EMOTTISI

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Emissione di sangue dal cavo orale da lesioni delle vie aeree profonde bronchiali ed alveolari

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- 300 / 600 ml nelle 24 ore
- Pazienti adulti di età media di 62 anni
- Età infantile rara
- Rapporto uomo donna 2:1
- 90% dei casi di grado moderato autoestinzione
- Mortalità di quella massiva tra 50 e 100%

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- Volume dello spazio tracheo bronchiale pari a 150 / 200 ml
- Il volume critico per il blocco degli scambi gassosi viene raggiunto rapidamente
- Decesso per asfissia prima che per shock emorragico

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CAUSE: DA GRANDI VASI

Infectious diseases		Abscess
		Bronchitis (acute or chronic)
25,8%	6,8%	Bronchiectasis
		Fungal infection
		Parasitic infection
		Pneumonia
	2,7%	Tuberculosis/nontuberculous mycobacteria
Cardiovascular diseases		Arteriovenous malformation
		Bronchial artery aneurysm
		Bronchovascular fistula
		Congestive heart failure
	2,6%	Pulmonary embolism/infarction
		Pulmonary hypertension
		Right-sided endocarditis
		Thoracic aortic aneurysm rupture/dissection
		Septic pulmonary embolism
Congenital diseases		Cystic fibrosis
		Pseudosequestation
		Pulmonary artery atresia or stenosis
Neoplastic diseases		Bronchial adenoma
		Lung metastasis
17,4%		Primary lung cancer
Vasculitic diseases		Behçet disease/Hughes-Stovin syndrome
		Lupus pneumonitis
		Takayasu arteritis
		Wegener's granulomatosis
Others		Chronic obstructive airway disease
		Drug
		Foreign body
		Iatrogenic (Swan-Ganz catheter)
		Interstitial fibrosis
		Lung contusion
		Pulmonary endometriosis
		Trauma
		Dieulafoy's disease of the bronchus
		Cryptogenic hemoptysis

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CAUSE: DA PICCOLI VASI

Immunologic and vasculitic diseases		Acute lung allograft rejection
		Antiphospholipid antibody syndrome
		Behçet disease
		Goodpasture's syndrome
		Henoch-Schönlein purpura
		Isolated pulmonary capillaritis
		Microscopic polyarteritis
		Mixed cryoglobulinemia
		Wegener granulomatosis
Cardiovascular diseases	4,2%	Mitral stenosis
Coagulatory diseases	3,5%	Iatrogenic (anticoagulants/thrombolytic agents)
		Coagulopathies
Others		Diffuse alveolar damage
		Lymphangioleiomyomatosis
		Pulmonary capillary hemangiomatosis
		Pulmonary hemosiderosis
		Tuberous sclerosis
		Veno-occlusive disease

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INITIAL MANAGEMENT

Action	Purpose
Monitor the vital parameters	Registration of pulse-oximetric oxygen saturation (SpO_2), respiratory and circulatory function (non-invasive blood pressure measurement [NIBP]); assessment of risk involved in interventional procedures and medicinal treatment
Give oxygen	Improvement of oxygenation
Place the patient with the bleeding side down	Prevention of the flow of endobronchial blood into unaffected lung segments
Sedation/anxiolysis	Calming of the patient, facilitation of diagnostic and therapeutic measures (NB: re-striction of breathing activity, ability to expectorate, ability to cooperate/communicate)
In massive hemoptysis: endotracheal or, if required, unilateral endobronchial intubation	Maintenance of gas exchange

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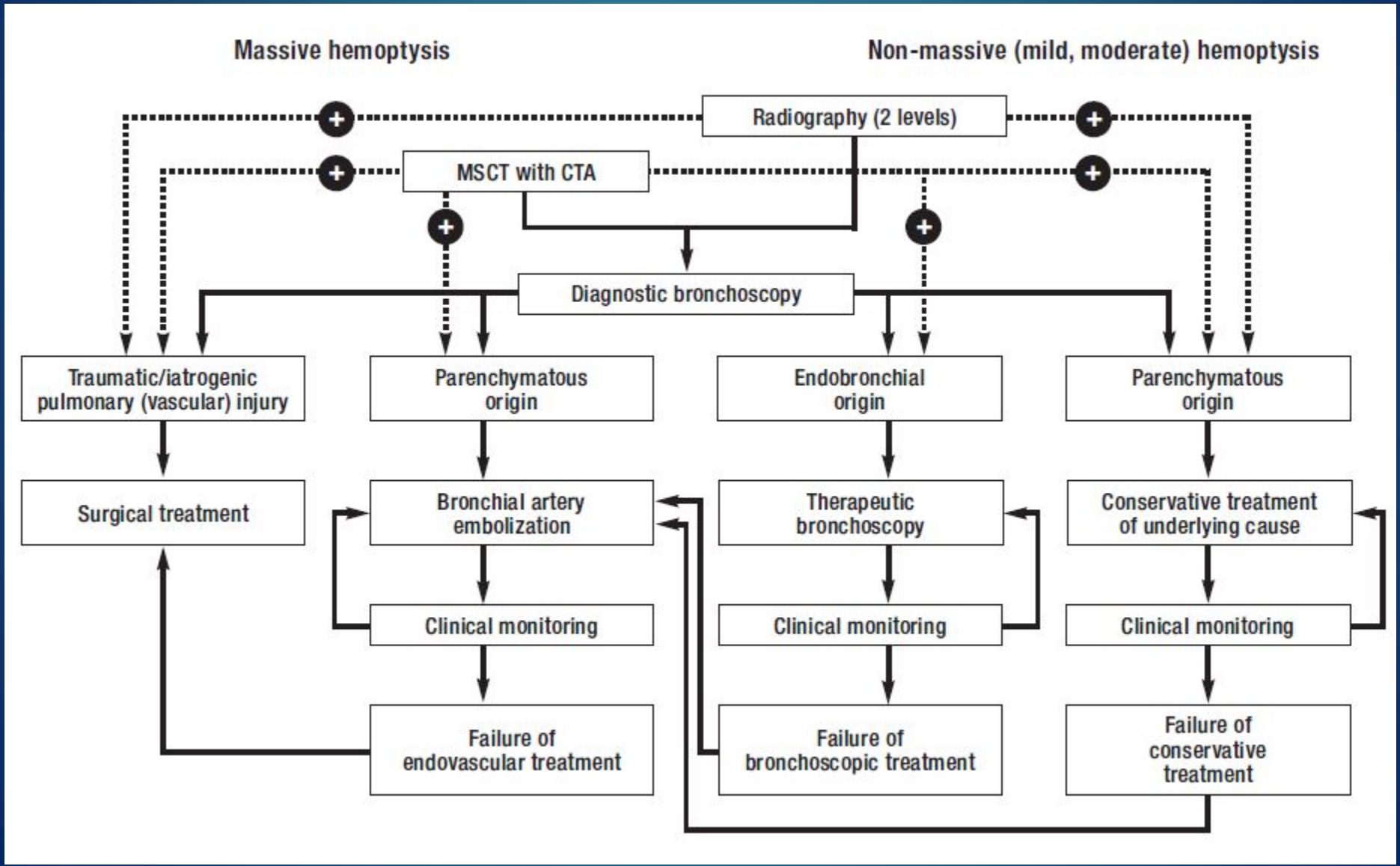
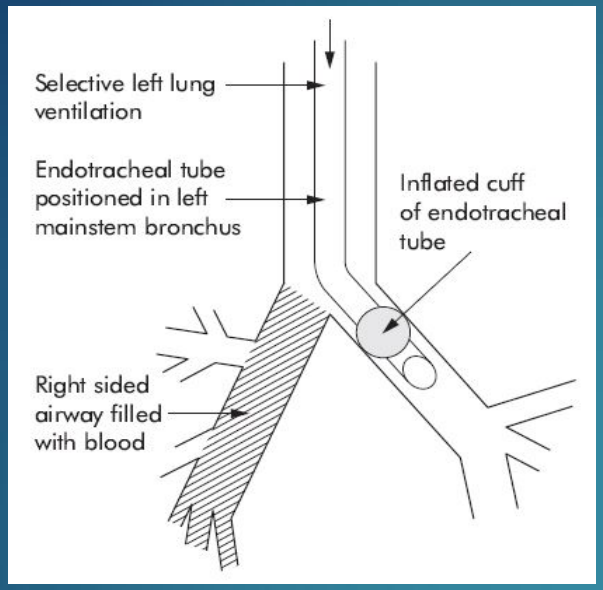
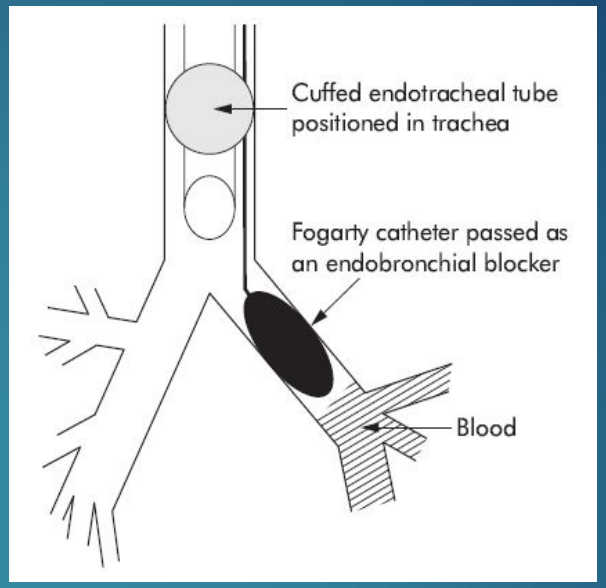
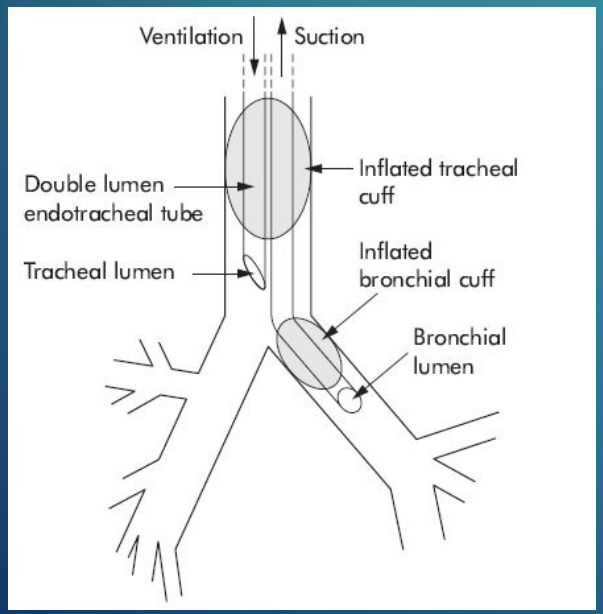
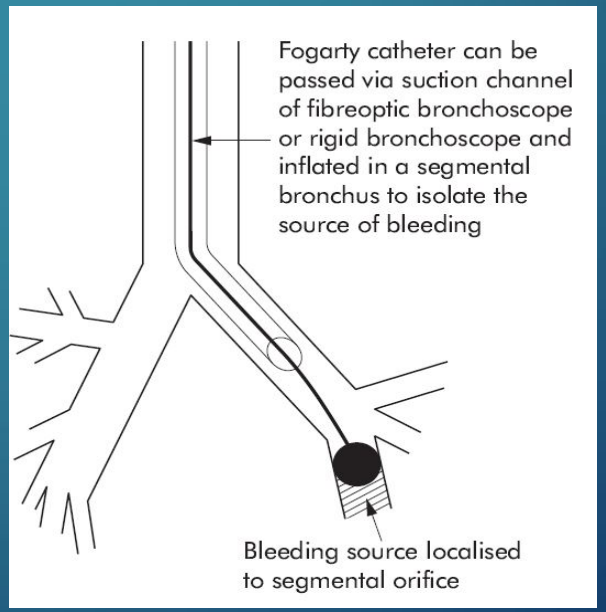

