PRESENTATION & MANAGEMENT OF COMMON THORACIC DISEASES

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48 millions of people in South Korea

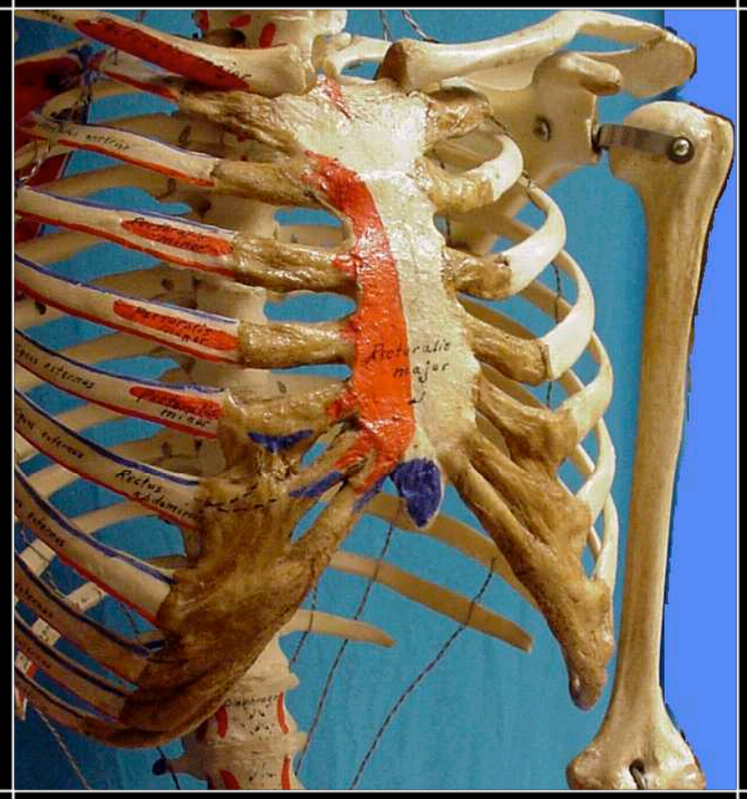
10 millions of people in Seoul


CK 2008 Nightview
blog.paran.com/imck2

Severance Hospital

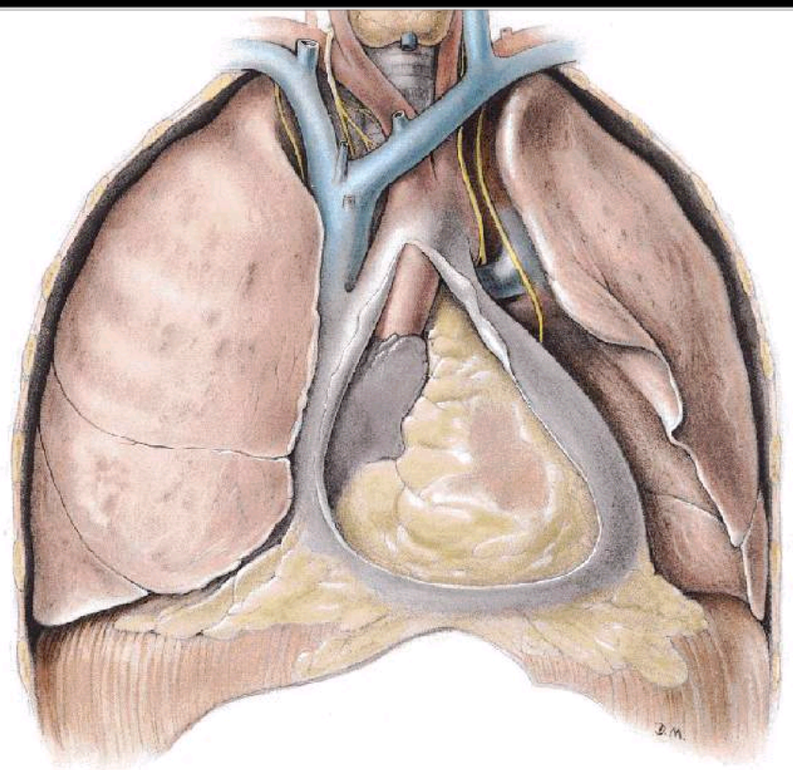
Established in 1885

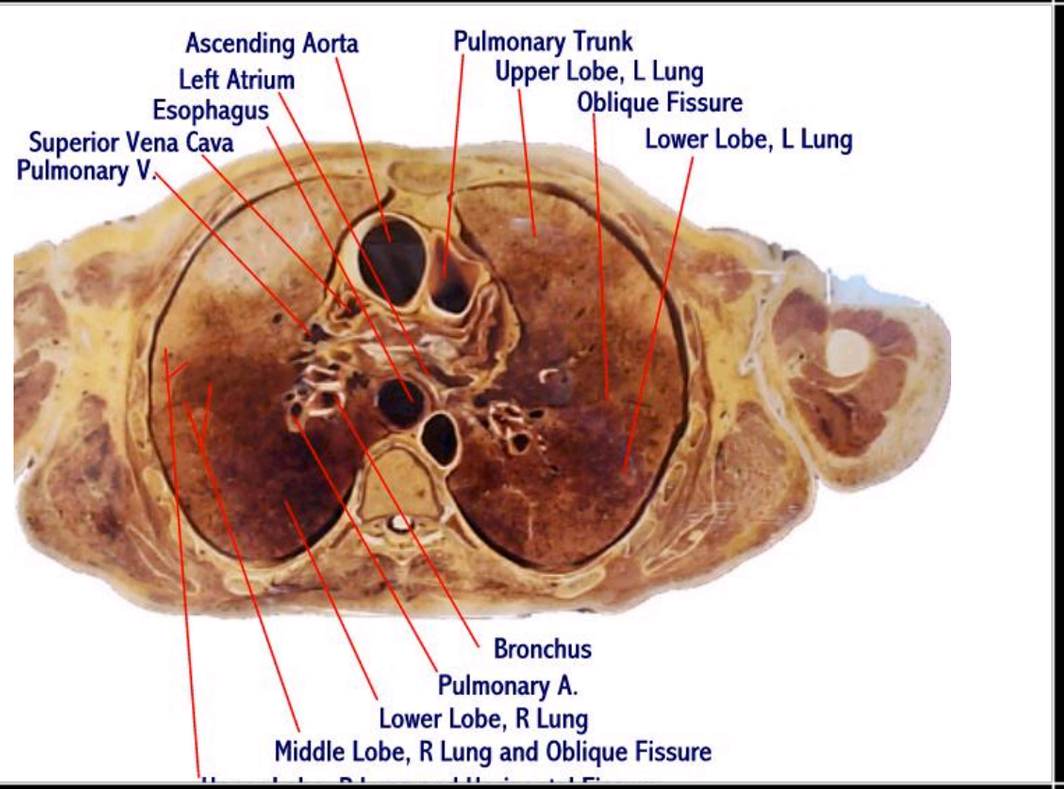
Thorax



the part of the body between the neck and the abdomen, including the cavity enclosed by the ribs, sternum, and vertebrae, and containing the chief organs of circulation and respiration

