

CIRA Case Of The Week

January 2017

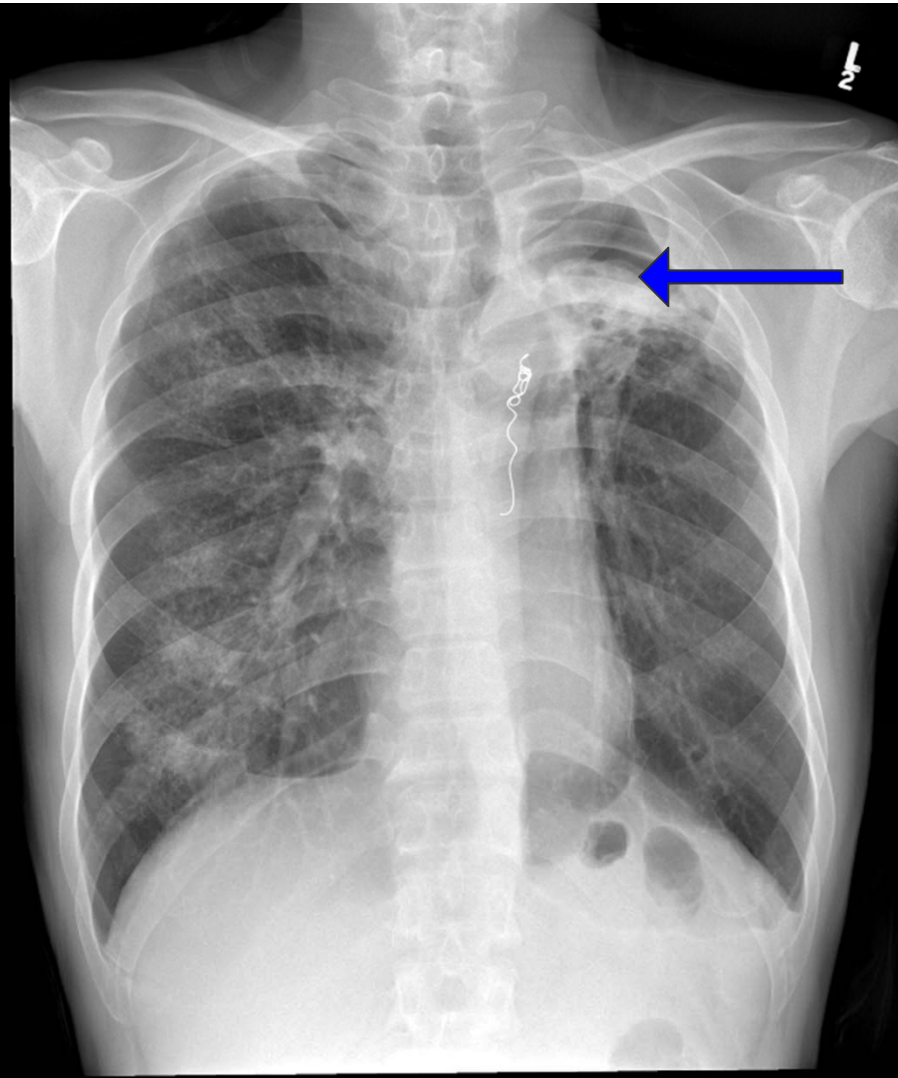
Case Courtesy of Drs. Abdul Aziz Qazi
and Dheeraj Rajan

