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Acute atrial fibrillation masquerading right main pulmonary artery embolism, another atypical presentation with literature review

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Abstract

We present a case of 94-year-old elderly lady who had an acute pulmonary embolism (PE) manifested as acute atrial fibrillation (AF) with raised d-dimer & troponin but without other clinical symptoms. She developed transient AF with rapid ventricular response of 160 bet per minute (bpm) but remained haemodynamically stable without requiring defibrillation or thrombolysis. The underlying PE wasn't diagnosed when she developed her AF. her CT pulmonary angiography (CTPA) subsequently confirmed acute embolus in the right main pulmonary artery. Her AF responded well to B-blocking therapy. Without AF, her PE would have passed unnoticed. The treatment course would have changed acutely if patient to become unstable but fortunately this wasn't the case. This case highlights the possible dilemma of treating acute rapid AF that wasn't primary but rather secondary to an underlying PE.

Keywords

atrial fibrillation; pulmonary embolism; atypical presentation; anticoagulation

Abbreviations

PE: Pulmonary Embolism; LMWH: Low Molecular Weight Heparin; ECG: electrocardiogram; CTPA: CT Pulmonary Angiogram; AF: Atrial fibrillation; CXR: Chest X-ray; CRP: C-Reactive Protein; bpm: beat per minute; BP: blood pressure

Background

PE is a commonly encountered acute medical emergency. While most clinicians may feel competent to suspect PE in the right clinical setting, it could possibly be challenging at odd times. There is a spectrum of ECG changes accompanying acute PE, majority of them are non-specific, especially sinus tachycardia. It's well known from previous reports that acute right ventricular strain pattern is commonly associated with acute PE [1-3]. It has also been reported that even ST segment elevation could represent atypical finding in such setting [4]. Troponin leak has also become a known finding accompanying right ventricular stretching. While the causal relationship between AF and PE never been established, it's a common practice for clinicians in acute medicine to suspect PE with new onset AF in those without significant cardiac history. This case highlights the issue of AF as a proxy to an underlying potentially fatal PE.

Case Presentation

This is a 94-year-old physically well & independent lady who presented with 3-weeks history of right leg swelling that worsened in last 4 days which was confirmed to be due to unprovoked right femoral & popliteal above knee DVT by the hospital ED department. She was admitted medically given her social circumstances& painful leg & received LMWH. She was medically stable & her vitals were within normal on arrival. Her chest was clear of focal signs with no signs of cardiac decompensation but her right thigh & calf were swollen & tender. Her ECG on admission was of sinus rhythm & free of acute ischaemic changes (figure 1). Of note that she denied any chest pain or shortness of breath during the preceding period or her hospital stay. Her past medical history was significant for stable angina, hypertension, osteoporosis & peptic ulcer disease. The following day she suddenly developed acute AF with rapid ventricular response of 150-160 bpm (figure 2), BP of 115/70, oxygen saturation of 96% room air & respiratory rate of 18 breaths per minute. She adequately responded to 2.5mg of intravenous metoprolol & her heart rate settled to 92 bpm. Her d-dimer & troponin T were both elevated. She went on to have CTPA 48 hours later which confirmed acute embolus within the right main pulmonary artery. She made slow but good progress over her two weeks of hospitalization. She was commenced on warfarin & was to remain on the same indefinitely.

Investigations

Her bloods on arrival showed elevated d-dimer of over 4000 ng/ml, elevated troponin T of 55 ng/L, raised CRP of 19.1 mg/L & reduced creatinine clearance at 54 ml/minute. Her full blood count indices were normal as well as her coagulation parameters, fibrinogen, CK, liver function tests, urea & electrolytes. Her CRP normalized later. Her CXR was normal. Her ECGs on presentation, during AF & subsequently pre-discharge are illustrated on figures 1, 2 & 3 respectively. Her CTPA (figure 4) showed right central main pulmonary arterial acute embolus.

Treatment

She received LMWH on arrival & subsequently Warfarin in addition to Bisoprolol & analgesia. She also received input from multidisciplinary team.

