

Recurrent Syncope and Complete Heart Block in Sub-Segmental Pulmonary Embolism

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Abstract

Complete heart block (CHB) in the setting of pulmonary embolism (PE) is rare with only few cases reported in literature. We present a case of CHB occurring in setting of sub-segmental hemodynamically stable PE and suggest a possible alternate mechanism for this phenomenon. A 52-year-old female with recent travel history presented with fever, shortness of breath and chest pain for two days. Diagnostic testing revealed elevated d-dimer, right bundle branch block on ECG, and right sub-segmental PE for which she was started on anticoagulation. Her hospital course was complicated by three episodes of syncope which occurred during episodes of severe pain with nausea and vomiting. Telemetry revealed sinus bradycardia followed by CHB during episodes. In this case, the patient had sinus bradycardia followed by CHB in the setting of severe pain causing nausea and retching which led us to postulate increased vagal tone as the mechanism of CHB in this patient. Given the transient nature of vagal stimulation mediated CHB, the need for permanent pacemaker for recurrence of CHB represented a clinical dilemma in this patient. After discussion of the risk and benefits with the patient, a decision was made to implant a permanent pacemaker.

Keywords: Syncope; Complete Heart Block (CHB); Pulmonary Embolism (PE)

Introduction

Complete heart block (CHB) in the setting of pulmonary embolism (PE) is rare with only few cases reported in literature [1-3]. Prior case studies have suggested a co-existing left bundle branch block with right ventricular strain leading to transient right bundle branch block as a mechanism of CHB in PE [1,2]. We present a case of CHB occurring in setting of sub-segmental hemodynamically stable PE and suggest a possible alternate mechanism for this phenomenon.

Case-Description

A 52-year-old female with a history of depression was referred to our hospital with complaints of fever, shortness of breath and chest pain for two days. She had severe, sharp, right-sided chest pain, aggravated by deep breaths or coughing, and radiation to right shoulder. She also had a history of frequent air travel and had recently returned from a trip to Florida. Upon presentation, she was noted to be tachypneic with elevated d-dimer and negative troponins on blood test. An ECG showed sinus rhythm with RBBB, unchanged from her prior ECGs on record. She was hemodynamically stable and a transthoracic echocardiogram (TTE) was negative for right ventricular (RV) strain. CT angiogram showed a right sub-segmental PE. She was started on heparin for anticoagulation. Her hospital course was complicated by three episodes of syncope which occurred during episodes of severe pain with nausea and vomiting. Telemetry strips during each episode showed sinus bradycardia followed by CHB lasting 7seconds, 30 seconds and 17 seconds respectively with spontaneous recovery to sinus rhythm. She underwent temporary transvenous pacemaker placement. With subsequent adequate analgesia, patient did not have

further recurrence of CHB. Coronary angiogram did not show an ischemic etiology for CHB. Due to concern for possible recurrence of similar arrhythmias, decision was made to implant a permanent pacemaker after discussion with the patient. She was discharged home on rivaroxaban for anticoagulation and with cardiology follow up.