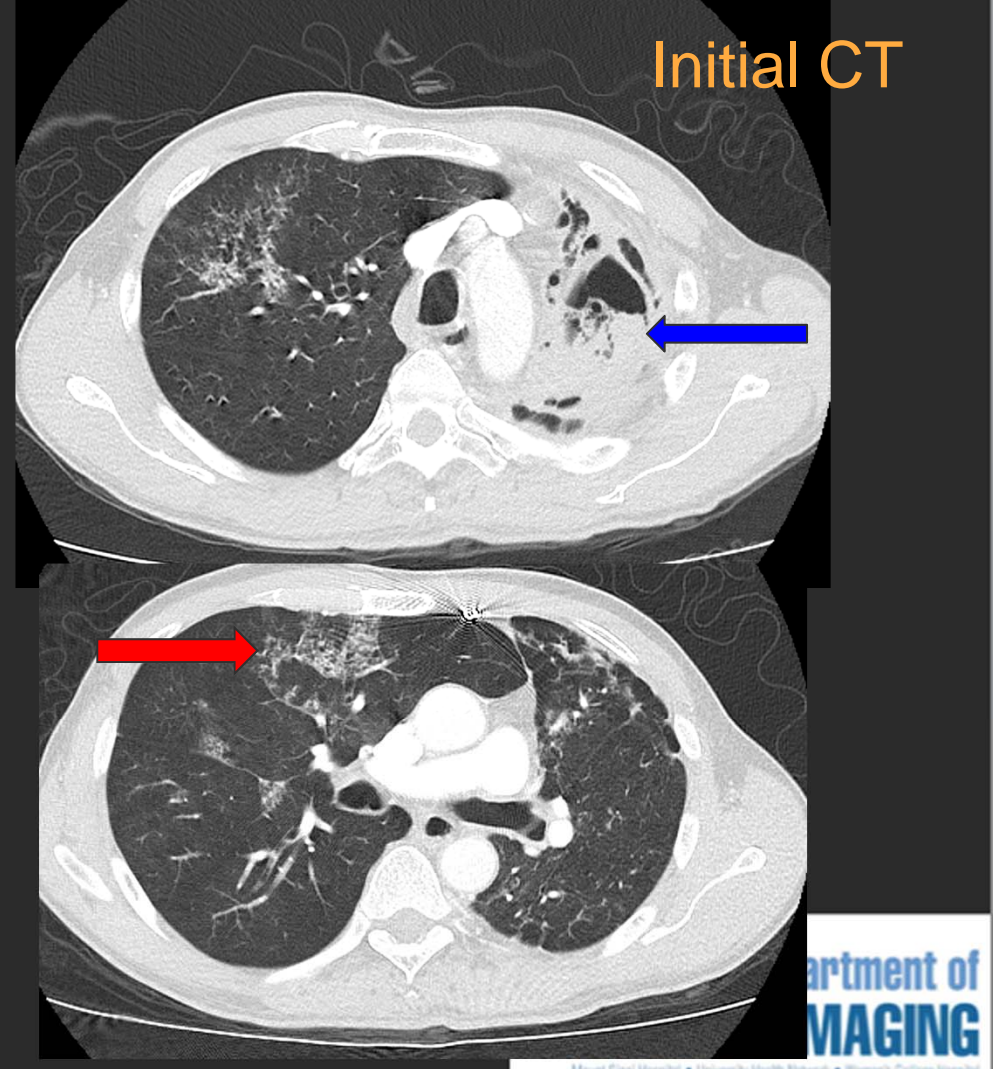
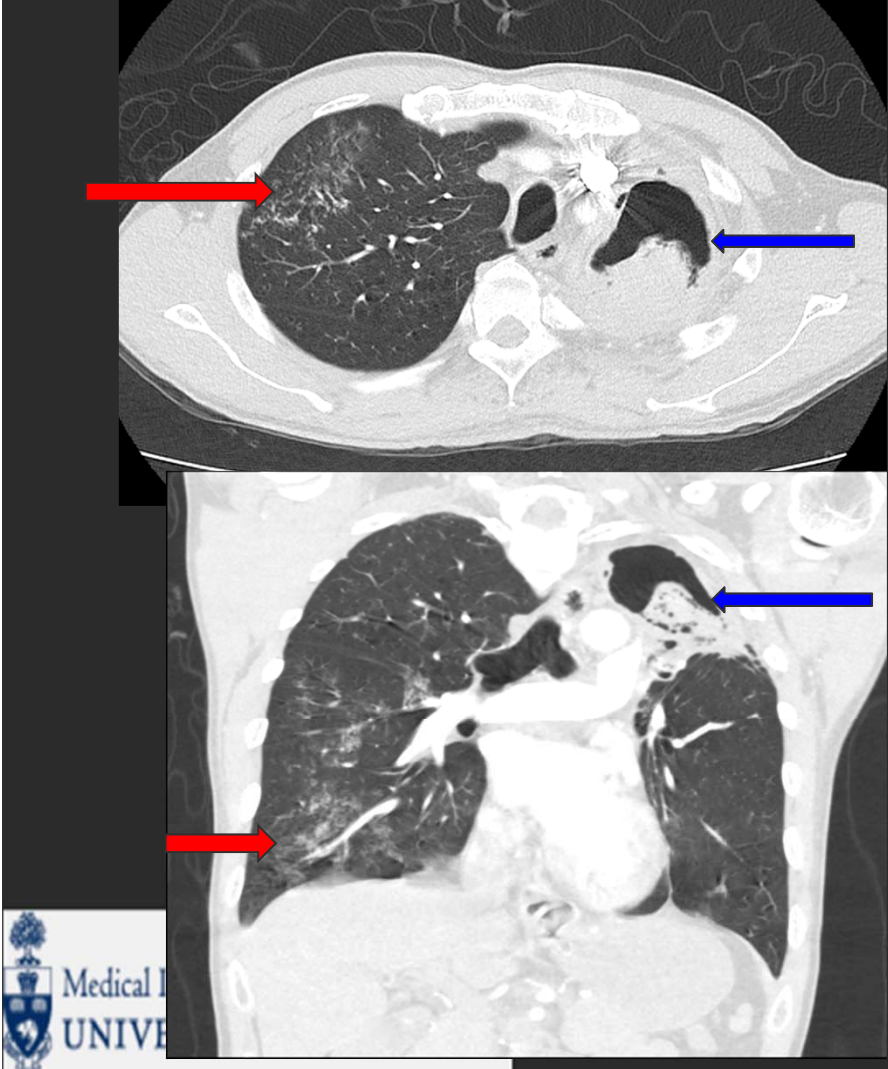
CASE PRESENTATION

- 55 year old male with known chronic left apical Aspergilloma
- Previous left internal mammary and bronchial artery embolization in 2013 for hemoptysis and refused future surgery
- Presented with small volume hemoptysis and tachycardia
- Chest x-rays and CT scan were performed