Discussion

What's unique about this case is that her PE was totally asymptomatic apart from the episode of transient AF. This could have become detrimental if she was haemodynamically unstable. It would have been indeed challenging for the acute team to decide between defibrillation & thrombolysis if her BP was low or continuing to deteriorate. Bedside Echo could have been useful but its practicalities not always by passable specially out of hours in less staffed hospitals given the timely required medical decision. From cardiac perspective, with her prior ischaemic heart disease & hypertension history, acute defibrillation for AF is warranted if she is haemodynamically unstable. On the other hand, given her DVT, massive PE leading to unstable haemodynamics is a valid possibility. It's interesting to see the agreement among the acute team about thrombolysing this patient who otherwise has no major contraindications apart from her age (relative contraindication). AF Clinically commonly alerts acute physicians to lower their threshold for suspecting PE diagnosis, however the formal association or any causal relationship never been established on epidemiological studies. It's well known theoretically that PE increases the right

atrial pressure causing stretching injury or dysfunction that can trigger PE. Gex et al. in their retrospective cohort of 2.5 thousands found that presence of AF doesn't increase the probability of PE in patients suspected with this diagnosis [5]& this could explain why AF hasn't been part of any PE predicting tool yet. Kenneth Flegel presented his argument [6] on this matter without arriving at final conclusion given the lack of evidence & the lack of interest among clinicians for the fact that management with anticoagulation is the key either way. AF as a cause of PE through direct embolization from right atrial thrombi had been also reported [7]. In addition, AF irrespective of its timing, was found to be a prognostic indicator of higher short & medium term mortality following acute PE [8].

