NON SURGICAL MANAGEMENT OF MASSIVE HEMOPTYSIS

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Definition of Hemoptysis

- The spitting of blood derived from the *lungs or bronchial tubes* as a result of pulmonary or bronchial hemorrhage.

Severity Classification

GRADE	AMOUNT /24 HRS	
Mild	< 50 ml	
Moderate	50 - 200 ml	
Severe**/Major*	> 200 ml *	150 ml per 12 hrs or** >400 ml per 24 hrs
Massive	> 600 ml	
Life-threatening		200 ml/h or 50 ml/h with respiratory failure.

*Corey R, Hla KM.Am J Med Sci 1987; 294:301–309.

**de Gracia J, de la Rosa D, Catal!an E, Alvarez A, Bravo C, Morell F. Respir Med 2003; 97: 790–795

#Garzon AA, Cerruti MM, Golding ME: Exsanguinating hemoptysis. J Thorac Cardiovasc Surg 1982; 84: 829–833.

Source of bleeding

- Bronchial arteries (90%)
- Pulmonary arteries

Causes of massive hemoptysis

Cardiac
Mitral stenosis
Tricuspid endocarditis
Congenital heart disease
Hematologic
Coagulopathy
Disseminated intravascular coagulation
Thrombocytopenia
Platelet dysfunction
Von Willebrand's disease
Infection
Lung abscess
Mycetoma
Necrotizing pneumonia
Parasitic
Fungal or tuberculous
Viral
Neoplastic
Bronchial adenoma
Bronchogenic carcinoma
Metastatic cancer
Traumatic
Blunt or penetrating chest injury
Ruptured bronchus
Fat embolism
Tracheal-innominate artery fistula
Systemic diseases
Goodpasture's syndrome
Granulomatosis with polyangiitis (Wegener's)
Systemic lupus erythematosus
Vasculitis
Behcet's disease
Idiopathic pulmonary hemosiderosis

Pulmonary
Bronchiectasis
Pulmonary embolism
Cystic fibrosis
Bullous emphysema
Iatrogenic
Bronchoscopy
Swan Ganz catheter-induced infarction
Pulmonary artery rupture
Transtracheal aspiration
Lymphangiography
Vascular
Pulmonary hypertension
A-V malformation
Aortic aneurysm
Drugs or toxins
Anticoagulants
Penicillamine
Trimellitic anhydride
Solvents
Crack cocaine
Aspirin
Thrombolytic agents
Miscellaneous
Amyloidosis
Broncholithiasis
Endometriosis
Foreign body
Cryptogenic
Septic pulmonary emboli
Lymphangioleiomatosis

Neoplastic

- Bronchogenic carcinoma
- Endobronchial tumors e.g carcinoid
- Metastasis

Pulmonary

- Bronchiectasis –CF
- Bullous emphysema
- Alveolar hemorrhage and underlying causes

Vascular

- Pulmonary artery aneurysm (Rasmussen aneurysm, mycotic, arteritis)
- Bronchial artery aneurysm
- PE
- Pulm HTN
- Airway-vascular fistula
- AV Malformations
- MS
- LVF

Vasculitis

- Wegener's granulomatosis
- Goodpasture's syndrome
- Behçet's disease
- SLE

Haematological

- Coagulopathy /Platelet disorders
- Uremia/ Platelet dysfunction
- Anticoagulant therapy

Etiologies of massive hemoptysis in several series

	South Africa• 1983–1990	New York City∆ 1991–1992	Jerusalem◇ 1980–1995
Bronchiectasis	51 percent*	25 percent	20 percent
Tuberculosis	73 percent	16 percent	
Bronchogenic carcinoma	5 percent	12 percent	15 percent
Aspergilloma	0	12 percent	
Pneumonia	4 percent	5 percent	23 percent
Bleeding diathesis	0	0	15 percent
Other	10 percent	5 percent	20 percent
Undefined	8 percent	19 percent	0
"Bronchitis"	0	5 percent	7 percent

* All patients with bronchiectasis had tuberculosis.
• *Data from Knott-Craig, CJ, Oostuizen, JB, Rossouw, G, et al, J Thorac Cardiovasc Surg 1993; 105:394.*
∆ Data from McGuiness, G, Beacher, JR, Harkin, TJ, et al, Chest 1994; 105:1155.
◇ Data from Hirshberg, B, Biran, I, Glazer, M, Kramer, M, Chest 1997; 112:440.