Massive hemoptysis
Non-massive (mild, moderate) hemoptysis
Radiography (2 levels)
MSCT with CTA
Diagnostic bronchoscopy
Traumatic/iatrogenic pulmonary (vascular) injury
Parenchymatous origin
Endobronchial origin
Parenchymatous origin
Surgical treatment
Bronchial artery embolization
Therapeutic bronchoscopy
Conservative treatment of underlying cause
Clinical monitoring
Clinical monitoring
Clinical monitoring
Failure of endovascular treatment
Failure of bronchoscopic treatment
Failure of conservative treatment

HEMOPTYSIS


Selective left lung ventilation
Endotracheal tube positioned in left mainstem bronchus
Inflated cuff of endotracheal tube
Right sided airway filled with blood


Cuffed endotracheal tube positioned in trachea
Fogarty catheter passed as an endobronchial blocker
Blood


Ventilation
Suction
Double lumen endotracheal tube
Inflated tracheal cuff
Tracheal lumen
Inflated bronchial cuff
Bronchial lumen


Fogarty catheter can be passed via suction channel of fibreoptic bronchoscope or rigid bronchoscope and inflated in a segmental bronchus to isolate the source of bleeding
Bleeding source localised to segmental orifice

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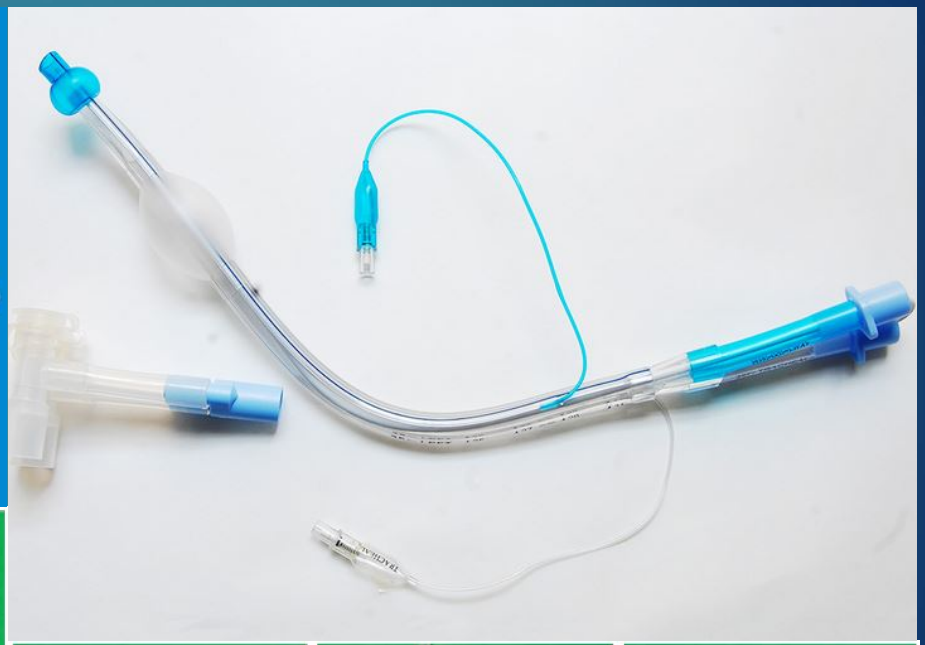

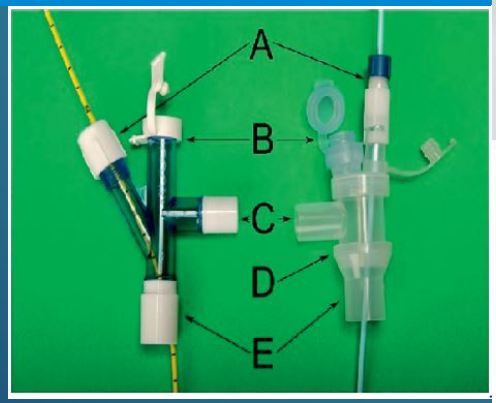

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- Polmone: 99 % apporto sangue dalle arterie polmonari e 1 % dalle arterie bronchiali
- Calibro a. bronchiali 1 -1,5 mm
- 1 % gittata cardiaca
- Nei casi patologici il calibro può arrivare a 7 - 8 mm ed al 30 % della gittata cardiaca
- 90 % emottisi originano dalle a. bronchiali
  5 % dalle a. polmonari
  5 % da arterie sistemiche non bronchiali

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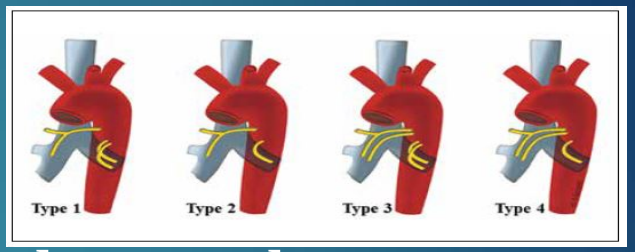
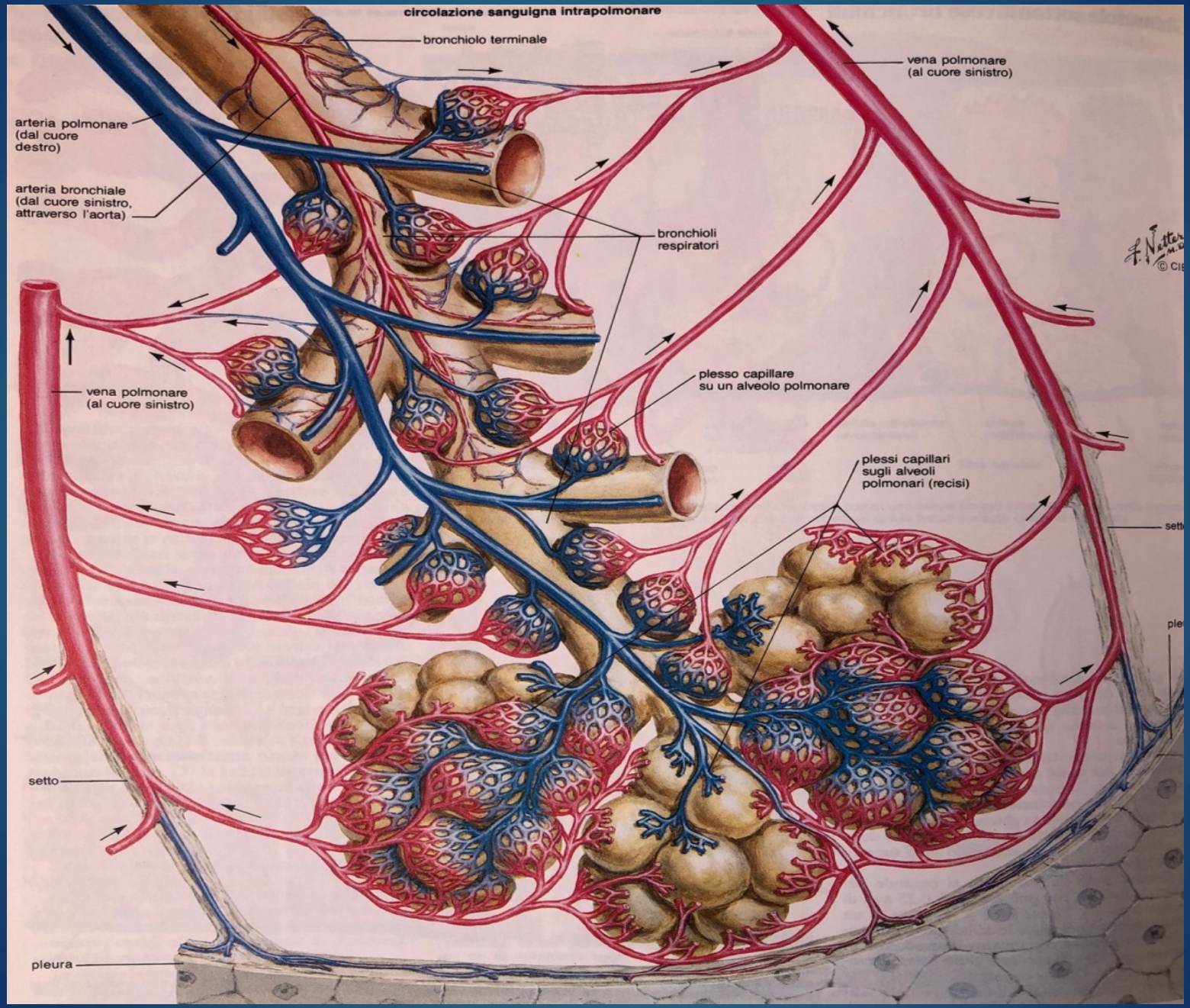
- Le arterie bronchiali originano nel 70 % dei casi dall'aorta toracica
- Nel 30% da altri vasi toracici



