CAIR Case of the Month

University of Toronto
Sinai Health System
University Health Network
Women's College Hospital

Case Courtesy of Dr. M. Tarulli, A. Jaberi, G. Annamali, K. Tan and M. Connolly

University of Toronto

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CASE HISTORY

- 72 year old female with biopsy proven Ewing sarcoma in the left thigh
- Encasement of NV bundle and deep femoral artery
- Left inguinal nodes
- Pulmonary metastases

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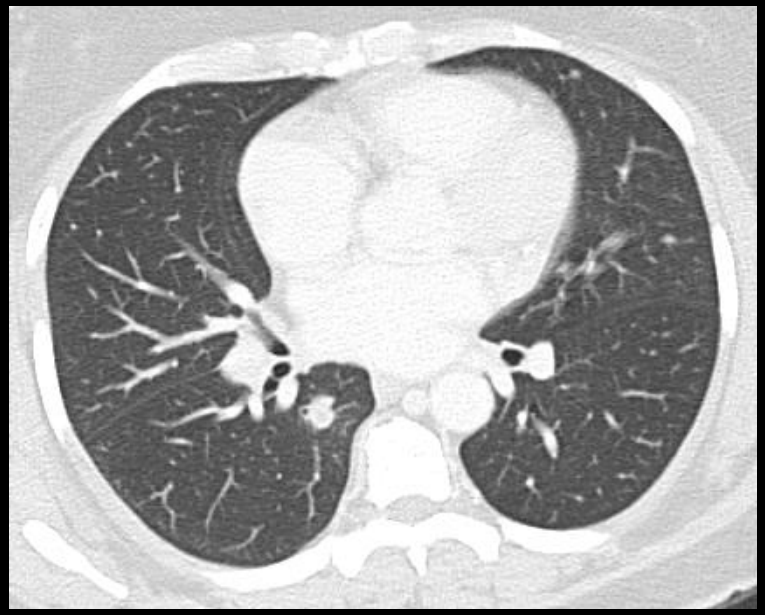
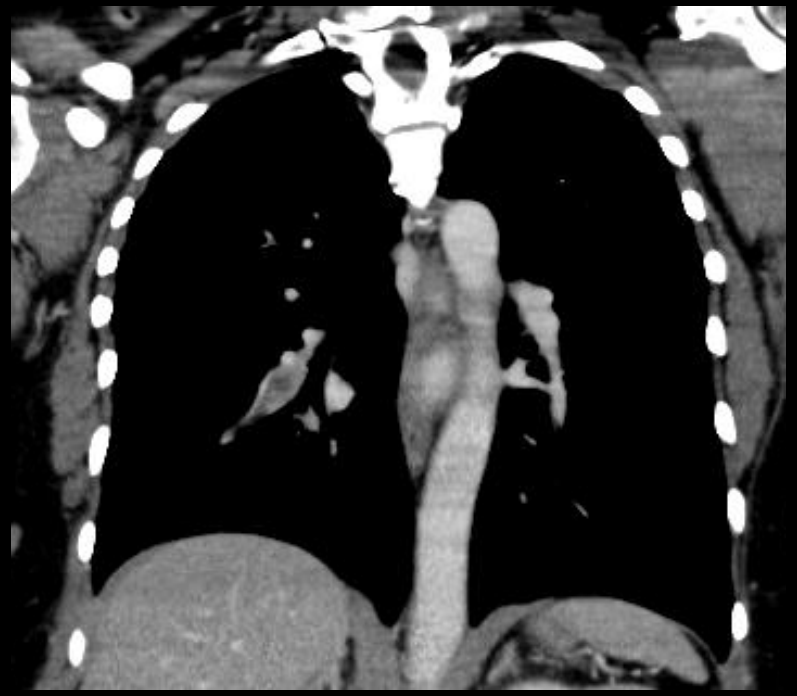
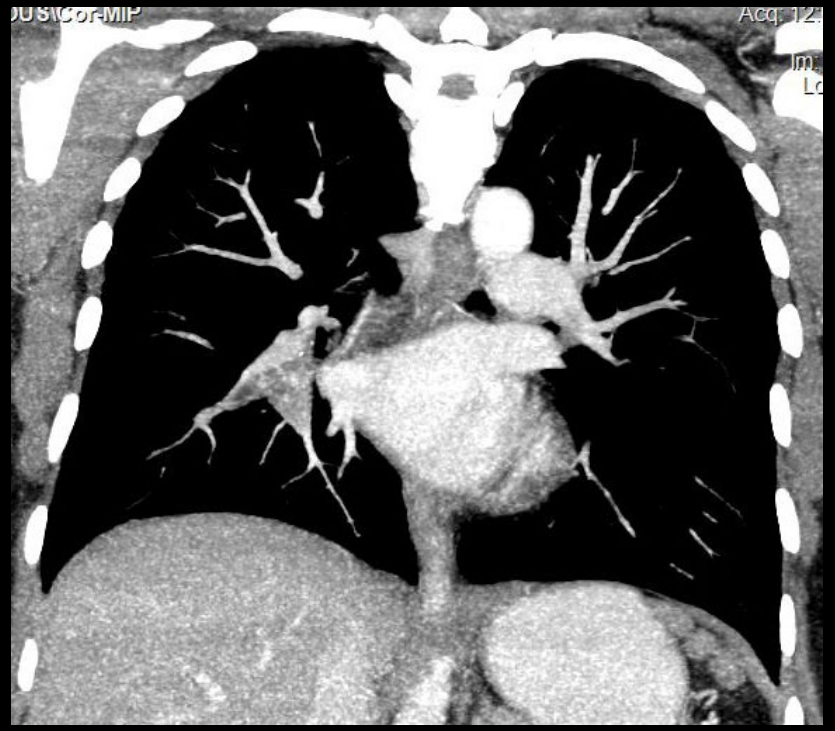
2015







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CASE HISTORY

- Branching filling defects in the right lower lobe with some expansion and calcification, consistent with tumor thrombus
- Patient underwent chemotherapy
- In 2016, follow up imaging demonstrated progression of metastases
- Multiple new lesions with cavitation in the LLL
- Fluctuating/enlarging endovascular deposits, largest in RLL

