



Case report

Non-operative treatment of a striking post-traumatic pulmonary artery intimal dissection

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1. Introduction

Pulmonary artery intimal injury caused by blunt thoracic trauma is extremely rare

The real incidence is unknown because most patients die before reaching the hospital and the majority of pulmonary artery dissections are detected post mortem.⁷

Traumatic pulmonary artery pseudoaneurysm is a rare complication of traumatic thoracic injuries. Although spontaneous resolution of some pulmonary artery pseudoaneurysms has been reported these lesions should not be left untreated because of the risk of rupture leading to massive haemoptysis and subsequent death in almost 50% of the cases.^{3,11,12} We present a case of post-traumatic pulmonary artery intimal injury evolved in pulmonary artery pseudoaneurysm underwent non-operative treatment and survived after ICU discharge.

2. Case report

A 55-year-old obese unrestrained woman was involved in a MVA accident. She was travelling in a car being struck by a truck, whilst sleeping on the back seats.

On the scene her GCS was 15/15, without any focal neurological deficit; she had a cracking rib and subcutaneous emphysema. Her vital signs were stable (BP: 100/60, HR: 90 bpm, SpO₂% = 92 in room air).

The patient was brought to our hospital, which is a first level trauma centre, referral centre for the local emergency medical service.

In the emergency department the patient underwent chest and pelvic X-ray showing moderate widening of the mediastinum and pelvic fracture. A contrast-enhanced chest/abdomen/pelvis CT was therefore performed upon her stability.

The CT pulmonary angiogram showed a post-traumatic pulmonary artery mild ectasia and intimal flap (Fig. 1). Other CT findings were bilateral clavicle fractures, bilateral multiple rib fractures with bilateral pulmonary contusions, a left pneumothorax, a widened mediastinum, type A pelvic fractures and L2–L3 vertebral fractures without spinal cord injury. A chest tube, inserted through a left mini-thoracotomy, drained the pneumothorax.

The patient remained haemodynamically stable and was then transferred from emergency department to the trauma intensive care unit (TICU).

Echocardiograms performed at TICU admission and as daily control demonstrated a normal size right ventricle with good right ventricular function.

On day two the respiratory situation deteriorated because of the worsening of the pulmonary contusions; the patient was intubated and connected to the ventilator.

On day five due to blood loss from fractures and airway infection the patient developed significant hypotension and a worsening of the gas exchanges. Blood transfusions and inotropes, dopamine 5–8 mcg/kg/min, improved the haemodynamics. Anticoagulant therapy with low-molecular-weight heparin at the dose of 100 mg/die and antibiotics were started on this same day.

Day five CT scan (Fig. 2) confirmed at pulmonary angiogram the presence of the intimal flap with a slightly further increase within the proximal right pulmonary artery, extending into a superior segmental branch.

Because of the need of prolonged mechanical ventilation, a percutaneous tracheotomy was performed.

On day six the respiratory function improved and progressive weaning by sedatives and inotropes was started.

On day eight the patient was awake and oriented, haemodynamically stable and showing a significant further improvement of the pulmonary function.

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Fig. 1. CT pulmonary angiogram showing a pulmonary artery mild ectasia and intimal flap.

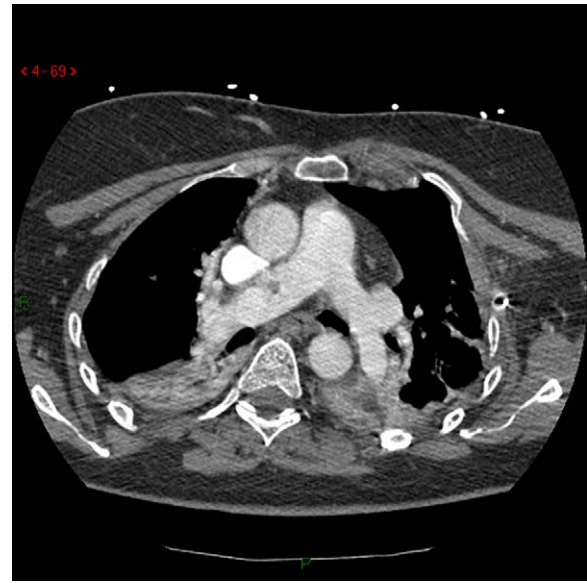


Fig. 2. CT pulmonary angiogram showing the intimal flap with a slightly increase within the proximal right pulmonary artery extending into a superior segmental branch.