- Le a. bronchiali possono essere plurime da 1 sino a 4
- Nel 5 – 10 % dei casi dall'a. bronchiale destra originano rami per vasi spinali e radicolari
- Spesso sono presenti anastomosi con le arterie polmonari
- Il ritorno venoso avviene attraverso le vene bronchiali nell'atrio destro ma spesso anche nell'atrio sinistro dalle vene polmonari


circolazione sanguigna intrapolmonare
bronchiolo terminale
vena polmonare
(al cuore sinistro)
arteria polmonare
(dal cuore
destro)
arteria bronchiale
(dal cuore sinistro,
attraverso l'aorta)
bronchioli
respiratori
vena polmonare
(al cuore sinistro)
plesso capillare
su un alveolo polmonare
plessi capillari
sugli alveoli
polmonari (recisi)
setto
pleura

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POLYVINYL ALCOHOL

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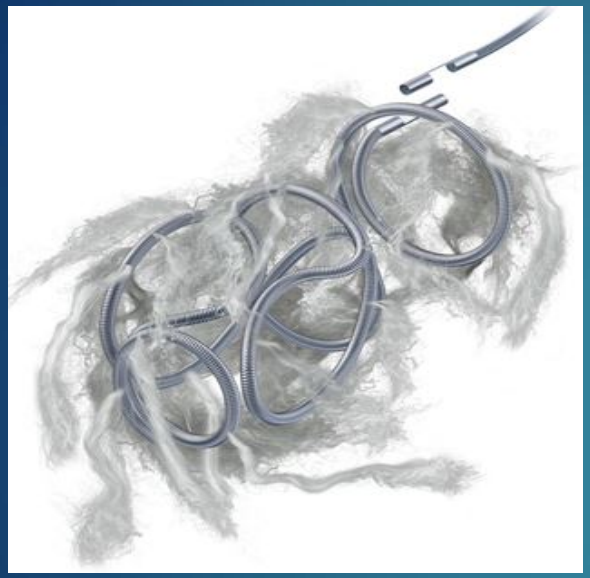

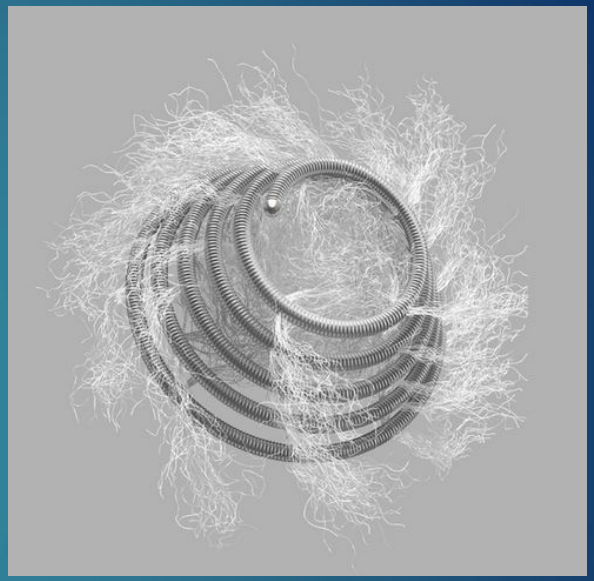

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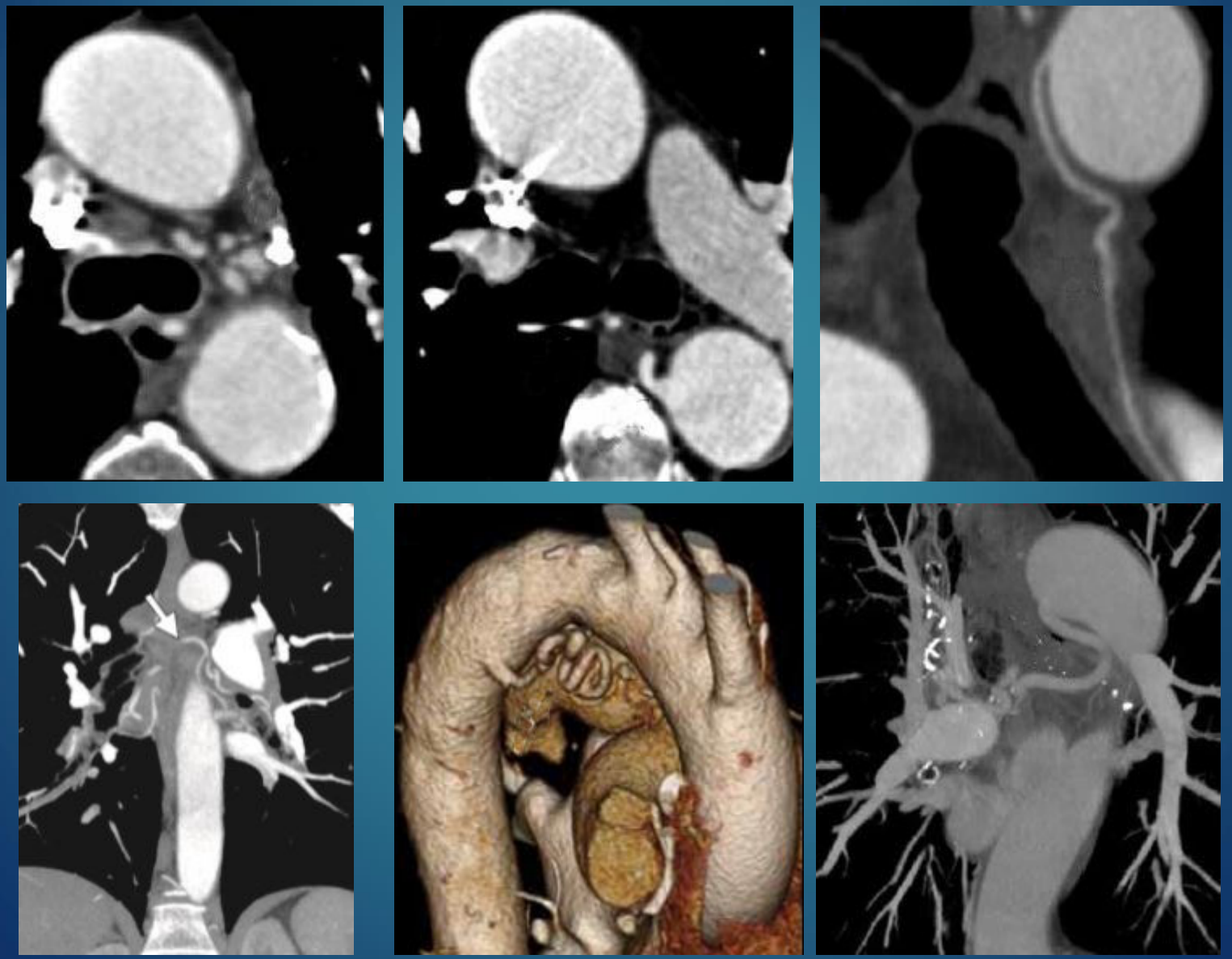

