Cardiac Radiology

Application Questions

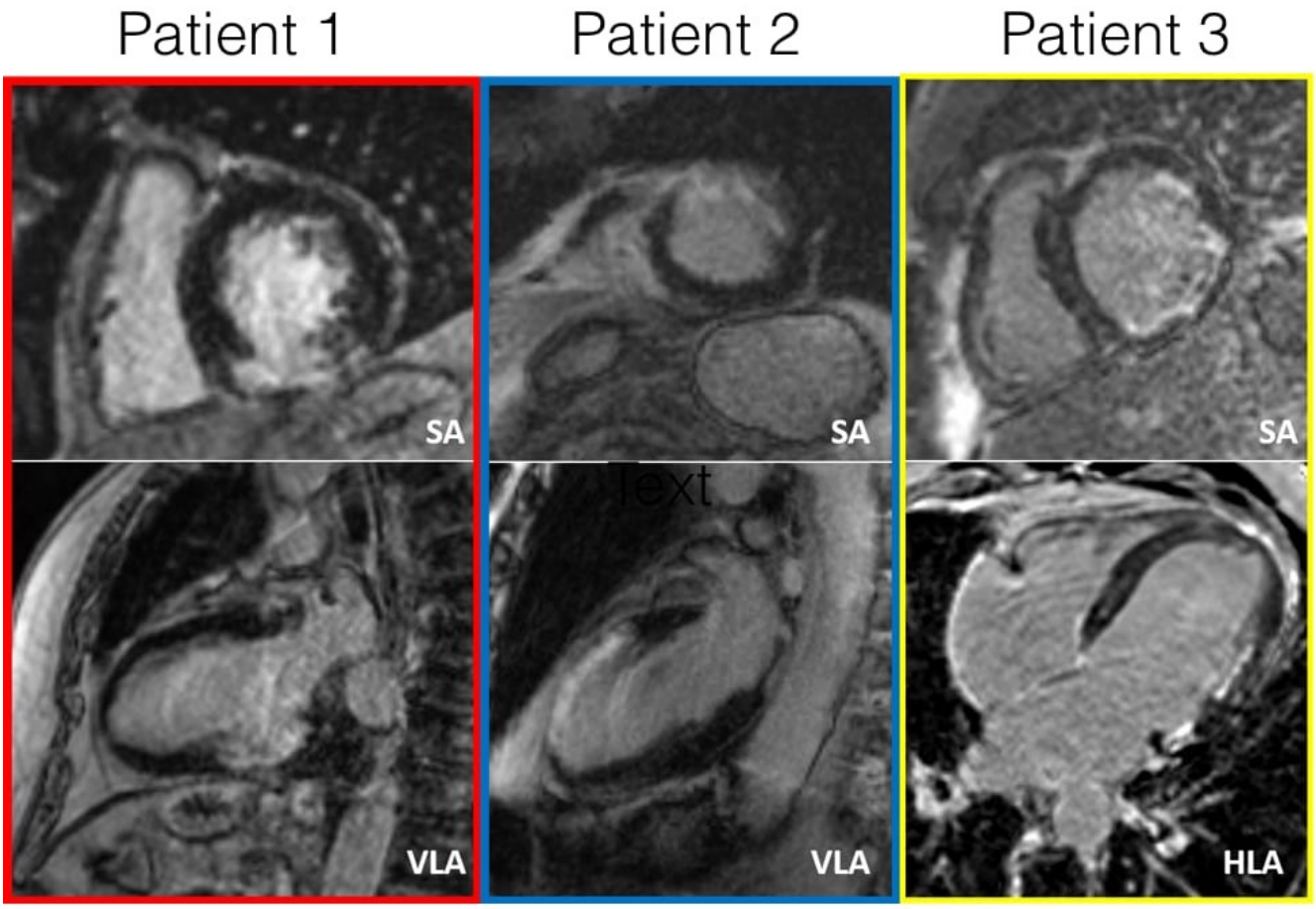
Question 1

Below are delayed enhancement images from three different patients who underwent cardiac MRI for evaluation of myocardial viability in the setting of known ischemic heart disease. Patient 1 (red) had an right coronary (RCA) territory infarct; patient 2 (blue) had a left anterior descending (LAD) infarct, and patient 3 (yellow) had a left circumflex (LCx) territory infarct. Which patient would benefit from revascularization of the affected vessel? (In the images below, SA=short axis; VLA=vertical long axis; HLA=horizontal long axis)

