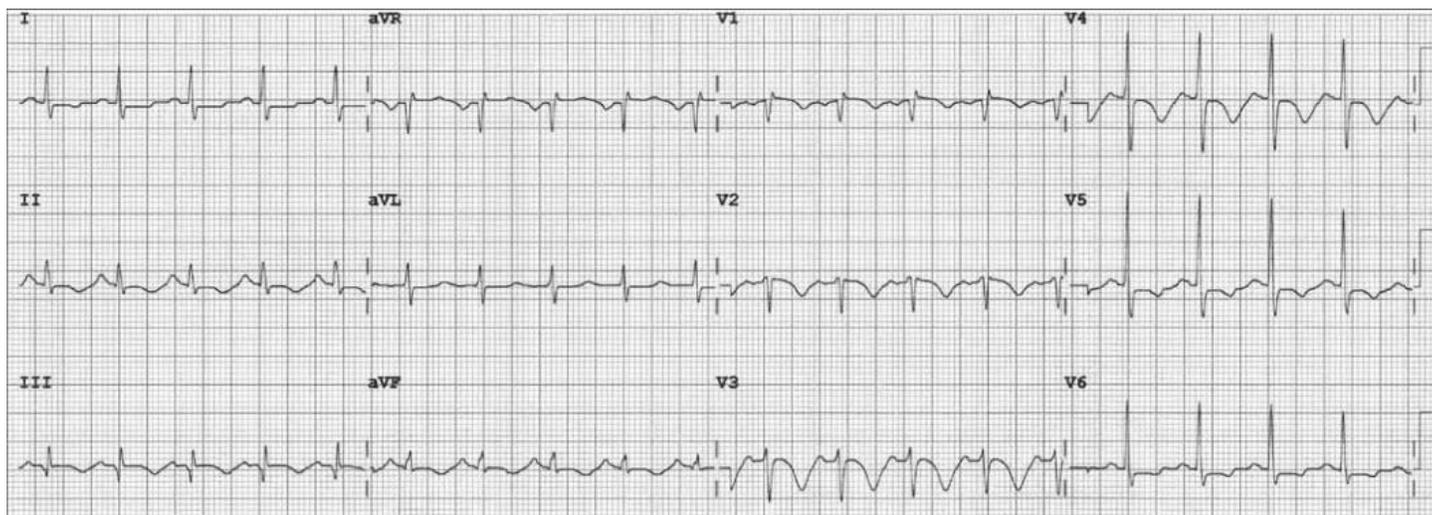


# What Do YOU Think of This ECG?

## Discussion

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**Figure 1**

This patient is a 46 year old female who presents with chest pain and dyspnea of acute onset. She is also very anxious and is crying. She keeps repeating, “Help me! Help me! Something’s happening to me.” She is also very agitated.

The rhythm is sinus tachycardia, and it is very regular. There is no ST elevation.

Let’s start BEFORE an ECG is recorded. You’ve heard her story and you’ve seen the patient. She is indeed very excited and agitated and very scared! You order the 12-lead ECG BECAUSE YOU ARE SPECIFICALLY LOOKING FOR SOMETHING! An ECG should be more than just one part of a “shotgun” arsenal. You do an ECG for a REASON – so what is YOUR reason here? Could the patient be having an *acute MI*? Certainly, given her age and the possibility that she is post-menopausal. WHAT ARE YOU LOOKING FOR ON THE ECG? Could it be an *acute pulmonary embolus*? Certainly. WHAT WILL YOU BE LOOKING FOR ON THE ECG? Could she be having an acute, perforated gastric or duodenal ulcer? Or a ruptured esophagus? All possibilities, though some could be ruled out quickly based on history and physical examination alone.

When you order an ECG during an acute or critical case – you should always know what you are looking for. Don’t think, “I’ll just throw a bunch of stuff against a wall and see what

sticks.” That is neither a clinical nor a scientific approach. If you know what you are looking for, you will be much less likely to miss it when it is there. Granted, you can’t be sure of what you’re going to find... but you should at least have an idea of what you are looking for.

Our most likely diagnosis here is acute pulmonary embolism, especially given additional history by her husband that her right leg had been in a cast for several months.

The three ECG signs to look for in cases such as this are:

1. Sinus tachycardia. Not ventricular tachycardia, atrial tachycardia, AVNRT or AVRT. Just sinus tachycardia. It’s present here.
2. T wave inversions in the inferior leads in the frontal plane and the right precordial leads (V1 – V3) in the horizontal (transverse) plane. Again, that is present here.
3. Incomplete or complete RBBB. Incomplete RBBB is actually more typical of an acute PE but either will do. Neither is present on this ECG, but we can see a definite right-pointing repolarization vector based on the S wave in Lead I and the small terminal r waves in Leads aVR and V1. Those small r waves aren’t *septal* r waves. Septal r waves appear *before* the first negative deflection – not after it!
4. A fourth possible finding is a rightward mean QRS axis in the frontal plane (not present here, either).

But why are these findings and diagnosis missed in too many cases? Because, through cynicism and bias, patients like this woman are immediately assumed to be having an anxiety or panic attack. Their significant physical symptoms are minimized or given a lower priority while there is an over-fixation on the emotional or psychiatric presentation. I have seen this happen on several occasions and each occasion ended badly! (And each case involved an *acute pulmonary embolism*.)

Here is the truth that many don’t want to hear: If a patient is having BOTH significant physical and emotional symptoms – you MUST address the physical symptoms FIRST. Yeah... I practiced emergency medicine for over 35 years, so – “been there, done that... LOTS of times!” I know it’s difficult but that is what must be done. By the time you get the mental symptoms under control – it may be too late for the body. The only exception is if the patient is about to cause harm to themselves or others.