Figures

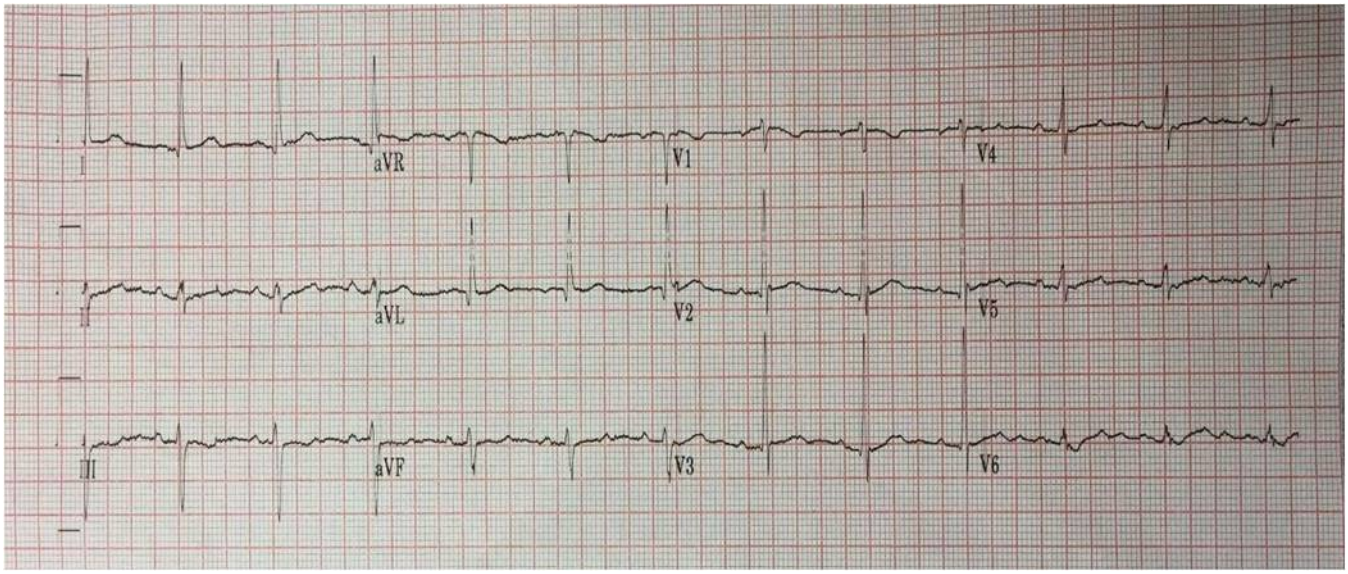

Figure 1: ECG on arrival

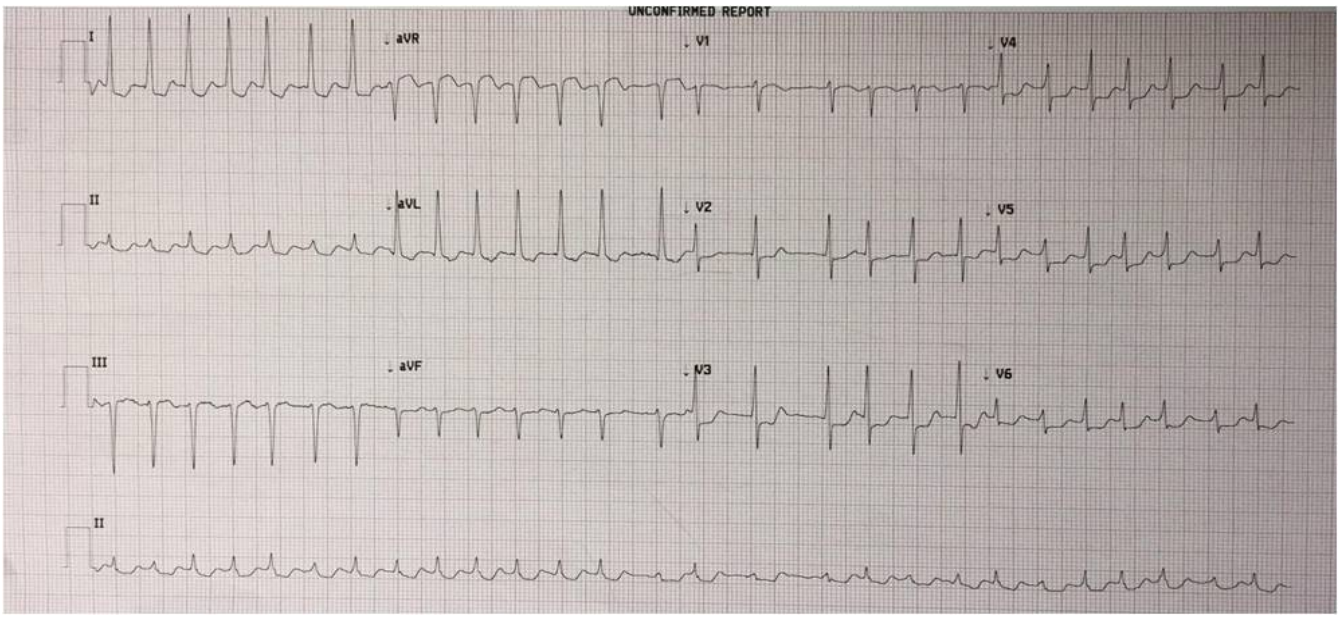

Figure 2: ECG showing rapid AF with global ST depression

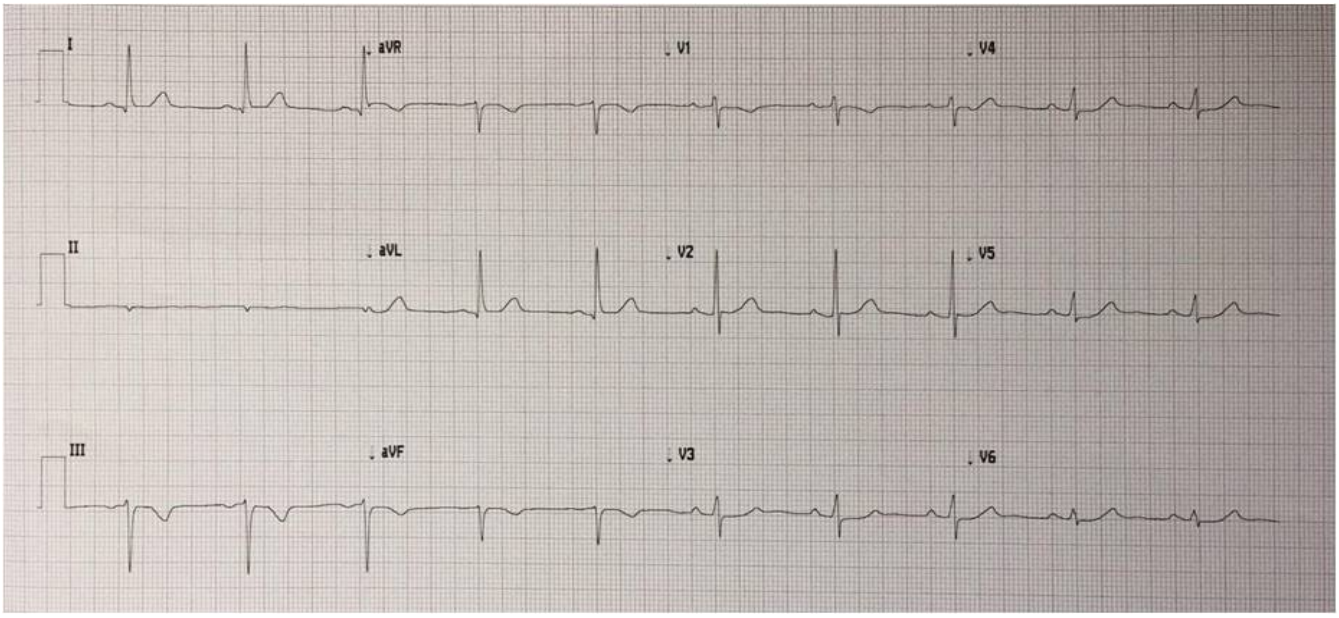

