THE CASE
A 29-year-old G1P0 woman at 13 weeks’ gestation came in for a routine prenatal visit complaining of sudden-onset heart palpitations that were occurring about once a week. Each episode lasted between 15 and 60 minutes and was accompanied by chest tightness, with no identifiable cause. The patient could inconsistently terminate the episodes with Valsalva maneuvers. She reported having had 2 similar incidents of palpitations within the past year. Her family history was significant for sudden cardiac death of her father and paternal grandfather in their fifth decades of life.

A cardiovascular exam was normal; heart auscultation revealed a regular rate and rhythm without murmurs, rubs, or gallops, and the peripheral pulses were normal. A thyroid-stimulating hormone (TSH) level, basic metabolic panel (BMP), and complete blood count (CBC) were within normal limits. A transthoracic echocardiogram was negative for structural heart disease.

THE DIAGNOSIS
An initial Holter monitor study failed to capture an episode of her palpitations. The frequency of her palpitations increased as her pregnancy progressed, occurring almost daily by the second half of the third trimester, and a repeat Holter monitor study in the third trimester was significant for a 3-minute episode of supraventricular tachycardia (SVT) that correlated with patient-recorded symptoms (FIGURE).

Based on these results, we diagnosed the patient with an atrioventricular nodal reentry tachycardia (AVNRT). Although atrioventricular reciprocating tachycardia (AVRT) remained a remote possibility, it is far less common, and a 12-lead electrocardiogram (EKG) showed no evidence of pre-excitation.

DISCUSSION
AVNRT is the most common form of paroxysmal supraventricular tachycardia (PSVT). It occurs more frequently in women and typically manifests in the second to fourth decades of life.1 AVNRT is a narrow complex tachycardia characterized by a heart rate of 120 to >200 beats/min.

FIGURE
Holter monitor study
Narrow complex tachycardia was captured with a Holter monitor study. P waves were obscured by the QRS complex, and the patient’s heart rate measured 218 beats/min.

THE PATIENT
29-year-old G1P0 woman; 13 weeks’ gestation

SIGNS & SYMPTOMS
- Heart palpitations
- Chest tightness
Hemodynamic changes in pregnancy can trigger arrhythmias
During pregnancy, hemodynamic changes (including increased blood volume and cardiac output) are thought to stimulate stretch-activated ion channels within the walls of the heart. Such changes may exacerbate previously existing cardiac arrhythmias or (less commonly) cause new-onset arrhythmias. A family history positive for arrhythmias or sudden cardiac death increases the likelihood of developing tachyarrhythmia during pregnancy. Women with a known history of PSVT might experience symptom exacerbation despite being on prophylactic therapy.

Detection and diagnosis
While AVNRT is relatively benign in pregnancy, other cardiac arrhythmias (eg, atrial fibrillation/flutter, ventricular tachycardia) carry a greater risk for fetal and maternal complications, underscoring the need to correctly identify the type of arrhythmia.

Physical exam findings are often unremarkable unless the patient is actively experiencing SVT in the office, in which case prominent jugular pulsations may be seen due to simultaneous contraction of the atria and ventricles.

The initial evaluation of a pregnant patient presenting with tachycardia should include a BMP, TSH, 12-lead EKG, and transthoracic echocardiography. In most patients with AVNRT, the results of these tests will be normal. A Holter monitor can be used to document an arrhythmia if the episodes are relatively frequent or an event monitor can be used if the episodes are infrequent.

EKG findings. When patients are actively experiencing SVT, EKG findings include a P wave obscured by the QRS complex, sometimes manifesting as a pseudo-R wave.

<table>
<thead>
<tr>
<th>Class</th>
<th>Medication</th>
<th>FDA pregnancy category</th>
<th>Lactation</th>
<th>Adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Flecainide</td>
<td>C</td>
<td>Little data, low levels enter breast milk</td>
<td>Little data, crosses placenta</td>
</tr>
<tr>
<td>II</td>
<td>Acebutolol</td>
<td>B</td>
<td>Enters breast milk, not preferred</td>
<td>Hypotension, bradycardia, tachypnea</td>
</tr>
<tr>
<td></td>
<td>Atenolol</td>
<td>D</td>
<td>Enters breast milk, not preferred</td>
<td>IUGR, do not use</td>
</tr>
<tr>
<td></td>
<td>Metoprolol</td>
<td>C</td>
<td>Safe</td>
<td>Bradycardia, sexual dysfunction</td>
</tr>
<tr>
<td></td>
<td>Pindolol</td>
<td>B</td>
<td>Safe</td>
<td>Bradycardia, sexual dysfunction</td>
</tr>
<tr>
<td></td>
<td>Propranolol</td>
<td>C</td>
<td>Safe</td>
<td>Bradycardia, sexual dysfunction</td>
</tr>
<tr>
<td>III</td>
<td>Sotalol</td>
<td>B</td>
<td>Enters breast milk, use only with close infant monitoring</td>
<td>Bradycardia, hypotension, IUGR, prematurity</td>
</tr>
<tr>
<td></td>
<td>Amiodarone</td>
<td>D</td>
<td>Unpredictable breast milk levels, not preferred</td>
<td>Growth retardation, prematurity, hypothyroidism</td>
</tr>
<tr>
<td>IV</td>
<td>Diltiazem</td>
<td>C</td>
<td>Enters breast milk at low levels</td>
<td>May have tocolytic effect</td>
</tr>
<tr>
<td></td>
<td>Verapamil</td>
<td>C</td>
<td>Enters breast milk at low levels</td>
<td>May have tocolytic effect</td>
</tr>
<tr>
<td>V</td>
<td>Adenosine</td>
<td>C</td>
<td>Safe, given its short half-life</td>
<td>Little evidence of harm in first trimester only</td>
</tr>
</tbody>
</table>
Tachyarrhythmias such as atrioventricular nodal reentry tachycardia may worsen or manifest with physiologic changes that occur during pregnancy. After establishing the diagnosis, effort should be made to manage the condition conservatively with Valsalva maneuvers and medication. Catheter ablation should be offered postpartum as a more definitive treatment option.

THE TAKEAWAY

AVNRT (and other tachyarrhythmias) may worsen or manifest with physiologic changes that occur during pregnancy. After establishing the diagnosis, effort should be made to manage the condition conservatively with Valsalva maneuvers and medication. Catheter ablation should be offered postpartum as a more definitive treatment option.

References