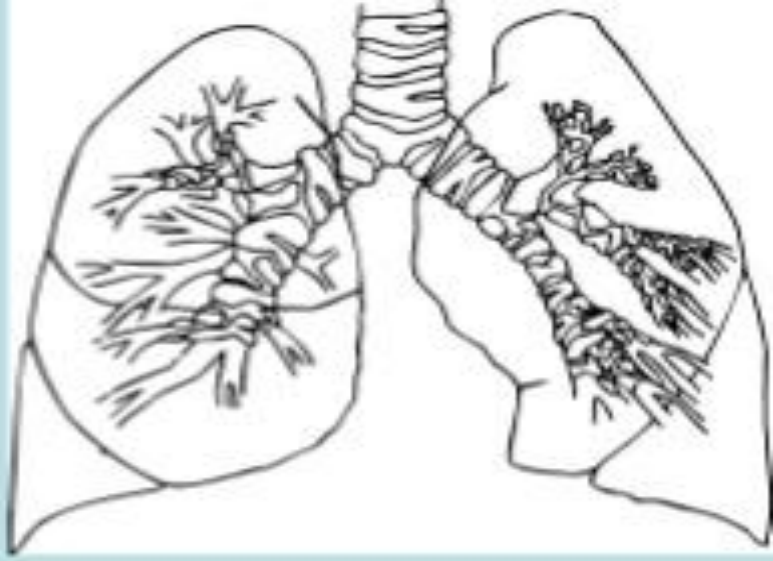
Predictors of Mortality

- 71% in patients who lost =>600 ml of blood in 4 h
- 22% in patients with =>600 ml within 4–16 h
- 5% in those with 600 ml of within 16–48 h
- Life-threatening massive : 5 to 15%.

MANAGEMENT


Provide suction.
Air way
Provide O2
Breathing
crystalloid solutions
AND blood products
Circulation

Management



Objects of Management -

Prevent asphyxiation
Localize site of bleeding
Arrest the bleeding
Determine cause of hemoptysis
Treat the patient definitively

INITIAL STEPS

1. IDENTIFY WHICH SIDE IS BLEEDING
2. POSITION THE PATIENT
3. ESTABLISH A PATENT AIRWAY
4. INSURE ADEQUATE GAS EXCHANGE
5. INSURE ADEQUATE CVS FUNCTION
6. CONTROL THE BLEEDING

History

- Does the patient have known pulmonary, cardiac, or renal disease?- smoke?
- Prior hemoptysis, other pulmonary symptoms, or infectious symptoms?
- FH of hemoptysis, brain aneurysms, epistaxis, or GI ? a skin rash?
- Exposed to asbestos?
- Bleeding disorder? DVT risk?
- DRUGS?
- Has the patient had (TB) or been exposed to TB?

Physical Examination

- Telangiectasias
- A skin rash,Splinter hemorrhages ,Needle tracks →IE
- An audible chest bruit or murmur that increases with inspiration → a large pulmonary AV malformation.
- P2, TR or PR, or RV lift
- Heart murmurs →MS , CHD
- DVT signs

Laboratory tests

- Type and cross-matching
- CBC ,COAG
- Electrolytes, BUN
- ABG
- Liver function tests
- Urinalysis
- Special tests

CXR

- Site of bleeding in 33–82% *of cases.
- Underlying cause in 35%**.
- Rarely normal

Bronchoscopy

- Flexible bronchoscopy is the initial diagnostic procedure of choice :

performed at the bedside, it is readily available, and it is highly successful at localizing the bleeding site if it is performed while the patient is bleeding.

- Intubation should be considered .

CT SCAN

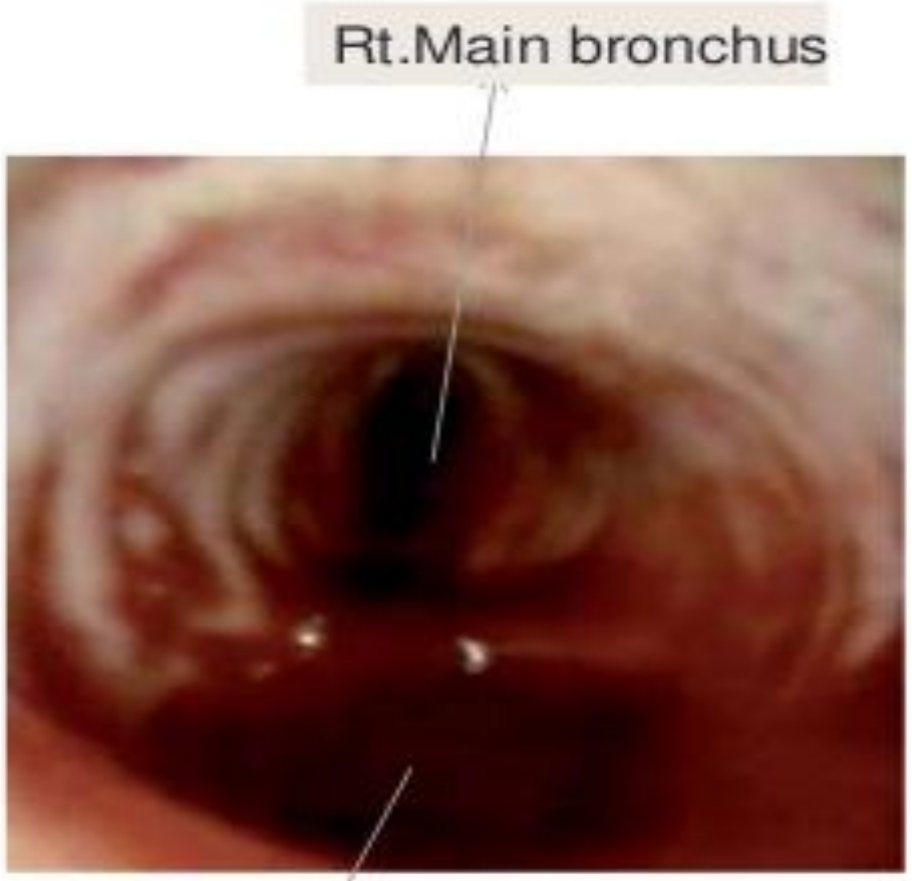
- Superior to CXR
- Correct localization in 70–88.5% of cases*