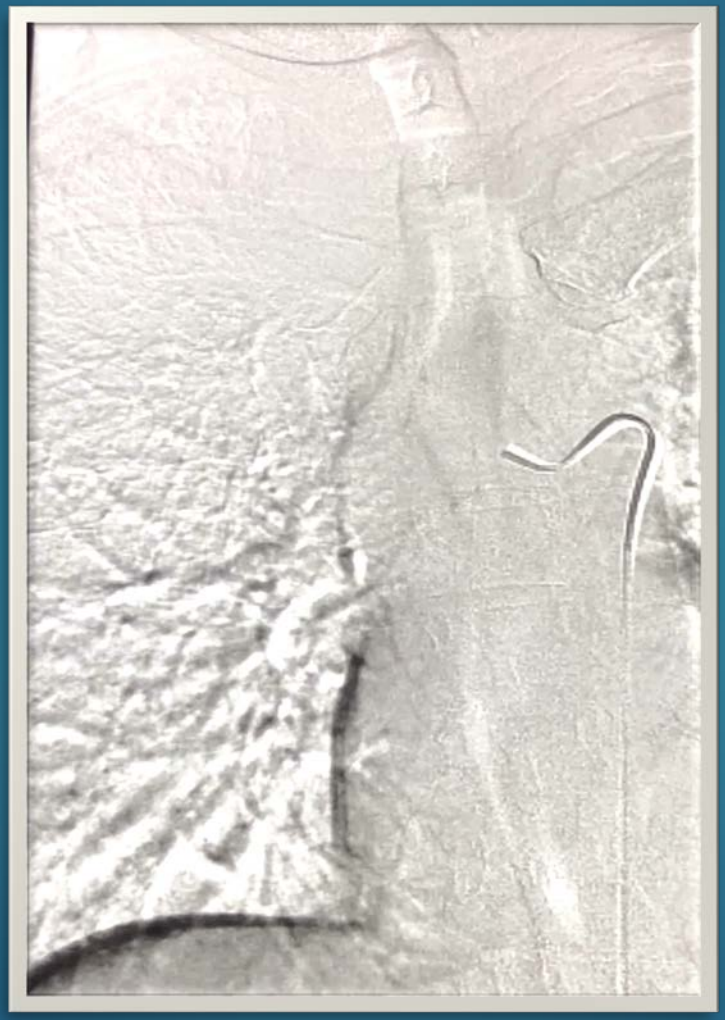

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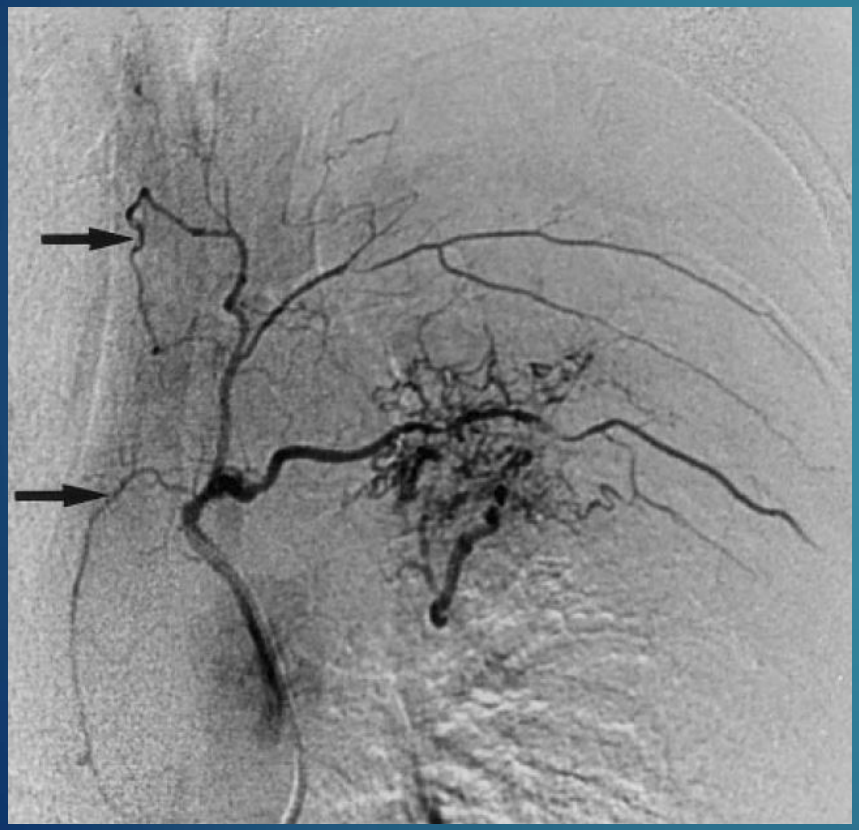
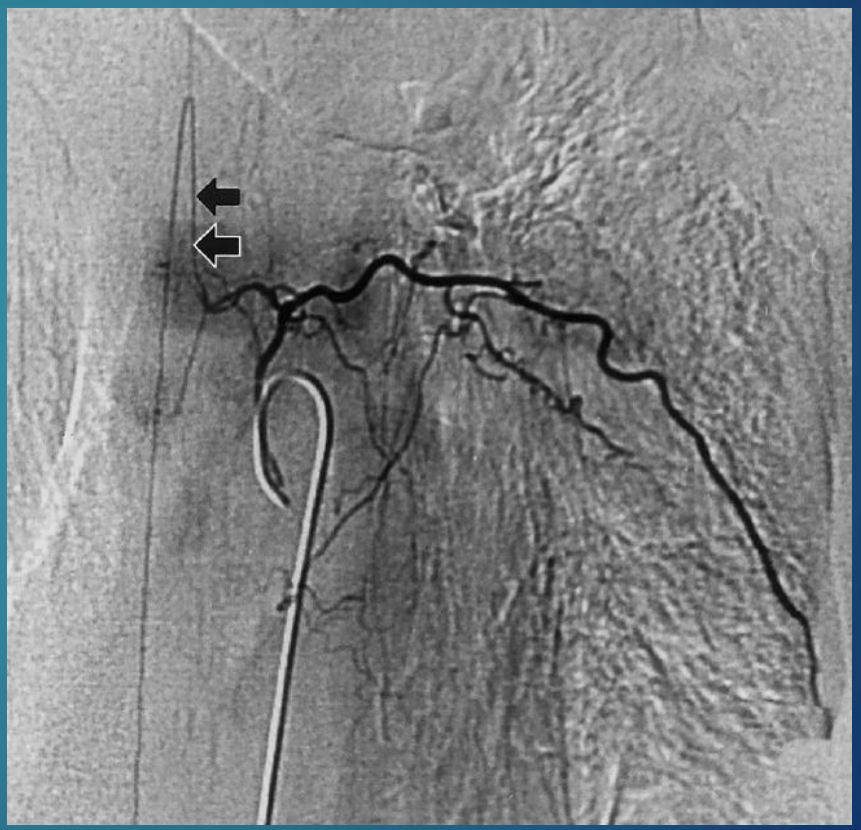


Arterie radicolari



Arteria spinale anteriore
o di Adamkiewicz

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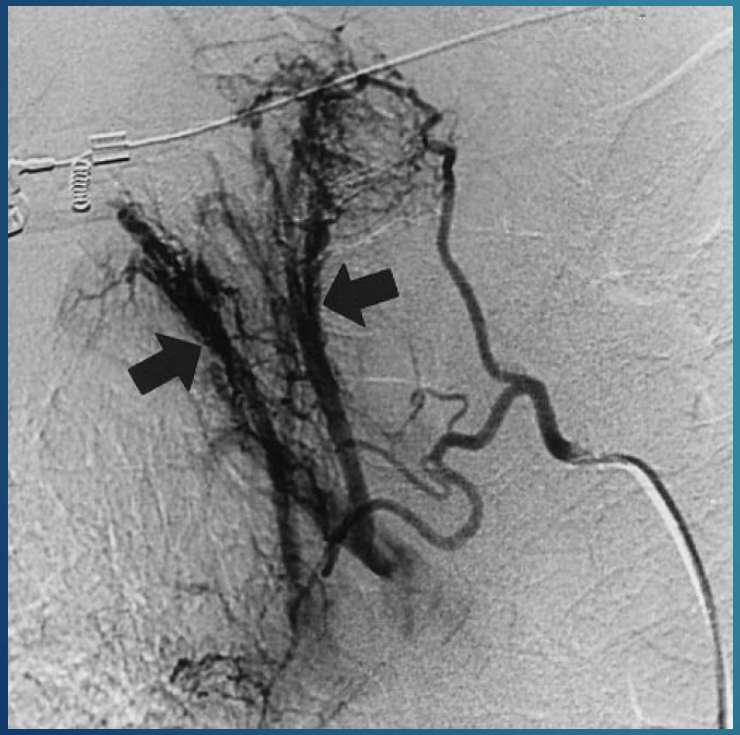

