



A challenging case on the evening acute weekend take (quiz case)

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Medford ARL (1), Edey AJ (2)

1)North Bristol Lung Centre, Southmead Hospital, North Bristol Hospitals NHS Trust, Westbury-on-Trym, Bristol BS10 5NB, UK.

2)Department of Radiology, Southmead Hospital, North Bristol Hospitals NHS Trust, Westbury-on-Trym, Bristol BS10 5NB, UK.

Correspondence: Dr Andrew RL Medford,

Question 1

A 55 year old man presented on the evening weekend acute medical take with a 10 day history of coryzal symptoms, purulent sputum and dyspnoea. He had taken a 9 hour trans-Atlantic flight 27 days previously and had a 20 pack year smoking history. Past history was also significant for type 2 diabetes, hypertension, ischaemic heart disease, previous ureteric stones, left hydronephrosis, and recurrent urinary tract infections. On examination, significant findings were an elevated BMI (40), hypoxaemic (SpO2 88% on air), hypertensive (blood pressure 160/90), with left basal post-tussive crackles and an accentuated pulmonary second sound and right ventricular heave. Initial investigations revealed a normal ECG, modestly elevated CRP of 40, GFR 77 (remainder of biochemistry normal), mild neutrophilia of 8.2 (remainder of FBC normal), urinalysis clear, Troponin T elevated at 62 and arterial blood gases: pO2 7.5kPa, pCO2 4 on air.

The initial CXR is shown in Figure 1. What is your main concern and what radiological investigation would you do next?