Thoracic Viscera





lungs
mediastinal structures
pleura / pericardium
nerves

Pleura

Mediastinum

Lung

Pleura

Anatomy & physiology

- Parietal pleura

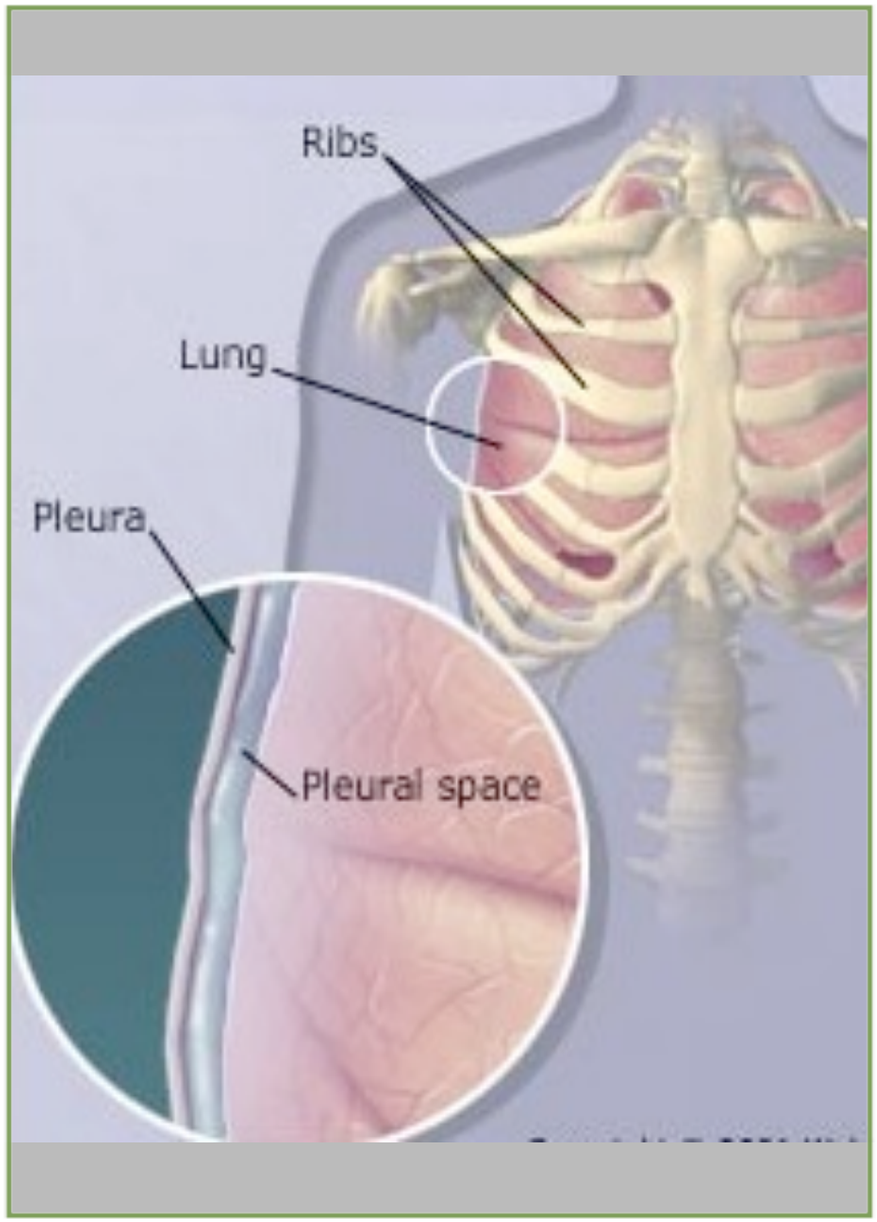
  somatic innervation

  intercostal, phrenic n.
- Visceral pleura

  no somatic innervation
- Pleural space

  fluid as lubricant

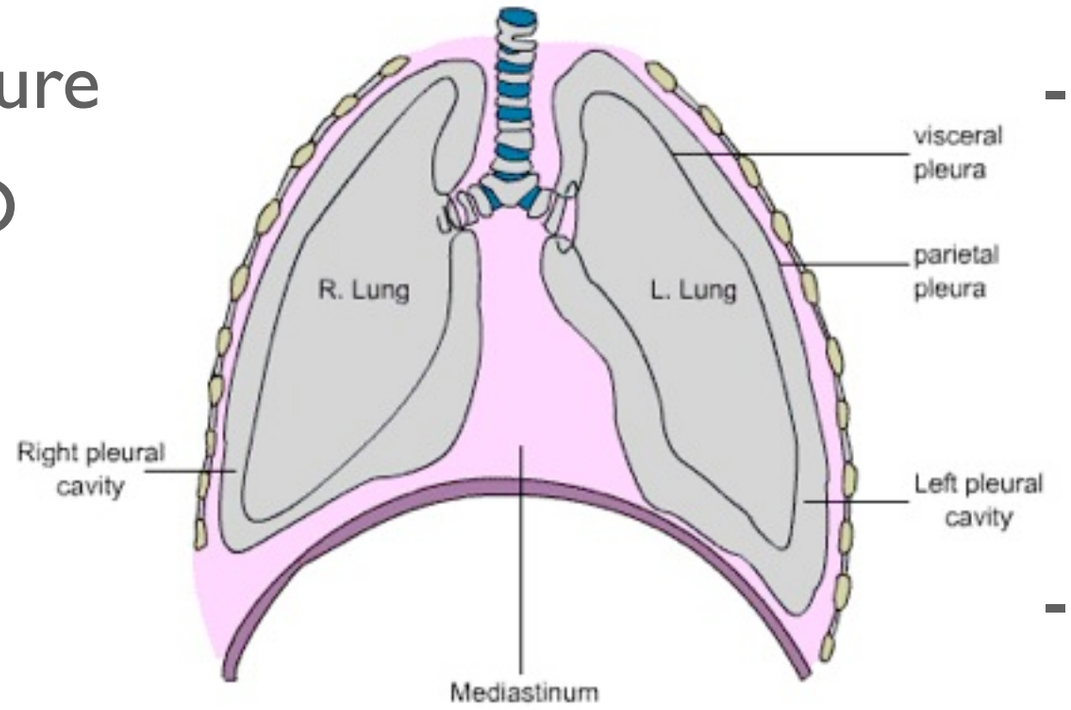
  0.01mL/kg/hr ^ 0.20mL/kg/hr



- Pleural pressure

  negative pressure

  -4 ... -8cmH2O



-8cmH2O

-2cmH2O

  valsalva meneuver - positive pressure

- Changes in pathologic condition

  ↓ - atelectasis, pulmonary edema, ILD

  ↑ - COPD, bronchial obstruction

Overview

Pneumothorax	Spontaneous primary — subpleural bleb rupture secondary — COPD, P. carini, lung cancer, LAM, catamenial neonatal — HMD, meconium aspiration Acuired iatrogenic barotrauma traumatic — blunt / penetrating
Hemothorax	Spontaneous — pneumothorax, pulmonary AVM Traumatic
Chylothorax	Congenital Traumatic blunt / penetrating / surgical / diagnostic / neoplasms
Pleural effusion	Transudate CHF / cirrhosis / nephrotic SD / myxedema Exudate infectious / neoplastic / postop / collagen vascular diseases
Empyema thoracis	Parapneumonic Lung abscess Post-surgical Trauma
Tumors	Localized fibrous tumor - benign / malignant Diffuse malignant mesothelioma

