

Does Low Well's Score Criteria Exclude Pulmonary Embolism?

Role of Bedside Echocardiography To Reliably Diagnose Pulmonary Embolism

In Acute Emergency setting

MUHAMMAD AZMI BIN SUKOR, MUHAMMAD FAIZ BIN BAHERIN

EMERGENCY AND TRAUMA DEPARTMENT, HOSPITAL TUANKU JAAFAR



INTRODUCTION

Pulmonary embolism is one of the common cause of cardiovascular death. Diagnosing pulmonary embolism should be based on history, clinical examination, risk stratification, investigation and imaging. Gold standard of diagnosing PE is through CT pulmonary angiography. However, bedside echocardiography is a reliable tool to diagnose pulmonary embolism non invasively in a short period of time. Prompt recognition and early treatment are crucial to minimize mortality and morbidity associated with Pulmonary Embolism. Here we present a case of near-missed pulmonary embolism in a patient diagnosed as acute myocardial infarction from other healthcare center.

CASE REPORT

We describe a case of a 43-year-old Malay gentleman, with multiple comorbidities. He was referred to the Emergency Department as Acute Myocardial Infarction. He came with typical anginal pain and shortness of breath. The blood pressure was normal. ECG revealed sinus tachycardia and right sided strain with T wave inversion over lead III, V1, V2, V3. Unconvinced with the diagnosis of Myocardial Infarction, we calculated the Well's Score to risk stratify the patient for Pulmonary Embolism and it turned out to be low risk. We performed bedside echocardiography and it revealed dilated right ventricle, flattening of interventricular septum, and McConnell's sign was present. In view of the pathognomonic echocardiographic finding and ECG, CT Pulmonary Angiogram was performed and it showed bilateral extensive Pulmonary Embolism. Patient was given anticoagulant and was admitted to the CCU for close monitoring. He was referred to IJN after bouts of hypotensive episodes in CCU, thrombectomy was done in IJN and he recovered well.