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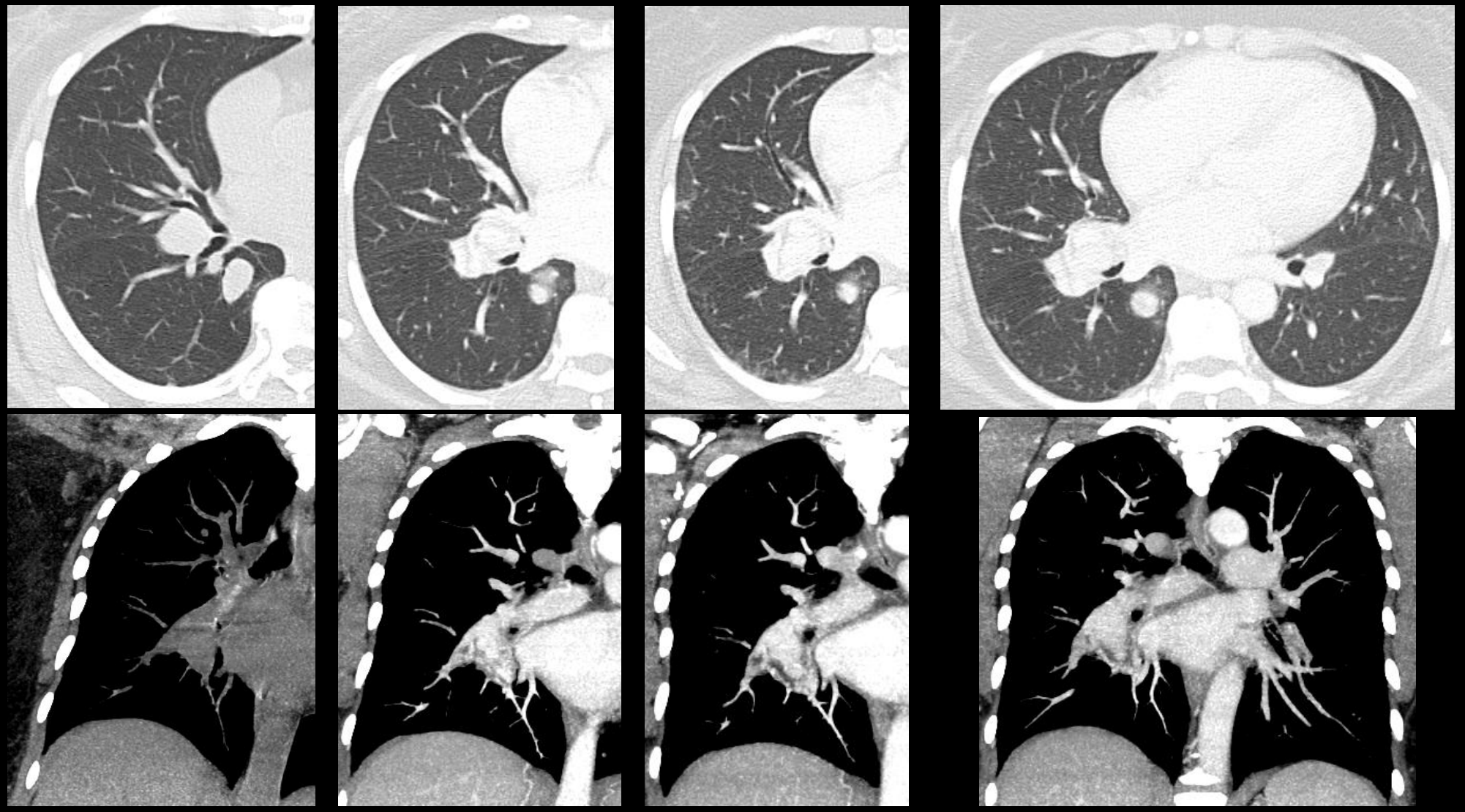
2016



January April July September

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CASE HISTORY

- By March 2017, continued progression of metastases, tumor emboli progressing to PA pseudoaneurysms bilaterally, largest in right lower lobe (approximately 2.2 cm)
- Clinically well with good functional status. Embolization was considered, and catheter angiogram was performed

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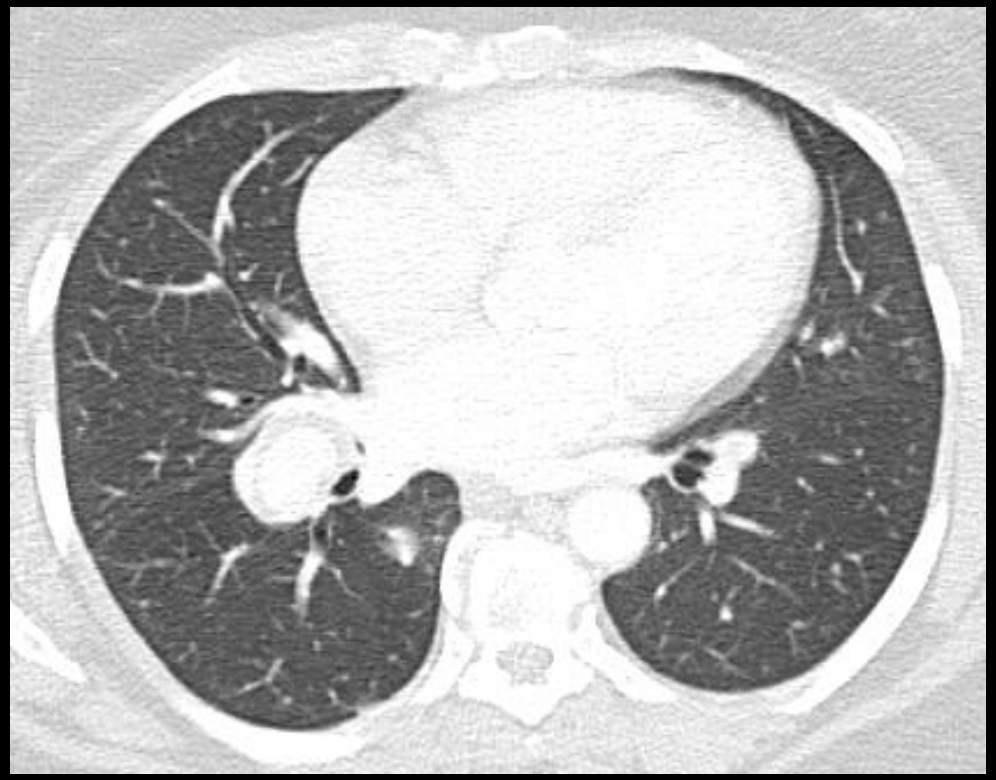
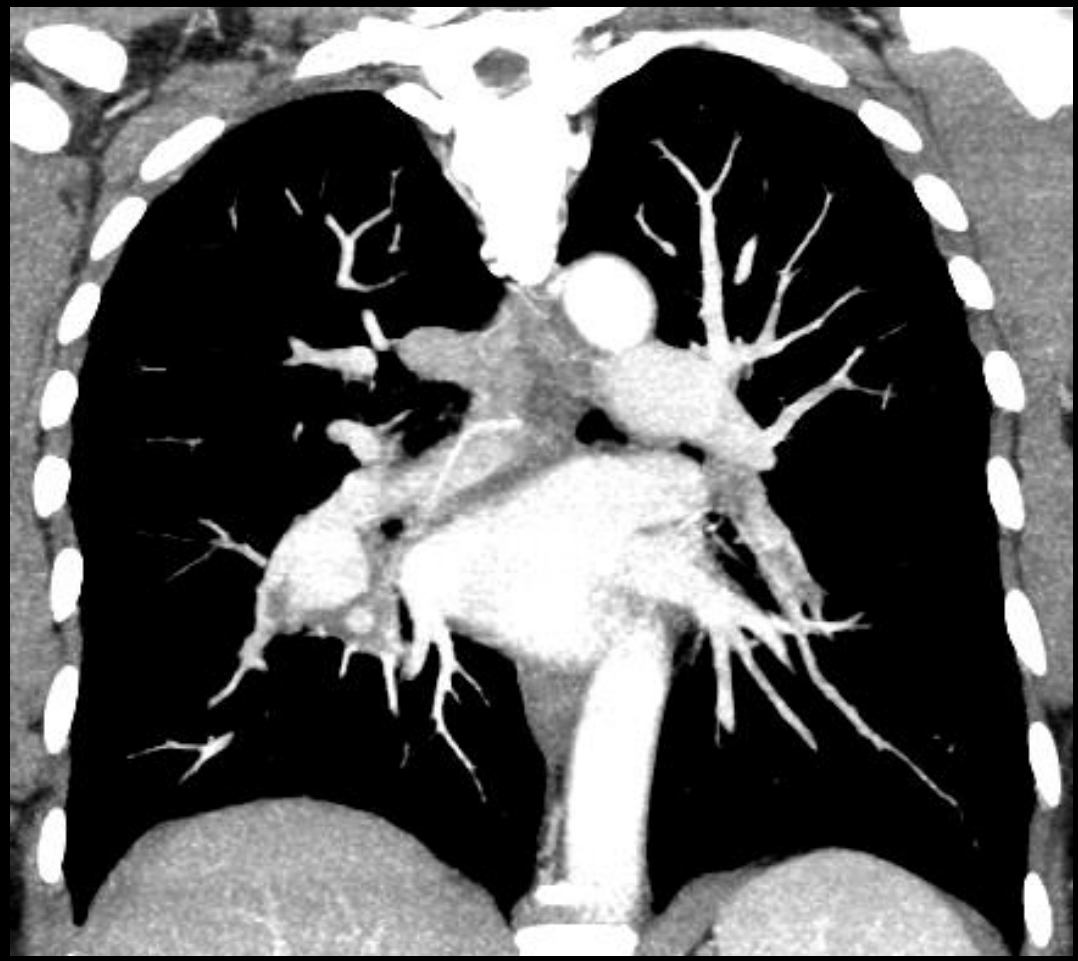
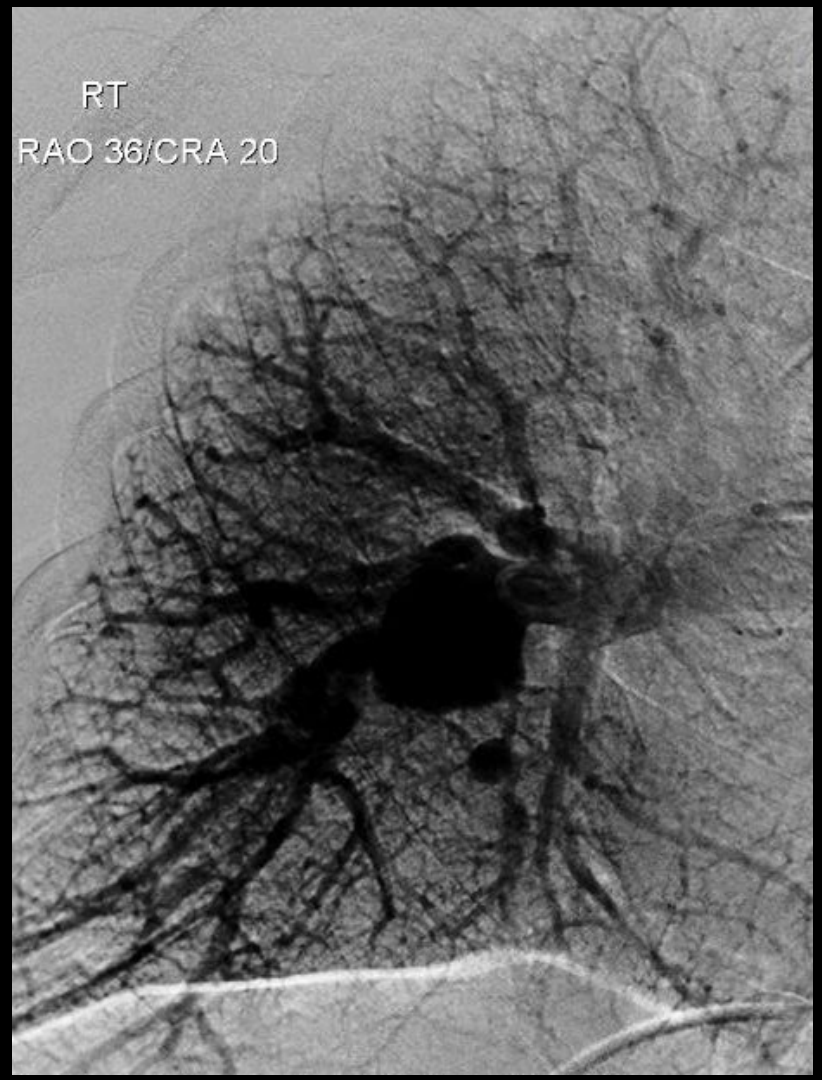
March 2017