Figure 3: ECG pre-discharge following anticoagulation showing reversion to sinus rhythm

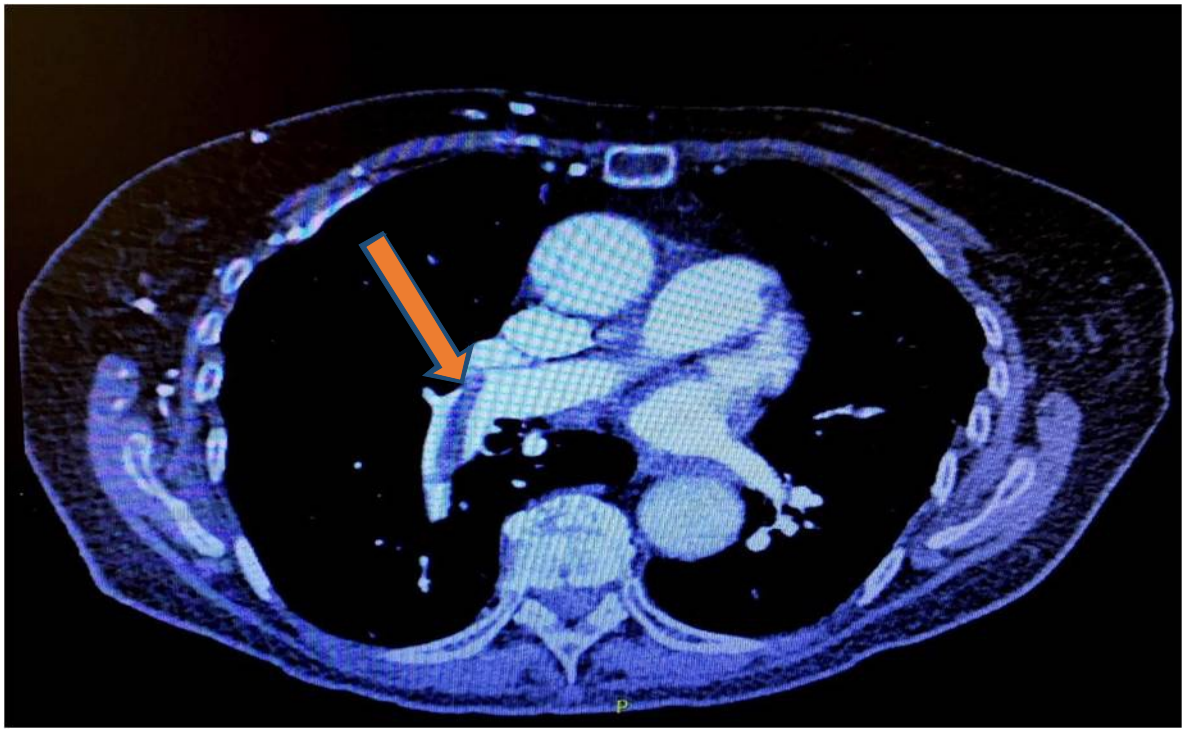

Figure 4: CTPA showing the embolus (filling defect) at the right main pulmonary (arrowed)

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