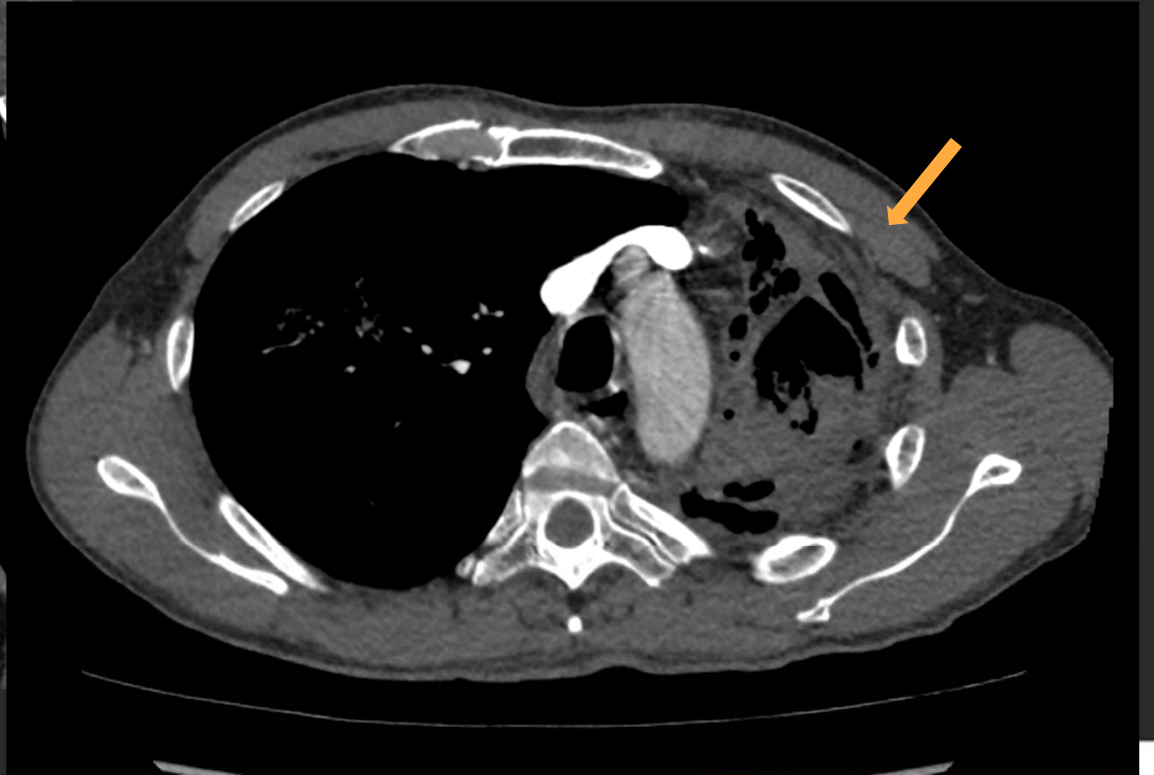
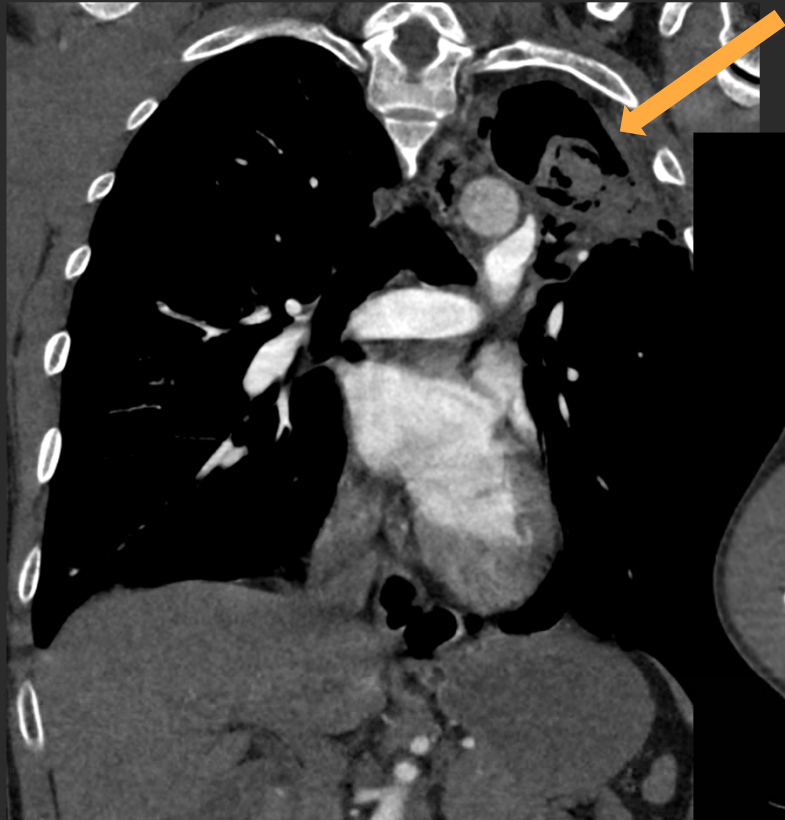
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Initial x-ray





