Sudden appearance of a mass on chest X-ray

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A 70-year-old man with a history of emphysema was in his normal state of health until developing left-sided chest pain while working on his son's car. He drove to a nearby fire station and was taken by paramedics to the local hospital. On his way to the hospital he twice suffered cardiopulmonary arrest, was defibrillated and underwent cardiopulmonary resuscitation (CPR). Upon his arrival at the hospital he was seen by a cardiologist and diagnosed as having an acute anterior wall myocardial infarction. He received tissue plasminogen activator (TPA) and was transported to our facility by helicopter. As thrombolytics failed to improve the continued chest pain and ST elevation, he was taken to the cardiac catheterization laboratory on his arrival. He underwent a successful percutaneous coronary angioplasty of the left anterior descending artery but his immediate course was complicated by hypotension and congestive cardiac failure. The patient was subsequently intubated and an intra-aortic balloon pump was placed for haemodynamic support. On the second day in the cardiac intensive care unit, the patient was noted to be anaemic, his haemoglobin having dropped from 13.5 to 8.8 mg/dl. The patient had a slight amount of blood-tinged sputum but did not have any large haematomas, gastrointestinal bleeding or evidence of retroperitoneal bleeding. His mental status remained intact. A chest X-ray showed a mass in the right lung field (figure 1). The patient also had a computed tomography (CT) scan of the chest to better image the mass (figure 2). The chest X-ray from the transferring institution was available for comparison (figure 3).

Figure 1 Chest X-ray on day 2

Figure 3 Chest X-ray from the transferring institution

Figure 2 Chest CT scan

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Questions

- 1 What does the mass represent?
- 2 Interpret the CT findings.
- 3 What part, if any, of the patient's history suggests the potential for this type of complication?

Answers

QUESTION 1

Review of the patient's chest X-ray showed a well-circumscribed, rounded opacity in the right lower lung field (figure 1) which was not present at admission. On closer inspection of the admission chest X-ray (figure 3), it was evident that the mass occupied a space where a large emphysematous bulla had existed.

QUESTION 2

The CT scan of the chest revealed bilateral effusions, bibasilar infiltrates and a large density in the right base with an air fluid level (figure 2). With no evidence of bleeding elsewhere, it was felt that the patient had had a small haemorrhage into the lung parenchyma but the majority of his blood loss was into an emphysematous bulla resulting from a complication of TPA administration.

QUESTION 3

The use of invasive vascular techniques (angiography and placement of an intra-aortic balloon pump) following thrombolytic administration are associated with a significantly higher rate of bleeding complications. It has been suggested that CPR is a relative contraindication for thrombolytics but there is no strong evidence against their use after a brief period of resuscitation.

Discussion

The bleeding risks of thrombolytic therapy have been well described.¹⁻³ Pulmonary haemorrhage is a rare complication of thrombolytic therapy. Three cases of pulmonary haemorrhage have been reported in the English literature⁴⁻⁶ and a further case was described in the Spanish literature.⁷ This patient represents a unique case of both intraparenchymal pulmonary haemorrhage and bleeding into an emphysematous bulla.

Perhaps the best definition of a major bleeding complication would be any episode leading to death, permanent disability, or a prolonged

hospital stay.⁸ Intercerebral haemorrhage may be the most feared complication of thrombolytic use with an incidence reported between 0.2–1%.^{2,3} Spontaneous bleeding episodes are rare. Complications are generally associated with vascular access. More invasive procedures such as coronary angiography or insertion of intra-aortic balloon pumps are associated with a high risk of a major bleeding episode. In studies that used early angiography (TIMI-1, TAMI-1, SWIFT, and ECGS IV), a major bleeding complication occurred at a rate of approximately 30%. In studies that did not use early angiography (GISSI 1 and 2, ISIS 2 and 3, AIMS and ASSET) the rate was roughly 5%.⁸ Intra-aortic balloon pumps carry a risk of 12–20% for major bleeding episodes.⁹ Patients receiving less than 10 minutes of CPR do not show an appreciable increase in bleeding complications with the use of thrombolytics.¹⁰ Our patient had received less than one minute of CPR.

To our knowledge, no case of bleeding into an emphysematous bulla has been reported. In addition to parenchymal involvement, this case demonstrated an additional blood loss into an emphysematous bullous cavity, which in our opinion was responsible for the majority of bleeding. Although our patient underwent invasive procedures, the site of bleeding was remote to the site of access or intra-arterial manipulation. We doubt that CPR precipitated the event. The patient had no external evidence of chest wall trauma and the haemorrhage was deep in the lung. This case illustrates a unique example of the dangers of thrombolytic therapy.

Final diagnosis

Bleeding into an emphysematous bulla resulting from a complication of TPA administration.

Keywords: thrombolytic complications; emphysematous bulla

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