Initial pulmonary angiogram: 7 Fr sheath, R CFV access

April 2017



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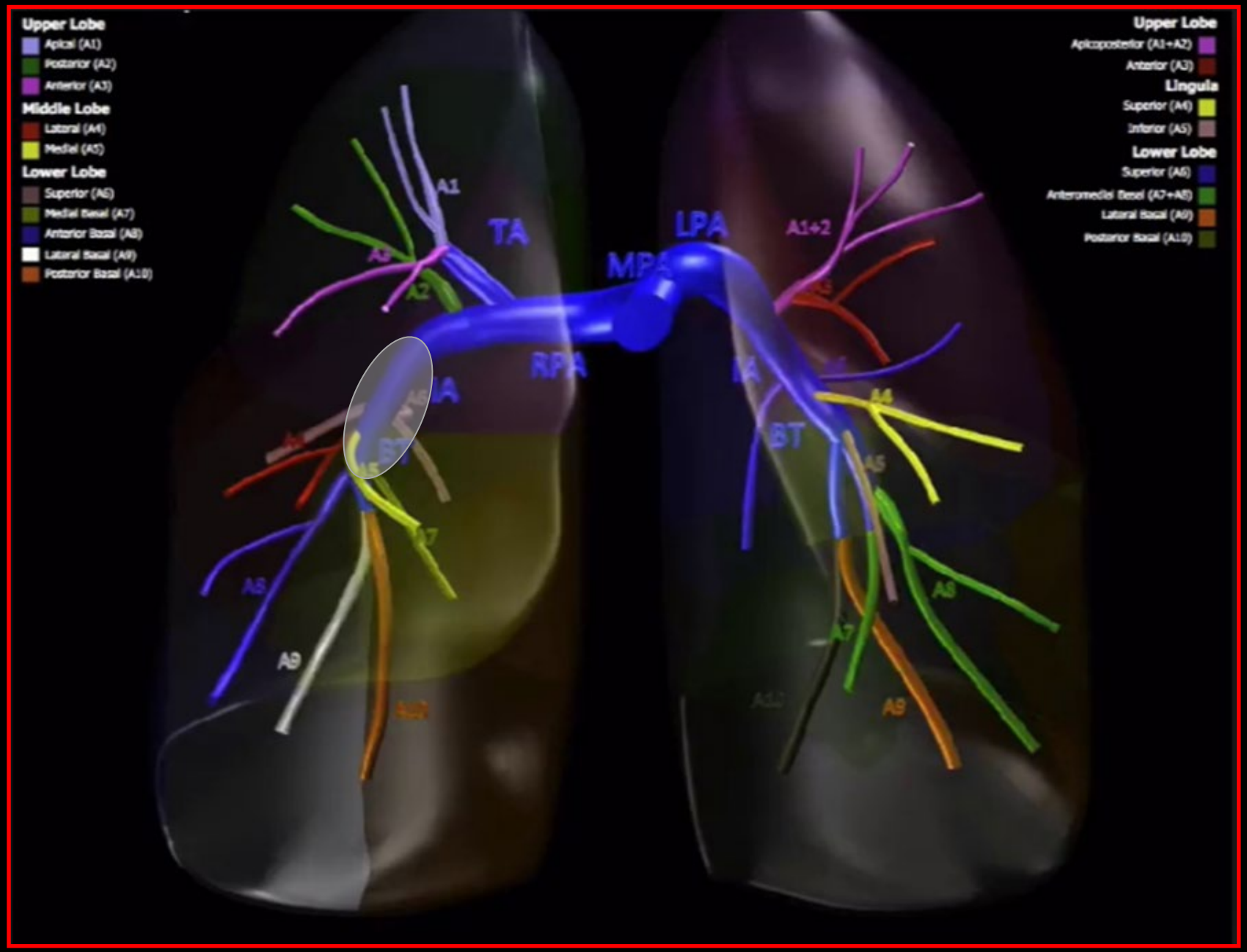
ANATOMY