Initial CT



Initial Imaging

- Chest x-ray and CT demonstrate **large left apical Aspergilloma**
- Multifocal areas of **patchy groundglass opacities within the left upper, right middle and right lower lobes**
- Embolization coils within the left internal mammary artery
- No evidence of active extravasation of IV contrast
- **Pleural thickening** was noted on the left

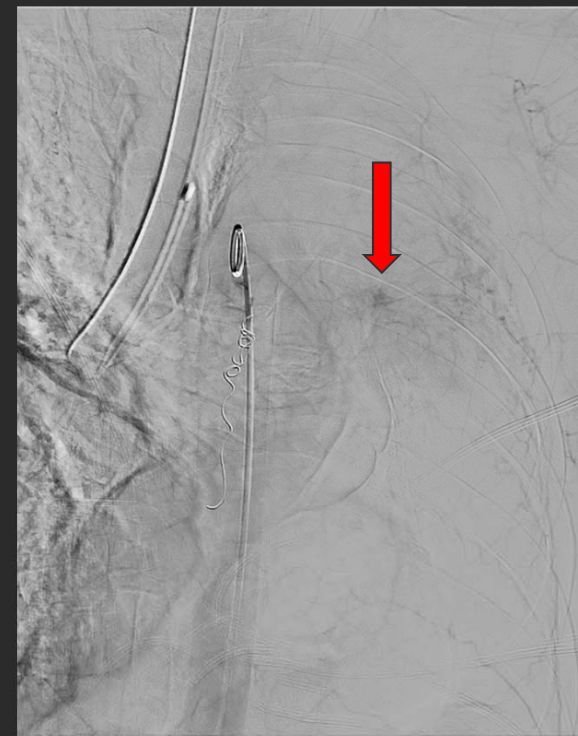
Clinical Course

- Patient admitted to ICU and volume resuscitated
- Subsequently **developed massive hemoptysis** (>1 L within 4 hours)
- Repeat chest x-ray demonstrated progression of airspace disease
- ICU consulted Interventional Radiology for emergent embolization

