FLASH BLOOD

AN UNUSUAL CASE OF INTERMITTENT MASSIVE HEMOPTYSIS

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PATIENT DESCRIPTION

Chief Complaint:

60 year old female presents with hemoptysis

Past Medical History:

Hemoptysis (3 episodes over 24 month period)

Bicuspid aortic valve and aortic coarctation

Surgical History:

AVR(mechanical St. Jude 2000) and aortic root repair

Hemi-aortic arch replacement

Medications:

Warfarin

Social History:

Anti-coagulation nurse

TIMELINE
1/2014

1st episode of hemoptysis- less than ½ cup bright red blood

No antecedent infections

Chest CT- ground glass opacity in the RUL

Evaluation with rhinoscopy and bronchoscopy-no bleeding source or mass was identified

INR was not supra-therapeutic

TIMELINE
10/2014

Minimal hemoptysis that was not evaluated

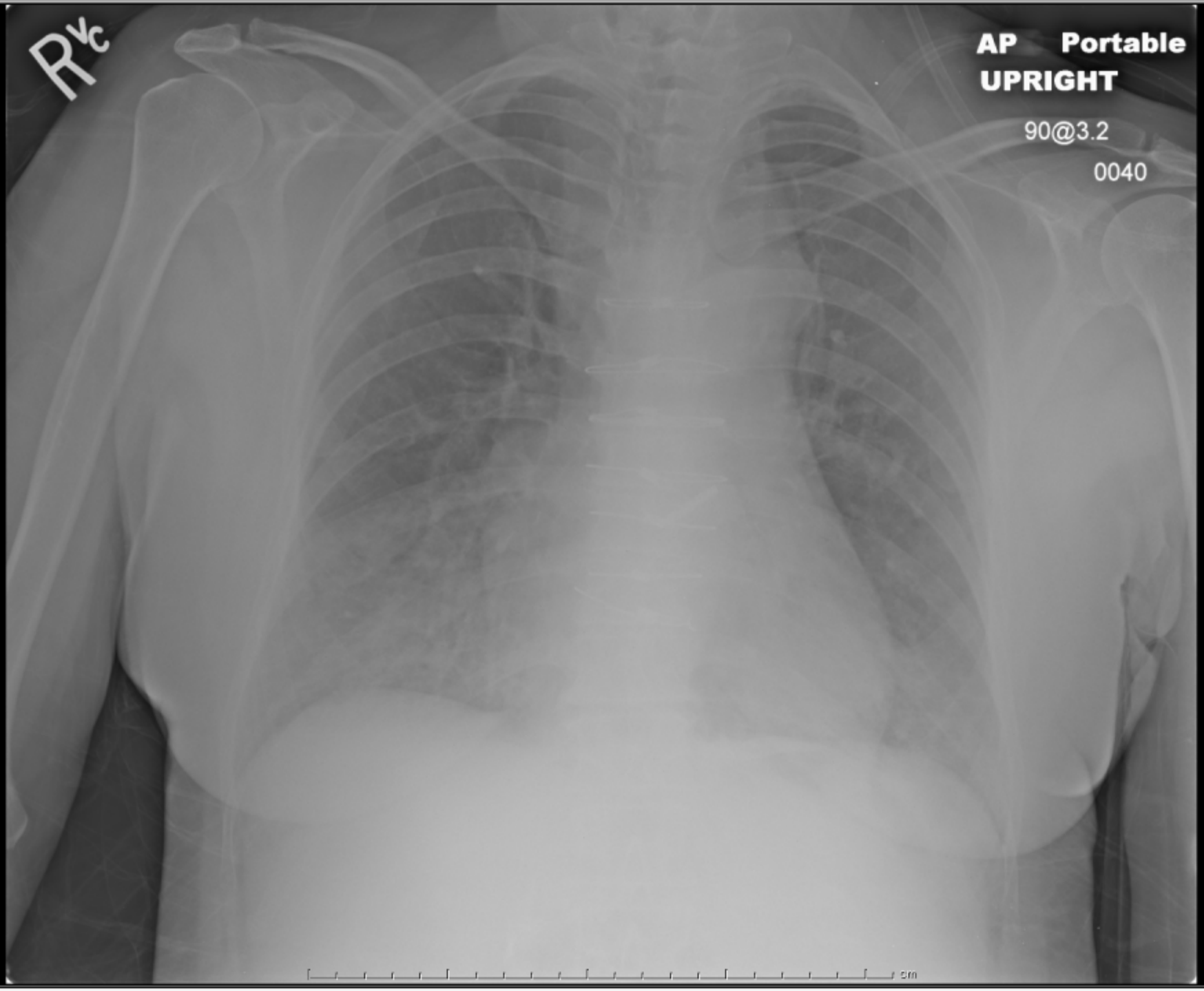
TIMELINE
12/2014

Massive hemoptysis with shock in setting of viral syndrome

CT- ground glass opacities right middle lobe, RUL, and both lower lobes

Cultures negative, viral panel negative, serologies (ANA, ANCA, GBM) negative, UA bland

