?**

When fetal pelviectasis is identified, careful ultrasound examination should be performed to rule out other associated malformations (Table 1).\(^5,6\) Ultrasound evaluation of the genitourinary system should include determination of bilateral versus unilateral involvement, presence of dilated ureter(s), appearance of the renal parenchyma and calyces, size and thickness of the bladder and bladder wall, and volume of amniotic fluid (Figure 2).

Structural defects, such as duplicated kidneys, are a relatively common cause of pelviectasis and should be considered.\(^3\) When there is a duplicated collecting system, insertion of the ureters into the bladder often is accompanied by an ureterocele with resultant obstruction of the ureter(s).

**Table 1** Postnatal pathology reported after prenatally detected pelviectasis

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Posterior urethral valves</td>
<td>0.2%</td>
</tr>
<tr>
<td>Ureteral obstruction</td>
<td>1.2%</td>
</tr>
<tr>
<td>Ureteropelvic junction obstruction</td>
<td>5%</td>
</tr>
<tr>
<td>Vesicoureteral reflux</td>
<td>5%-10%</td>
</tr>
<tr>
<td>Total with any pathology</td>
<td>12%</td>
</tr>
</tbody>
</table>

Data from Lee RS, et al.; Shog S, et al.\(^3\)
It is never normal to visualize the ureters prenatally, and this finding may imply obstruction at the vesicoureteral junction, bladder outlet obstruction, or reflux. Megareter can also result from an intrinsic ureteral problem. Gender should be assessed by ultrasound because pelviectasis is more common in males and the differential diagnosis is somewhat different in male and female fetuses. In addition, internal and external genital tract anomalies can accompany urinary tract malformations, so this should be assessed.

What is the risk of chromosomal abnormality with isolated pelviectasis?
Aneuploidy is present in 0.3% to 0.9% of fetuses with isolated pelviectasis. Although some studies have reported an association between isolated pelviectasis and Down syndrome, overall the data are mixed and there is no consensus as to whether this finding should be used to adjust aneuploidy risk.

In general, amniocentesis is not pursued solely on the basis of a finding of isolated pelviectasis (unilateral or bilateral) in an otherwise low-risk patient. However, when other risk factors are present, such as advanced maternal age, abnormal or borderline serum screening, or other features suggestive of Down syndrome, further genetic counseling and/or amniocentesis should be considered.

After initial diagnosis, what is appropriate antenatal follow-up?
The goal of antenatal management is to detect those cases that might represent true renal pathology requiring postnatal evaluation and treatment. With this in mind, fetuses with pelviectasis 4 mm or larger in the second trimester should have a follow-up evaluation at approximately 32 weeks' gestation with the primary goal of determining the need for postnatal evaluation (Figure 3). At the time of the third trimester follow-up exam, about half of cases of mild pelviectasis will have normalized and half will remain unchanged or worsened. In cases of resolution of pelviectasis in the third trimester, no postnatal follow-up has been recommended. Nonetheless, of those cases of pelviectasis that normalize prior to birth, up to 15% may develop postnatal pelviectasis within one month. If the fetal renal pelvis on this third-trimester exam measures 7 mm or larger, postnatal evaluation is recommended to rule out significant urinary tract pathology. The likelihood of postnatal abnormalities based on the prenatal findings is summarized in Table 2.

What is appropriate neonatal management?
The goal of postnatal management is to identify those few cases with significant abnormalities of the urinary tract while avoiding unnecessary and invasive testing in infants with physiologic or clinically insignificant pelviectasis. Pediatric evaluation should include a physical exam as well as imaging studies to detect abnormalities such as obstructive uropathy or vesicoureteral reflex.

Initial postnatal imaging typically involves an ultrasound examination of the kidneys and bladder. Because fluid shifts in the first few days of life may result in underestimation of the degree of hydronephrosis, this initial ultrasound examination is often deferred until after 7 days after birth.

<table>
<thead>
<tr>
<th>Degree of antenatal renal pelvis dilatation</th>
<th>2nd trimester</th>
<th>3rd trimester</th>
<th>Frequency of postnatal pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>4-6.9 mm</td>
<td>7-9.9 mm</td>
<td>12%</td>
</tr>
<tr>
<td>Moderate</td>
<td>7-9.9 mm</td>
<td>9-14.9 mm</td>
<td>45%</td>
</tr>
<tr>
<td>Hydronephrosis</td>
<td>≥ 10 mm</td>
<td>≥ 15 mm</td>
<td>90%</td>
</tr>
</tbody>
</table>

Data from Lee RS, et al.

Infants with a normal postnatal ultrasound, defined as a renal pelvic diameter smaller than 7 mm without calyceal or ureteric dilatation, and no signs of renal dysplasia or anomalies, require no further evaluation. Infants with postnatal hydronephrosis usually have a repeat ultrasound at 6 weeks of age. Most neonates will have improvement or stabilization over the first few months of life.

Increased rates of urinary tract infections have been reported in children with antenatally diagnosed pelviectasis or hydronephrosis. The risk is higher if a urinary tract abnormality is present, and is higher in girls than in
boys. Because of this, antibiotic prophylaxis is often recommended until the urinary tract has been evaluated and an abnormality has been ruled out.

**What is the prognosis for the infant?**
The likelihood that the infant will have a significant renal or urinary tract anomaly depends on the severity of the pelviectasis, if the findings persist into the third trimester, and if there is bilateral involvement. Most cases of pelviectasis, and even moderate degrees of hydronephrosis, resolve by 18 months of age. A small percentage (3% to 7%) of children with antenatal pelviectasis require postnatal surgery (eg, pyeloplasty, fulguration of posterior urethral valves, or ureterocalic operations), and another 5% to 10% have some degree of vesicoureteral reflux.

**References**