Available online at www.sciencedirect.com

ScienceDirect

Journal of Electrocardiology 47 (2014) 75 – 79

JOURNAL OF Electrocardiology

www.jecgonline.com

ECG manifestations in submassive and massive pulmonary embolism. Report of 4 cases and review of literature☆,☆☆,★

Eduardo Abarca, MD,[a,*] Ajay Baddi, MD, FACC,[b] Rossana Manrique, MD[c]

[a]Department of Internal Medicine, Louis A. Weiss Memorial Hospital, Chicago University Hospitals, Internal Medicine PGY-2, Chicago IL
[b]Department of Cardiology, Louis A. Weiss Memorial Hospital, Chicago University Hospitals
[c]Louis A. Weiss Memorial Hospital, Clinical Observer

Abstract ECG findings suggestive of right ventricular (RV) hemodynamic derangement, in the appropriate clinical setting, can lead to further diagnostic consideration and earlier institution of treatment, aiming to decrease the high morbidity and mortality associated with submassive and massive pulmonary embolism (PE). In this paper, we review 4 cases with chest computed tomography (CT) confirmed PE with their respective ECG findings. In all the cases patients had an RV strain pattern on ECG, although in different clinical scenarios, including one with an initial diagnosis of acute coronary syndrome (ACS). In one case, a transitory short PR interval was seen, a finding not previously reported, in the literature. The most common finding was T wave inversion (Twi) in the anterior leads.

© 2014 Elsevier Inc. All rights reserved.

Keywords: Pulmonary embolism; ECG; Right ventricular strain pattern

Introduction

Pulmonary embolism (PE) is the third most common cause of death from cardiovascular disease after heart attack and stroke. The clinical presentation of PE ranges from subclinical to severe, the latter associated with high morbidity and mortality. Its clinical probability can be assessed empirically or with prediction rules or scores.[1] This assessment is aimed to identify patients with intermediate to high clinical probability that will benefit from immediate treatment while waiting for test results. PE has been associated with several non specific ECG manifestations but with the widespread availability of other diagnostic tests, the role of ECG, in the acute setting, is primarily for diagnosing other clinical entities, such as acute coronary syndromes (ACS).[2,3] However, several recent studies have found a relationship between certain ECG findings and the presence of submassive or massive PE. These ECG changes are secondary to RV pressure load modifications that lead to alterations in the right-sided cardiac conduction system. As a group they are known as RV strain pattern. From these findings, T wave inversion (Twi) in the anterior leads has shown the strongest correlation with elevated Right Ventricular (RV) systolic pressure. In this paper, we review the ECG findings on four chest Computed Tomography (CT) confirmed PE cases and also performed a review of the available literature.

Case 1

A 47 year-old-female presented with sudden onset of dyspnea and tachycardia. Her past medical history included recent brain meningioma surgery, left sided hemiparesis and obesity. Her vitals included a blood pressure of 95/60 mmHg, heart rate of 120 beats/min, pulse oximetry 89% and respiratory rate of 28 breaths/min. The physical examination was unremarkable except for tachycardia, left sided hemiparesis and hemianesthesia. The 12 lead ECG showed an S wave in lead I and Twi and deep Q waves in lead III (Fig. 1), all new findings. A chest CTA revealed pulmonary emboli occluding 70% of the main right pulmonary artery and 80% of left inferior lobar artery and also RV dilatation (RV diameter/Left Ventricular diameter index >0.9), finding confirmed by 2D echo. A venous

☆ None of the authors has any conflict of interest, financial or otherwise.

☆☆ This study was done with no financial support. This manuscript is original and any part has not been and will not be submitted elsewhere for publication.

★ Each author has contributed to read and approved the manuscript.

* Corresponding author. Department of Internal Medicine, Louis A. Weiss Memorial Hospital, Chicago University Hospitals, Internal Medicine PGY-2, 4646N Marine Dr Suite # 7100, Chicago IL 60640.

E-mail address: eabarca@weisshospital.com

0022-0736/$ – see front matter © 2014 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.jelectrocard.2013.06.019