https://www.med-ed.virginia.edu/courses/rad/CTPA/index.html

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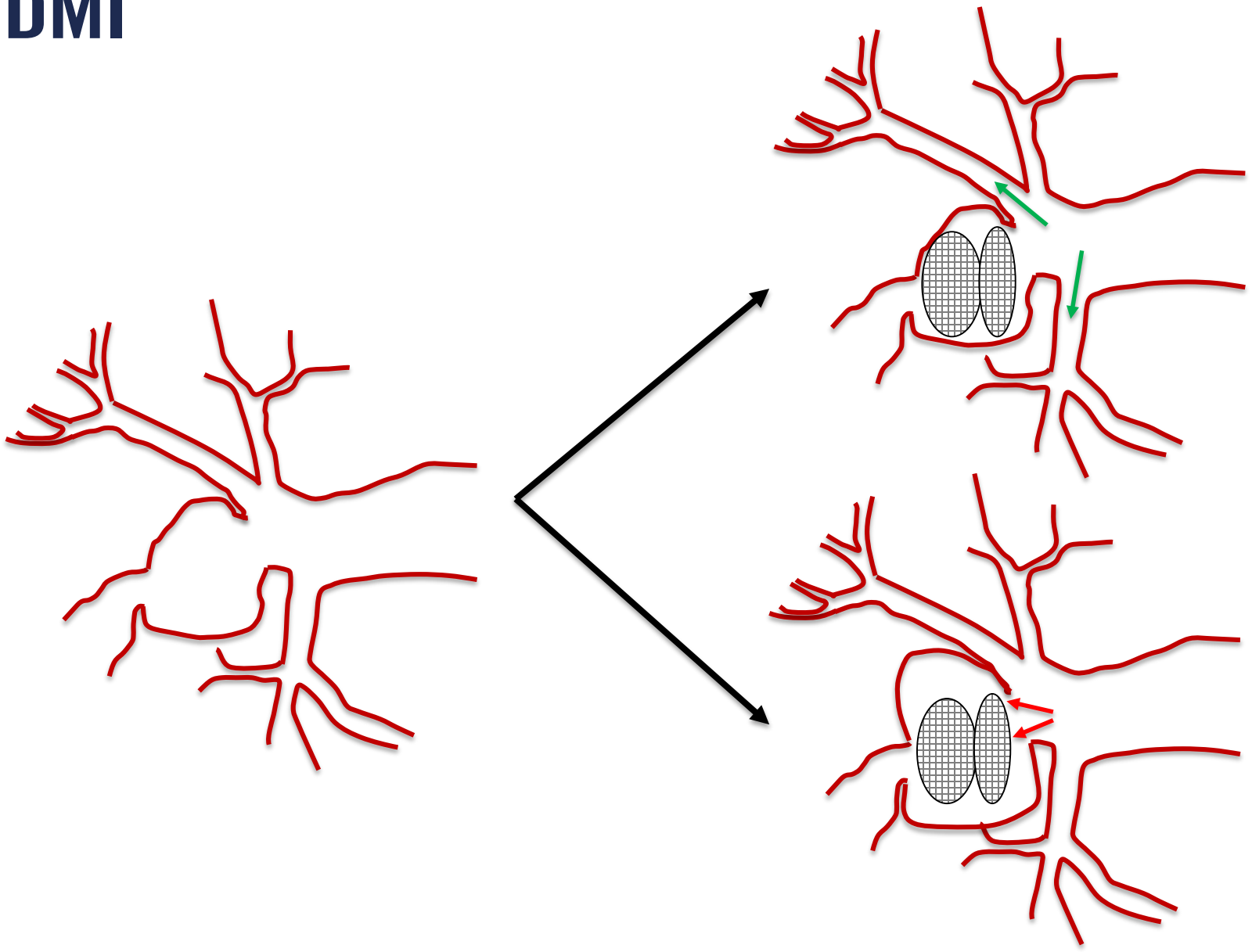
TREATMENT DECISIONS

- Largest pseudoaneurysm with proximal component involving the interlobar artery
- Close proximity to proximal segmental branches to the lower and middle lobe
- Primary goals

