

Pulmonary embolism as a cause of suicide attempt by stabbing in the chest. Clinical dilemmas

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Case Report

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Abstract

Background

Pulmonary embolism is the third most common cause of cardiovascular death. While the conditions that rank 1st and 2nd manifest with characteristic symptoms, pulmonary embolism is a tricky, often oligosymptomatic disease. While in the case of stable patients, diagnosed with a low-risk disease, the treatment is predictable, in patients with co-existing medical conditions, anticoagulation treatment leads to serious bleeding in 7.22 out of 100 treated patients/year, with a mortality rate reaching 9%.

Case presentation

This report presents a case of a male patient with self-inflicted knife chest wound as a result of severe chest pain due to massive pulmonary embolism, as well as the resulting clinical dilemmas.

Conclusions

The above case is a rarely seen concomitance. It describes an invariably rare attempt to deal with the untreatable pain of a pulmonary embolism. I will certainly be a guide for other doctors that it is possible to perform similar procedures without endangering the patient's life despite clear contraindication in guidelines.

Introduction

Pulmonary embolism (PE) is a tricky disease with non-specific symptoms. It affects both young people with an uneventful medical history and chronically ill elderly patients during hospitalization due to other causes. The appropriate diagnosis often requires extensive knowledge, strong intuition and sometimes even luck. Determination of the level of D-dimers from the blood, in any patient with chest pain to exclude pulmonary embolism leads to unnecessary overperformance of computed tomography pulmonary angiography (CTPA) due to frequent exceeded D-dimer values even in healthy patients [1]. Massive PE mortality reaches 50% [2]. Each additional disease concurrent with pulmonary embolism increases mortality especially in elderly. It has been proven that despite the hemodynamic instability in patients with confirmed pulmonary embolism, thrombolysis was less often administered in the case of concomitant diseases, than in the case of patients with only PE. This is especially true if treatments used are mutually antithetical. ESC very clearly specify concomitant situations and diseases that are contraindications to the administration of thrombolysis [3]. In the case of acting contrary to clear, global guidelines, in the event of failure of the implemented treatment, doctors must take into account the possibilities of lawsuit consequences. However, there are reports of successful violations of the guidelines [4]. We present a case of a patient with a stab wound in the chest that was made to "relieve" the pain caused by massive pulmonary embolism.

Materials And Methods

This report presents a case of a male patient with self-inflicted knife chest wound as a result of severe chest pain due to massive pulmonary embolism, as well as the resulting clinical dilemmas.

Results

A 46-year-old male patient was brought to the emergency department (ED) due to dyspnea secondary to a knife wound to the chest. According to the report of the paramedics who had transported the patient, upon first contact he had tachypnea of approx. 40 breaths per minute and a saturation of 80% without oxygen therapy. The large amount of blood in the patient's surroundings, chest wound in the heart area and signs of shock spurred the paramedics' "load and go" decision. Examination at the ED revealed: a Glasgow Coma Scale (GCS) of 14, heart rate 147 beats per minute, the blood pressure 88/60 mmHg, saturation with an oxygen mask at a 15 L/min flow rate – 90%, pale, clammy skin, pronounced respiratory effort with the involvement of accessory respiratory muscles. A 4-centimeter, heavily bleeding wound was identified below the left nipple, without features of subcutaneous emphysema. Symmetrical vesicular breath sounds above the lung fields, heart sounds were regular, with no murmur. Abdomen soft, not painful; post-thrombotic syndrome-type ulcerations on both calves, without edema. The patient denied any consumption of alcohol or substances of abuse. He denied suicidal ideation. Medical history was difficult to collect due to dyspnea and the patient's severe restlessness and pain. The patient was unable to utter more than 1–2 words, kept removing the oxygen mask, claiming that he was unable to breathe through it. Blood was collected for laboratory testing. Morphine and lorazepam were administered intravenously (i.v.), leading to pain reduction and therefore calming the patient down, which enabled the placement of a mask on maximum oxygen flow rate. Bleeding was stopped by packing and compression. Lung ultrasound examination revealed normal sliding, no pneumothorax, free fluid in the pleural cavities nor tamponade were observed. Focused Assessment Sonography in Trauma (FAST) revealed no parenchymal organ injury. An ECG revealed sinus tachycardia approx. 140 bpm, right axis deviation, negative T waves in the V1–6 leads. The patient reported that severe thoracic pain had appeared several days earlier. A piercing-type discomfort on the left side of the chest was constant and intensified upon inspiration. The patient sought advice from the family doctor twice but he felt no improvement after taking the prescribed analgesics. The pain became so severe that it prevented free inspiration. Due to the pin-point location and the helplessness evoked by the lack of relief, he decided to thrust a knife where pain was most intense to alleviate the discomfort. He also reported that he had abused alcohol in the past and he had been sober for 2 years at the time. The reason for quitting his addiction was deep vein thrombosis of the lower extremity, diagnosed approx. 24 months earlier after several days of binge drinking. He reports that he took the prescribed medications for 3 months and as a result of the effective drug therapy and an almost 4-month period of alcohol abstinence, he discontinued anticoagulant therapy, regarding alcohol as the cause of thrombosis. He lived in the city center, alone, he was a widower, his wife died few years back because of breast cancer. A suspicion of pulmonary embolism was raised and a chest CT scan with contrast enhancement was ordered. A CT scan revealed a chest wound on the left side which did not penetrate into the pleural cavity. A massive embolism was identified in all segments of the right lung, with complete occlusion of arteries up to segment 8. Apart