IMAGES

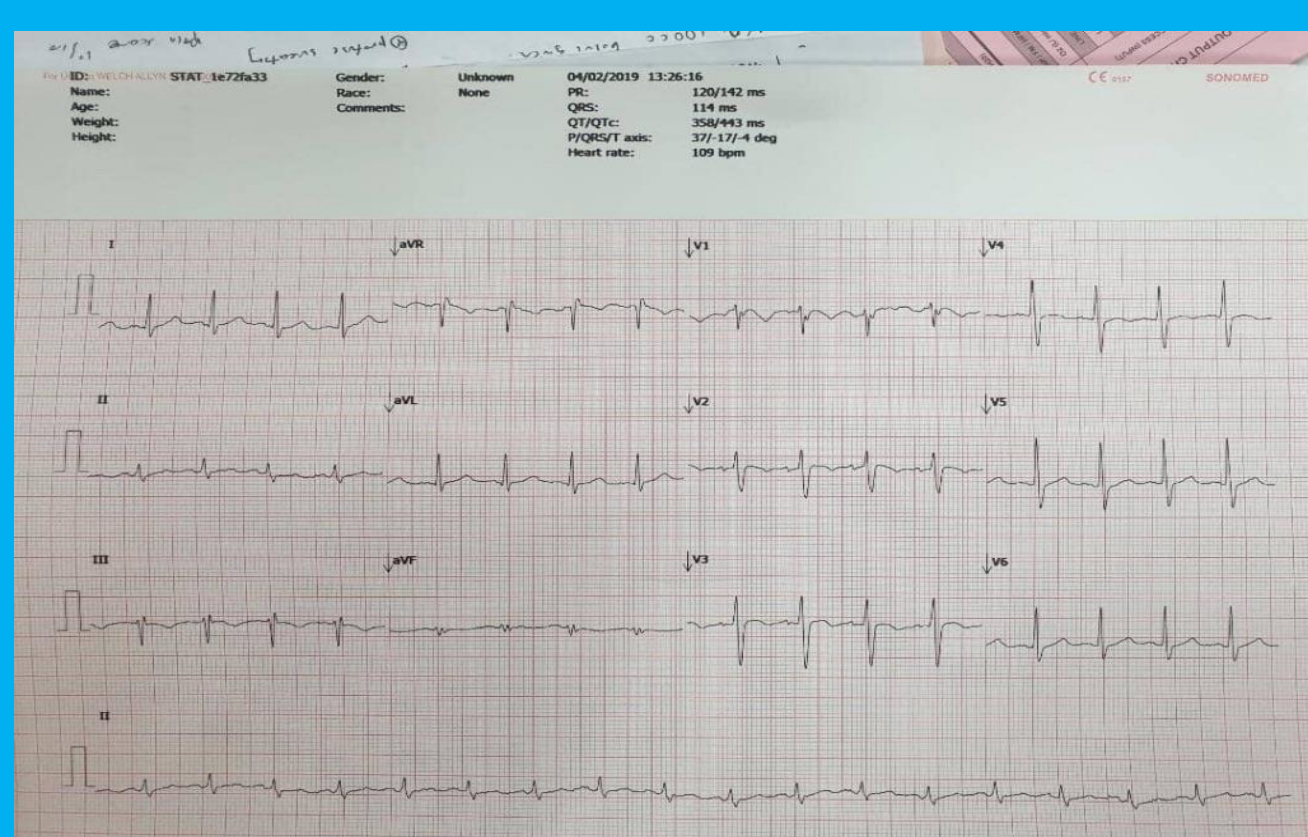


FIGURE 1. ECG revealed right sided strain with T inversion over precordial leads



FIGURE 2 Bedside echo revealed dilated right ventricle with D-shaped left ventricle