1. Treat the aneurysm
2. Prevent large pulmonary infarction

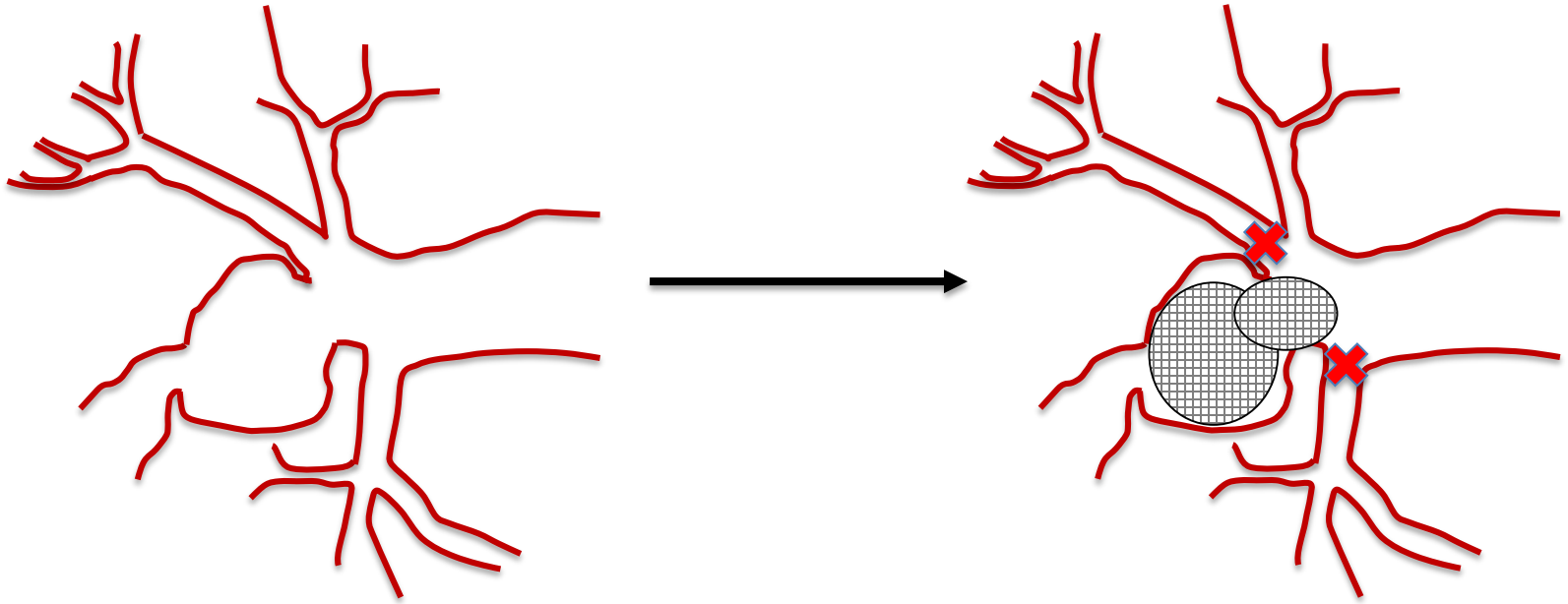

RT
RAO 36/CRA 20



CONSERVATIVE

- Safer for segmental branches

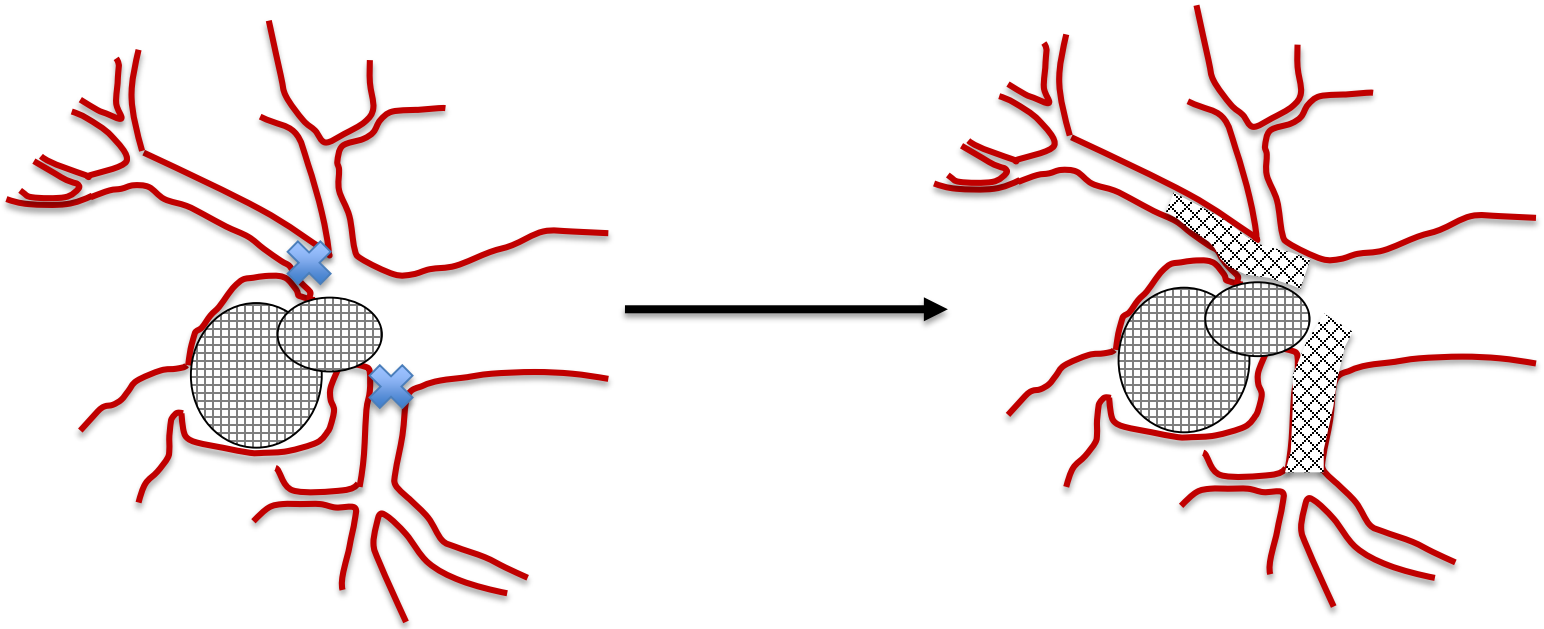
- Higher risk of aneurysm growth over time



AGGRESSIVE

- Lower risk of aneurysm growth
- Higher risk of proximal segmental occlusion and infarct

PLAN

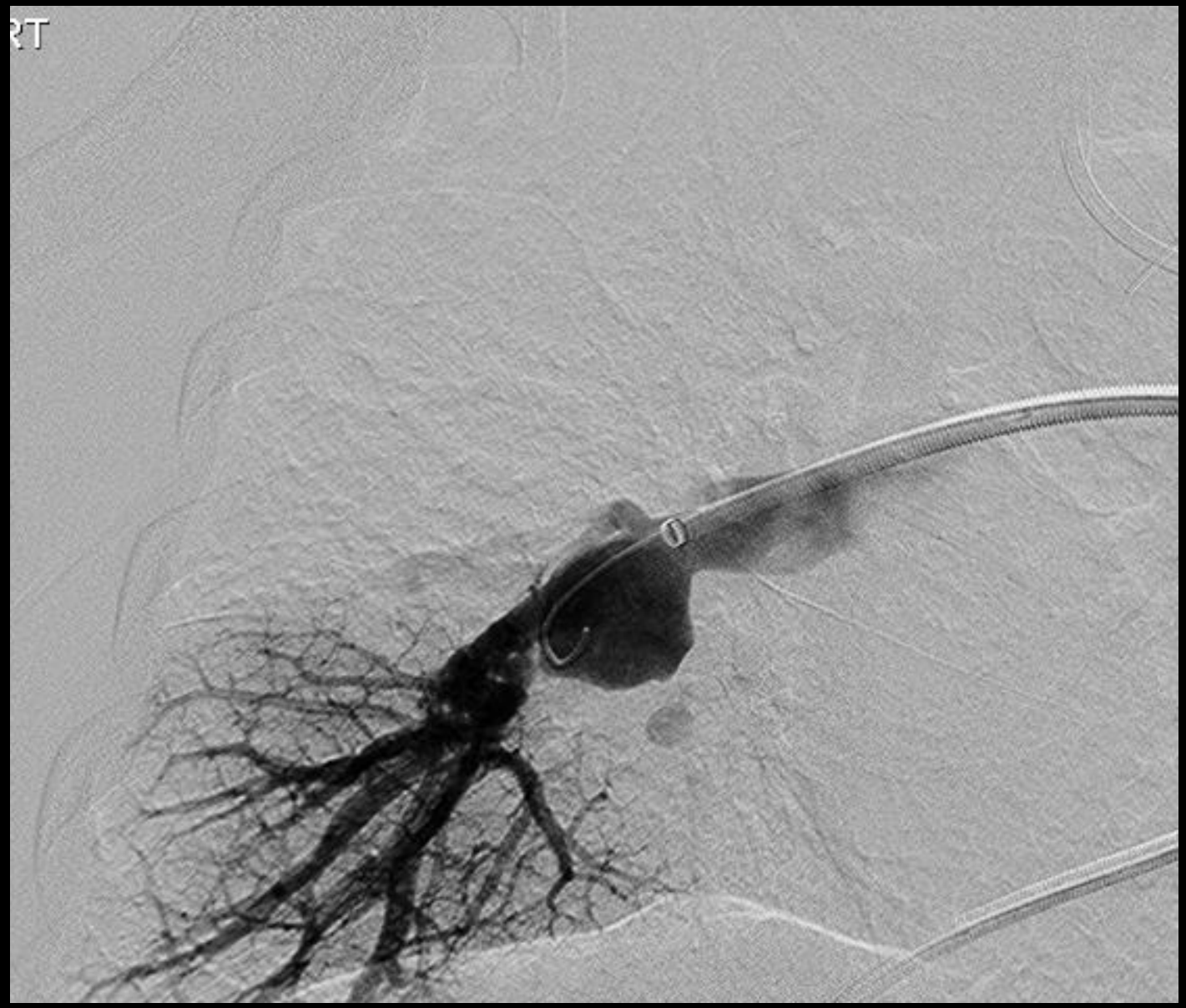


COMBINED APPROACH

- Lower risk of aneurysm growth with proximal occlusion device placement
- “Safety” stents to minimize risk of proximal segmental occlusion/infarct

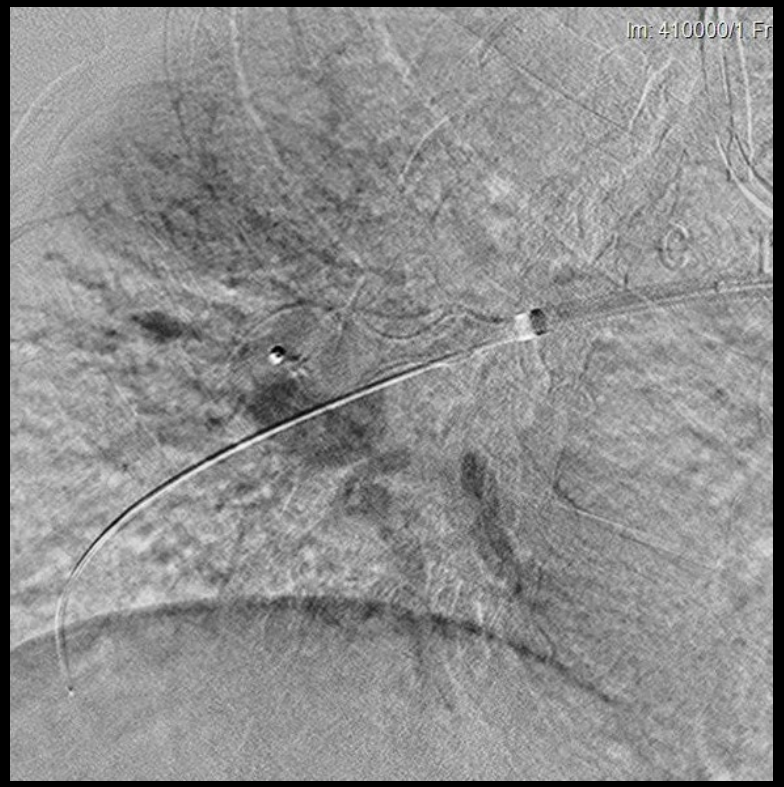
INTERVENTION

- Right common femoral vein access, 80 cm 10 Fr sheath
- 0.035” glidewire and 5 Fr pigtail catheter to select the right interlobar artery



