

An Unusual Presentation of an Unprovoked Pulmonary Embolism; Diagnostic Challenges in the Emergency Department

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Abstract

Pulmonary embolism is a life-threatening condition and in most cases the presentation is typical with h/o pleuritic chest pain, breathlessness and h/o prolonged immobilization. However unusual presentations are not very rare and its awareness can avoid delay in its diagnosis and prevent mortality.

A 23 years old male presented to ER with non-specific complaints of right upper quadrant pain and fever for 2 days. His vital signs were within normal limits apart from tachycardia and all initial investigations were normal. Due to his increased breathlessness, Well's score was checked but it was zero. However D-dimer was done which showed high values 1000ng/ml following which CTPA was performed that showed multiple right sided pulmonary emboli. He was then started on LMWH and Direct thrombin inhibitor and was discharged after 4 days.

The purpose of publishing this case is to make physicians aware of the unusual presentations of pulmonary embolism and that too in a patient who did not have any known risk factors.

Keywords: Pulmonary Embolism; Unusual Presentation; Abdominal Pain; S1Q3T3; CTPA; Well's Score; LMWH; UFH.

Introduction

Pulmonary embolism (PE) is a common cardiovascular emergency which is caused by occlusion of pulmonary vasculature. It occurs as a complication of underlying venous thrombosis known as deep vein thrombosis (DVT). Various risk factors contributing to venous thromboembolism (VTE) include hypercoagulability of blood, endothelial injury and vascular stasis [1,2].

The variability of clinical presentation sets the clinician up for potentially missing the diagnosis of pulmonary embolism. Typical signs and symptoms include pleuritic chest pain, breathing difficulty, hemoptysis, syncope, tachypnea, tachycardia and cyanosis [3].

Electrocardiogram (ECG) changes in PE has a wide spectrum of presentation starting from classical

S1Q3T3 pattern to non-specific changes like Right ventricular (RV) strain pattern and sinus tachycardia [3,4,5].

Timely diagnosis and early management of PE decreases mortality and improves patient's outcome. Various scores are used for determining clinical probability of PE. A study was done to assess various scores like Well's score, modified well's score and Geneva score along with D-Dimer values to exclude PE.

It showed similar results when combined with normal D-dimer values [6]. Most frequently used score in clinical practice is Modified Well's score which include parameters like clinical signs and symptoms, Heart rate, history of immobilization or surgery in previous 4 weeks, previously diagnosed DVT, hemoptysis and history of treatment for malignancy in last 6 months. PE contribute to 50,000 - 200,000 deaths annually with a mortality rate of 30% in

cases without any treatment due to delay in diagnosis [7]. Various post-mortem studies have shown that up to 70% of cases of PE have been misdiagnosed. Around 40% of these patients had visited physician with bizarre complaints weeks prior to their death [7,8]. Therefore, early diagnosis and management is the key to reducing mortality in cases of PE.

Case Study

A 23 year old male with no co-morbidities presented to Emergency Department (ED) with sudden onset right upper quadrant abdominal pain and low grade fever since last 2 days. Patient denies any chest pain, dyspnea or any other similar episodes in past. On presentation to ED, he was conscious and oriented and had a pulse rate of 85/min, blood pressure of 110/80mm hg, respiratory rate of 18/min, afebrile with 100% oxygen saturation on room air. Electrocardiogram revealed normal sinus rhythm. Physical examination revealed well appearing male in mild distress due to pain.

Abdominal examination revealed tenderness in right upper quadrant, soft, non-distended, palpable liver 3 fingers below the coastal margin and pain aggravated on deep inspiration. Neurological, respiratory and cardiovascular systemic examinations were unremarkable. Laboratory investigations revealed normal complete blood count, Liver function test, and urinalysis and serum lipase.

Ultrasound whole abdomen and chest x-ray suggested right lower lobe haziness with right pleural effusion. CT scan chest was done suggestive of right lower lobe consolidation with mild pleural effusion. CT abdomen did not reveal any abnormality. He started developing mild breathing difficulty with respiratory rate - 30 and pulse rate-110, which was initially thought to be due to anxiety. Findings of CT were not correlating with clinical condition of the patient.

Then, He was evaluated for pulmonary embolism (PE), 2D echocardiography was normal but his Well's score was 0. However D-dimer was raised to about 1000 ng/ml following which CTPA of chest was performed which showed confirmatory evidence of acute multiple right sided pulmonary emboli.

Pulmonology and Cardiology references were sought and patient was shifted to intensive care unit (ICU).

Course in hospital and outcome

Supportive treatment along with Low molecular weight heparin (LMWH) Enoxaparin and Dabigatran were started. Enoxaparin was stopped after 5 days.

He started improving and was discharged in a stable condition after 4 days on Dabigatran. He was followed up in OPD after 3 days and he was totally symptom-free.

Discussion

This case illustrates 23 year old male with no comorbidities presenting with abdominal pain as an unusual presentation of pulmonary embolism.

As discussed above, timely diagnosis and management of PE aids in reducing the mortality. Due to absence of pathognomonic signs and symptoms, diagnosis of PE is missed out in many cases. Because of numerous atypical presentation of PE in patients, one should always have a high degree of clinical suspicion to exclude or include PE as a possible diagnosis. Various studies have reported abdominal pain as a presenting complaint in 6.7% patients with PE [9].

Exact pathophysiology of abdominal pain behind PE is still an unsolved mystery. Some of the potential reasons like infarction in microvasculature of mesentery, hepatic congestion, tension on sensory nerve endings and distension of glisson capsule are considered as the cause for abdominal pain in PE [10].

Early recognition and assessment of PE can be done on the basis of history, clinical presentation and use of adjuncts like ECG, chest x-ray, laboratory investigations and Computed tomography pulmonary angiography (CTPA). ECG findings typically associated with PE comprises of S1Q3/S1Q3T3 pattern, rightward QRS axis shift-wave inversion in pre-cordial leads, transient, complete/incomplete Right bundle branch block and sinus tachycardia [11].

Chest x-ray is not a specific diagnostic tool but can be used for excluding differential diagnosis like pneumothorax and other infective lung pathologies [12]. 2-D echocardiography determines the RV status and aids in the management of hemodynamically unstable patients [13]. Among all, CTPA is considered as the gold standard investigation for diagnosis of PE [14].

Even after diagnosis of PE is made, it is associated with considerable mortality and morbidity.

Considering appropriate anti-coagulant therapy in case of PE has shown to drastically reduce mortality and recurrence of disease. In comparison to unfractionated heparin (UFH), LMWH has more beneficial anticoagulant effects and pharmacokinetics. REF. Current guidelines from American college of chest physicians recommend use of LMWH over UFH in patients with sub massive PE. For many years, standard choice of anti-coagulant therapy has been LMWH overlapping and followed by oral Vitamin K antagonist [15,16].

These days, direct thrombin inhibitors like Rivoroxaban, Dabigatran and edoxaban offer alternate treatment options in cases of PE with numerous advantages over conventional therapy [17]. Daily fixed dose regimen can ease out patient management and can make outpatient treatment more practical [18].

Our patient presented with abdominal pain which is a very unusual presentation of an unprovoked PE. High degree of clinical suspicion and correlation of clinical signs and symptoms led to the early diagnosis and management of the patient.

Conclusion

Pulmonary embolism, being a life threatening condition, with its numerous unusual presentations poses a diagnostic challenge for the emergency physicians. Clinical suspicion and knowledge of atypical presentation of PE can aid in improving patient's outcome and thereby reducing mortality.

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