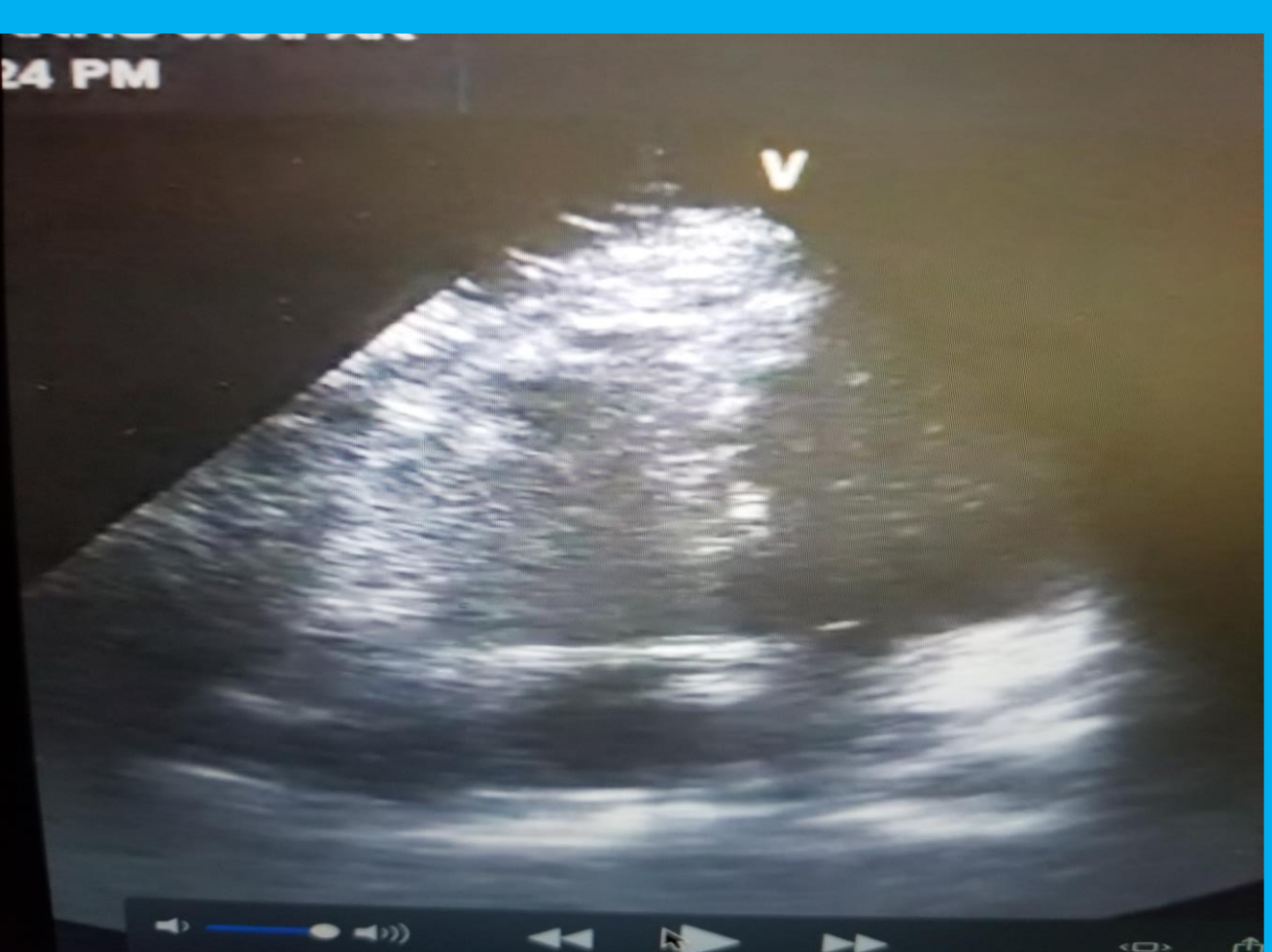


FIGURE 3 Bedside echo revealed dilated right ventricle and right atrium (McConnell sign)

DISCUSSION

Well's score is a validated diagnostic scoring that can be used to risk stratify Pulmonary Embolism. The patient as discussed above had a low modified Well's score. He had typical angina pain and low risk stratification of PE. In a center where there's no bedside echocardiography, this would mislead the diagnosis of pulmonary embolism and in our case, he was diagnosed as acute myocardial infarction in health clinic.

Electrocardiogram plays a role in diagnosing pulmonary embolism. One of clinical indicator for pulmonary embolism is presence of t wave in precordial leads. A study showed that presence of T wave inversions in precordial leads is the most specific finding in confirmed massive pulmonary embolism(1) which is similar to ECG finding in our case.

Bedside echocardiography is one of the cheapest, non invasive, most easily accessible tool that can reliably be used to rule out pulmonary embolism in emergency setting. Patient presenting with chest pain has varieties of differential diagnosis ranging from acute coronary syndrome, to Pulmonary Embolism. The most common sign seen in echocardiography for patient suffering sub massive to massive PE is the presence of right ventricular dysfunction, including dilated right ventricle and 'D' shaped of left ventricle. McConnell's sign is the most distinct echocardiographic finding described in patient with acute pulmonary embolism. This sign shows regional pattern of right ventricular dysfunction, with akinesia of the mid free wall and hypercontractility of apical wall.(2)

Combining history of chest pain, ECG and bedside echocardiography, we were convinced that this patient had pulmonary embolism despite of low risk stratification using well's criteria. CTPA revealed massive bilateral Pulmonary Embolism and patient was treated with anticoagulant in Emergency Department, and later was referred for thrombectomy in IJN

CONCLUSION

Pulmonary embolism is life threatening and challenging to diagnose. Every treating physician need to have a high clinical index of suspicions after combining history, physical examination and imaging. Bedside echocardiography is the cheapest, reliable and easiest tool to help us diagnosing pulmonary embolism

REFERENCES

1. Ferrari E, Imbert A, Chevalier T, et al. The ECG in pulmonary embolism. Predictive value of negative T waves in precordial leads--80 case reports. Chest. 1997;111:537-43.
2. McConnell's sign: an early and specific indicator of acute pulmonary embolism. SeongBeom Oh et al. Crit Ultrasound J. 2015; 7(Suppl 1): A20.