INTERVENTION

- Glidewire advanced distal to the aneurysm into the right lower lobe segmental arteries
- 22-mm Amplatzer 2 occlusion device was placed into the aneurysm and proximal neck without detachment while pulling back the sheath



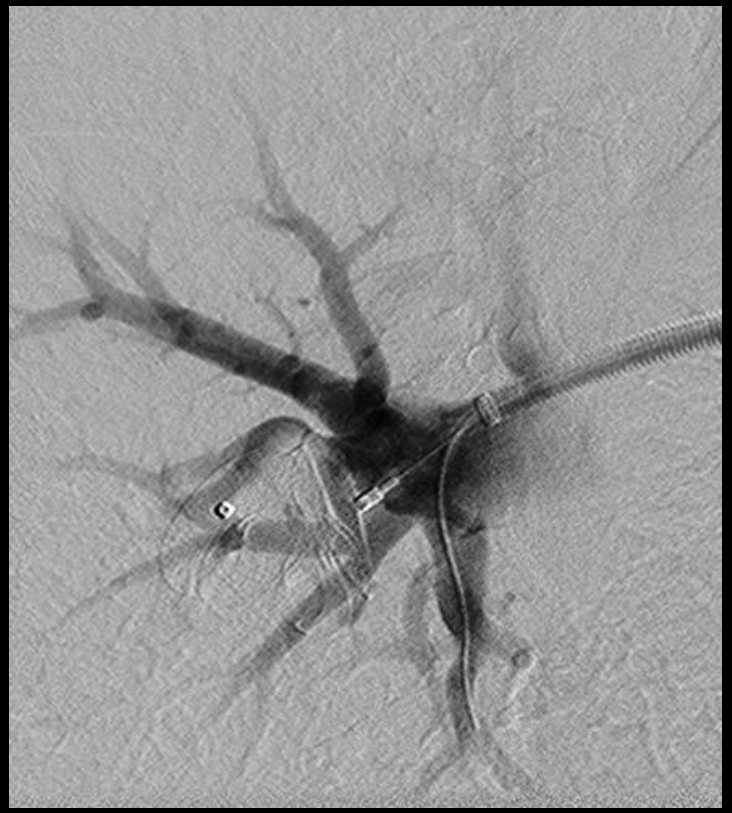
INTERVENTION

- Good early occlusion of the pseudoaneurysm

INTERVENTION

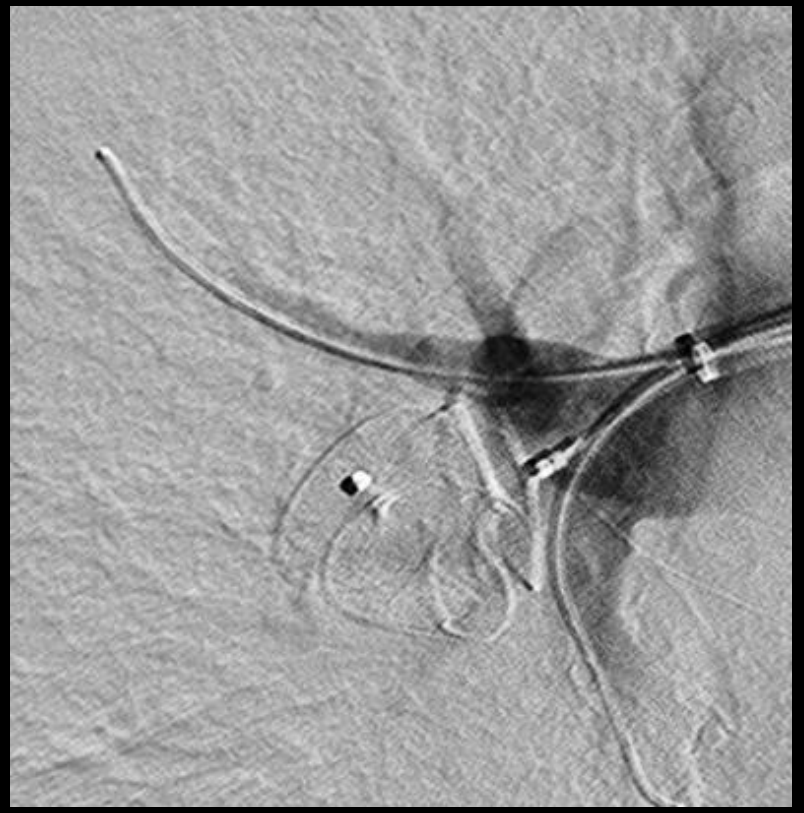
- Concern for long term patency of branching segmental arteries in close proximity to the pseudoaneurysm
- Decision was made to continue with stenting to minimize risk of pulmonary infarction

INTERVENTION



Access was gained into **a lower lobe segmental artery (medial basal)**

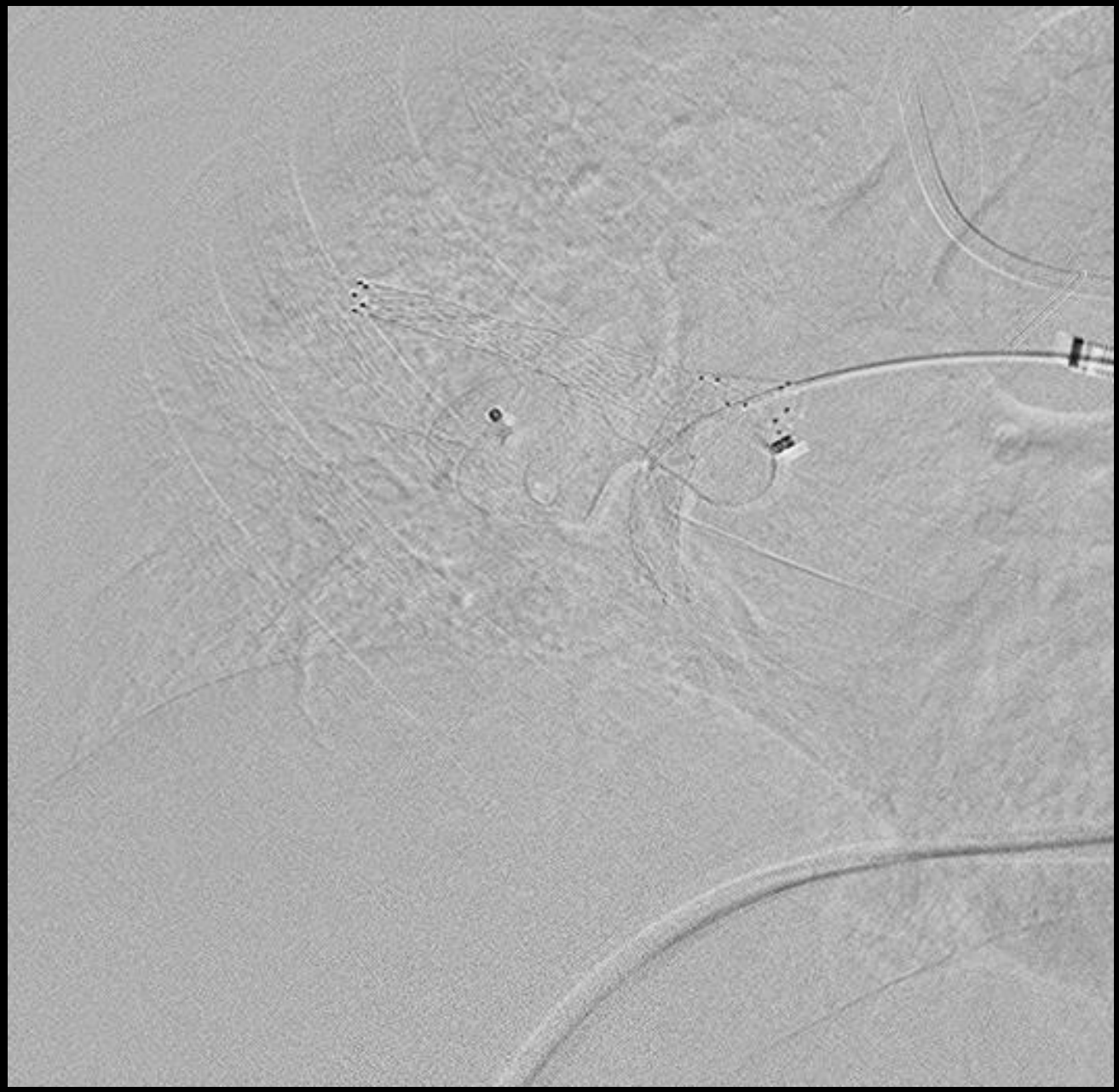
Repeated for **lateral right middle lobe segmental artery**



