Case study

Syncopal status revealing a massive intracardiac thrombi complicated by pulmonary embolism

Abstract

Pulmonary embolism (PE) is a common condition characterized by clinical polymophism making its diagnosis difficult. Syncope as an initial symptom of pulmonary embolism has proven to be a difficult clinical correlation to establish, although described in the literature. It is more common in men than in women owing to its relationship with smoking and comorbid diseases. For patients younger than 55 years of age, the incidence rate of PE is higher in women owing to the use of oral contraceptives and pregnancy. Transthoracic echocardiography (TEE) is a vital examination diagnosis and stratification PE whereas Thoracic Angio computed tomography scan confirms PE diagnosis. We report a rare case of pulmonary embolism with a massive free-floating intracardiac thrombus that was revealed by recurrent episodes of syncope in a middle age patient followed-up for stable controlled type 2 diabetes mellitus under diet only without other known risk factor for thromboembolic disease.

Introduction

Pulmonary embolism (PE) is a common condition characterized by clinical polymophism making its diagnosis difficult [1]. On the other hand, syncope is an extremely frequent symptom for visit to the emergency department, relatively easy to detect, but whose etiologies are varied and the diagnostic orientation is sometimes difficult [2]. Syncope as an initial symptom of pulmonary embolism has proven to be a difficult clinical correlation to establish, although described in the literature [3]. Transthoracic echocardiography (TEE) is a vital examination, as it can highlight intra-cardiac thrombi, which is the case in 4 to 18% of

patients with an increasing proportion due to the accessibility and performance of ultrasonographic examinations. [4]. If the unfavorable prognosis of these situations is well established, their management is far from being consensual. Between heparin treatment, fibrinolysis and embolectomy, the data from reported cases and meta-analyses seem to be disparate. In the absence of large studies, the therapeutic approach on a case-by-case basis seems to be appropriate.

We report here the case of a 59-year-old patient admitted to the emergency department for syncopal status revealing a massive free-floating thrombus in right atrium of the heart, complicated by pulmonary embolism.

Case presentaion

A 59-year-old man was brought by non-medical paramedics to the emergency department at 4:30 p.m. for the onset of a malaise with brief loss of consciousness at his workplace. His only personal history is type II diabetes for less than 6 months, on a diet only. He has no notable family history, takes no treatment and is not followed for neoplasia. He reported the spontaneous onset of recurrent syncope around 1:30 p.m. associated with stage 3 NYHA dyspnea and significant vagal functional symptoms (nausea, sweating). Syncope is a type of brief loss of knowledge with tonic-clonic convulsions without loss of urine or biting of the tongue, or postcritical coma. The patient had no chest pain or palpitations prior to the discomfort. Upon arrival, the patient was conscious and oriented with a Glasgow score of 15/15. He had a body temperature of 38°C, the systolic blood pressure was measured at 120 mmHg, and the diastolic blood pressure at 60 mmHg, the heart rate at 81 beats per minute. He was breathless, with a respiratory rate of 28 cycles per minute with a capillary oxygen saturation in ambient air of 85%. Cardiac and pulmonary auscultation was without abnormality. The peripheral pulses are all perceived and symmetrical. The abdomen was

soft, painless, without palpable hepatosplenomegaly, and the superficial lymph nodes were free. Examination of the legs finds no clinical signs of deep vein thrombosis (DVT). The electrocardiogram showed a regular sinus rhythm at 81 beats per minute, with no anomaly in the PR space, biphasic T waves in the septo-apical leads with the presence of Q and T waves in lead III and an S wave in lead I (Figure 1).

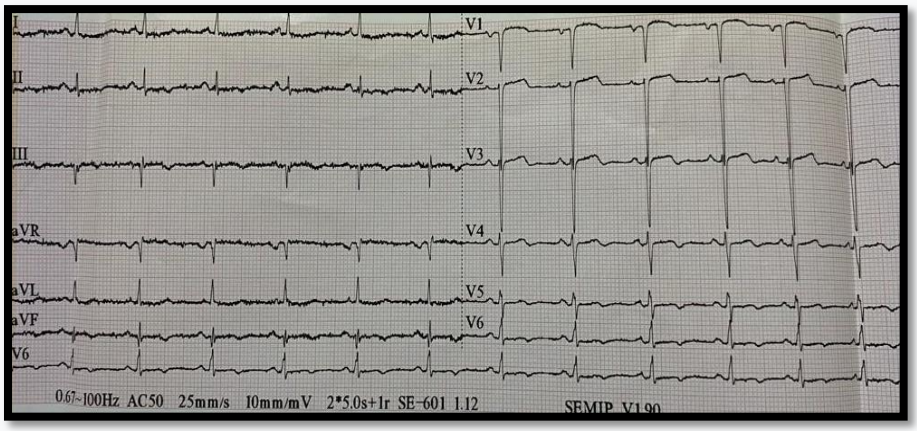

Figure 1: ECG shows relative signs of pulmonary embolism; biphasic T waves in septo-apical leads.