from that, thrombi were visible in the upper lobe segments of the left lung except the artery up to the 1st segment, left lower lobar artery completely devoid of contrast (Fig. 1,2).

The patient was transferred to the Cardiac Intensive Care Unit; considering the chest wound and risk of bleeding, a heparin infusion was initiated, taking into account the possibility of reverting its effects using protamine sulfate. Echocardiography was carried out, revealing an enlarged right ventricle, paradoxical septal motion with features of left ventricular overload. After 3 hours, BP dropped to 60/0 mmHg. The patient, whose condition was developing towards respiratory insufficiency, was urgently consulted by an anesthesiologist and a vascular surgeon. In condition of hypotension bleeding was so small that it allowed to freely find both ends of the bleeding vessels and bind it. Despite the chest wound, a multidisciplinary decision was made to administer fibrinolysis, which led in few minutes to a rapid improvement. No bleeding from the wound was observed. Oral vitamin K antagonist (VKA) and bridging therapy were initiated. Fever and dyspnea appeared on the 3rd day. A chest X-ray revealed lobar pneumonia, an empirical antibiotic was initiated. Proximal vein thrombosis of the left lower extremity was diagnosed during hospitalization. Due to the rapid improvement of the patient's general condition and normalization of ECHO images the plan to implant a vena cava filter was abandoned. The patient was discharged on day 24 of hospitalization in a good general condition, with a properly healing chest wound. During follow-up at the Cardiology Outpatient Clinic after 3 months, an exercise test and echocardiography were carried out, revealing no abnormalities. The patient took the medications and monitored INR values very systematically; all measurements during the 3 months were within the recommended limits, the patient remained sober. Until discharge, as well as during subsequent follow-up visits, no local complications of bleeding vessel ligation were observed.

Discussion

PE remains the 3rd most common cause of cardiovascular death [5]. The pathomechanism behind the development of deep vein thrombosis and PE was described by the 19th century scientist from Berlin, Rudolf Virchow. Although more than 150 years have passed, vessel wall injury, hypercoagulability and flow disturbances still remain the most common causes of thrombi development [6]. Pulmonary embolism is called "the Great Masquerader". The reason is a multitude of symptoms and clinical presentations. In nearly 25% of cases, the first symptom of pulmonary embolism is cardiac arrest, and pulmonary embolism is the cause of 15% of cardiac arrests [7, 8, 9]. Typical pulmonary embolism symptoms – acute pleuritic pain, hemoptysis and dyspnea – occur in only one per ten patients. Although clear guidelines are available for the treatment of pulmonary embolism, there are many cardiological clinical cases where the initiation of standard treatment may lead to tragic results. For example administration of antiplatelet drugs to STEMI patient, with concomitant UGIB [10]. Initiating standard treatment when faced with evident features of external bleeding seems to be unreasonable, even if the patient is hemodynamically instable, and active bleeding is a contraindication to the initiation of anticoagulation. Therefore, how to proceed if, apart from the active bleeding chest wound, initiation of anticoagulation treatment is indicated? And what to do in the case of circulatory crisis and the need to initiate thrombolysis? Based on the multi-disciplinary discussion at the patient's bedside, a decision was

made to start thrombolysis, assessing the risk of bleeding as much lower than the risk of death in the course of massive pulmonary embolism.

Conclusion

Without careful medical history collection and clinical examination, the primary disease would probably remain undiagnosed, and the occurrence of hypotonia within several hours after admission would presumably be considered to be a new expanding emphysema or a new intrathoracic bleeding. This case is also very interesting due to the need to initiate fibrinolytic treatment in a patient with an open wound of the chest. It also suggests the possibility to initiate anticoagulation and thrombolytic treatment in patients with an active but stoppable bleeding from large chest wound.