Repeat x-ray



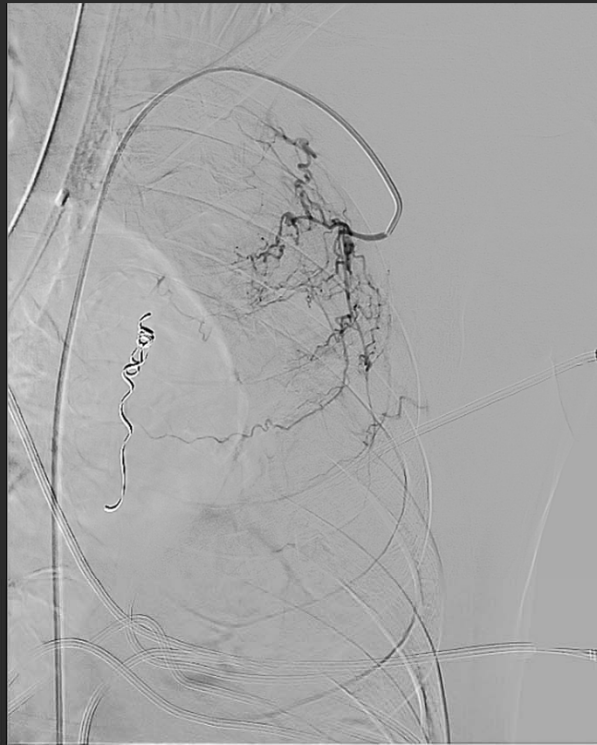
Catheter - Aortogram



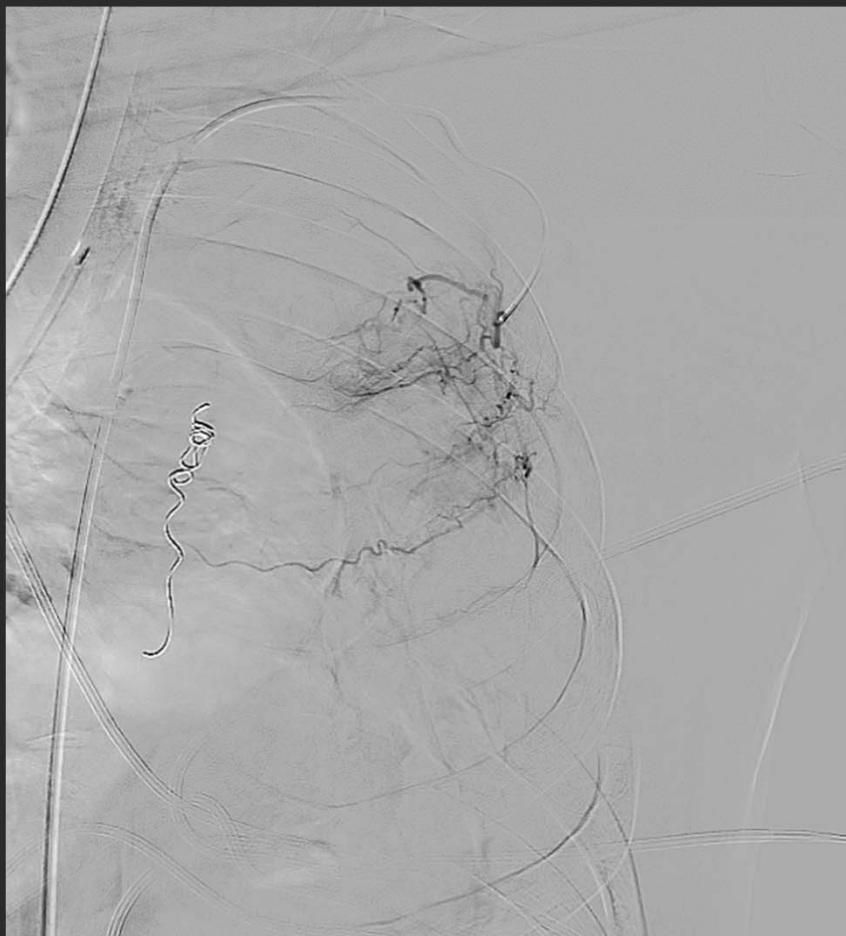
Aortogram - Findings

- Aortogram performed using 5F pigtail catheter
- No bronchial arteries visualized
- Embolization coil within the left IMA
- **Multiple areas of abnormal parenchymal enhancement arising from the lateral thoracic artery and its branches**

Lateral Thoracic Artery - Superior Branch - Pre-Embolization



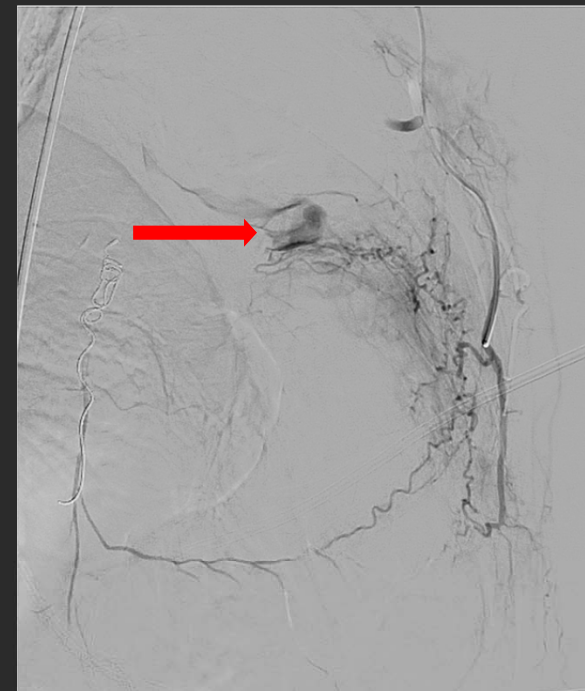
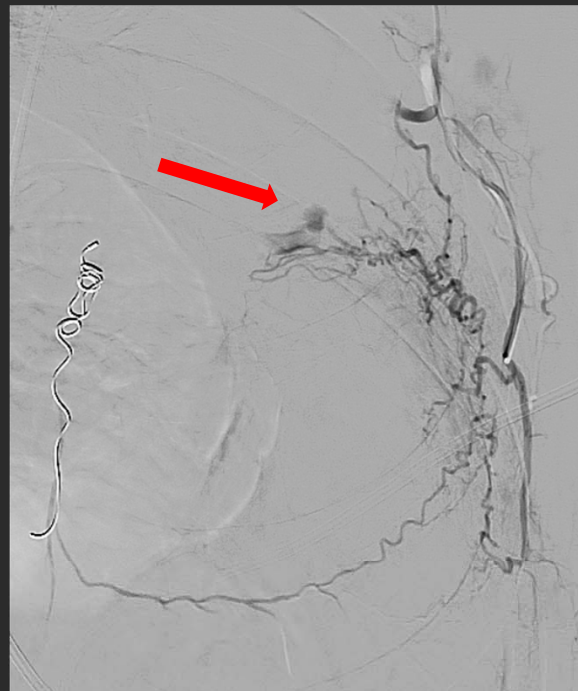
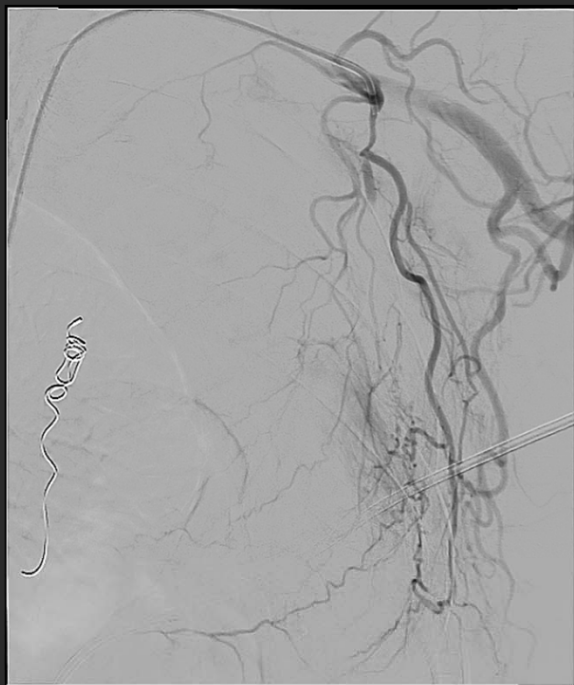
Lateral Thoracic Artery - Superior Branch - Post-Embolization