  Multidetector CT - bronchial and nonbronchial systemic arteries .
- Better than bronchoscopy for determining the cause of bleeding.

Arteriography

- Persistent bleeding following bronchoscopy.
- The preceding bronchoscopy may be helpful in identifying the area of bleeding→ assisting the radiologist in locating the precise bleeding site.
- Therapeutic embolization is possible during the diagnostic arteriography procedure.

Protection of nonbleeding lung



- If bleeding side is known
  Keep patient at:

  -Rest

  -Lateral decubitus

  -Bleeding side down

- IDENTIFY WHICH SIDE IS BLEEDING
- POSITION THE PATIENT
- **ESTABLISH A PATENT AIRWAY**
- INSURE ADEQUATE GAS EXCHANGE
- INSURE ADEQUATE CVS FUNCTION
- **CONTROL THE BLEEDING**

CONTROL THE BLEEDING

- Non-surgical

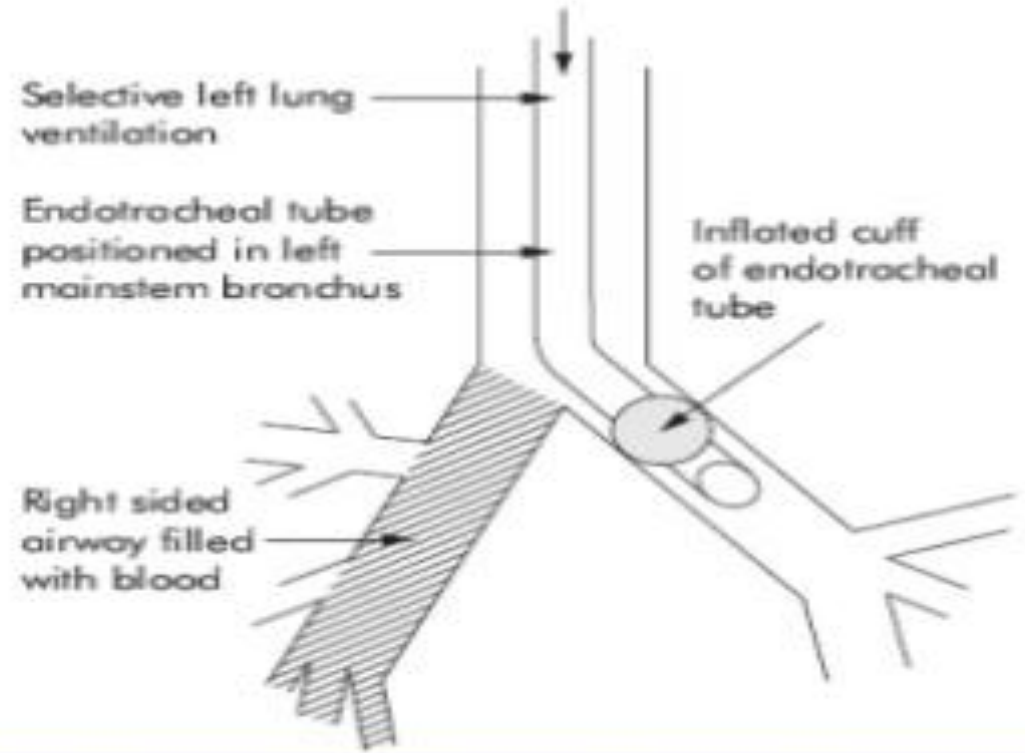
Blood products
Bronchoscopic measures
BAE

- Surgery

Selective Intubation

SINGLE LUMEN ETT

- Selectively intubate the non bleeding lung.



Selective intubation of L Main bronchus in R sided massive hemoptysis

RIGID BRONCHOSCOPE

RIGID

ADVANTAGES

- Larger lumen- packing/clearing clots
- Improved suctioning

- Better clearance
- Improved visualization
- Continuous OPENING FOR airway

FLEXIBLE

ADVANTAGES

- Performed at bedside
- Access:UL/distal orifices
- CAN DO Lavage
- Topical anaesthesia

RIGID

DISADVANTAGES

- Poor visibility of peripheral lesions and UL
- GA

FLEXIBLE

- DISADVANTAGES
- Poor suction
- Air way patency is not good

URGENT OPERATION INDICATIONS

FUNGUL BALL

LUNG ABSCESS

CAVITARY DISEASE(eg TB)

FAILURE TO CONTROL BLEEDIND


THANK YOU