Abbreviations

CTPA - computed tomography pulmonary angiography

ED – emergency department

FAST - Focused Assessment Sonography in Trauma

PE – pulmonary embolism

VKA – vitamin K antagonist

Declarations

Ethical Approval and Consent to participate

Not applicable

Consent for publication

Available

Availability of supporting data

Data are available from the corresponding author on reasonable request

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

J.N. designed and directed work. E.N. collected all the data. M.D. described all of the CT scans. G.G. and M.K. provided critical feedback and helped with manuscript writing. All authors worked together on the final form of manuscript.

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Authors' information (optional)

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Figures

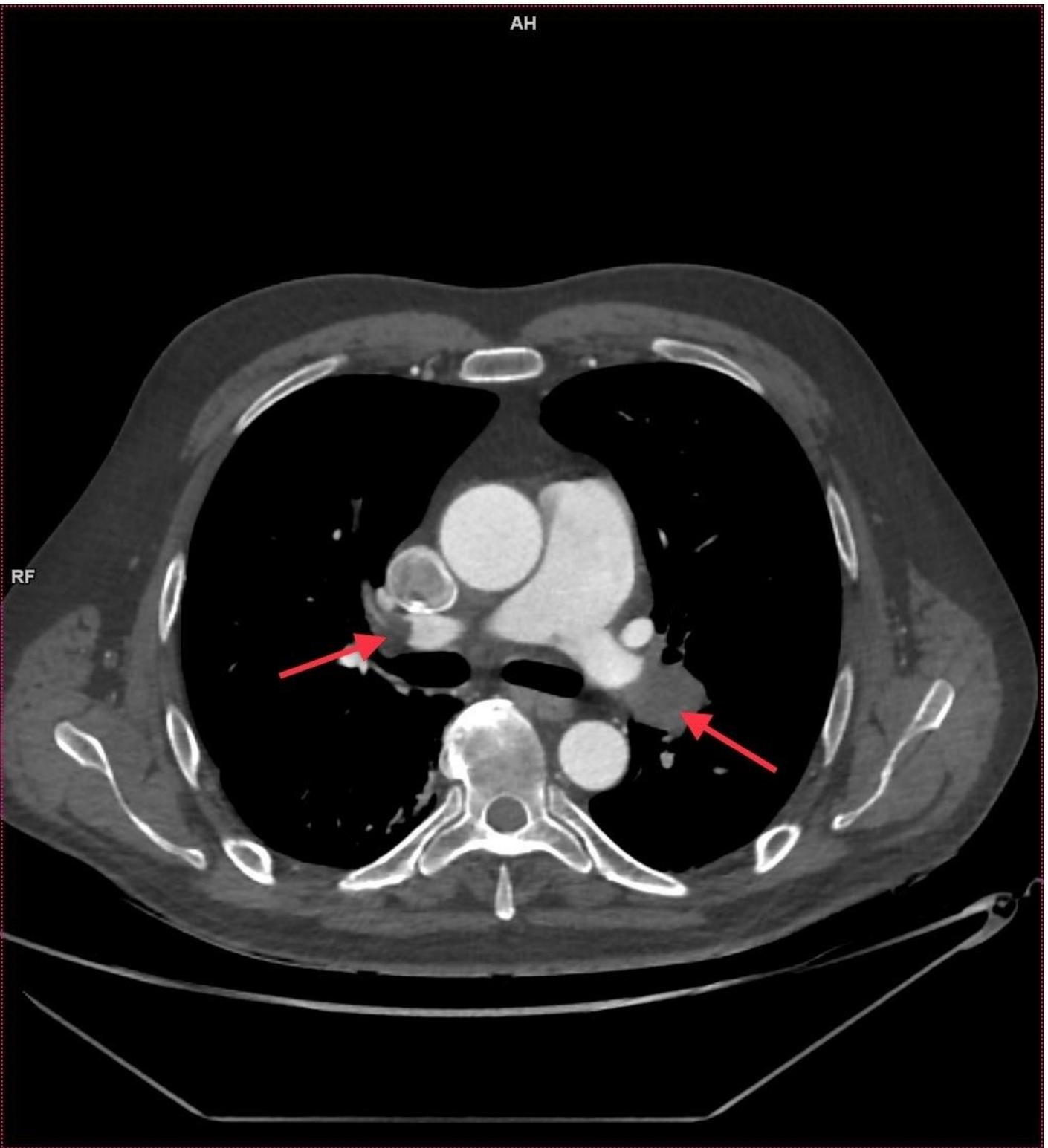


Figure 1

Chest CTA. The image show bilateral pulmonary embolism on chest computed tomographic angiography (red arrows)



Figure 2

Chest CTA. The CT angiography scan of an sagittal section through the chest showing blood clot in the left pulmonary artery (red arrow). The stab wound appears in the anterior region of the lower part of the chest where there is irregularity in the skin and small subcutaneous haematoma. In addition, no injuries to the thoracic organs are observed (white arrow)