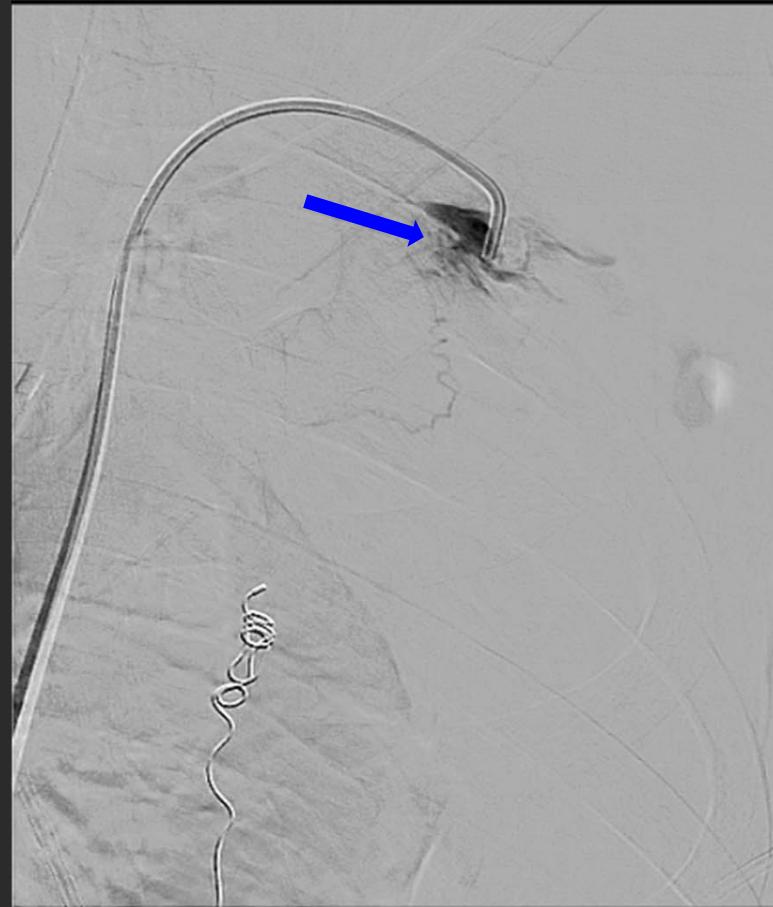
Lateral Thoracic Artery - Superior Branch - Embolization

- Main and **superior branch** of the lateral thoracic artery was selectively cannulated
- Selective angiogram demonstrated **abnormal parenchymal enhancement**
- Embolized using polyvinyl alcohol particles (150-250 microns) to stasis

Lateral Thoracic Artery – Inferior Branch - Pre-Embolization



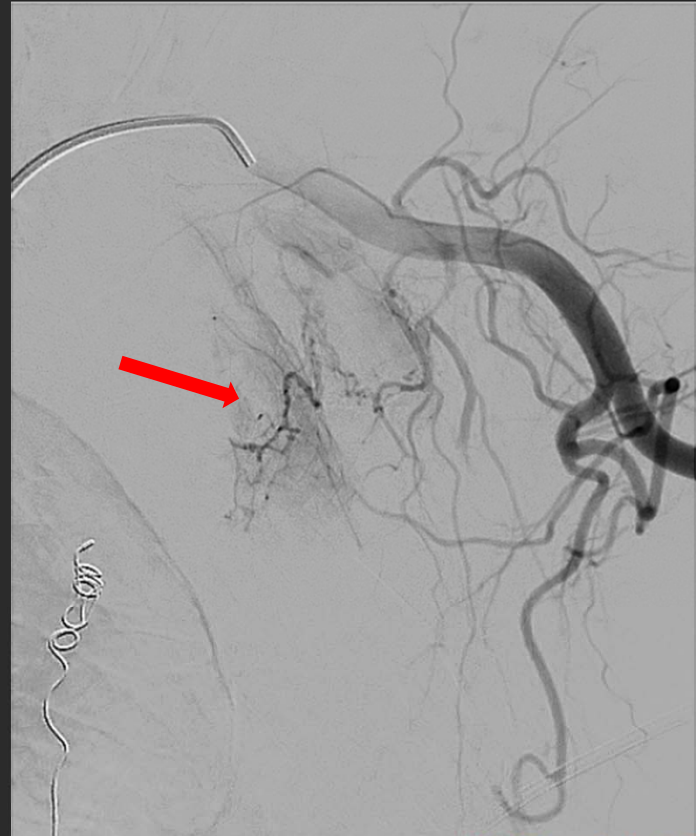
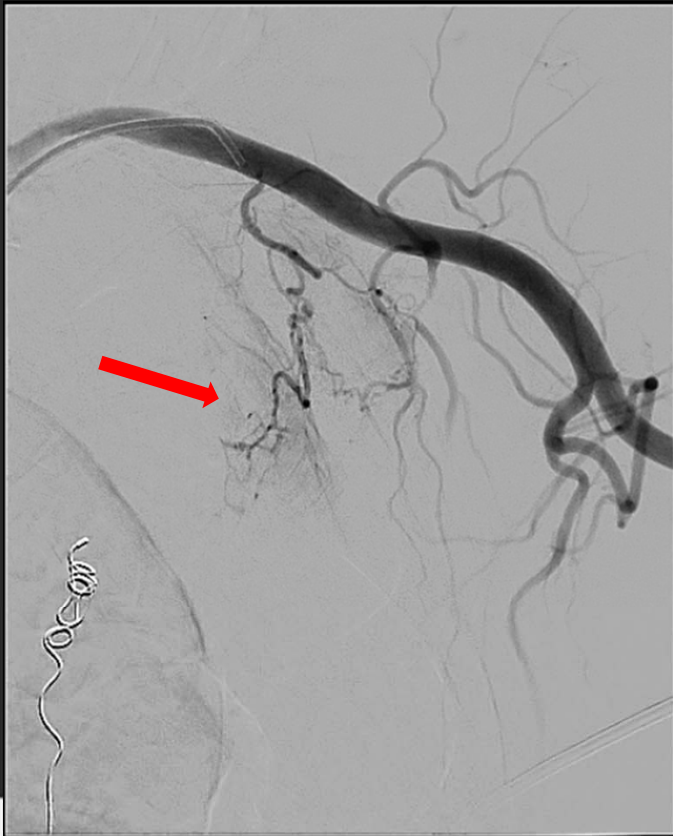
Lateral Thoracic Artery – Inferior Branch - Post-Embolization



