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Case Report

Huge traumatic pulmonary artery pseudoaneurysm

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ABSTRACT

Pulmonary artery pseudoaneurysm is a very rare complication of penetrating thoracic trauma. We present a case of a 27-year-old woman who developed a 6.5-cm traumatic pulmonary artery pseudoaneurysm after suffering multiple stab wounds to the chest and the abdomen. The pseudoaneurysm was successfully treated endovascularly with vascular plug occlusion and coil embolization.

Introduction

Post-traumatic pulmonary artery pseudoaneurysms (PAPs) are extremely rare, with only 30 cases reported in the literature. Although pseudoaneurysms can be clinically silent, patients typically present with dyspnea, chest discomfort, or hemoptysis. Treatment modalities include surgical resection and trans-arterial embolization. We present a case of a 6.5-cm, post-traumatic PAP that was successfully treated via an endovascular approach.

Case report

A 27-year-old female presented to the emergency department after suffering 2 stab wounds to the right flank and the left posterior thorax, inferior to the scapula. An initial chest X-ray was obtained (Fig. 1), which revealed a left tension hemopneumothorax and contralateral mediastinal shift. The patient was intubated and a left thoracostomy tube was placed in the trauma bay with immediate return of 1200 mL of sanguineous fluid.

The patient was taken emergently to the operating room. A left thoracostomy was performed revealing a posterior left lower lobe 2-cm pulmonary laceration which was repaired with polydioxanone suture. Next, an exploratory laparotomy was performed showing a severe right renal laceration and small liver laceration, necessitating a right nephrectomy and packing of the right retroperitoneum and liver laceration. Daily postoperative chest X-rays were obtained, demonstrating the development of a left infrahilar rounded mass that was first visible on postoperative day (POD) 4 and becoming progressively better visualized on subsequent chest

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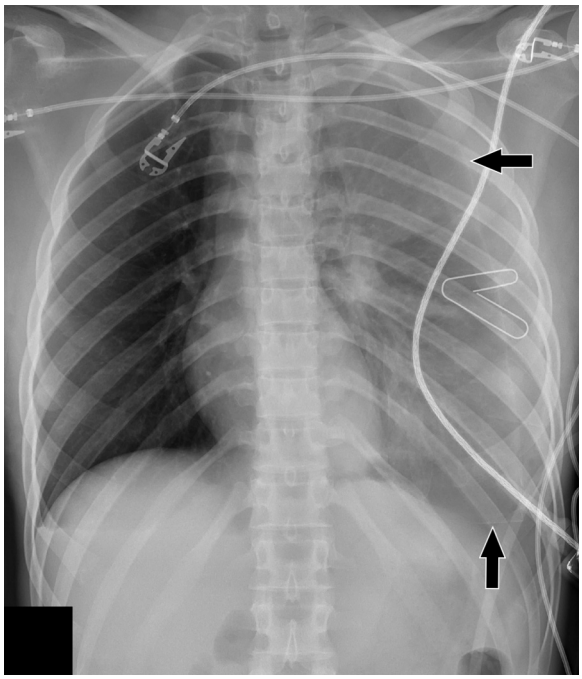

Fig. 1 – Initial anteroposterior (AP) chest X-ray demonstrates left tension hemopneumothorax with contralateral mediastinal shift. The arrows mark the left lung visceral pleural line. The metallic paperclip overlying the left midchest marks the skin entry stab wound site on the patient's back.

X-rays (Fig. 2). This mass was interpreted as a postoperative hematoma or seroma. Owing to elevated liver function tests, on POD 7 an abdominal CT was obtained which showed the known liver laceration and a moderate amount of peritoneal fluid. On POD 8 magnetic resonance cholangiopancreatography was obtained to evaluate for a bile leak. No bile leak was identified. However, a well-defined rounded mass in the posterior left lower lung was incompletely imaged and was interpreted as a hematoma or postoperative fluid collection (Figs 3A and B).