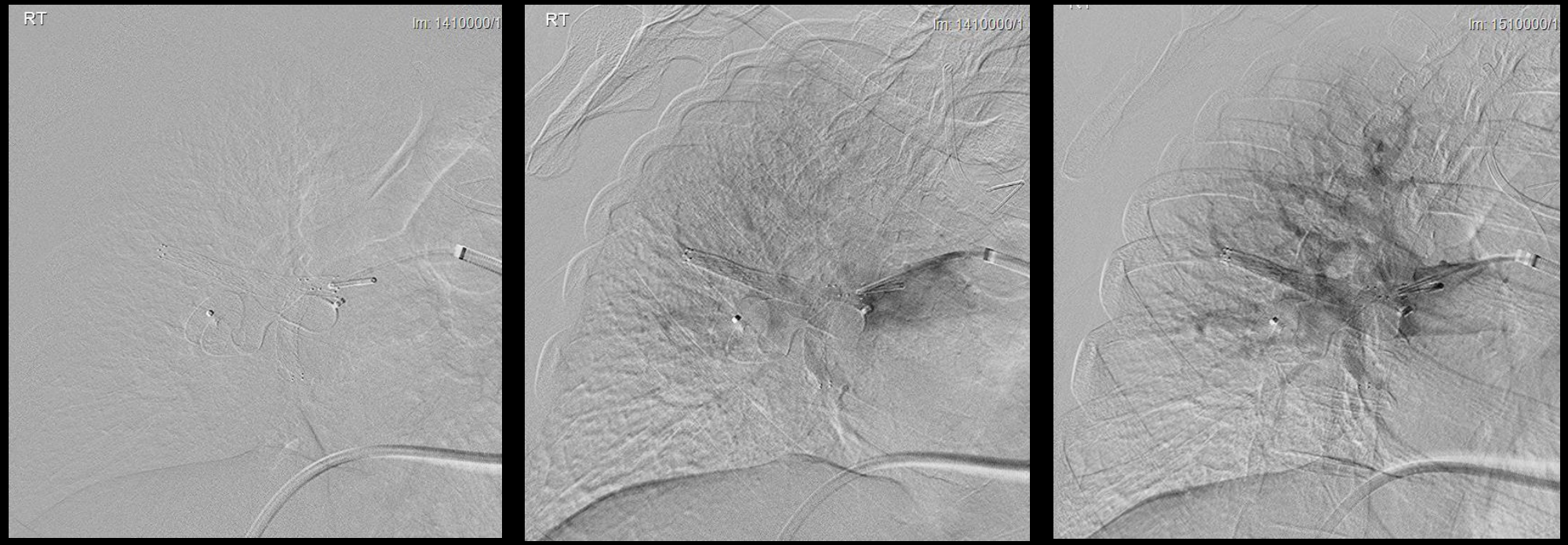
Patency demonstrated in the segmental branches

INTERVENTION

- 8 mm x 60 mm self-expanding stents in the right middle lobe lateral segmental artery across the origin of the aneurysm and into the right interlobar artery
- 7 mm x 40 mm self-expanding stent was placed from a right lower lobe segmental artery across the origin of the aneurysm
- Amplatzer plug subsequently detached



INTERVENTION



Final angiographic runs demonstrated patency of the stents and occlusion of the aneurysm

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CASE SUMMARY

- Successful pseudoaneurysm occlusion with stents to promote patency of branching segmental arteries in the lower and middle lobes
- No immediate complications
- Follow up at 2, 4, and 6 months demonstrate stable thrombosis of the aneurysm sac with increased tumor thrombus and patent stents, overall significant increase in disease burden

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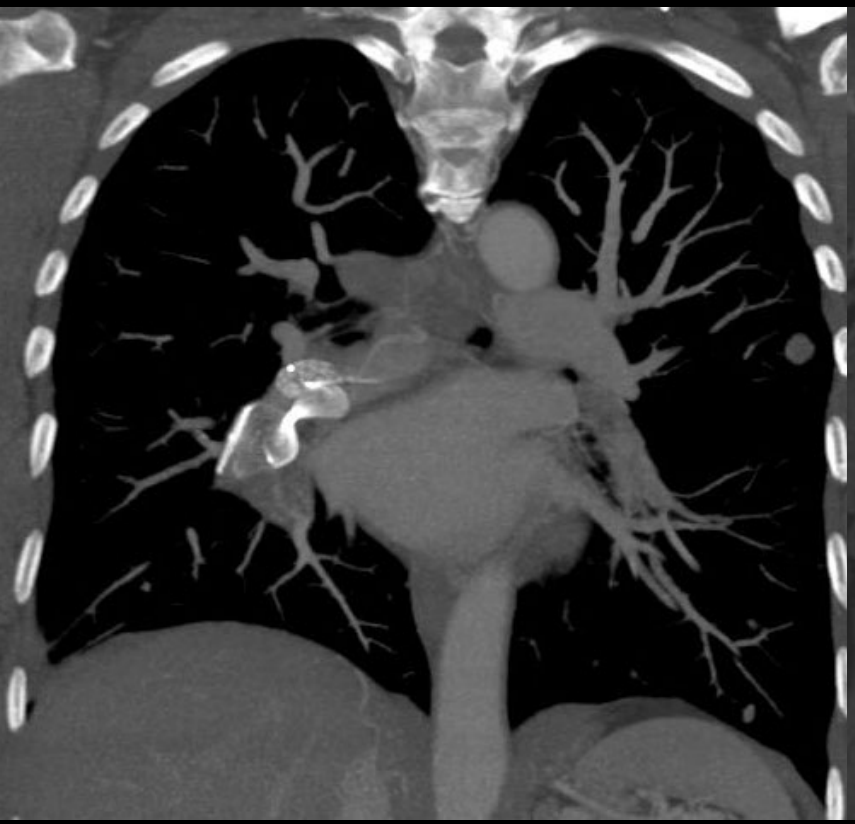
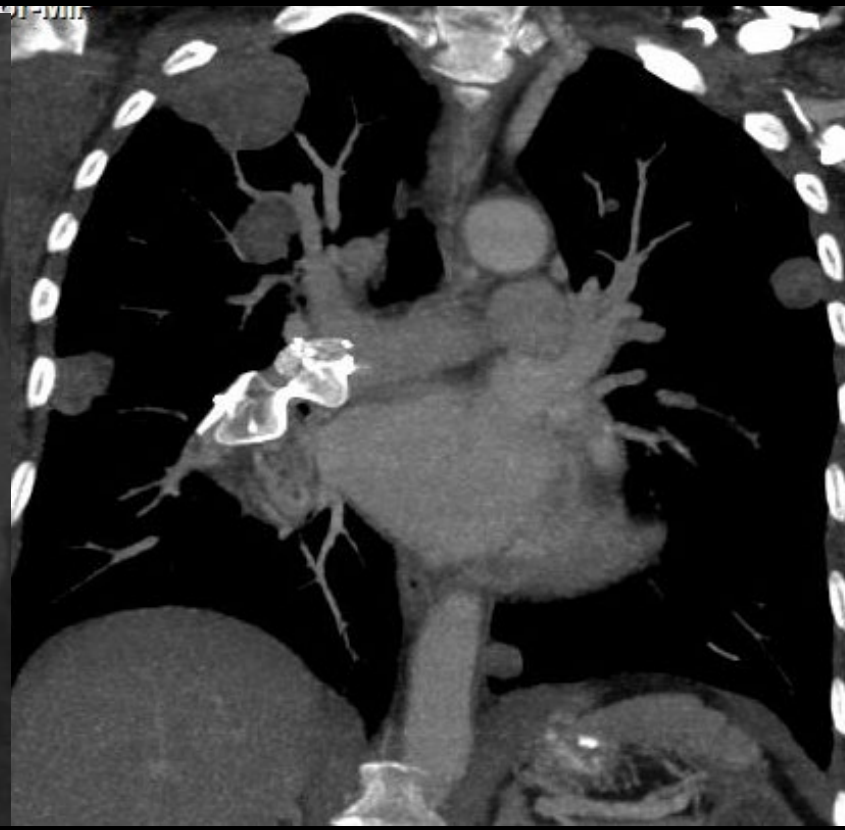
FOLLOW UP