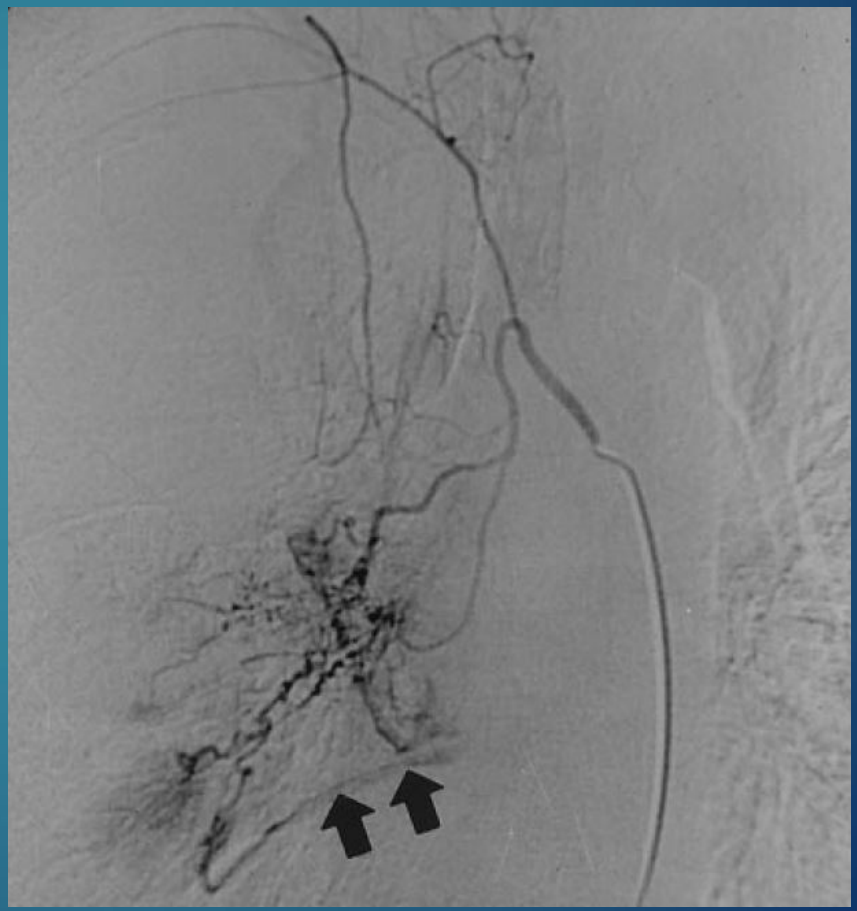

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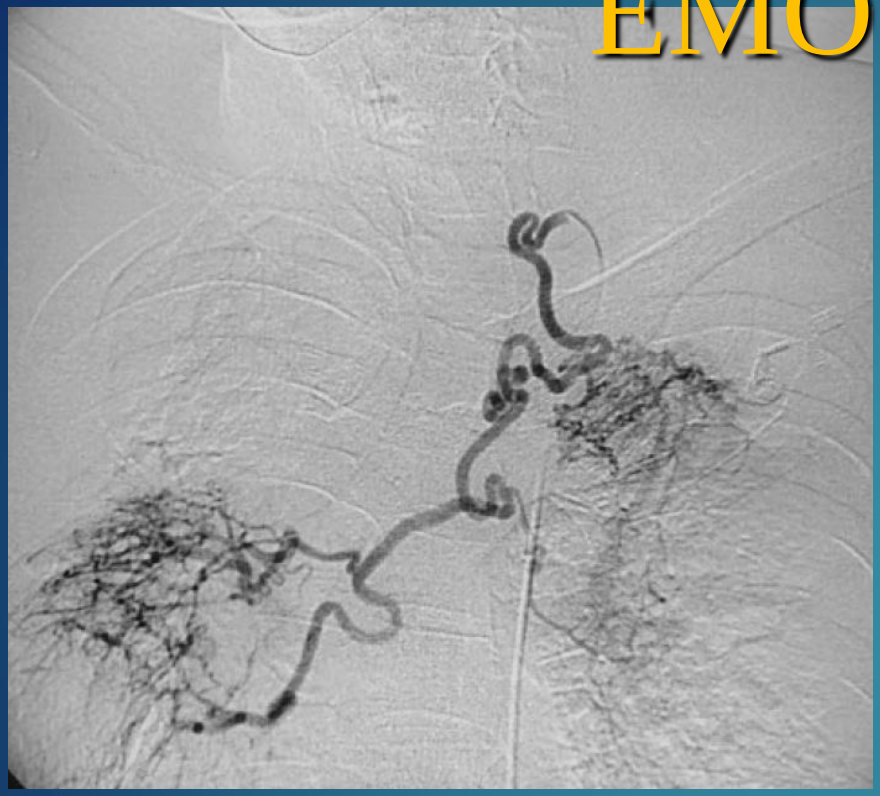

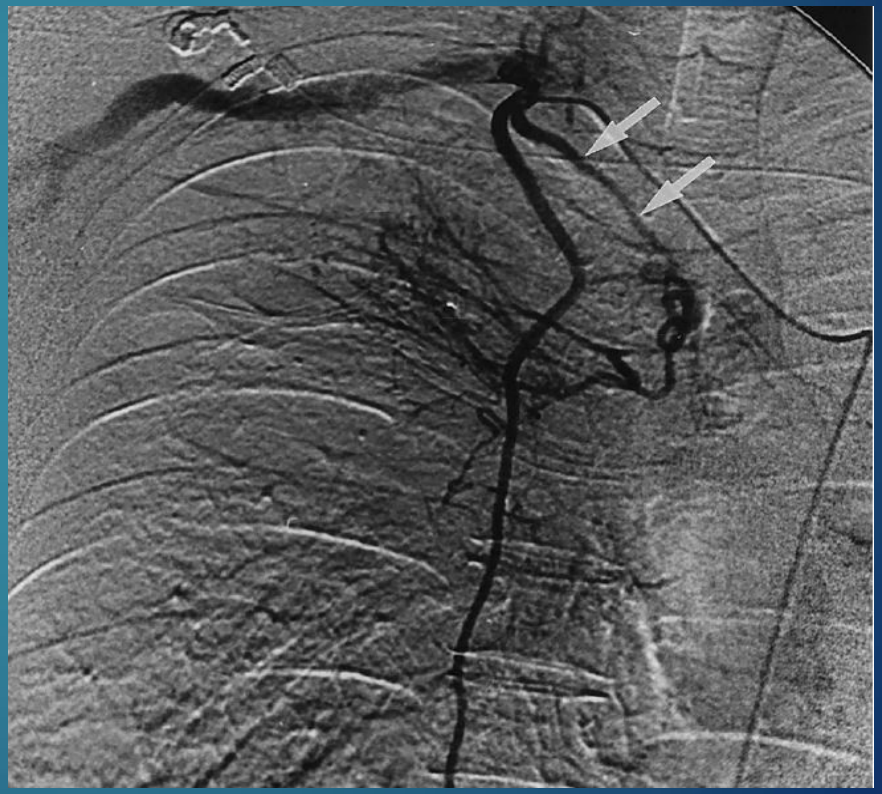

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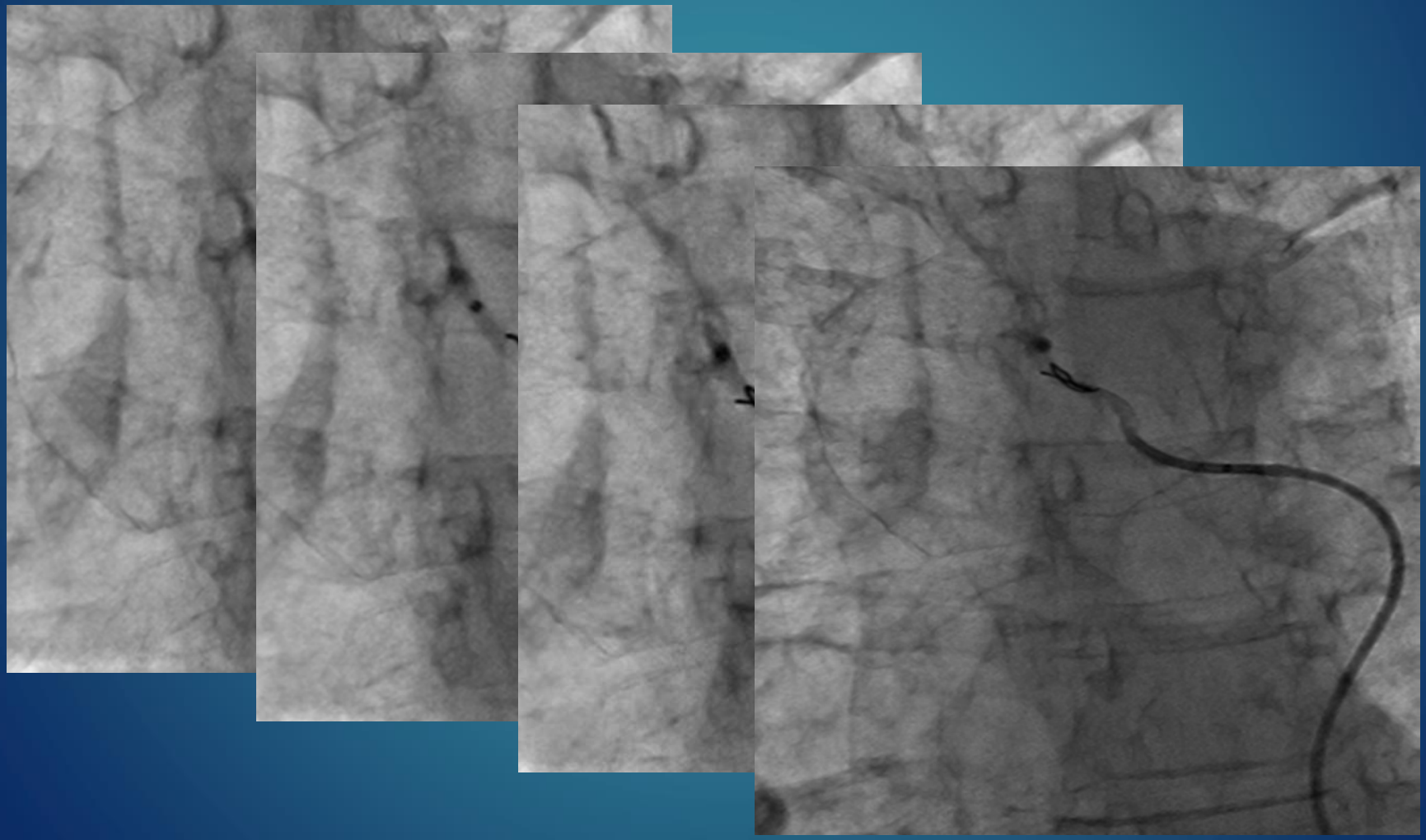

