

How Many Findings Do YOU Recognize on This ECG?

Discussion

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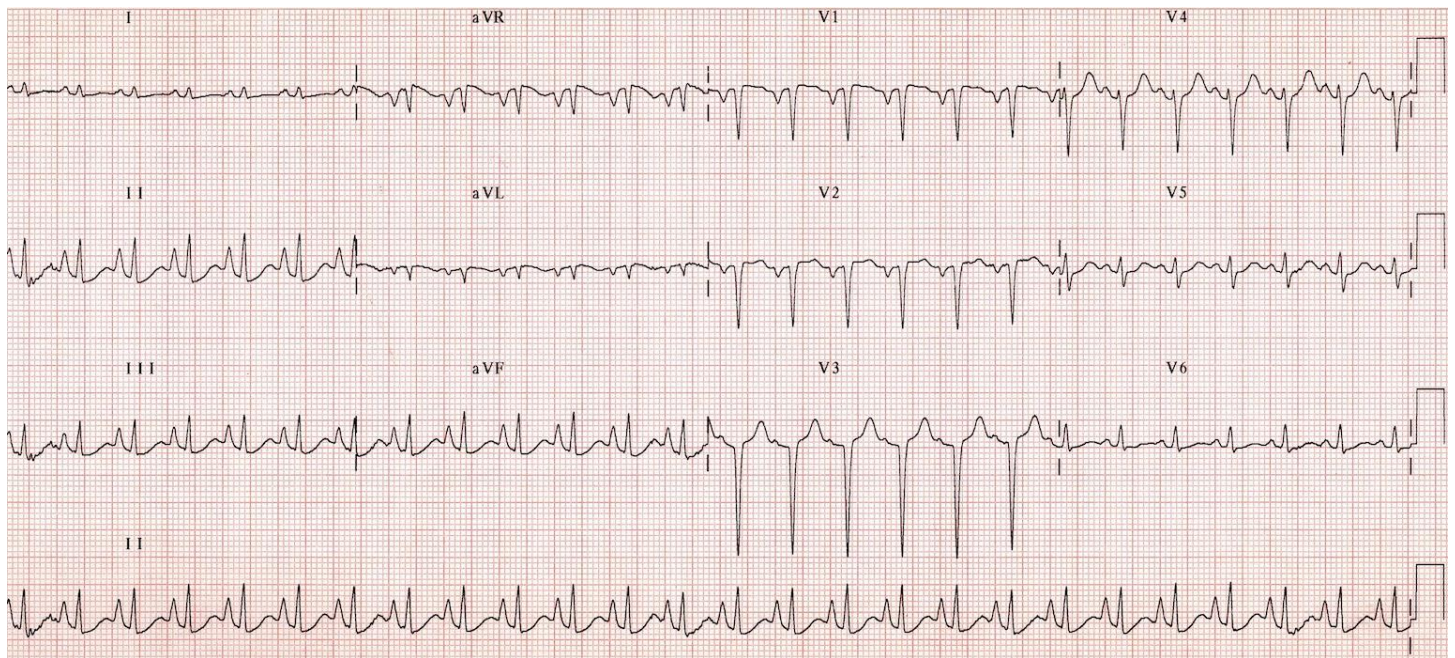


Figure 1

There are many problems here and certainly more than one diagnosis.

The tall P waves in the inferior leads are very characteristic of *P pulmonale* indicating enlargement and likely hypertrophy of the right atrium. *An easy diagnosis.*

There is an obvious size disparity between the left-sided leads and the inferior leads in the frontal plane, with the left-sided leads (I and aVL) having much lower voltage. That is because the inferior leads are viewing the heart via an axis that runs through the mediastinum thus avoiding much of the hyperinflated lung tissue. The left-sided leads are located laterally and must pass through much of the poorly-conducting, hyperinflated lungs. That significantly alters the voltage in those leads, rendering the deflections very small. You can also see that Leads V5 and V6 in the horizontal plane, being left-sided leads also, are small as well. *An easy diagnosis.*

Now comes the difficult part. Look at the P waves in Lead V1. They are wide and deeply negative with no upright component. That looks like a rather obvious left atrial abnormality – likely left atrial hypertrophy. But you would be **WRONG!** That is **RIGHT** atrial enlargement – not **LEFT** atrial enlargement!

Why is that? It's because of the right ventricular hypertrophy!

“Wait a minute!” you say. “Right ventricular hypertrophy has tall R waves in the right precordial leads!”

Let me enlighten you. Types A and B right ventricular hypertrophy have tall R waves in the right precordial leads – but Type C does not! And this is classic Type C right ventricular hypertrophy! The RVH has caused an electrical rotation of the heart along with the advanced emphysema which has drawn the heart downward and lower in the chest, creating a situation in which the electrode for Lead V1 now sees the right atrial depolarization impulse traveling *away* from it – thus recording a *deep* and *strictly negative* P wave.

And let me preemptively say, “You’re right! There is no RBBB!”

This ECG is quintessential ADVANCED PULMONARY EMPHYSEMA!