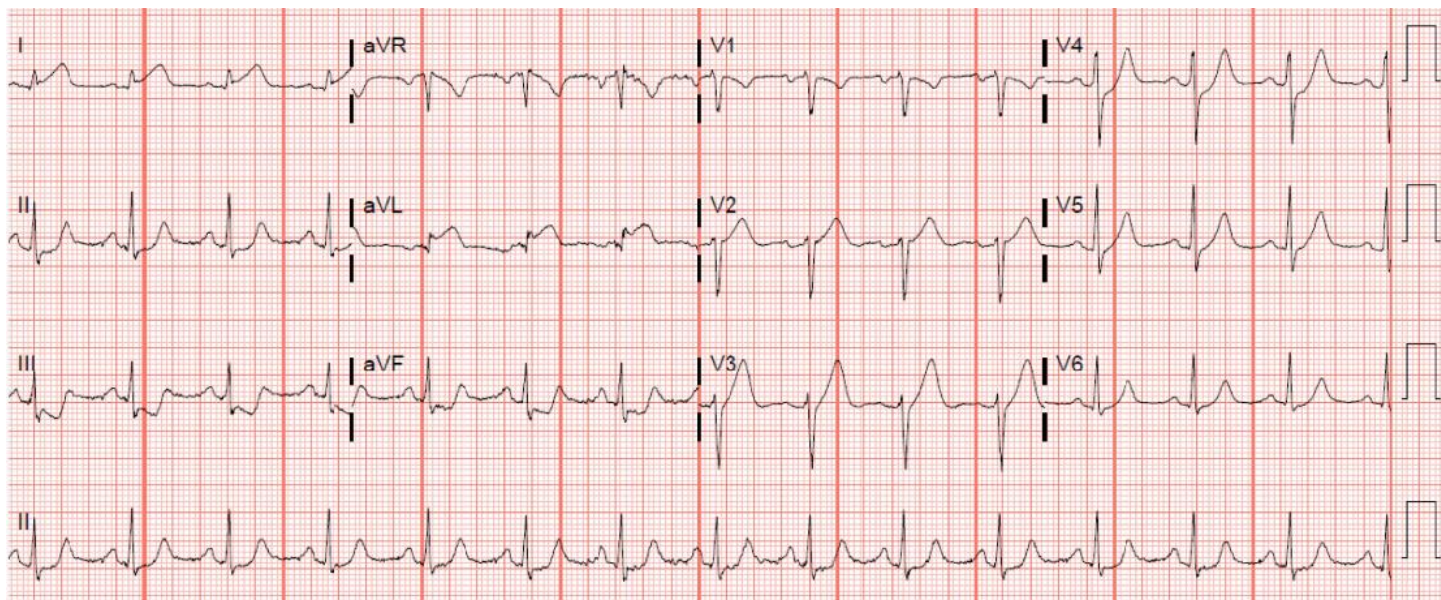


What Do You Have to Say About This ECG?

Discussion

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This primary diagnosis here is very evident. But there are also some other findings that need explanation...

1. What is the primary diagnosis?

Acute basolateral (formerly “high lateral”) transmural ischemia. There is NO myocardial infarction on this ECG!

2. Which coronary artery is the culprit?

Although an occlusion of either the LCx or the LAD could result in this ECG, I strongly favor the LAD.

3. When you decide which coronary artery is the culprit, explain what rules out the other two arteries.

a) **There is ST elevation in Leads I and aVL. You will NEVER see this with an occlusion of the RCA.**

b) **While an occlusion of the LCx can result in ST elevation in Leads I and aVL, it almost always includes ST elevation in the inferior leads as well – but we don’t see that here. That strongly favors the LAD as the culprit.**

c) **Leads V2 and V3 demonstrate hyperacute T waves (note the width of the bases). It would be extremely unusual for an occlusion of the LCx to manifest changes in those leads. I think you would be more likely to spot a sasquatch on your next nature walk. That favors the LAD as the culprit.**

4. Why is there ST depression in Leads II, III and aVF?

Those are reciprocal changes to the STE in Leads I and aVL which validate our impression of a basolateral transmural ischemia. We don't really need it in *this* case, but sometimes the ST elevation can be very subtle and the reciprocal changes help a lot!

5. Are the T waves in the inferior leads inverted or upright? How would YOU classify them?

The T waves are upright. When a T wave is biphasic, it is designated *by the way it ends*. These T waves appear neg/pos biphasic, so they are considered upright.

6. What do you think of the T waves in Leads V2 and V3?

As mentioned, they are very characteristic of hyperacute T waves. Hyperacute T waves represent myocardial ischemia that is advancing toward – *but has not yet reached* – the epicardial layer. It is possible to halt the ischemia at this point and the hyperacute T waves will disappear without developing ST elevation. This is considered a Birnbaum-Sclarovsky Grade 1 ischemia.

7. What does the deep S wave in Lead V3 suggest? (Hint: It suggests that something is NOT present. What is NOT present?)

The deep, significant S wave tells me that the myocardial ischemia has not progressed to Birnbaum-Sclarovsky Grade 3 which would be indicated by terminal QRS distortion. In such a case, the S wave in Lead V3 would be significantly diminished or even absent.

8. Why is there ST depression in Leads V4 – V6?

The STE in Leads I and aVL and the hyperacute T waves in Leads V2 and V3 indicate an occlusion that involves the upper (basal) lateral wall of the left ventricle. While the LAD serves the area covered by Leads V4 – V6, that also happens to be the best perfused area of the heart. The LCX, the RCA and (when present) the ramus intermedius also provide that area with circulation. It is likely that there is enough circulation supplied by the other arteries to prevent a transmural ischemia. Unfortunately, however, not enough to prevent subendocardial ischemia. This raises the question of disease in one or more of the other arteries!