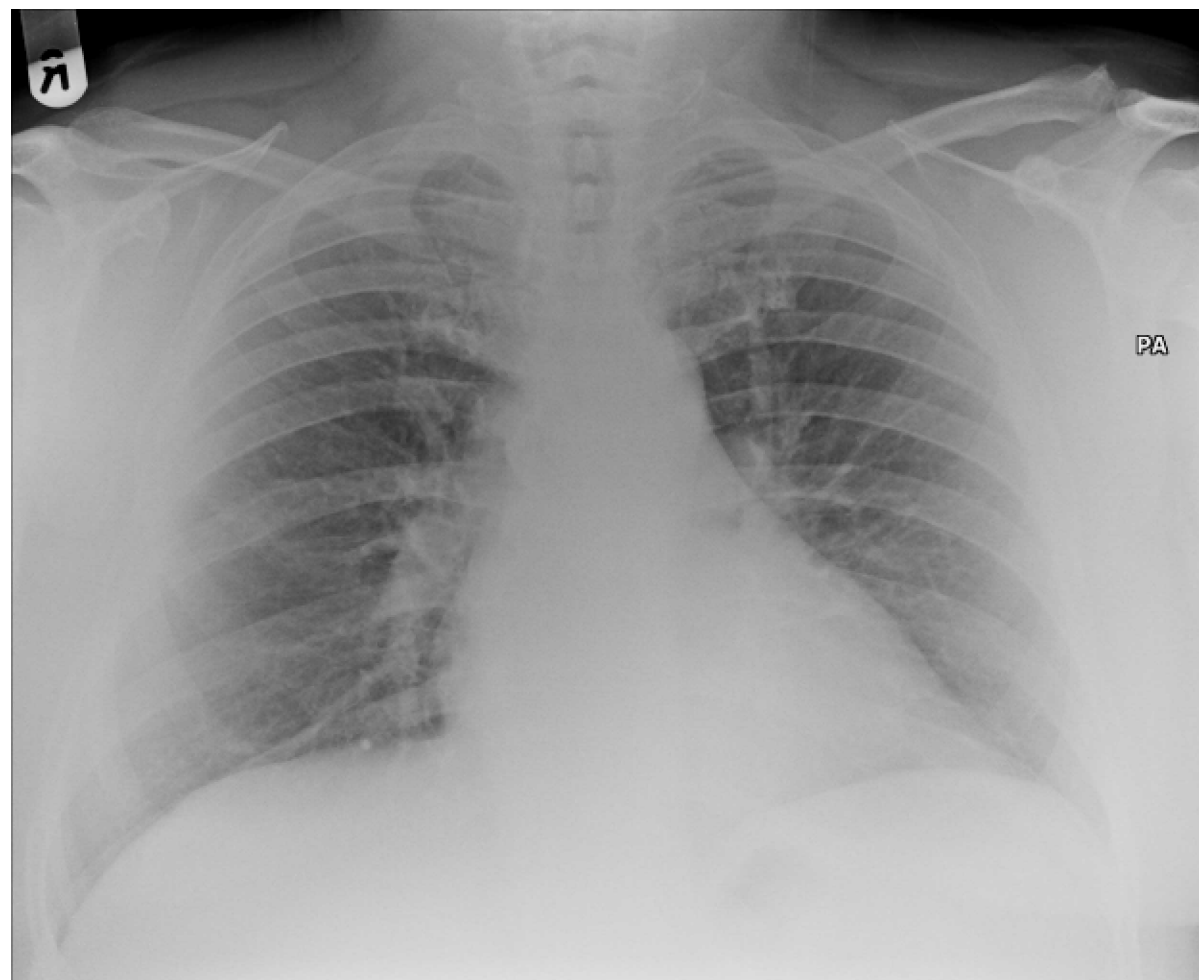


Figure 1

Answer 1

The initial CXR was normal (the cardiac size is within normal limits). The main concern was of pulmonary embolism bearing in mind the recent flight, the hypoxic respiratory failure, elevated A-a gradient and elevated BMI for no apparent reason on the CXR. There is also clinical evidence of pulmonary hypertension implying a previous pathology (to have caused this) as well as intercurrent lower respiratory tract infection. As well as oxygen therapy and antibiotics, he was therefore anticoagulated and scheduled for a CT pulmonary angiogram (in view of the attendant

pulmonary hypertension to provide an assessment of pulmonary vascular diameter and anatomy as well as looking for pulmonary emboli).

Question 2

He then collapsed on the toilet, and was noted to be more dyspnoeic with SpO2 77% on air. He was also noted to have lost his left arm pulses and be complaining of tearing left arm pain. An ECG and repeat CXR (Figure 2) were normal.

What is your main clinical concern now and what radiological test would you consider?

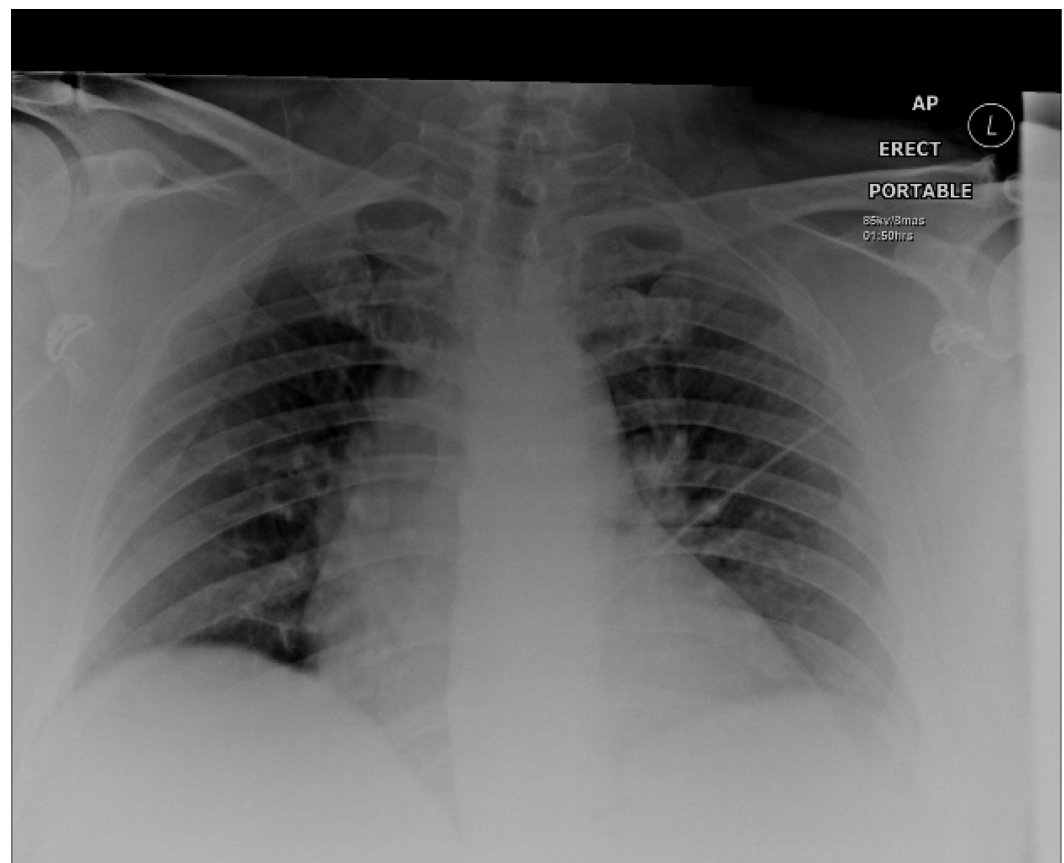


Figure 2

Answer 2

In view of the loss of pulses and left arm pain, aortic dissection must be considered and a CT aortogram performed, which has the advantage of assessing the pulmonary vasculature and for pulmonary emboli at the same time.

quiz case continued

Question 3

What can you see on the CT aortogram below (Figures 3A-E)? Describe 5 significant findings.