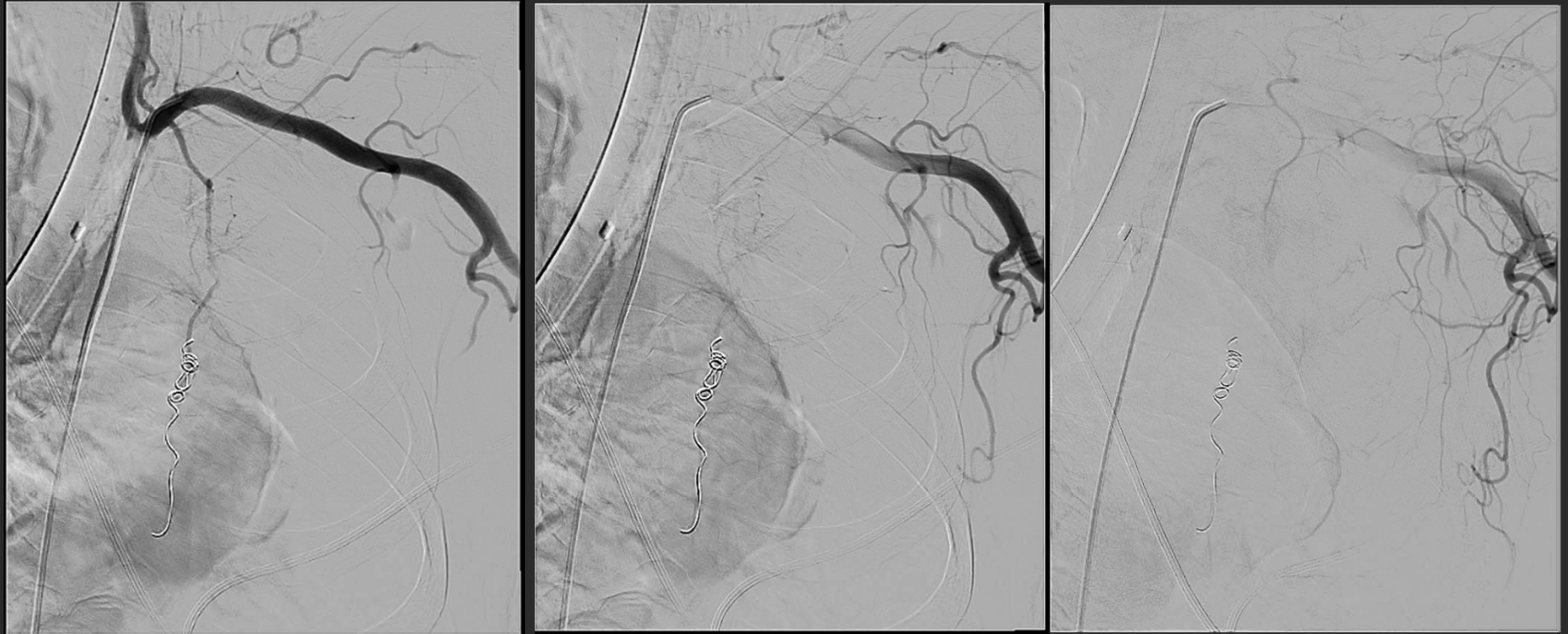
Lateral Thoracic Artery – Inferior Branch - Embolization