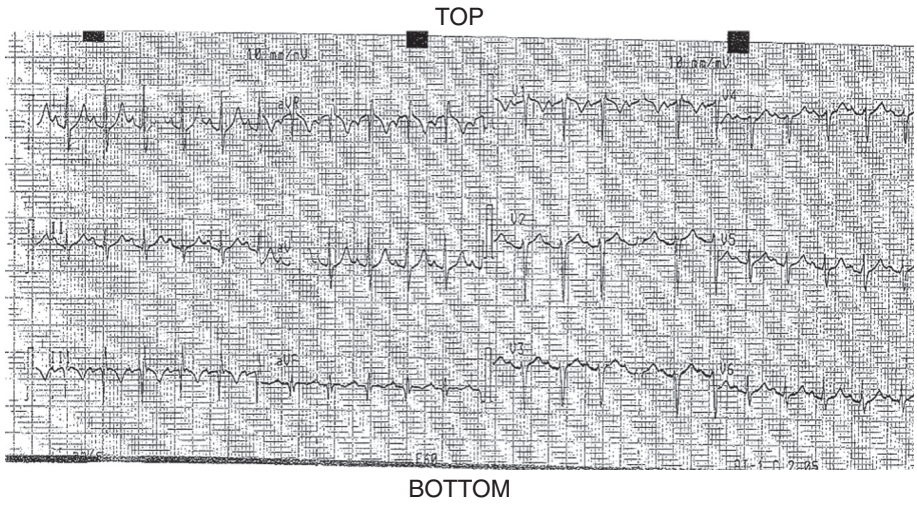

Fig. 1. 12 lead ECG showing the McGinn–White pattern: S wave in lead I and T wave inversion (TWI) and deep Q waves in lead III, all new changes.

Doppler ultrasound showed left popliteal acute deep venous thrombosis (DVT). The patient underwent systemic anticoagulation with subsequent clinical and echocardiographic improvement. A follow up ECG showed disappearance of S wave in I and Q waves in III.

Case 2

An 86 year-old-female nursing home resident was admitted for near syncope while she was doing minimal physical activity. Her past medical history included asthma, hypertension and history of breast cancer. Her vitals included a blood pressure of 84/60 mmHg, heart rate of 80 beats/min, respiratory rate of 27 breaths/min and oxygen saturation of 88%. Physical examination was unremarkable with the exception of mild edema and pain of the left calf. The 12 lead ECG (Fig. 2) showed short PR interval (98 ms), new S waves in lead I, V_4 and V_5 and symmetric T wave inversion (Twi) in leads V_1 to V_3, all new changes compared to a baseline ECG. A 2D echo showed RV dilatation. A chest CT showed distal emboli in both main pulmonary arteries associated with RV dilatation. A venous ultrasound showed left femoral acute DVT. A follow up ECG disclosed normalization of the PR interval, persistence of Twi in V_1–V_2 and S waves in V_4 and V_5. The patient underwent systemic anticoagulation with subsequent clinical improvement, but with persistent RV dilatation at 6 week follow up.

Case 3

A 51 year-old-male was seen in the emergency department for new onset of dyspnea on minimal activity associated with dizziness and diaphoresis. His past medical history included diabetes mellitus and hyperlipidemia. Vitals included a blood pressure of 80/64 mmHg, heart rate of 140 bpm, respiratory rate of 30 breaths/min. His PaO_2 was 79 mmHg on ABG. Physical examination was remarkable for diaphoresis and for tachypnea. The ECG (Fig. 3) showed Twi in leads V_1–V_5, Twi in lead III and aVF and Q waves in lead III, all new findings compared to a baseline ECG. A

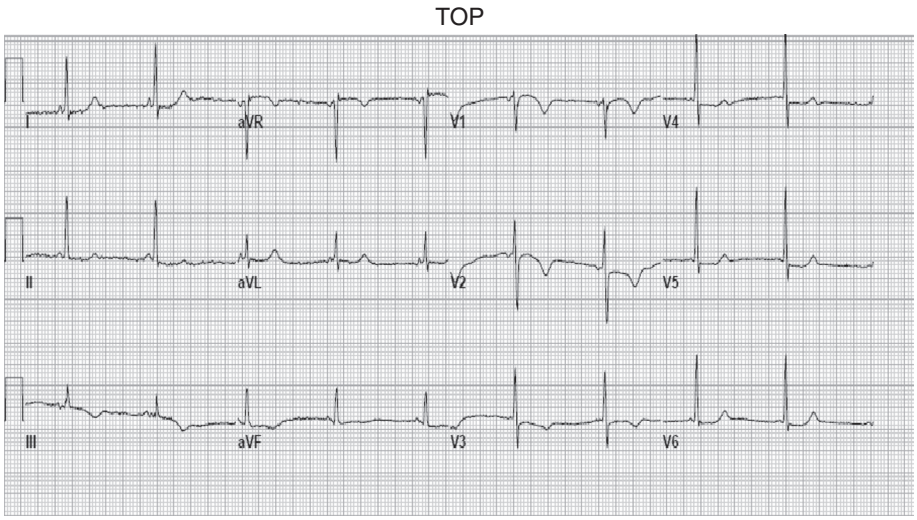

Fig. 2. 12 lead ECG showing short PR interval (98 ms), S waves in leads I, V_4 and V_5 and symmetric T wave inversion in leads V_1 to V_3.

Download English Version:

https://daneshyari.com/en/article/2967739

Download Persian Version:

https://daneshyari.com/article/2967739

Daneshyari.com