The initial biological assessment finds a hemoglobin at 12g/dl, a hematocrit level at 45%, platelets at 157000/µl, serum creatinine at 9.5mg/l, or a glomerular filtration rate evaluated at 86ml/min (MDRD), D-dimers at 3156ng/ml, highly sensitive cardiac troponin marker at 256ng/l and C-reactive protein 35 mg/l. The hemostasis assessment was without abnormality.

The performed transthoracic echocardiography (TTE) showed a massive thrombus in the right atrium protruding into the right atrium (RA) to the right ventricle (RV) through the tricuspid valve. This thrombus was polylobed and free-floating, protruding further into the RV in diastole (Figures 2 and 3). The right heart chamber was dilated associated with pulmonary hypertension (59 mmHg). The longitudinal systolic function of the RV was impaired with the presence of pericardium effusion blade. A massive fixed thrombus

measuring 25mm x 15mm partially obstructing at the level of division of the pulmonary artery trunk was visible (Figure 4). Left ventricular function was normal.

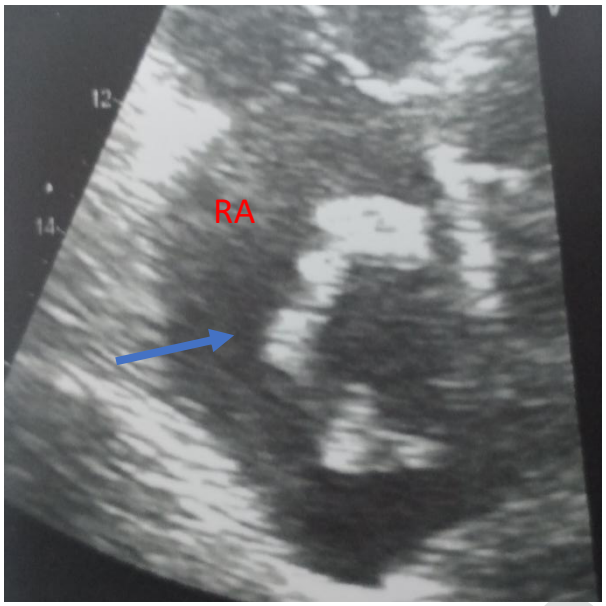

Figure 2: TEE; 4 chambers view zoom centered on the RA: Massive free-floating right heart polylobed thrombus (RHT) with no adherences to the right atrium walls.

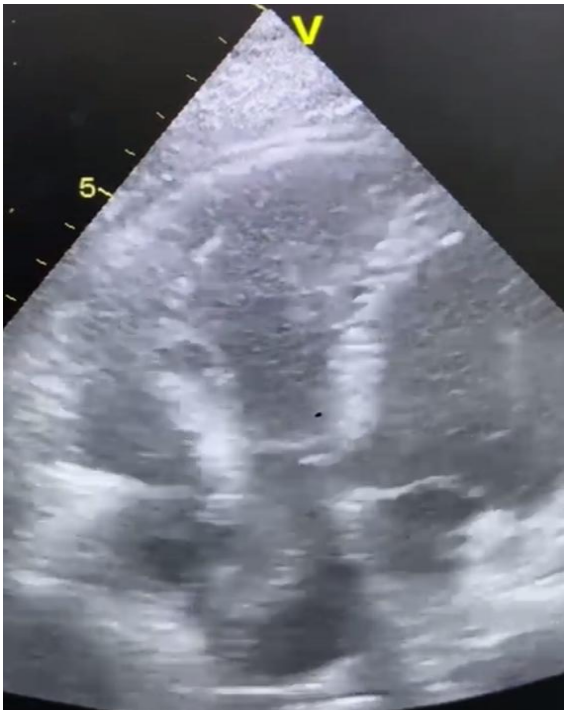

Figure 3: TEE; 4 chambers view: massive mobile polylobed thrombus protruding into the right ventricule in diastole.