- Inferior branch of the lateral thoracic artery was selected using a 2.4 Fr Progreat microcatheter
- Selective angiogram demonstrated **active contrast extravasation**
- Vessel was also embolized with PVA particles to stasis
- Post-embolization run demonstrated **resolution of parenchymal enhancement and extravasation**

Subclavian Artery – Collateral Branch – Pre-Embolization



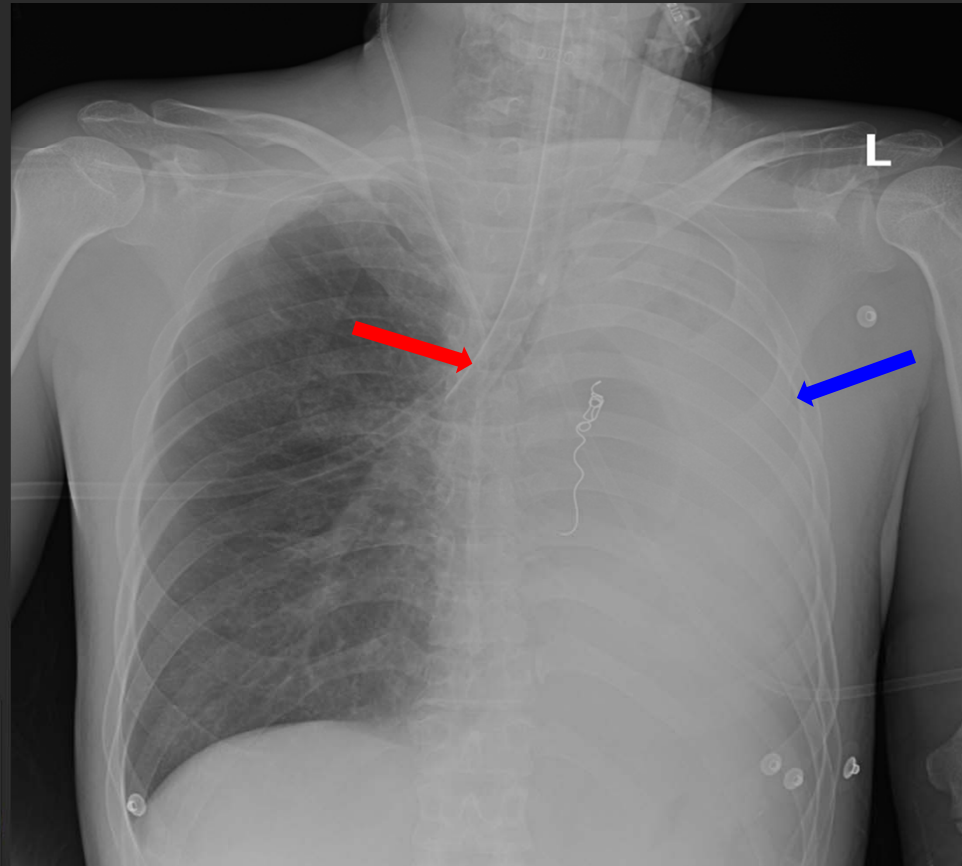
Subclavian Artery – Collateral Branch – Post-Embolization



Subclavian Artery – Collateral Branch – Embolization

- Selective angiogram of the left subclavian artery was performed
- **Abnormal parenchymal enhancement** arising from a collateral vessel off the proximal subclavian artery
- Vessel was embolized to stasis
- Angiogram post-embolization demonstrated resolution of parenchymal enhancement

Post-procedure x-ray



Post-procedure x-ray

- Patient's hemoglobin stabilized and hemoptysis resolved
- X-ray demonstrated selective intubation of the **right mainstem bronchus** and **complete opacification of the left hemithorax**

Discussion

- Patients with inflammatory lung disease develop **hypertrophied bronchial arteries** leading to massive hemoptysis
- 75% of patients with aspergilloma experience recurrent hemoptysis after BAE
- Bronchial and **non-bronchial collaterals** develop in patients with prior BAE, including:
 - Internal mammary artery, thyrocervical trunk, **subclavian**, axillary and inferior phrenic artery
- **Pleural thickening** >3 mm and tortuous vascular structures within extrapleural fat suggest non-bronchial systemic supply (sensitivity 80% and specificity 84%)

Discussion

Angiographic findings for massive hemoptysis:

- Hypertrophic and tortuous bronchial arteries
- Neovascularity
- Hypervascularity
- Shunting into pulmonary artery or vein

Extravasation is very specific but rare (3.6 - 10.7%)

References

- Burke CT, Mauro MA. Bronchial Artery Embolization. *Seminars in Interventional Radiology*. 2004; 21(1):43-48
- Yoon et al. Bronchial and Nonbronchial Systemic Artery Embolization for Life Threatening Haemoptysis: A Comprehensive Review. *Radiographics*. 2002; 22:1395-1409
- Yoon et al. Massive Hemoptysis: Prediction of Nonbronchial Systemic Arterial Supply with Chest CT. *Radiology*. 2003; 227:232-238