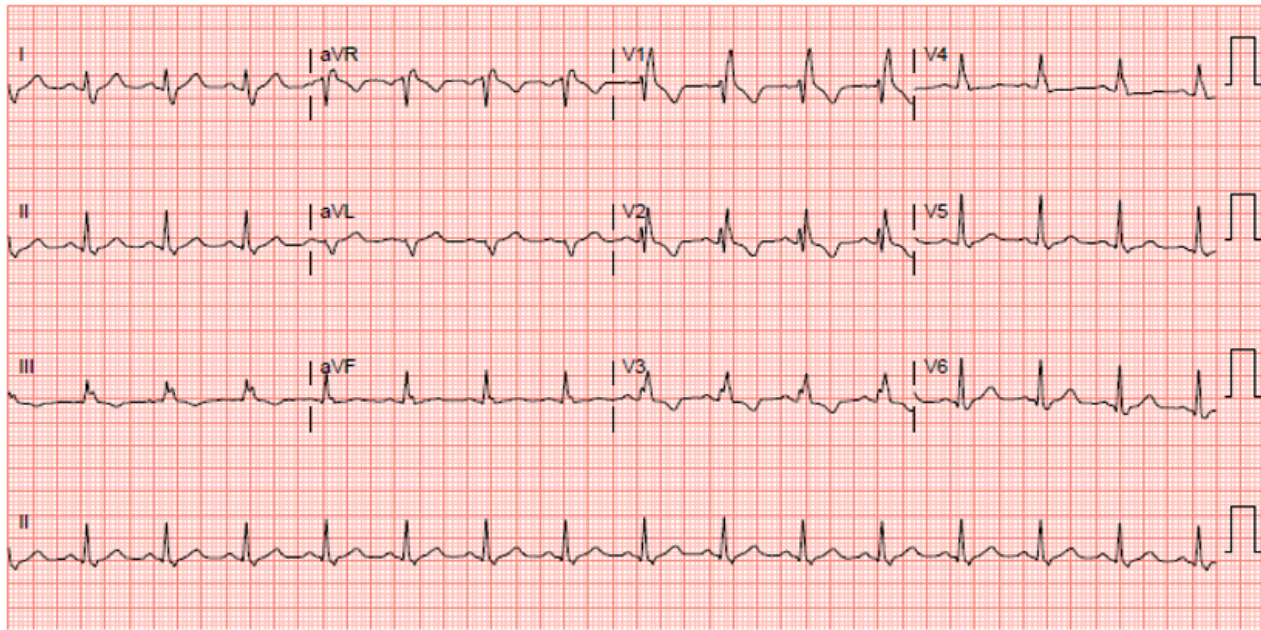


Figure 1: Baseline EKG.

Discussion

PE is associated with a variety of ECG changes including sinus tachycardia, RAD, RBBB, and S1Q3T3 pattern [4]. Complete heart block in the setting of PE is rare. In previously reported cases, a pre-existing left bundle branch block with a new right bundle branch block in the setting of massive PE causing RV strain, was postulated as a cause of CHB [1-3]. However, our patient did not have LBBB on prior EKGs. In this case, the patient had sinus bradycardia followed by CHB in the setting of severe pain causing nausea and retching which led us to postulate increased vagal tone as the mechanism of CHB in this patient. Simpson, *et al.* had previously reported two cases of vagal syncope and transient AV block in two patients with PE [5]. Given the transient nature of vagal stimulation mediated CHB, the need for permanent pacemaker for recurrence of CHB represented a clinical dilemma in this patient. After discussion of the risk and benefits with the patient, a decision was made to implant a permanent pacemaker. While prospective studies may provide valuable insight into risk of recurrence and need for permanent pacemaker in these patients, the rarity of the phenomenon makes prospective studies difficult.

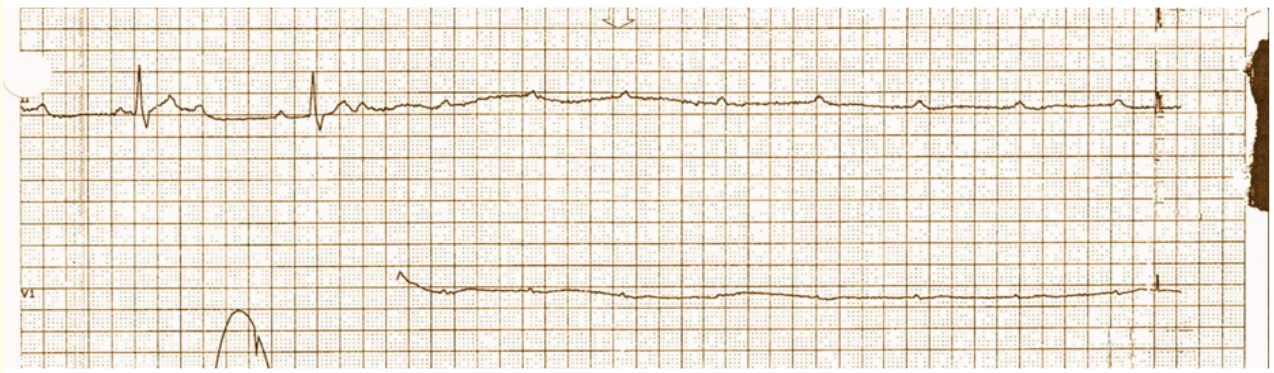


Figure 2: Onset of Complete heart block – note PR prolongation in last conducted sinus beat.



Figure 3: Recovery of normal Sinus rhythm.

Conclusion

It is important to recognize the various complications that can arise from a PE and underlying pathophysiological mechanisms. While some of these complications are transient and likely to improve with treatment of the PE, management decisions should be individualized for each patient and clinical situation.

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