Kaplan USMLE Step 3 prep: Confirming a diagnosed “heart valve problem”

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If you're preparing for the United States Medical Licensing Examination® (USMLE®) Step 3 exam, you might want to know which questions are most often missed by test-prep takers. Check out this example from Kaplan Medical, and read an expert explanation of the answer. Check out all posts in this series.

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This month's stumper

A 44-year-old man comes to the emergency department because of a seven-day history of fever and a two-day history of red spots on his eyes. He also reports some lethargy and fatigue. His past medical history is otherwise unremarkable. He does state that when he was a teenager a physician once told him that he had a "heart valve problem" that would require him to take antibiotics on dental visits.

His temperature is 38.0 ºC (99.4F), blood pressure is 140/75 mm Hg, pulse is 92 beats per minute, and respirations are 16 a minute. He has bilateral conjunctival hemorrhages and small indurations present on the dorsal surface of his hands. He has a 1/6 systolic ejection murmur heard best at the apex.

The finding most likely to confirm the diagnosis is:

A. Echocardiogram showing mitral regurgitation.

B. Echocardiogram showing valvular mass.
C. Elevated erythrocyte sedimentation rate.

D. Positive V/Q scan.

E. Single positive blood culture.

The correct answer is B.

Kaplan Medical explains why

This patient has a diagnosis suspicious for infective endocarditis (IE). This disease is an infection of the endocardium which produces vegetations that may be seen on an echocardiography as a mass. If left untreated, endocarditis is fatal. The majority of cases of IE occur in patients with abnormal valves who have not had recent procedural intervention. The diagnosis is made on the duke criteria, which are modifications of the prior Von Reyn criteria. There are two major and five minor criteria and for diagnosis two major or one major and two minor or five minor criteria are required. For this patient who has the presence of three minor (fever, conjunctival hemorrhage, and Osler nodes), a major criterion is required. This is definitive echocardiographic evidence of infection.
Why the other answers are wrong

**Choice A:** An echocardiogram showing mitral regurgitation is supportive of the diagnosis, but not definitive since this patient has been told in the past that he had a valvular disorder. Since the MR is not known to be new, it is not definitive evidence of IE infection, but rather, is supportive, and so a valvular mass is best in confirming the diagnosis.

**Choice C:** Any systemic inflammatory reaction will elevate the erythrocyte sedimentation rate. Therefore, this test is of minimal use in confirming IE. It is not present as one of the duke criteria.

**Choice D:** A positive V/Q scan is evidence of a pulmonary embolism. It is common with IE to have septic pulmonary infarcts from vegetations being sent to the distal arterial tree, but not to have "pulmonary emboli," which are venous events.

**Choice E:** The other major diagnostic criterion for IE is positive blood cultures for typical organisms causing IE from two separate cultures. The presence of a single positive culture is of no diagnostic value.

For more prep questions on USMLE Steps 1, 2 and 3, view other posts in this series.