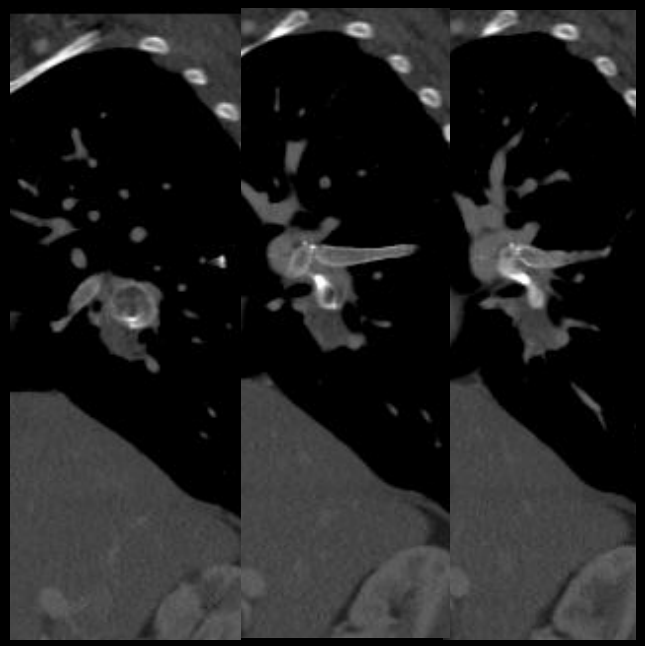
2 month

4 month

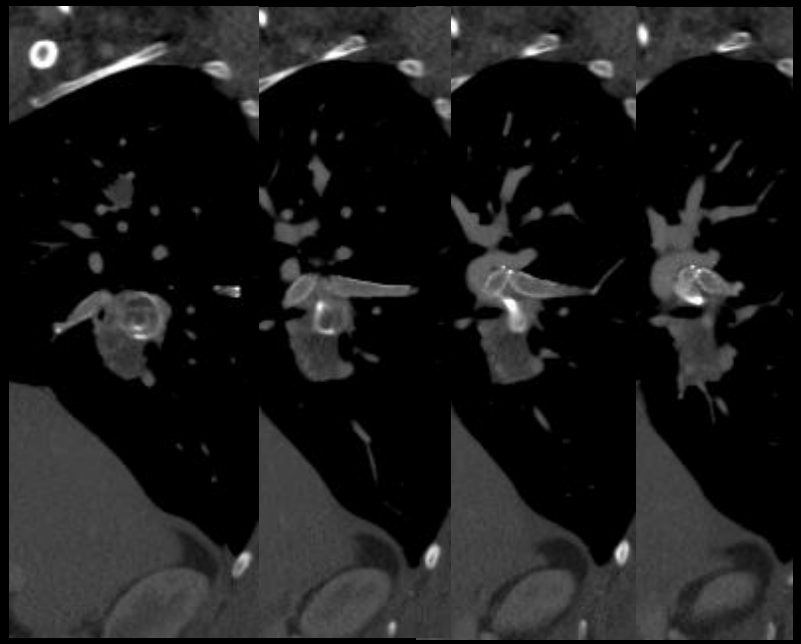


6 month

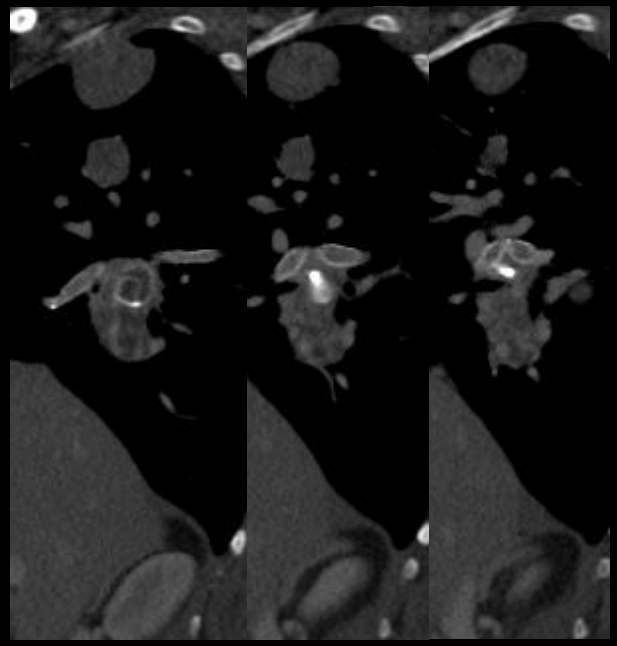
FOLLOW UP



2 month



4 month



6 month

BACKGROUND/DATA

- Pulmonary artery pseudoaneurysms are rare (and from sarcoma even more rare)
- Risk of massive hemoptysis, pseudoaneurysm enlargement and rupture (leading to death in ~50% of patients)
- Percutaneous embolization is a viable minimally invasive alternative to open thoracotomy and resection of the pseudoaneurysm and affected lobe [1, 2, 3]
- Additional stenting is a rarely used - case studies in the setting of trauma (stent graft followed by coils for large pseudoaneurysm) [4]
- Similar approaches have been investigated for hemoptysis in the setting of lung tumor treated with embolization and stent graft placement (in press) [5]

REFERENCES

1. Chen, Y. et al. "Pulmonary Artery Pseudoaneurysms: Clinical Features and CT Findings". American Journal of Roentgenology 2017 208:1, 84-91American Journal of Roentgenology. 2017;208: 84-91. 10.2214/AJR.16.16312
2. Shin, S. et al. "Peripheral Pulmonary Arterial Pseudoaneurysms: Therapeutic Implications of Endovascular Treatment and Angiographic Classifications." Radiology 2010 256:2, 656-664
3. A. Park & W. Cwikiel (2007) Endovascular Treatment of a Pulmonary Artery Pseudoaneurysm with a Stent Graft: Report of Two Cases, Acta Radiologica, 48:1, 45-47
4. Huet, N., Rodiere, M., Badet, M. et al. Covered Stent and Coils Embolization of a Pulmonary Artery Pseudoaneurysm After Gunshot Wound. Cardiovasc Intervent Radiol (2016) 39: 778. https://doi.org/10.1007/s00270-015-1257-2
5. Marcelin, C., Soussan, J., Desmots, F. et al. Outcomes of Pulmonary Artery Embolization and Stent Graft Placement for the Treatment of Hemoptysis Caused by Lung Tumors, Journal of Vascular and Interventional Radiology, Available online 5 May 2018, In press.