Bronchoscopy- no active bleeding, no anatomic abnormalities, BAL in RML had non-clearing serially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TIMELINE
5/2015

Self limited, scant hemoptysis on two occasions for which she was never seen

No infectious symptoms at that time

TIMELINE
8/2015

Acute massive hemoptysis- loss of 1L blood. No recent illness

Intubated in ED

CT chest- extensive bilateral lower lobe and right middle lobe pulmonary hemorrhage

Treated with empiric pulse dose steroids and plasmapheresis

Repeat serologic workup negative

PHYSICAL EXAM

T 37.2, P 61, *BP 84/45*, RR 20, SaO2 100% on 100% FiO2

HEENT: Nasal mucosa normal. Oral mucosa without ulcers. Endotracheal tube in place with *bloody secretions*. OG in place without blood or coffee ground material

Neck: No JVD present. No tracheal deviation or thyromegaly

Cardiovascular: Regular rate and rhythm, intact distal pulses, 2/6 systolic murmur loudest at apex with radiation to axilla, no rubs or gallops

Pulmonary/Chest: Regular effort, synchronous with ventilator, *diffuse rhonchi bilaterally* without wheezes or rales

Skin: No rashes

LABS

ANA negative

C3- 86

C4- 14

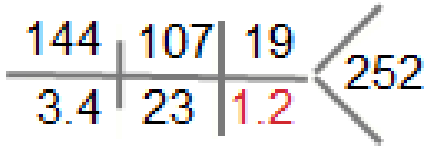
RA negative

RO and LA negative

CMV negative

GBM negative

Cytology negative



Urinalysis: bland

DIFFERENTIAL DIAGNOSIS

Infectious	Mycobacteria (particularly tuberculosis) Fungal infections (including mycetoma) Necrotizing pneumonia and lung abscess (*Klebsiella pneumoniae, Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus pneumoniae,* other *Streptococcus* spp. and *Actinomyces* spp.) Bacterial endocarditis with septic emboli Parasitic (paragonimiasis, hydatid cyst)
Neoplastic	Bronchogenic carcinoma Endobronchial tumors (carcinoid, adenoid cystic carcinoma) Pulmonary metastases Sarcoma
Pulmonary	Bronchiectasis (including cystic fibrosis) Chronic bronchitis Alveolar hemorrhage and underlying causes
Vascular	Pulmonary artery aneurysm (Rasmussen aneurysm, mycotic, arteritis) Bronchial artery aneurysm Pulmonary infarct (embolism) Pulmonary hypertension Congenital cardiac or pulmonary vascular malformations Airway-vascular fistula Arteriovenous malformations Mitral stenosis Left-ventricular failure
Miscella-neous	Endometriosis Lymphangioleiomatosis Broncholithiasis Cryptogenic Foreign body aspiration Lung transplantation
Vasculitis	Wegener's granulomatosis Goodpasture's syndrome Behçet's disease Systemic lupus erythematosus
Trauma	Induced by diagnostic bronchoscopy (brushing/biopsy) Related to interventional pulmonology procedures (dilation, metallic stent placement, high-dose brachytherapy) Catheter-induced PA rupture Blunt or penetrating chest injury Transtracheal procedures
Hemato-logical	Coagulopathy (congenital, acquired or iatrogenic) Platelet disorders
Drugs and toxins	Penicillamine Solvents Crack cocaine Trimellitic anhydride Bevacizumab

HOSPITAL COURSE

ECHO- good valvular function with normal right sided pressures

Right heart catheterization- normal with wedge pressure of 14

Bronchoscopy- diffuse alveolar hemorrhage from right middle lobe

Bronchial artery angiography by IR did not reveal a structural source of her bleeding however bronchial arteries were not identified

HOSPITAL COURSE

Hospital day 9- large volume hemoptysis

Repeat bronchoscopy- localized the bleeding to left lower lobe and noted tracheal lesions

Repeat CTA supported this location as a source

Thoracic surgery was consulted

Subsequent CTA- lesion at the area of the aortic arch repair extending from the aortic arch to close proximity of the left lateral tracheal wall