A. Patient 1

B. Patient 2

C. Patient 3



Question 2

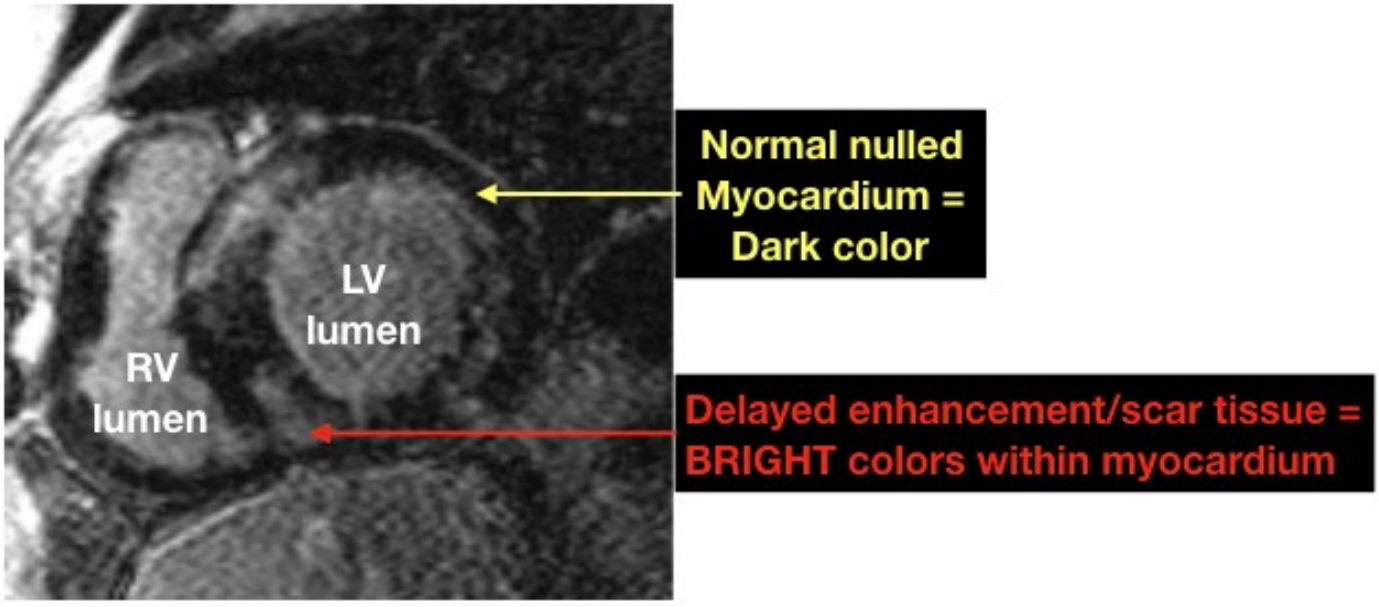
A patient underwent cardiac magnetic resonance imaging. The provided image is from the delayed enhancement sequence, displayed in the short axis view with anatomy as detailed. The pattern of delayed enhancement is patchy and mid-myocardial. Based on these findings, what is the most likely diagnosis?

