

## ANSWER TO PHOTO QUIZ

## The ECG, a useful ally in the emergency room

**Keywords** - pulmonary embolism, electrocardiography, diagnostics

### Diagnosis

The current ECG shows sinus rhythm, 115 beats/min, a vertical heart axis, incomplete right bundle branch block (RBBB), slight ST-segment elevation in lead aVR, and slight ST-segment depressions in leads V4-6, II, aVF and I, which were all new compared with an ECG five years earlier. These findings provide a clear suggestion of right ventricular overload which could be caused by pulmonary embolism (PE). Our patient indeed turned out to have massive bilateral PE.

Knowledge about the electrocardiographic signs of PE dates back to 1935 when patients with acute massive pulmonary hypertension due to PE were observed to more frequently exhibit an S wave in lead I and Q wave (and negative T wave) in lead III.<sup>[1]</sup> Recent studies estimate this SIQTIII pattern to be present in 15-25% of patients and find it to be associated with poorer outcomes.<sup>[2]</sup> Also complete RBBB or incomplete RBBB, atrial arrhythmias, loss of R waves, and inverted T waves in the right precordial leads have been associated with elevated right-sided cardiac pressures due to PE.<sup>[2]</sup> Sinus tachycardia is frequently seen (40% of cases) and can reflect haemodynamic

compromise but also hypoxia and pain and is therefore also often seen in milder cases. Importantly, none of aforementioned characteristics is fully specific or sensitive for PE but should be seen as pieces in a Bayesian puzzle comprising a-priori risk and clinical findings.<sup>[3]</sup>

### Disclosures

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The patient provided informed consent for publication of this case report.

### References

1. McGinn S, White PD. Acute cor pulmonale resulting from pulmonary embolism: its clinical recognition. *JAMA*. 1935;104:1473-80.
2. Ullman E, Brady WJ, Perron AD, et al. Electrocardiographic manifestations of pulmonary embolism. *Am J Emerg Med*. 2001;19:514-9.
3. Wells PS, Ginsberg JS, Anderson DR, et al. Use of a clinical model for safe management of patients with suspected pulmonary embolism. *Ann Intern Med*. 1998;129:997-1005.