

Pulmonary Arterial Pseudoaneurysm due to Penetrating Thoracic Trauma:

Clinical Presentation, Diagnosis, and Treatment

Michael McMahon, MS4; Andrew Ea, MD; Hector Ferral, MD (Mentor)

Case Description

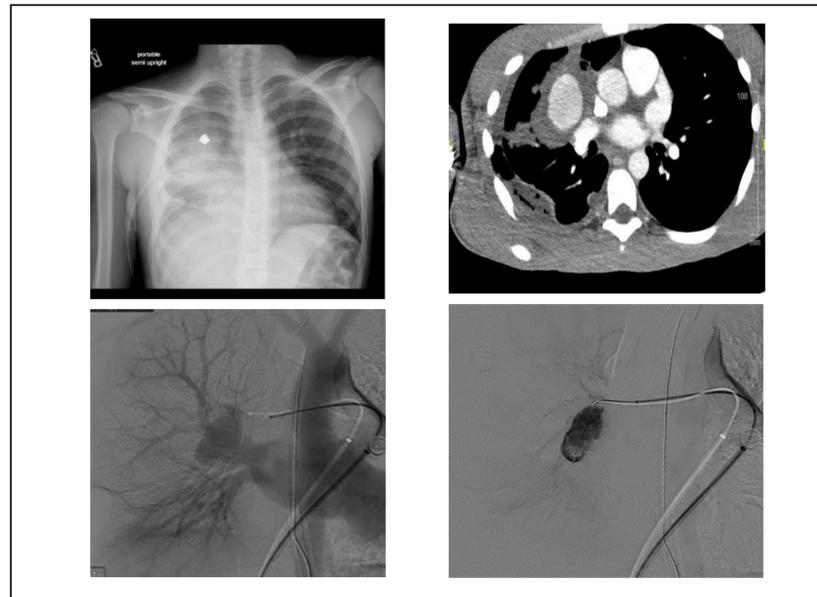
Introduction:

Pulmonary artery pseudoaneurysm (PAP) is a rare but potentially lethal condition. Acquired PAPs are most commonly caused by trauma (often iatrogenic) and infectious disease. Infectious causes include bacterial endocarditis, tuberculosis, mucormycosis, and pyogenic infection. Traumatic PAPs can be caused iatrogenically by catheterization, as well as by blunt and penetrating thoracic trauma, as described below. **A pseudoaneurysm, which involves the media and adventitia of the arterial wall, is more prone to rupture than a true aneurysm, which involves all three layers of the wall.** The condition may be suspected on chest X-ray or CT but requires CT angiography for definitive diagnosis. Radiologic findings of PAP include hilar enlargement or a new focal lung mass on chest radiograph. **CT angiography shows saccular or fusiform areas of dilatation with homogenous contrast filling** which occurs simultaneously with the pulmonary artery. **The lesions are treated by endovascular repair or surgery. Diagnosis and treatment are vital due to the high risk of mortality in the event of a rupture.**

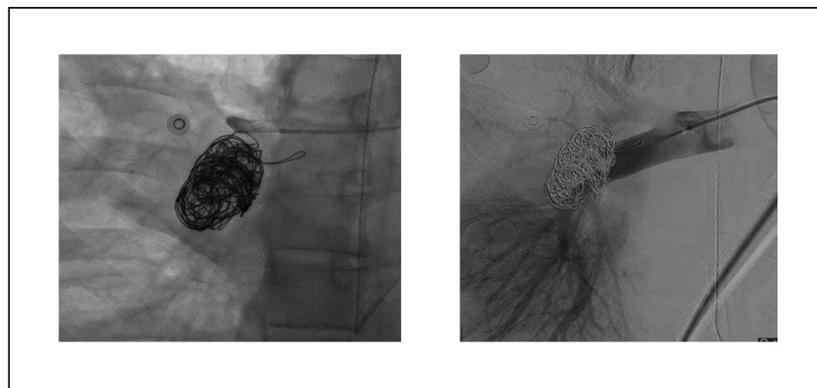
Patient Presentation:

- Chief Complaint
 - GSW to the chest
 - Unresponsive, hemodynamically unstable
 - ED CXR indicates **large right sided hemothorax**, CT indicates active extravasation
- Initial Management
 - Intubated, **chest tube placed**
 - Taken for emergent exploratory laparotomy, non-therapeutic
- Pre-Embolization Hospital Course
 - **CXR on Hospital Day 8: persistent hemothorax, increasing atelectasis** on the Right
 - Patient remains hemodynamically stable, breathing comfortably on room air
 - **CT Chest w/ Contrast on Hospital Day 12: enlarging extravasation** in the right upper lung
 - IR consulted for possible intervention

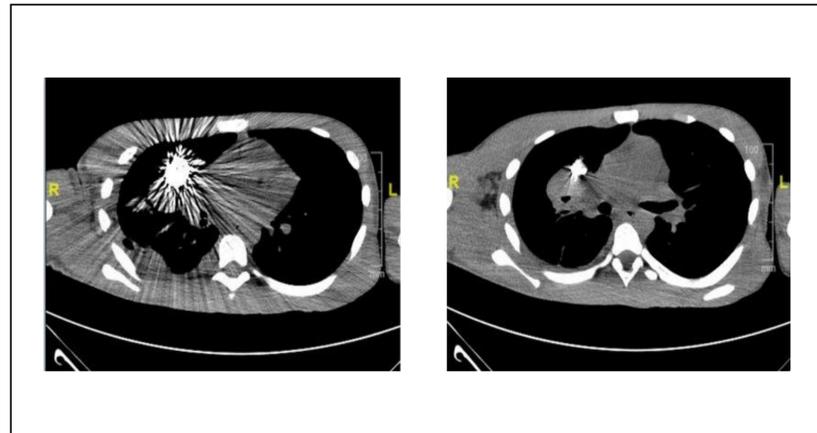
Pre-Embolization Imaging



Embolization



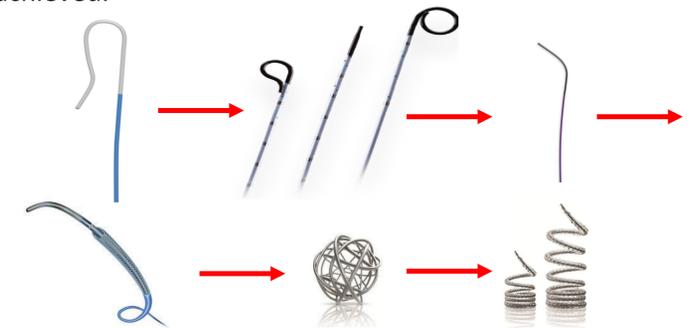
Follow Up Imaging



Procedure Steps/Key Devices

Steps:

- Access was obtained via **the right common femoral vein**.
- Access to the right pulmonary artery was obtained with a **Simmons 1 catheter**.
- A diagnostic pulmonary arteriogram with a **straight flush catheter** documented that the lesion originated from a pulmonary artery branch.
- A 10 Fr by 70 cm sheath was used to stabilize catheter position in the pulmonary artery.
- Multipurpose catheter (**MPA2**) and microcatheter combination **was used to perform super-selective catheterization of the right upper lobe interlobar branch** of the lesion.
- **A Progreat microcatheter** was advanced into the lesion to embolize
- The pseudoaneurysm was embolized with 11 coils total: **Three 20 mm framing coils and eight 20 mm hydrogel coils** (AZUR, Terumo, Japan) until complete obliteration was achieved.



Conclusion

Pulmonary artery pseudoaneurysm is a serious condition, due to the high rate of mortality in the event of a rupture. **These types of lesions should be suspected in patients with penetrating thoracic trauma who present with hemoptysis and the radiologic findings described in the introduction.** While surgery is appropriate in rare cases, **endovascular placement of coils is an effective form of treatment**, which results in obliteration of the lesion and significantly decreased risk to the patient.