A. Ischemic myocardial infarction

B. Myocarditis

C. Pericarditis

D. Angiosarcoma



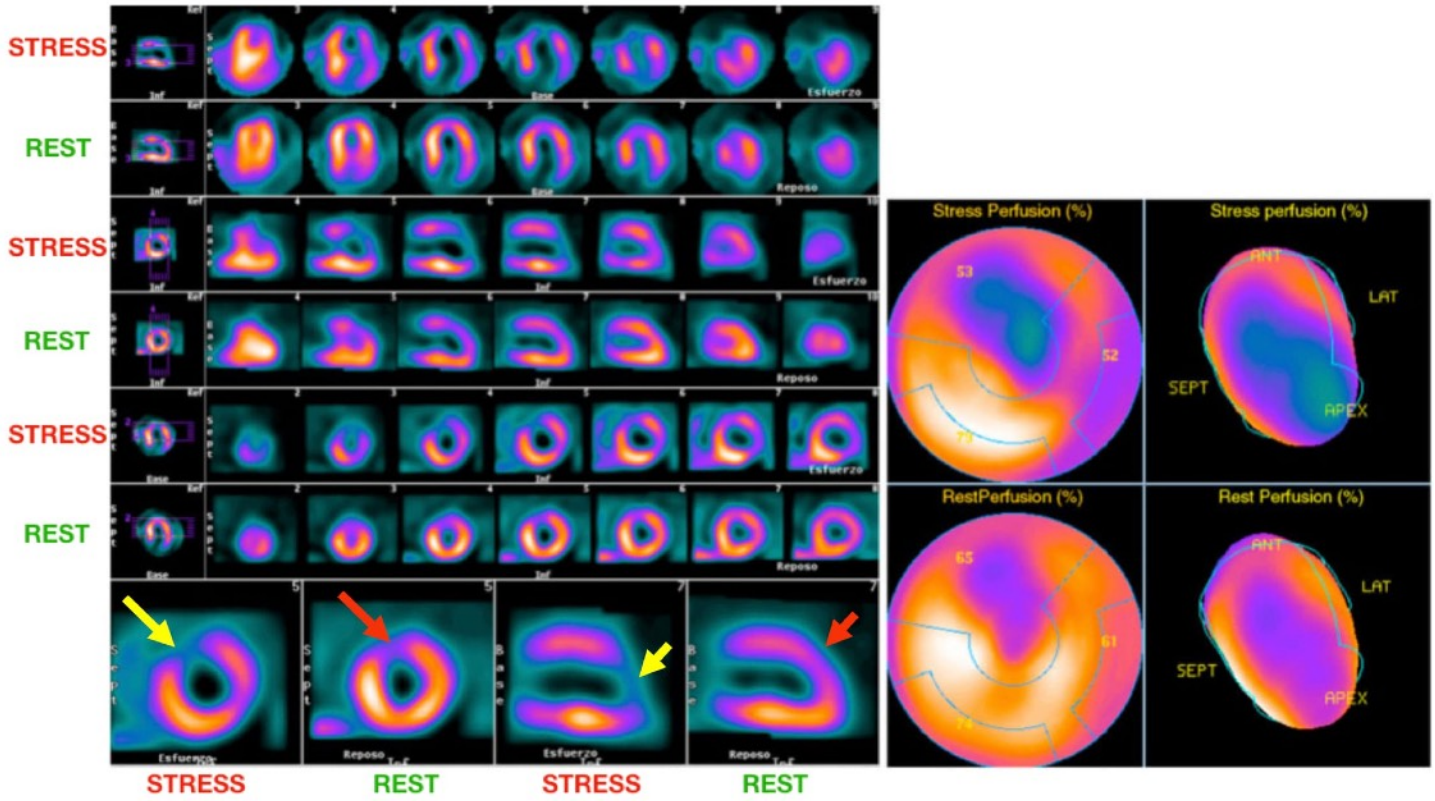
Question 3

Below are images from a myocardial nuclear perfusion test obtained in a 70-year-old man, a former heavy smoker, diabetes, hypertension, and obesity with worsening chest pain on exertion. Images are acquired after injection of radiotracer with the patient resting (REST) and after peak exercise (STRESS). There is decreased radiotracer uptake at the left ventricular apex on the stress images (yellow arrows) compared to the rest images (red arrows). Based on the difference between radiotracer distribution in the myocardium during rest and stress, what is the most likely etiology for the patient's chest pain?

A. Costochondritis

B. Hemodynamically significant CAD

C. COPD exacerbation



Question 4

Below are images from CCTA exams of four different patients, demonstrating the origins of the coronary arteries. (Ao=aorta, LA=left atrium, RA=right atrium, LV=left ventricle, RV=right ventricle, PA=pulmonary artery). Which patient has normal anatomy?

A. Patient A

B. Patient B

C. Patient C

D. Patient D