The 24-hour rhythmic holter inscribed a very frequent supraventricular extrasystoles (Figure 5).

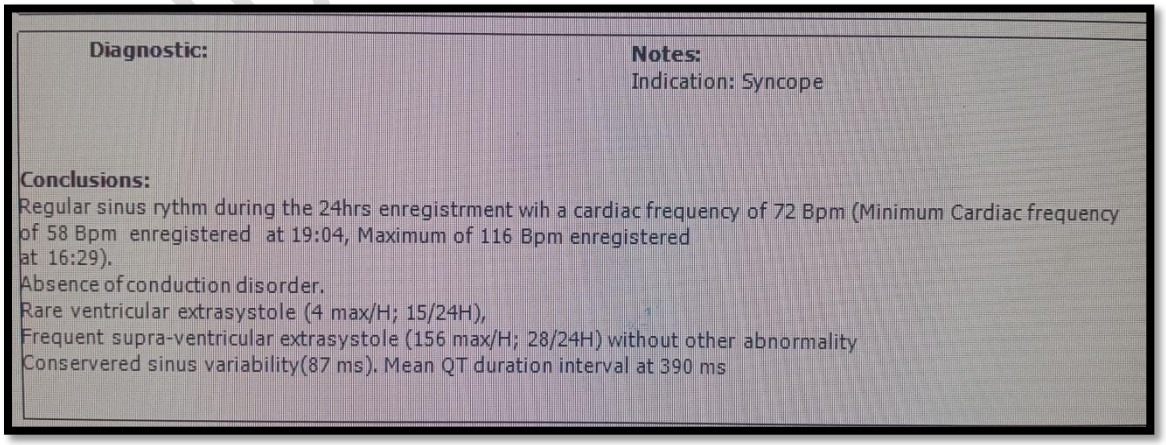

Figure 5: 24-Hour rhythmic holter shows frequent supraventricular extrasystoles.

The angio-CT scan confirmed a massive bilateral proximal pulmonary embolism with acute severe pulmonary hypertension without parenchymal lesions of the lungs (Figure 6). Further imagery assessment shows no signs of deep vein thrombosis (DVP) during doppler ultrasound.