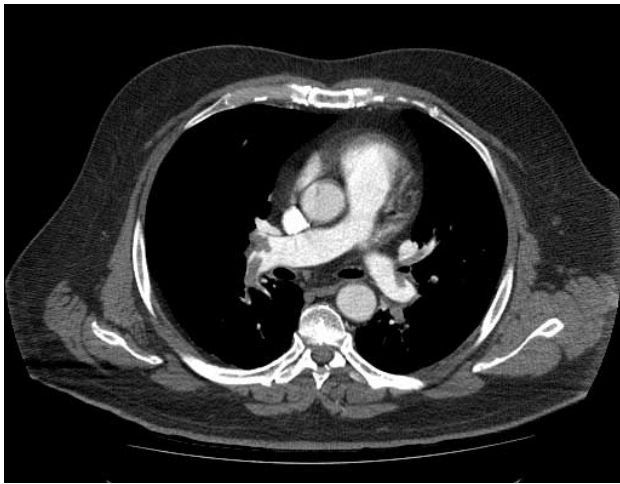


Figure 3A



Figure 3B



Figure 3C



Figure 3D



Figure 3E

Answer 3

Significant findings accounting for the clinical findings included: bilateral pulmonary emboli at the level of the main pulmonary arteries (Figure 3A), occlusive left subclavian artery embolism (Figure 3B), an atrial septal defect (ASD), and evidence of right heart strain with elevated pulmonary artery pressures (dilated pulmonary trunk) (Figures 3C-D). The lungs were clear apart from left basal atelectasis (Figure 3E). There was no aortic dissection.

Question 4

He required transfer to the intensive care unit for more invasive monitoring and resuscitation. Due to the ASD, he was not thrombolysed systemically due to the risks of further systemic embolism. He underwent placement of a caval filter (having confirmed there was no thrombus in the right femoral vein on ultrasound) to reduce the chance of clot dispersal from the pelvis and lower limbs.

Question 5

His condition remained critical. What has been performed between Figures 4A and 4B?

Figure 4A

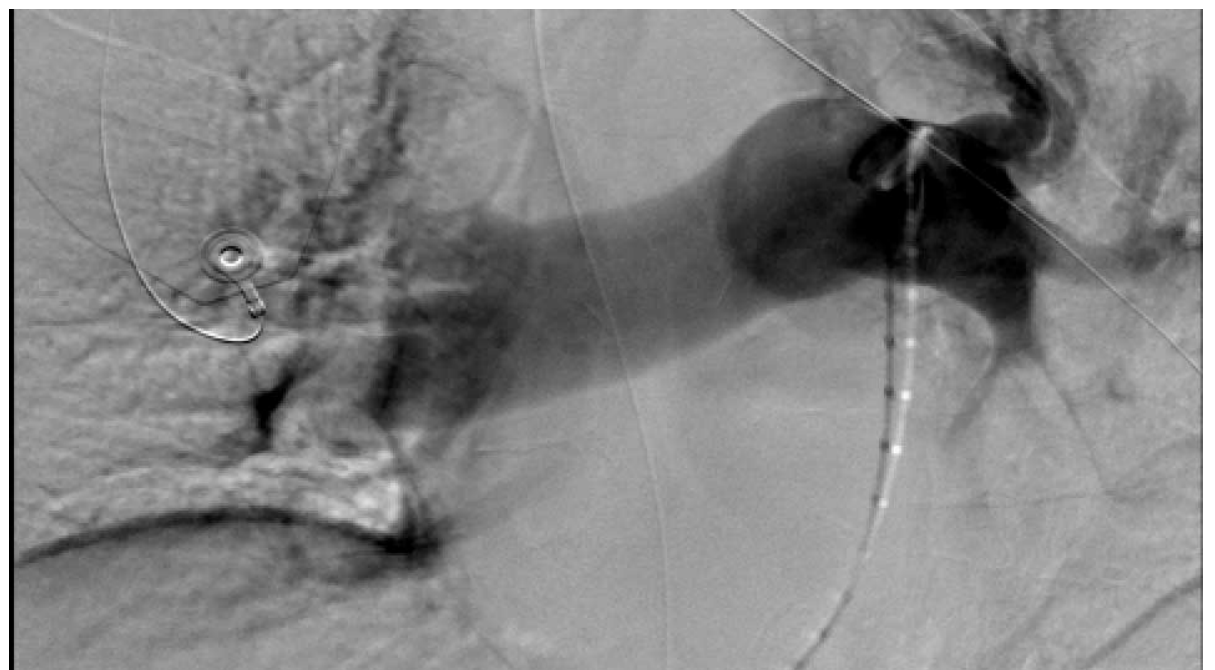


Figure 4B



Answer 5

Invasive transfemoral pulmonary angiography was performed with subsequent mechanical and pharmacological (20mg Actilyse) thrombolysis. The pulmonary angiogram prior to intervention (Figure 4A) shows widespread proximal filling defects.

Post-procedural imaging (figure 4B) shows significant dispersal of clot with improved flow particularly on the left.

Conclusion

The patient's condition remained too critical to allow emergency ASD closure and he deteriorated despite initial improvement following catheter thrombolysis.

Final diagnosis

Paradoxical embolism to left subclavian artery due to an untreated ASD with secondary pulmonary hypertension, concurrent bilateral proximal pulmonary emboli and lower respiratory tract infection.