On day 12, CT pulmonary angiogram (Figs. 3 and 4) revealed an initial enlargement of the pulmonary artery (pseudoaneurysm formation).

The surgical operation was deemed to carry a risk too high compared to possible benefits and the endovascular procedure was not feasible, therefore we carried on with non-operative treatment until day 20, when the patient, stable and breathing spontaneously, was discharged from the unit and transferred in Germany, her native country.

Once back, the patients has been monitored for six more days in ICU and then transferred to the ward for further 20 days and then discharged home. A follow up ANGIO-CT scan 45 days after the trauma showed a persistent but stable pseudoaneurysm formation with vascular patency. At 3 months follow up the patient is alive and doing well.

3. Discussion

We present a case of pulmonary artery intimal injury after blunt thoracic trauma.

Although few similar cases are present in the literature, to the best of our knowledge, this is the first report of a patient surviving such an injury without developing catastrophic haemodynamic complications.

This injury is similar to aortic post-traumatic injury both for imaging presentation, histological pattern and mechanism of injury.¹

Evolution to pulmonary artery pseudoaneurysm, although rare, is described. The relative infrequency has been attributed to the low pressure–high flow nature of the pulmonary arterial system.⁸

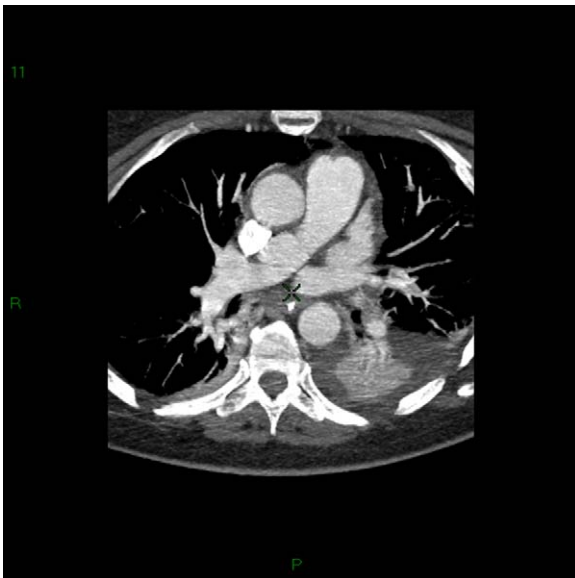


Fig. 3. CT pulmonary angiogram showing the pseudoaneurysm formation.



Fig. 4. CT pulmonary angiogram showing the pseudoaneurysm formation.

Forces involved in great vessel trauma seem to be osseous pinching, torsion, tension, and increased intravascular pressure.^{2,4}

A possible explanation of the mechanism of injury in our patient could be the compression of the vessel between the dorsal vertebral bodies and the sternum.

Angio CT is a highly sensitive tool for traumatic great vessel injuries with a very high negative predictive value.^{1,5,6,9,10}

As for minimal aortic injury these lesions are immediately evident at CT, even when small in size, with less than 1-cm intimal flap and with non-significant haematoma.

Management of pulmonary artery pseudo aneurysm depends on location, size, and symptoms. Treatment options include aneurysmectomy, arterial branch ligation, pulmonary resection, or angiographic embolisation.⁸

Acute surgical treatment of such a lesion may be challenging or even impossible and hopeless because of the presence of simultaneous multiple severe injuries in multiple trauma patients. Non-operative management and endovascular selective procedures are probably the best way to manage these lesions in patients surviving the acute injury.

In our case a surgical repair via sternotomy was not feasible for the contemporary presence of multiple lesions and the morbidity risks, at the same time endovascular procedures did not find indication because of the position of the pseudoaneurysm and the high risk of pulmonary infarction.

Therefore, since the stability of haemodynamic status as well as of the anatomic lesion, we decided to wait and see, monitoring the lesion and delaying the definitive surgical repair after a satisfactory improvement of thoracic and spine lesions.

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