A follow-up CT of the abdomen on POD 12 partially imaged a 4.8-cm pseudoaneurysm in the posterior left lung contacting the posterior costal pleura (Fig. 4). Despite incomplete imaging of the pseudoaneurysm, given its large size, this was felt most likely to arise from the systemic circulation; however, a pulmonary artery source was also considered. Selective digital subtraction angiography (DSA) of the left seventh and eighth intercostal arteries was performed that demonstrated a truncated left eighth intercostal artery with a small site of contrast extravasation, consistent with arterial inury, but no filling of the pseudoaneurysm. Given the clear arterial inury, the left eighth intercostal artery was assumed to be the source vessel. After multiple attempts at crossing the occlusion were unsuccessful, the proximal intercostal artery was completely embolized with detachable coils and the procedure ended. A follow-up Color Doppler ultrasound of the left chest was performed the next day that showed a persistent patent pseudoaneurysm with a "yin-yang sign" (Fig. 5). Therefore, a dedicated CT angiogram of the chest was obtained on POD 13 to better identify the relevant vascular anatomy. A 6 × 6.5 cm pseudoaneurysm with partial mural thrombus was found arising from the left lower lobe posterior basal segmental artery (Fig. 6). After consultation with the thoracic surgery service, the oint decision was made to initially attempt endovascular embolization with plans for operative resection of the entire left lower lobe should this fail.

Working through the right femoral vein, a catheter was passed through the heart into the left main pulmonary artery. Diagnostic DSA demonstrated a large pseudoaneurysm arising from the posterior basal segmental branch of the left lower lobe with 2 distinct distal subsegmental arteries (Fig. 7A). A tri-axial 80-cm 7 French system was created, and the 2 distal posterior basal subsegmental arteries were embolized with fibered coils. Owing to the extremely short segment of normal artery between the origin of the left lower lobe posterior basal segmental branch and the pseudoaneurysm, and the desire to preserve flow into the anterior basal and lateral basal segmental arteries, a plug was chosen to occlude the origin of the pseudoaneurysm. A 6-mm Medtronic MVP microvascular plug was initially deployed but was quickly pushed into the pseudoaneurysm sac. Next, a 10-mm AMPLATZER Vascular Plug II (St. Jude Medical Inc., St. Paul, MN) was deployed slightly more proximally and remained in place within the origin of the posterior basal segmental artery. Completion DSA confirmed no persistent flow within the pseudoaneurysm as well as preserved flow in the superior, anterior basal, lateral basal, and medial basal segmental branch arteries (Fig. 7B).

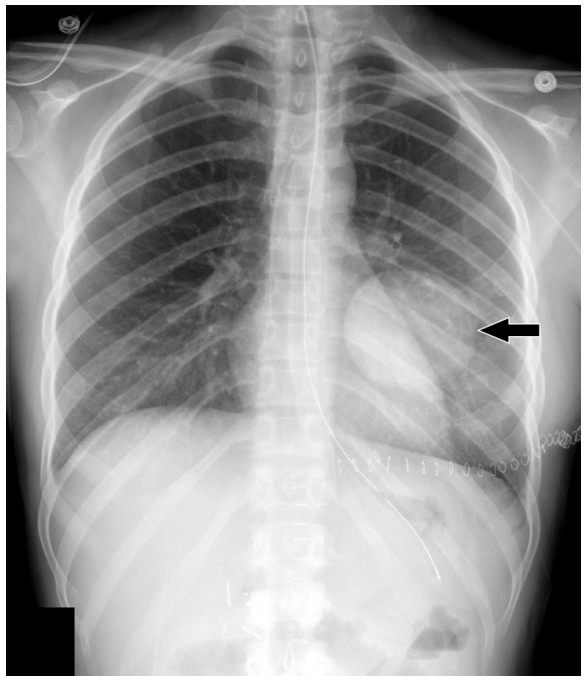

Fig. 2 – Follow-up AP chest X-ray 11 days after initial presentation demonstrates resolution of the left tension hemopneumothorax after surgical drainage. A large circumscribed rounded mass at the left midchest has developed (arrow).