AMSER Case of the Month
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54-year-old female with anomalous origin of the right coronary artery

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Patient Presentation

- HPI: a 54-year-old woman presented to the emergency room with chest and jaw pain. She reports an eight-month history of intermittent fatigue and flushing with no dyspnea on exertion. Her troponin was elevated; she was diagnosed with NSTEMI and underwent cardiac catheterization and RCA stent placement. During PCI, it was discovered that she had an abnormal RCA origin and course.

- PMx: Coronary artery disease, obesity (BMI=38), hypertension, hyperlipidemia, type 2 diabetes mellitus, 10 pack year smoking history
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Scenario Id</th>
<th>Procedure</th>
<th>Adult RRL</th>
<th>Peds RRL</th>
<th>Appropriateness Category</th>
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</thead>
<tbody>
<tr>
<td>3196448</td>
<td>MRA chest without IV contrast</td>
<td>0 mSv O</td>
<td>0 mSv [ped] O</td>
<td>Usually appropriate</td>
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<td></td>
<td>MRA chest without and with IV contrast</td>
<td>0 mSv O</td>
<td>0 mSv [ped] O</td>
<td>Usually appropriate</td>
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<td>MRI heart function and morphology without IV contrast</td>
<td>0 mSv O</td>
<td>0 mSv [ped] O</td>
<td>Usually appropriate</td>
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<td></td>
<td><strong>CTA coronary arteries with IV contrast</strong></td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped]..</td>
<td>Usually appropriate</td>
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<td>Arteriography coronary with ventriculography</td>
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<td>3-10 mSv [ped]..</td>
<td>May be appropriate</td>
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<tr>
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<td>MRA abdomen without and with IV contrast</td>
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<td>MRI heart function with stress without IV contrast</td>
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Coronary CTA Axial (labeled)

Right coronary artery

A = Aorta
PA = Pulmonary Artery
Final Dx:

Anomalous origin of the right coronary artery from the left coronary sinus with an interarterial course
Classifying RCA anomalies

- **By origin**
  - From pulmonary artery
  - **From aorta** our patient

- **By course**
  - Interarterial our patient
  - Subpulmonic
  - Prepulmonic
  - Retroaortic
  - Retrocardiac

- **By anatomy**
  - Duplication

- **By termination**
  - Hypoplasia
  - Fistula
  - Congenital absence
Clinical Significance

• Prevalence of anomalous origin of RCA is 0.25%
• Most are asymptomatic, but may be symptomatic and present with:
  • Angina
  • Myocardial infarction
  • Sudden cardiac death
• Our patient is at risk for ischemia due to the interarterial course of her RCA
• What is the mechanism of ischemia due to an interarterial course?
  • Acute angle of RCA from aorta, along with acute angle leaving aorta, and pathway between aorta and pulmonary artery means the RCA gets compressed during exercise
References