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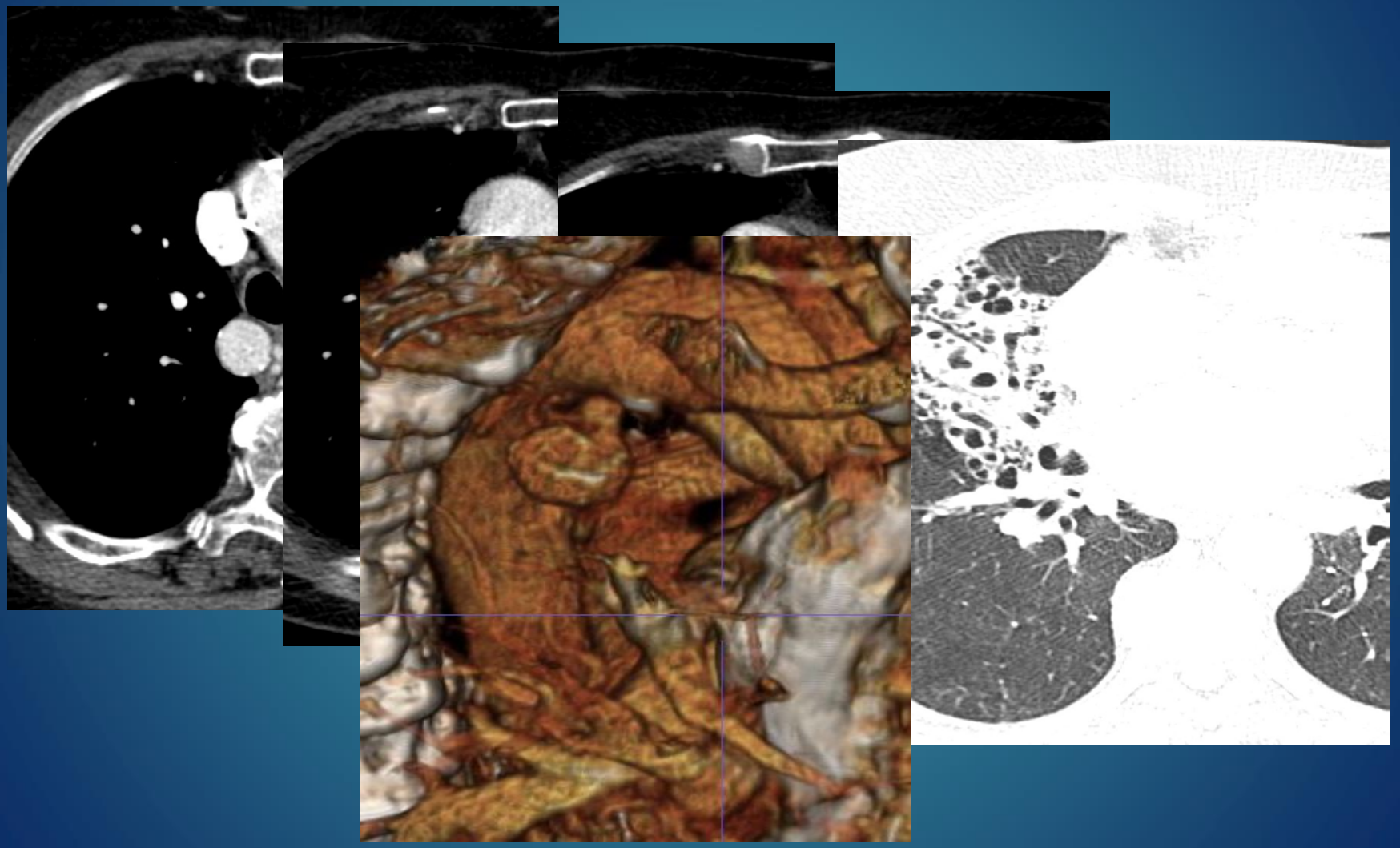

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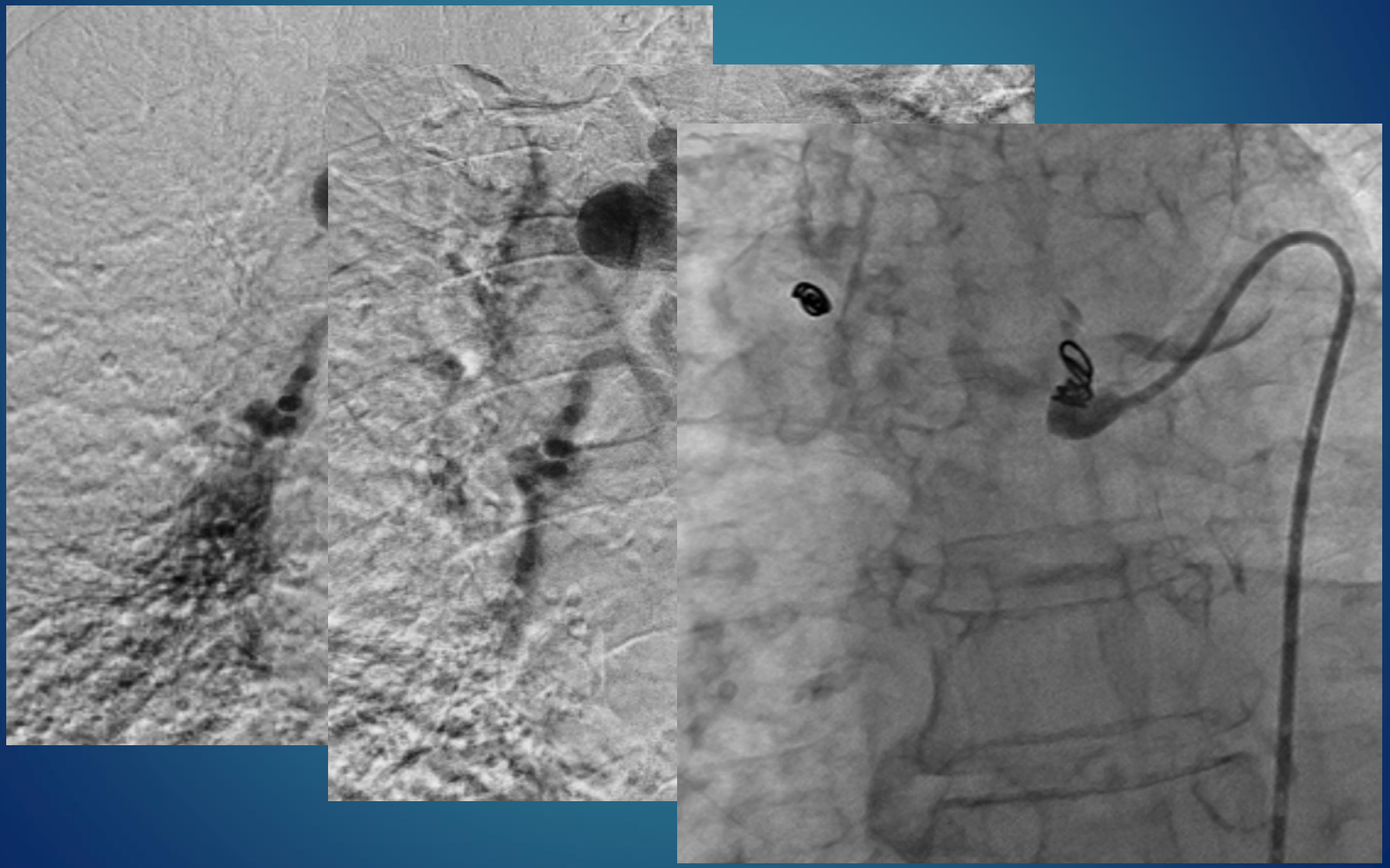

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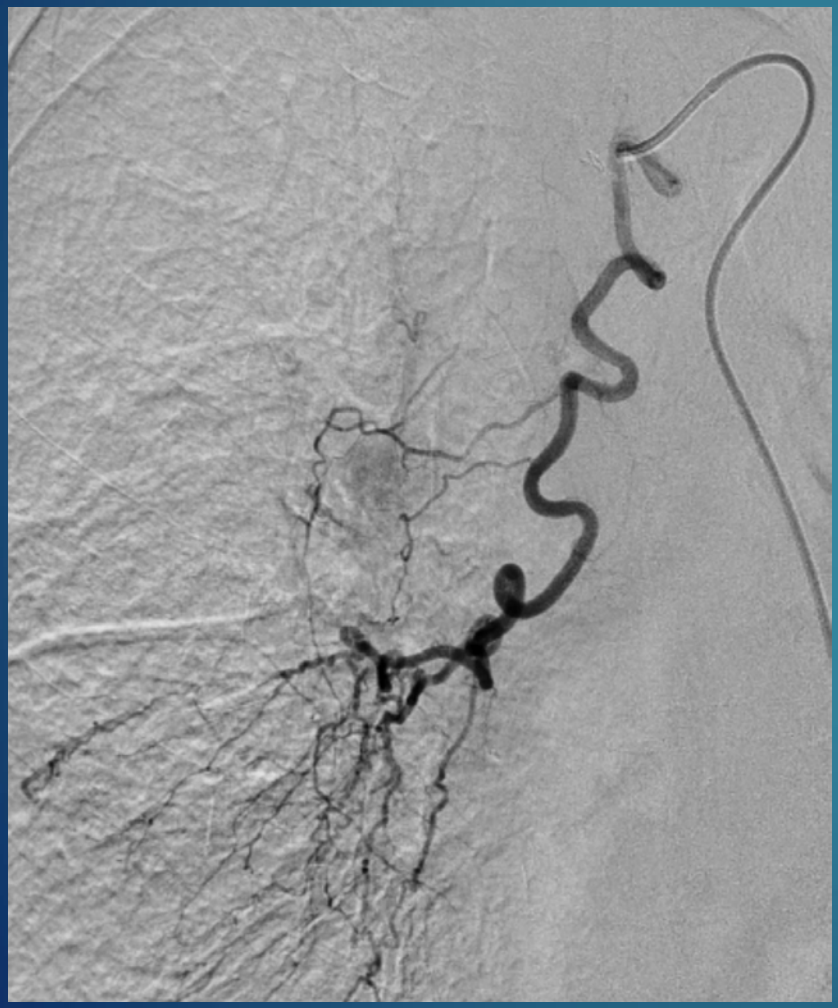