Closed drainage system

- Underwater seal drainage

  drainage of fluid, air etc

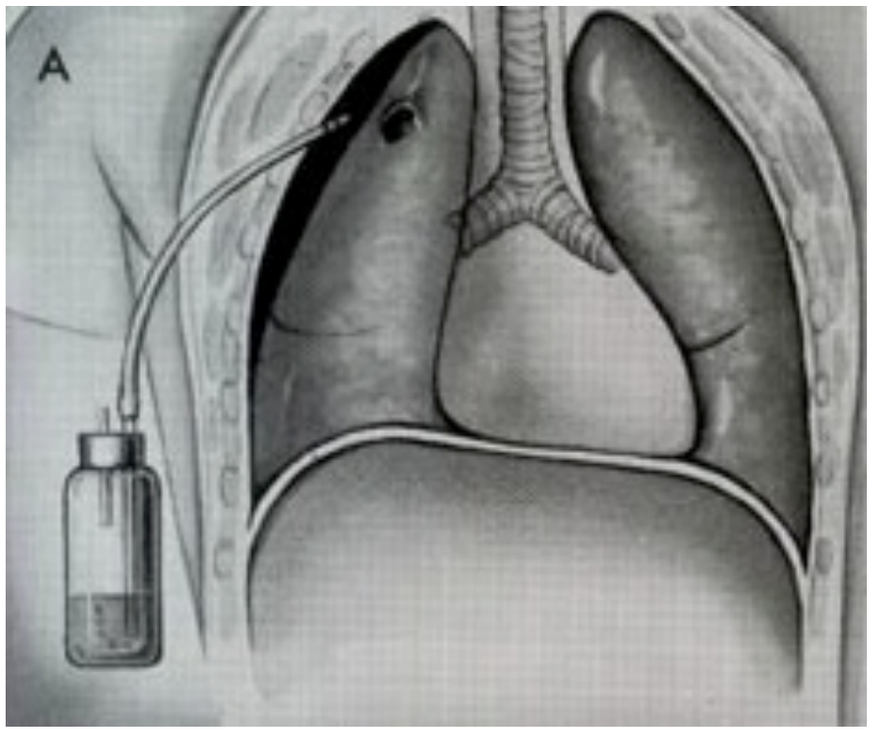
  re-expansion of the lung

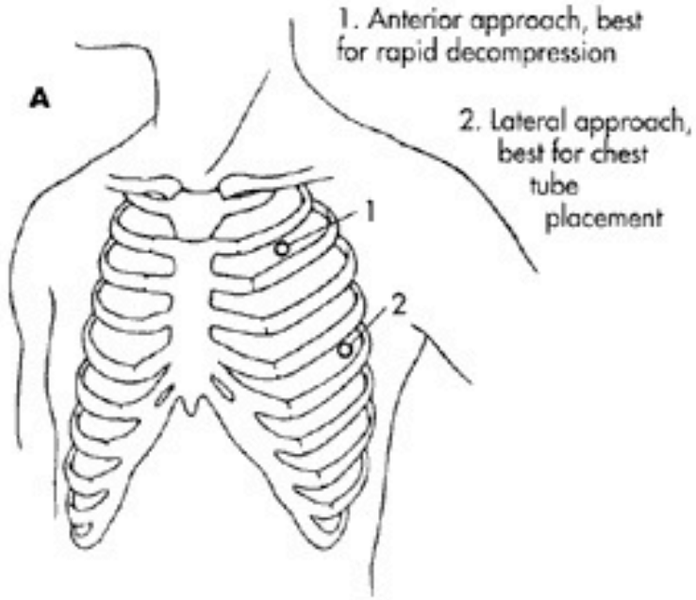
  ↓

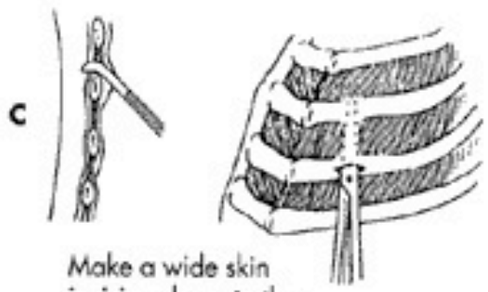
  maintain negative pressure

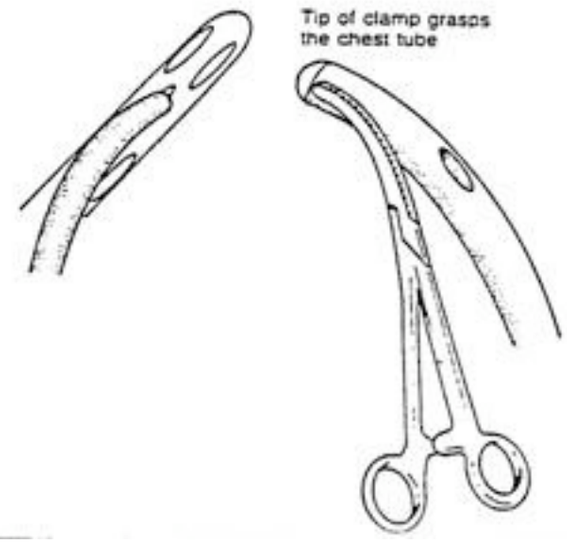