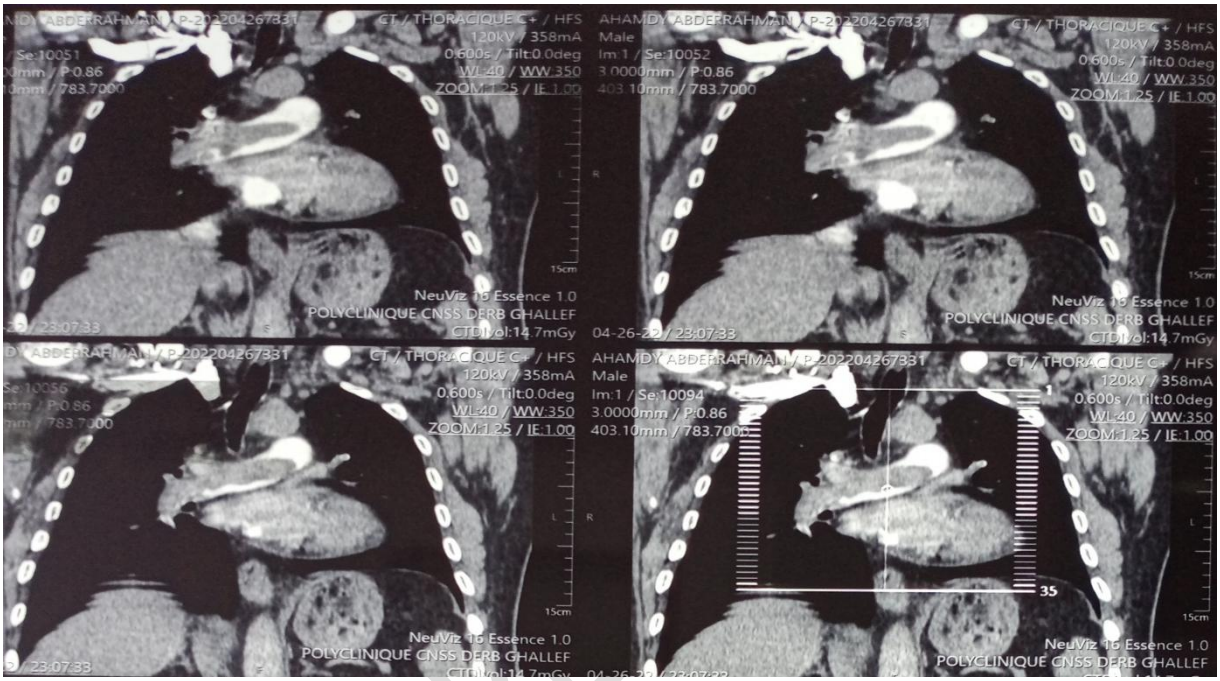

Figure 6: Thoracic angio-CT scan: shows massive bilateral pulmonary embolism.

No systemic thrombolysis treatment was administered, the patient receives standard treatment with unfractionated heparin for 3 days and a relayed oral anticoagulant (acenocoumarol).

The evolution was favorable in the 72 hours following admission, marked by the cessation of syncope, in an eupneic patient, with an ambient air saturation of 94%. Transthoracic echocardiography shows absence of the thrombus in the right heart chambers with reduced size of the thrombus at the region of bifurcation of the pulmonary artery trunk day-3 and day-8 TEE control. (Figure 7).

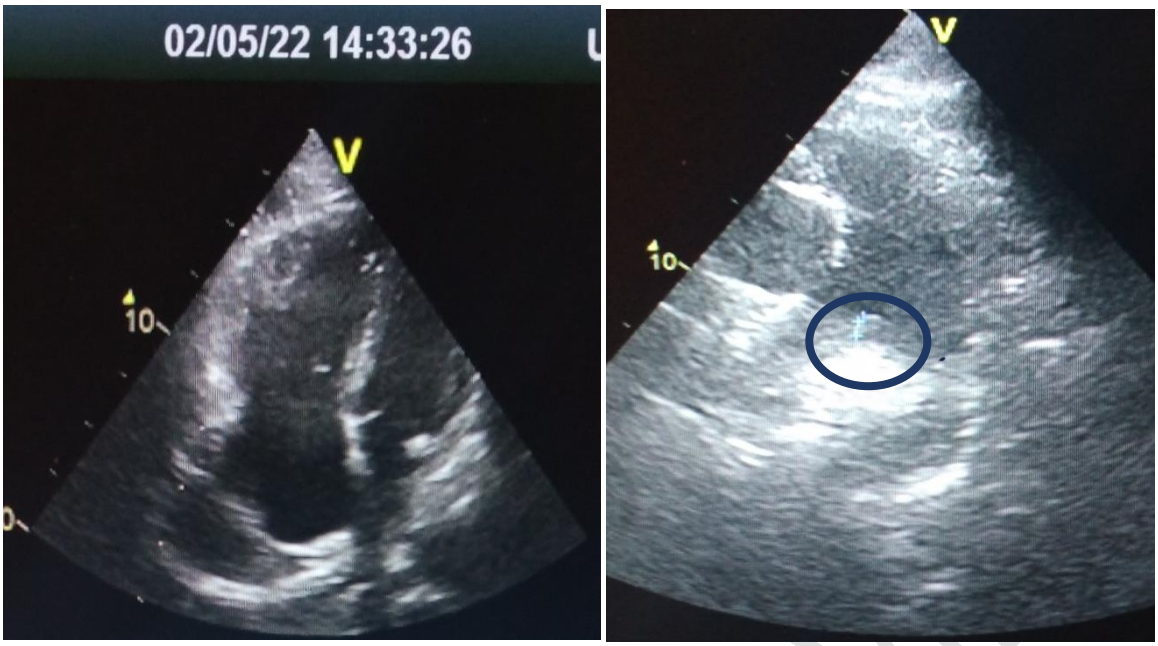

Figure 7 : A- TEE 4 chambers view: absence of thrombus in right heart chambers.

B- Reduced size thrombus at the region of bifurcation of the pulmonary artery trunk (circle)

The only possible risk factor for thromboembolic disease related was android obesity.

Patient was discharged after the realization of exhaustive analysis for the search of other thromboembolic risk factors possibly responsible for the massive pulmonary embolism which came out negative. He was under effective anticoagulation with a last INR control of 2.45 on 3/4 tablet 4mg of acenocoumarol. The long-term follow-up of the patient is carried out in an outpatient cardiology consultation.