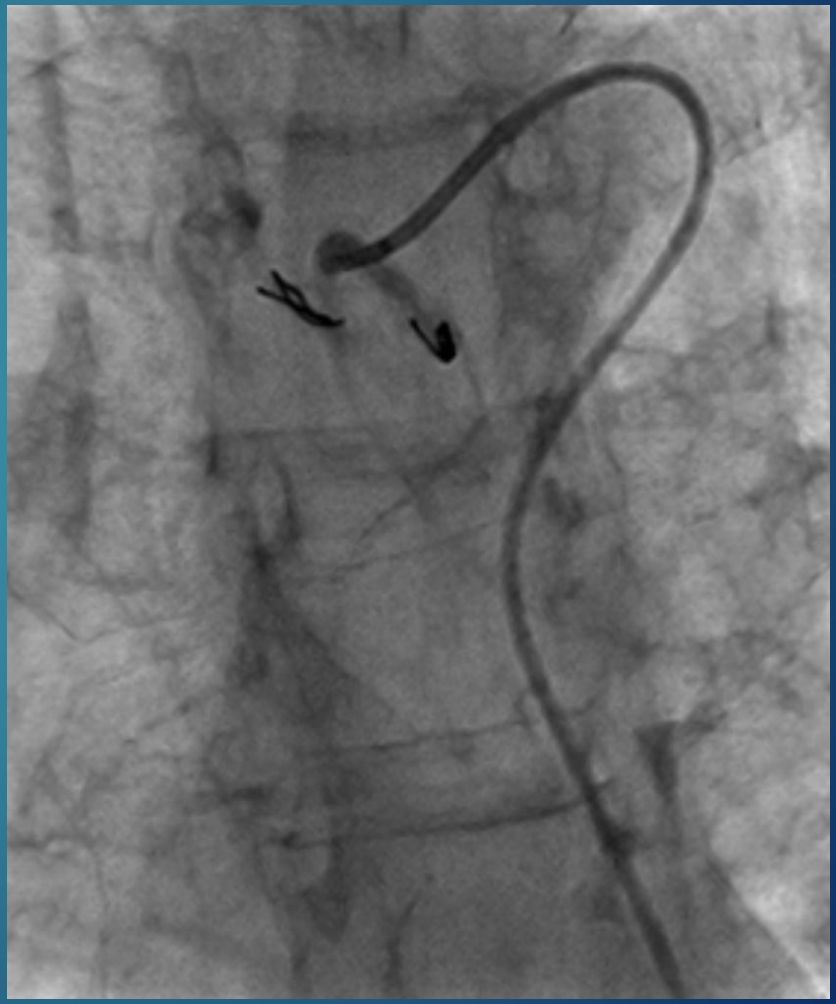

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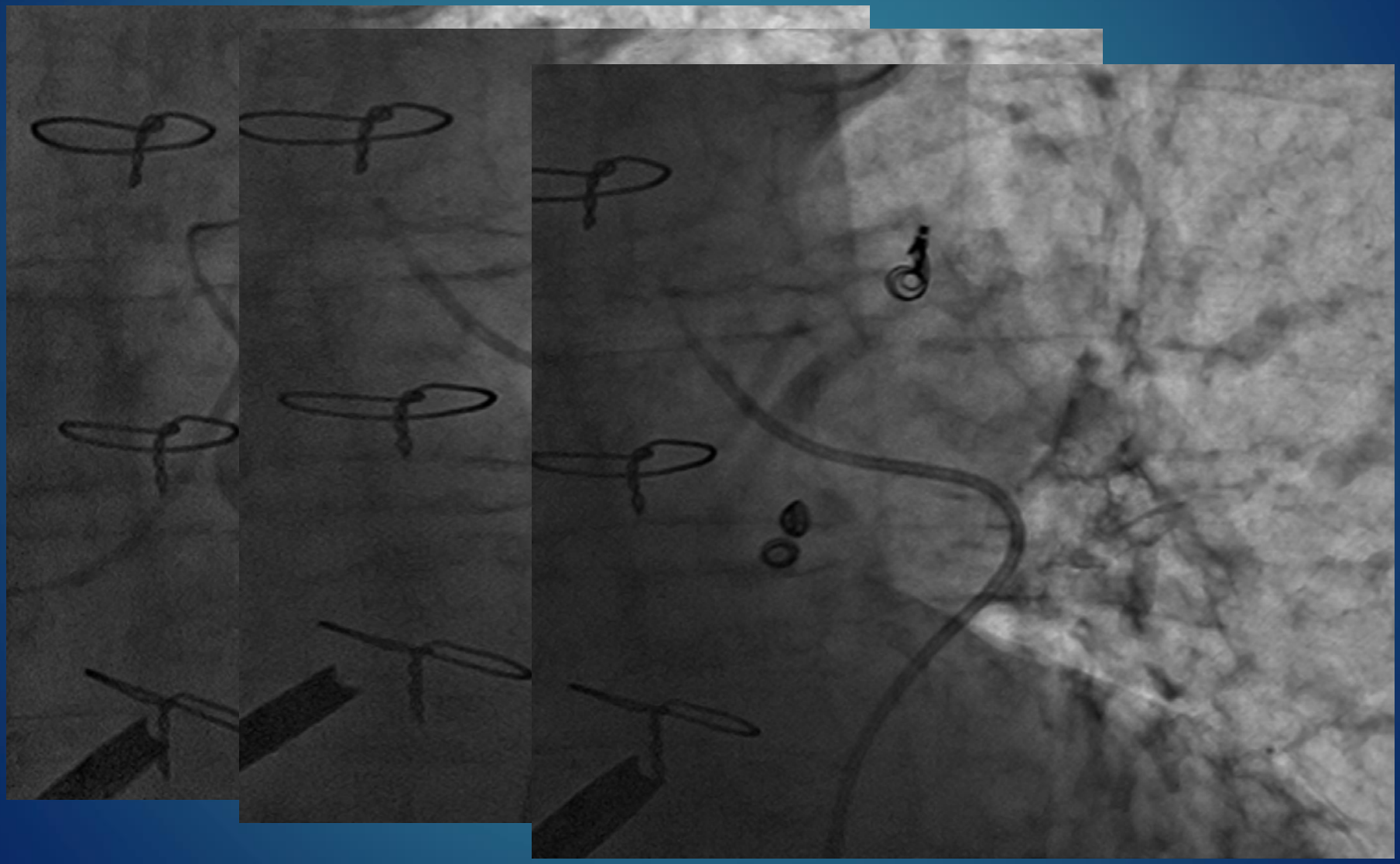

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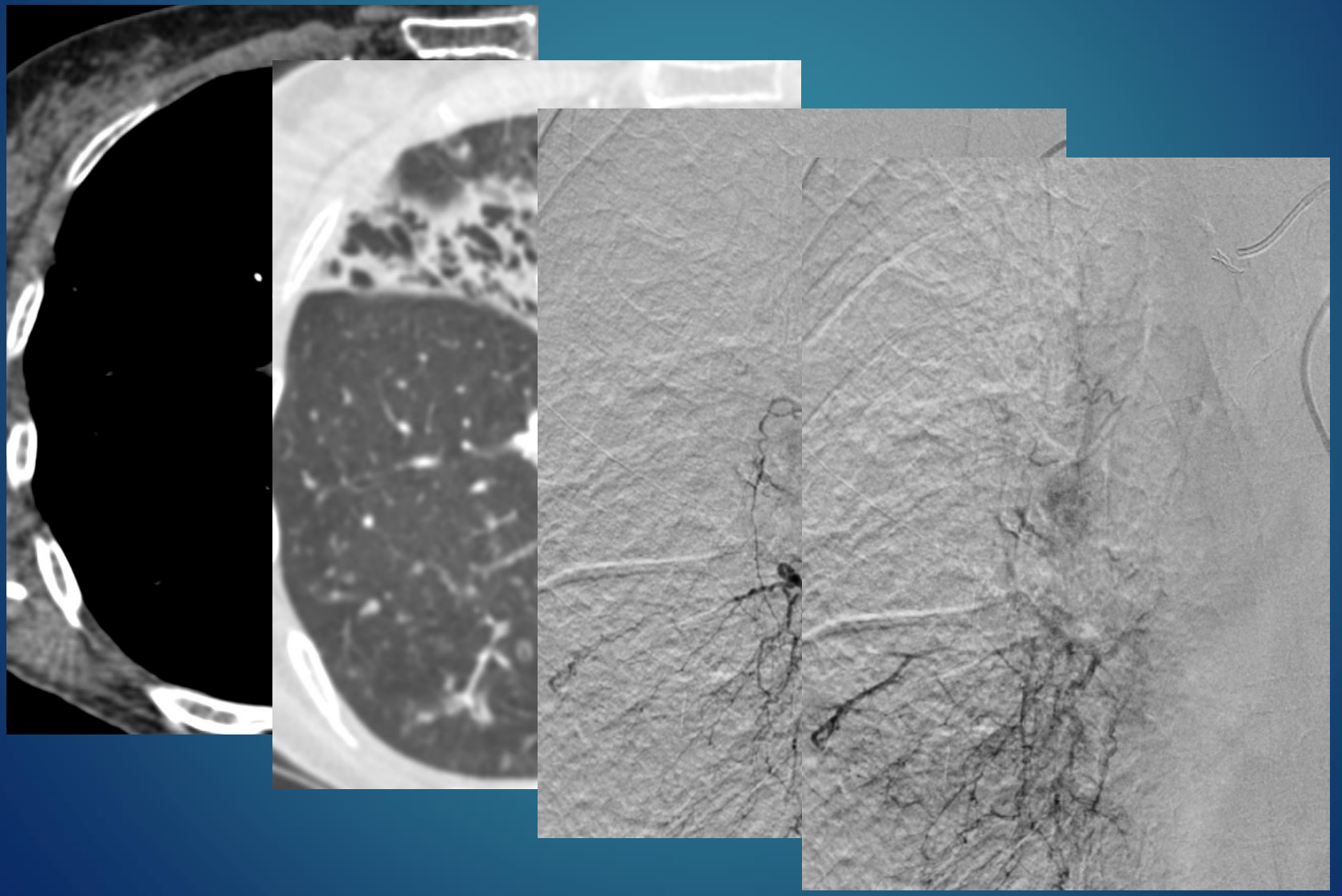