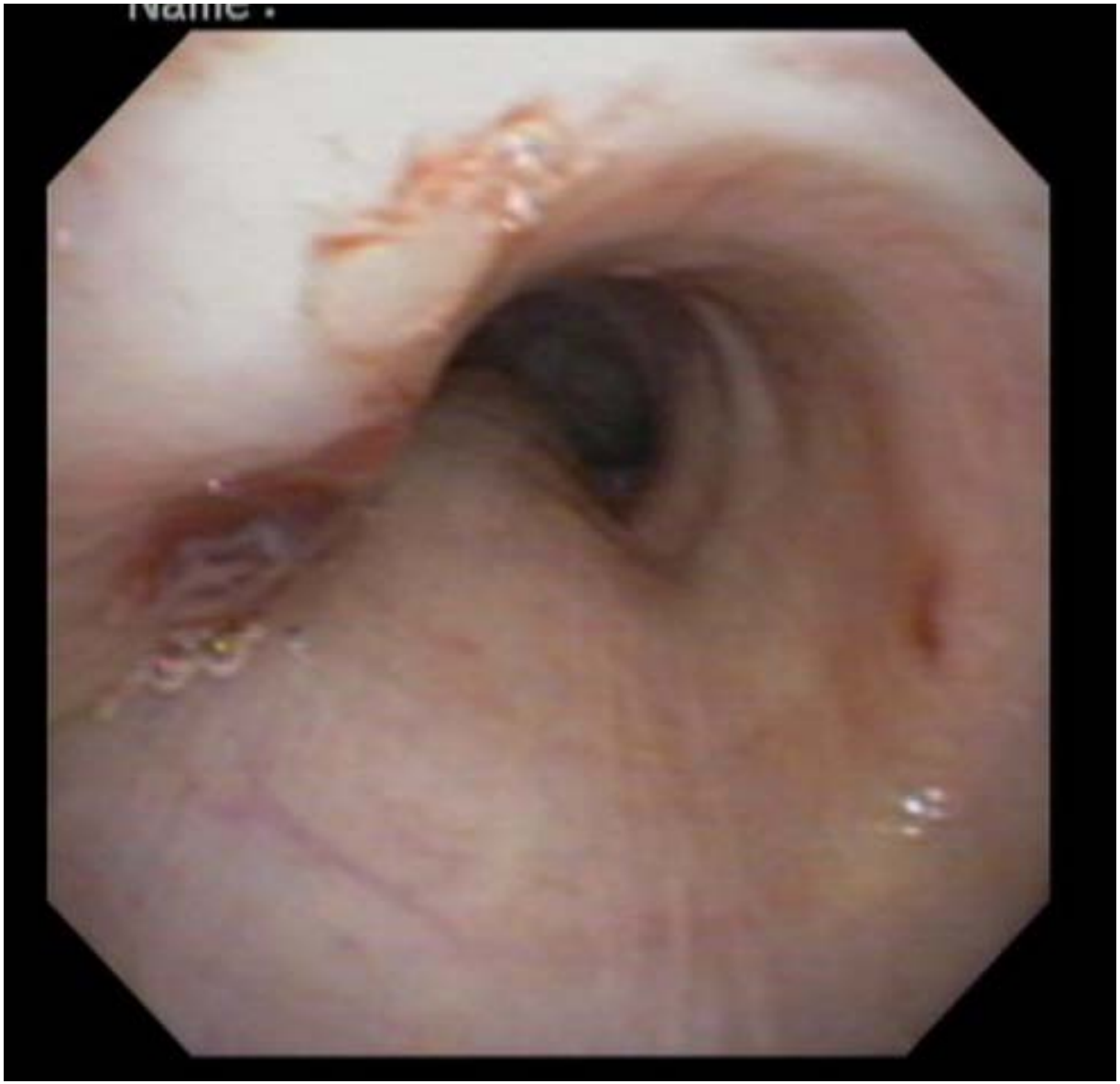
Cardiac catheterization- dilated aortic arch with an ulceration at the aortic root repair suture line

HOSPITAL COURSE

Scheduled for exploratory surgery

Bronchoscopy demonstrated a pulsating erosion approximately 3cm above the carina consistent with an ulcerated, aortotracheal fistula

She underwent repair of her trachea-aorta fistula due to pseudoaneurysm of distal aortic anastomosis



FINAL DIAGNOSIS

Aortotracheal fistula after AVR, aortic root repair, and hemi-aortic arch replacement in 2000

She underwent aortic arch replacement with graft and trachea was repaired with a pericardial flap

Patient was seen in clinic one month later and was recovering well with no recurrent hemoptysis despite therapeutic INR