Discussion

We report a rare case of pulmonary embolism that was revealed by recurrent episodes of syncope in a middle age patient followed-up for stable controlled type 2 diabetes mellitus under diet without other known risk factor for thromboembolic disease. An extremely large mobile thrombus was found in the right heart chambers and an associated large fixed thrombus obstructing the bifurcation region of the pulmonary artery trunk. PE is a serious and potentially lethal disease. It is more common in men than in women owing to its relationship with smoking and comorbid diseases. For patients younger than 55 years of age,

the incidence rate of PE is higher in women owing to the use of oral contraceptives and pregnancy (5). The only comorbid diseases in our patient were controlled type 2 diabetes mellitus and obesity.

In the study of Kasper et al. 35% of the enrolled high-risk PE patients or PE patients with right ventricular dysfunction (RVD) showed a PE related syncope (6). Timmons et al. reported a higher percentage of collapse in older than in younger PE patients (24% vs. 3%, P b .02) and hypothesized that the greater incidence of collapse in older patients reflects their reduced cardiopulmonary reserve (7). Our patient was classified as intermediate-high-risk PE as he presented right ventricular dysfunction despite a conserved cardiopulmonary reserve.

Bedside echocardiography is an invaluable tool in the management of these patients, allowing serial assessment of right ventricular chambers size and function and of changes in thrombus size or morphology. Despite the increase in the diagnosis with the widespread use of echocardiography, free-floating RHT are still considered a rare finding. They can be identified in less than 4% of unselected patients with PE, but their prevalence may reach 22% in high-risk patients (8). As compared to our case the free-floating thrombus combined with the massive thrombus in the bifurcating region of the pulmonary trunk was easily accessed with TEE helping in the immediate administration of thrombolytic drugs.

In view of the reported high mortality, the coexistence of PE with RHT is regarded as a medical emergency and requires immediate treatment. Contemporary treatment modalities for PE vary, ranging between heparin alone, thrombolysis, catheter-directed therapy, and surgical embolectomy. However, the optimal management of PE associated RHT remains unclear owing to the low number of cases and the lack of randomized controlled trials.
The hemodynamic benefits of thrombolysis in patients with PE are well established and it is currently recommended for high risk and selected intermediate-high risk patients (9). In our case unfractionated heparin was used instead of systemic thrombolysis resulting into a dissolved thrombus in the right heart chambers and reduction of the size of the pulmonary artery trunk thombus by 50% after a duration of 3 days therapy.

Surgical embolectomy with exploration of the right heart chambers and pulmonary arteries under cardiopulmonary bypass is another treatment option (9,18). However, it is not readily available due to the inherent delay of general anesthesia, cardiopulmonary bypass. Emerging catheter-directed therapies for PE are also promising methods in patients with RHT with some successful cases reported (10-16). Rose et al. reviewed 177 cases presenting with RHT described on literature and described an improved survival rate with thrombolytic therapy that was statistically significant when compared to either anticoagulation therapy or surgery (17). However, in our case unfractionated heparin (UFH) therapy showed a significant efficacy without hemorrhage complications.

Bleeding risk helps in determining type of treatment offered. Patients who are deemed a high bleeding risk should be considered for a more conservative approach. Total duration of anticoagulation and type of anticoagulation should be individualized based on bleeding risk profile of a patient. Bleeding risk assessment should be done annually, particularly in the elderly population, to determine the need for ongoing anticoagulation (19). The bleeding risk in our patient was low with a HAS-BLED score of 1. Oral anticoagulation based on acenocoumarol was relayed to UFH with an achieved INR rang of 2.45 before discharge. More recent data using propensity scores to compare reperfusion therapy to anticoagulation alone found no significant difference in mortality and bleeding, with a higher risk of recurrence with reperfusion therapy (20).

The presence of a right heart thrombus is rare, thus the choice of therapy is based on the physician's discretion and clinical judgment and based on availability and patient factors which often preclude the development of one-size-fits-all treatment algorithms (21). This case illustrates the difficulty of certain management decisions in the cases of PE especially in patients with massive RHT and pulmonary truck obstruction.

Conclusion

Pulmonary embolism with syncope is difficult to diagnose. Physicians and other healthcare professionals should be vigilant with patients who have syncope, as this symptom may be a missed sign of a life-threatening pulmonary embolism.

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