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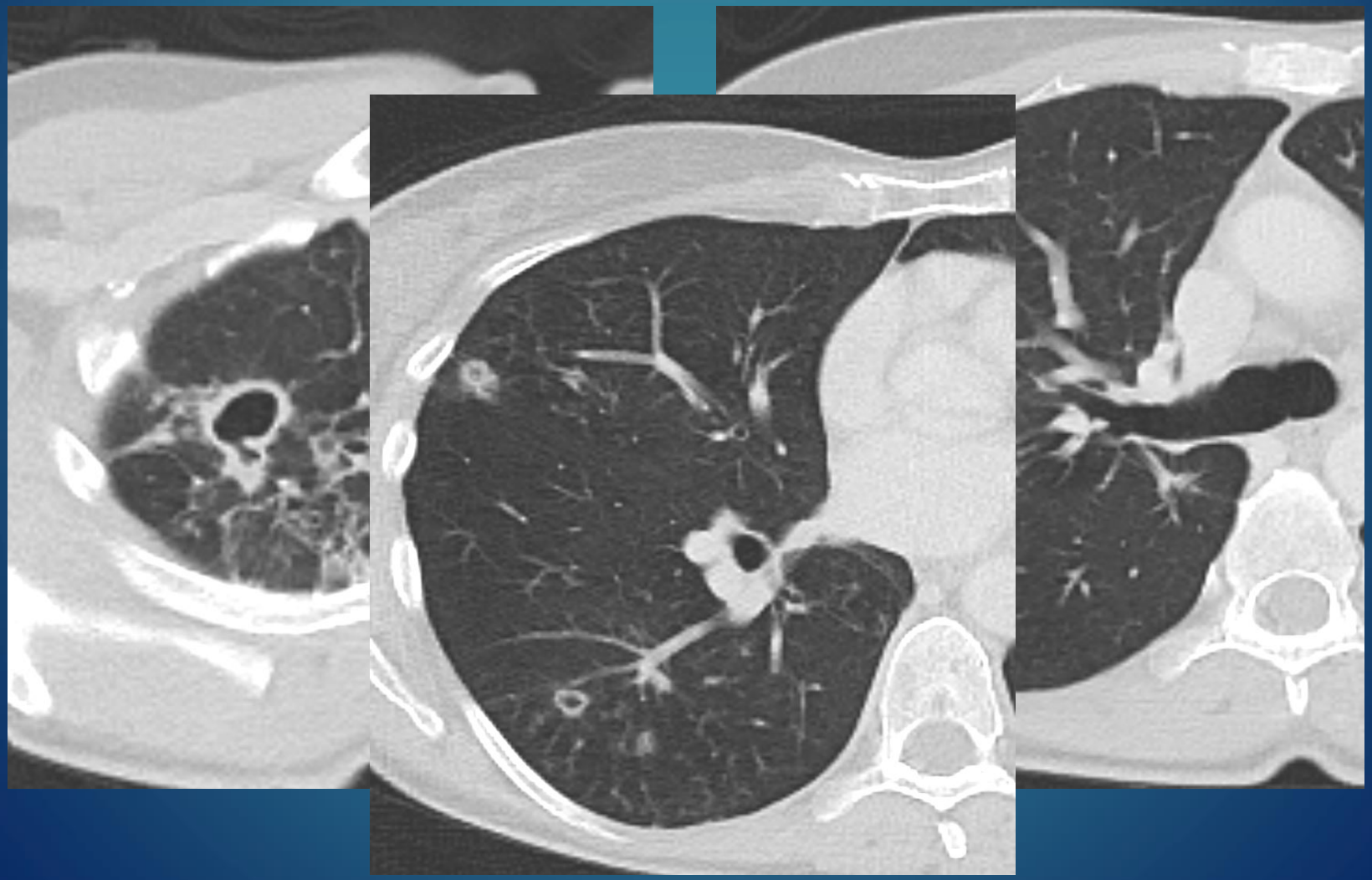

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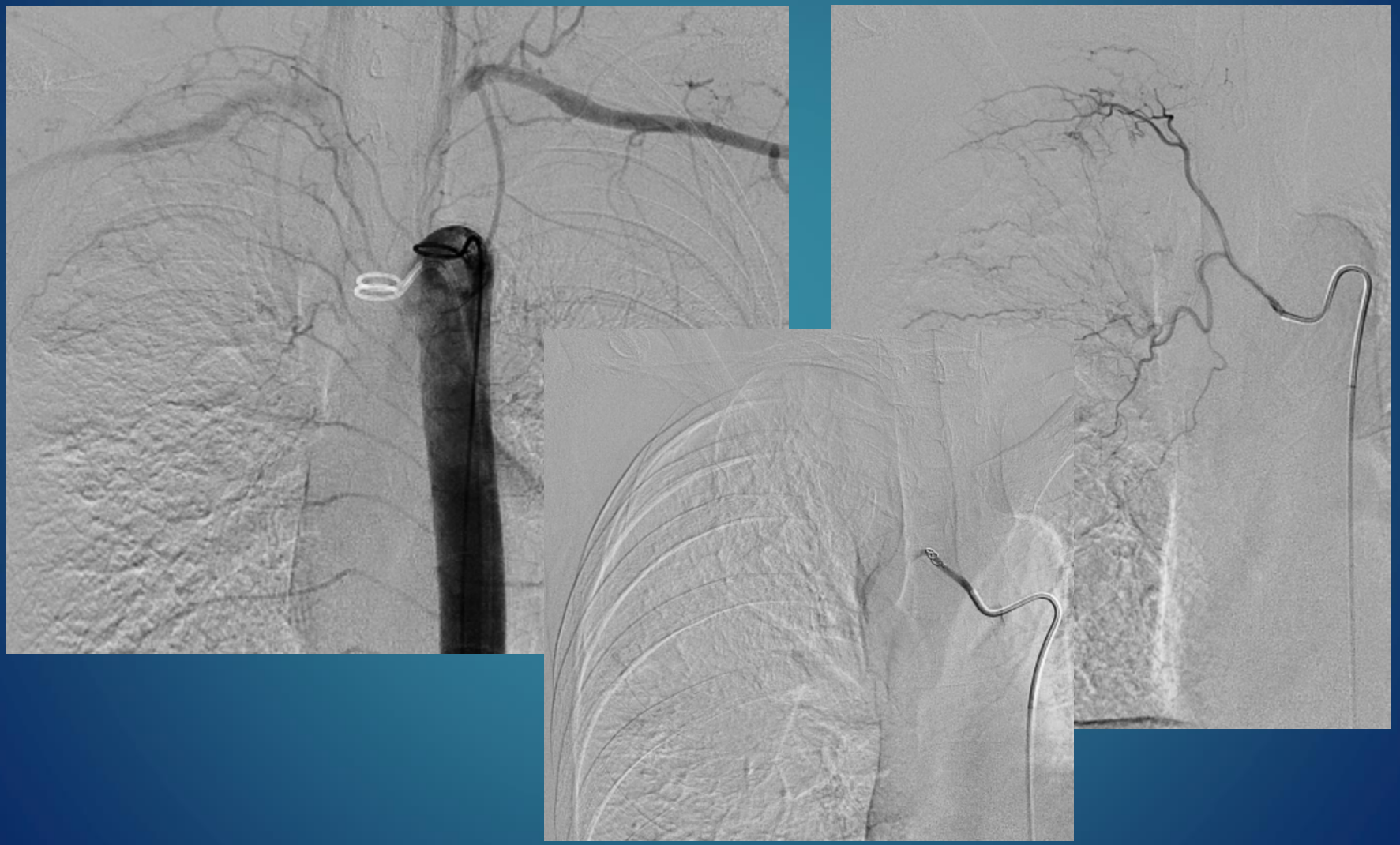

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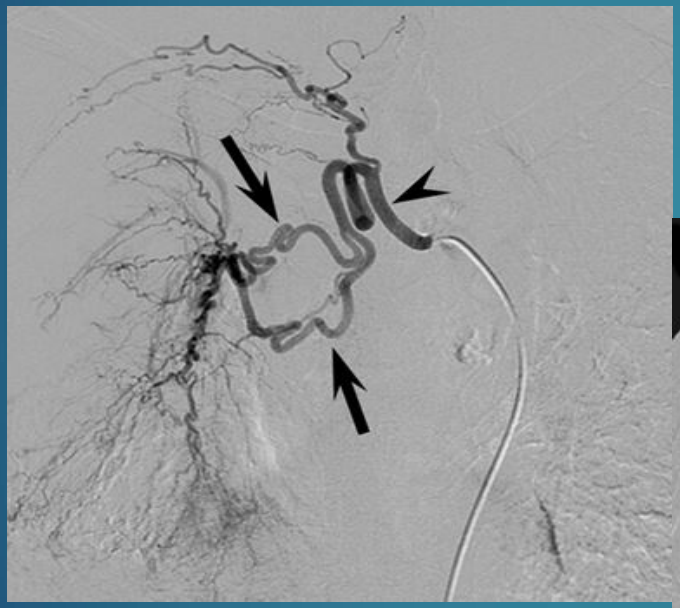

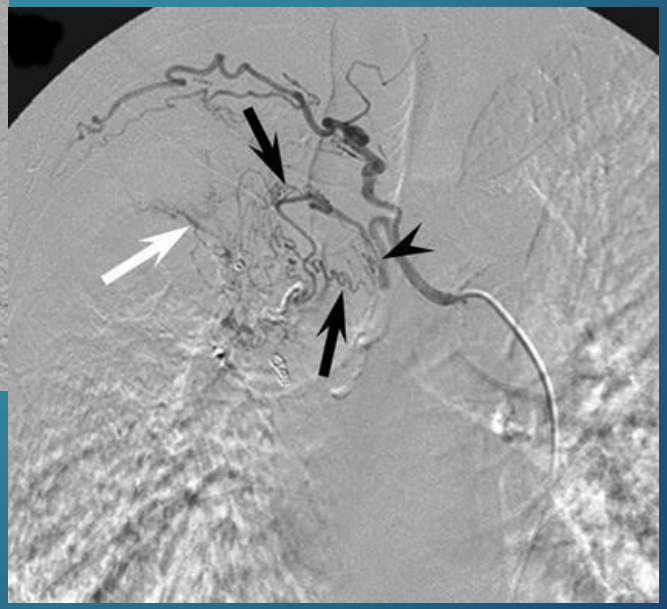

Recidiva

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GRAZIE PER L’ATTENZIONE