MASSIVE HEMOPTYSIS

Usually present with sentinal bleed

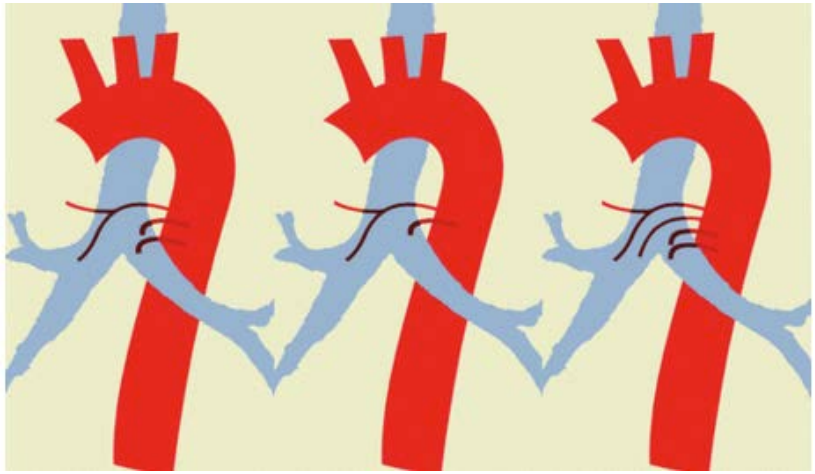
Frequently fatal- mortality rate from massive hemoptysis depends on the bleeding rate and etiology

Hemoptysis >1L/24hr in presence of malignancy carries mortality of 80%

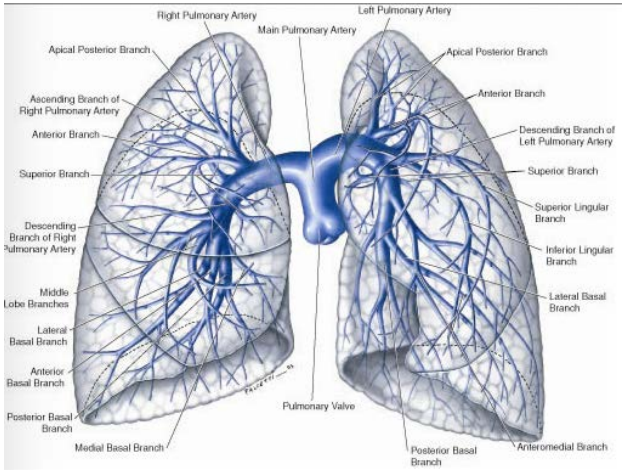
Intensive care and early consultation with pulmonologist

In life threatening bleeds diagnosis and therapy must occur simultaneously

SOURCE OF BLEEDING

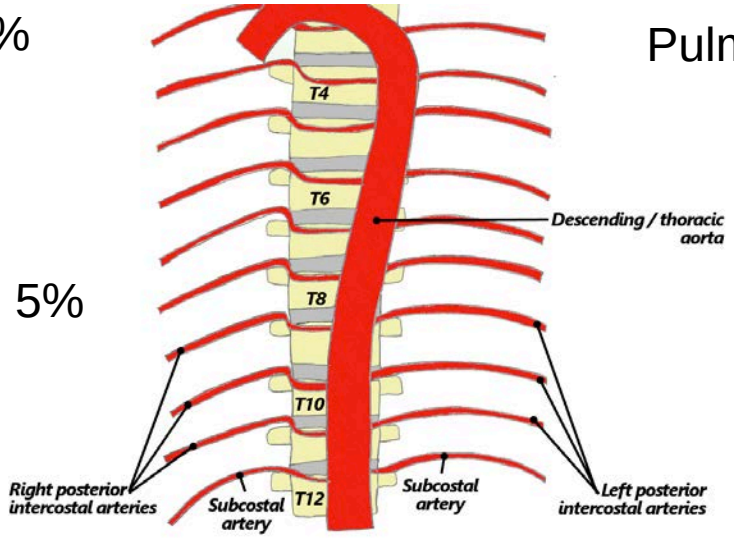


Bronchial Arteries 90%



Pulmonary Circulation 5%

Systemic Circulation 5%
Rarely aortic source



CT ANGIOGRAPHY

Vascular and IR December 2004

46 patients with hemoptysis

86% of cases who undergo combined analysis of CT and conventional angiography show concordant findings

15% of patients had a lesion not seen on CT

KEY POINTS

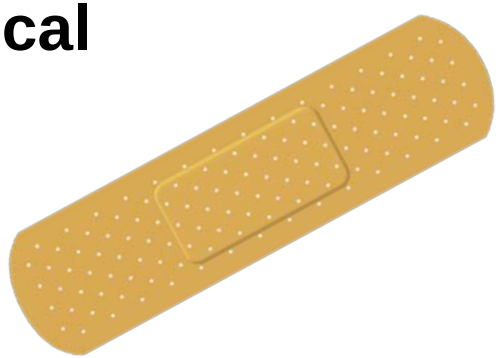
Massive hemoptysis can be fatal

Broad differential diagnosis

High index of suspicion with any surgical manipulation

The role of the critical care team

- **Stabilize- intubate, resuscitate**
- **Localize- CXR, bronch, CTA**
- **Mobilize- IR and/or thoracic surgery**



Questions?

Thank you

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