

OK.

Thank you for joining us for another portal education video.

And today, we're gonna work through a case that involves a 12 lead ECG pattern that you can't miss, and also a 12 lead pattern that is at times misunderstood.

So this was an elderly patient who had had recent vascular surgery for peripheral vascular disease who had developed a cool extremity and also developed chest pain, thus called EMS.

Patient has a history again of peripheral vascular disease.

Also, a history of hypertension and end stage renal disease on dialysis. You can see your vitals listed there with a blood pressure of 148 / 45 heart rate of 78.

The patient was noted to be afebrile and saturating 92% on room air. So there is absolutely a differential diagnosis to consider here with limb ischemia, acute coronary syndrome, aortic dissection, amongst other things, at play, but at this point a 12 lead was obtained and I really want to focus on that.

So here was the patient's initial 12 lead electrocardiogram, and if you think about how we've discussed reading 12 leads in the past, this rate looks reasonably normal.

The rhythm is irregular and they're look to be some premature atrial contractions causing that irregularity.

The QRS is narrow.

There are P waves before the QRS complexes.

If you look here in aVF you see PQRS PQRS and then when you look for ST-T wave changes consistent with a ischemia or other pathology, if you focus first on the inferior leads, you have some subtle ST depression in 2.

When you go to your anterior V leads, there's not much to speak of until you start getting out more laterally in 4, 5, and 6, where you start to see some subtle ST depression.

Finally, in 1 and a VL, you can see ST depression in 1 and a little more subtle ST depression in AVL.

There are no changes consistent with posterior MI. So at this point the patient started to complain of worsening symptoms, most notably worsening chest pain so a repeat 12 lead was obtained and in comparison now the rate is faster.

The rhythm looks regular.

QRS continues to be narrow and there continue to be P waves. And if you look at your ST changes, you start to see deeper depression in 2. You now are starting to see some ST depression in V2, V3, and even more pronounced depression in V 4, 5 and 6. If you move out to 1 and aVL you see continued and deeper ST depression worse in lead 1, and then when you look at aVR you see significant ST elevation in lead aVR.

So again, sinus rhythm on the 1st 12 lead, you see some PAC's, there's ST elevation in aVR with diffuse ST depression and those changes are dynamic from 12 lead one to two.

So what does this all mean when you see ST elevation in AVR with diffuse ST Depression and what's the clinical significance of this pattern?

This pattern in the past has been considered to be a STEMI equivalent, but those recommendations have changed.

This is really indicative of global subendocardial ischemia, and while it is definitely a high risk ECG finding, there are acute coronary syndrome causes as well as non-ACS causes and making that distinction is really important because recognizing the non-ACS causes and treating those appropriately is obviously going to lead to patient benefit instead of getting stuck in the trap of thinking this is always acute coronary syndrome.

More likely than not, it will be from a non-ACS cause, and again this pattern is not specific for STEMI.

There's a myriad of non-ACS causes including hypoxemia, sepsis, GI bleed, amongst other things.

If this is due to acute coronary syndrome, then this is concerning for a proximal left sided lesion in the left main or proximal LAD or multivessel disease.

This patient had aortic dissection ruled out given the chest pain and cold extremity. Underwent a large work up that ruled out other causes for this 12 lead finding as well.

The patient had ongoing chest pain with an initial positive troponin that was noted to rise on recheck and given all of those things, they were taken to the Cath lab where they were noted to have multivessel coronary disease with a culprit lesion in the LAD which was stented and the patient did well.

So really important 12 lead pattern to both recognize and understand the significance of and if you want to do some more reading into this Dr. Smith's ECG blog has a really great review as does journal Feed, and then finally you can see a paper there on the bottom that dives into this as well.

So again, thank you for joining us and I look forward to doing this again soon.