  prevent contamination from

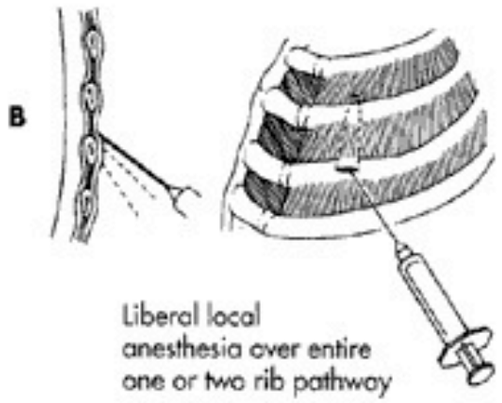
  the room air

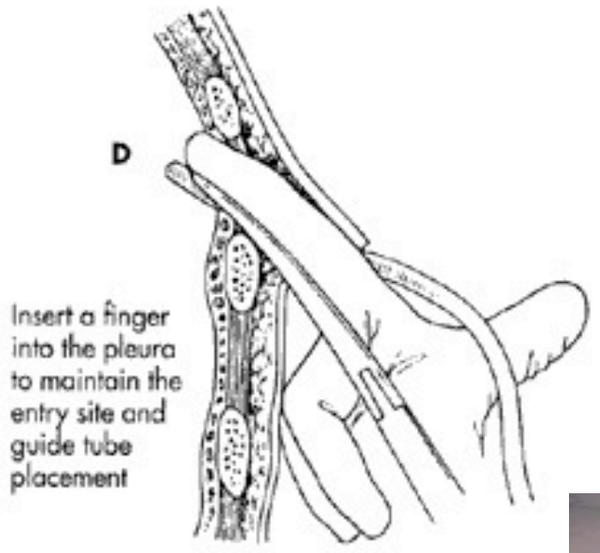



A
1. Anterior approach, best for rapid decompression
2. Lateral approach, best for chest tube placement
1
2


C
Make a wide skin incision down to the rib surface

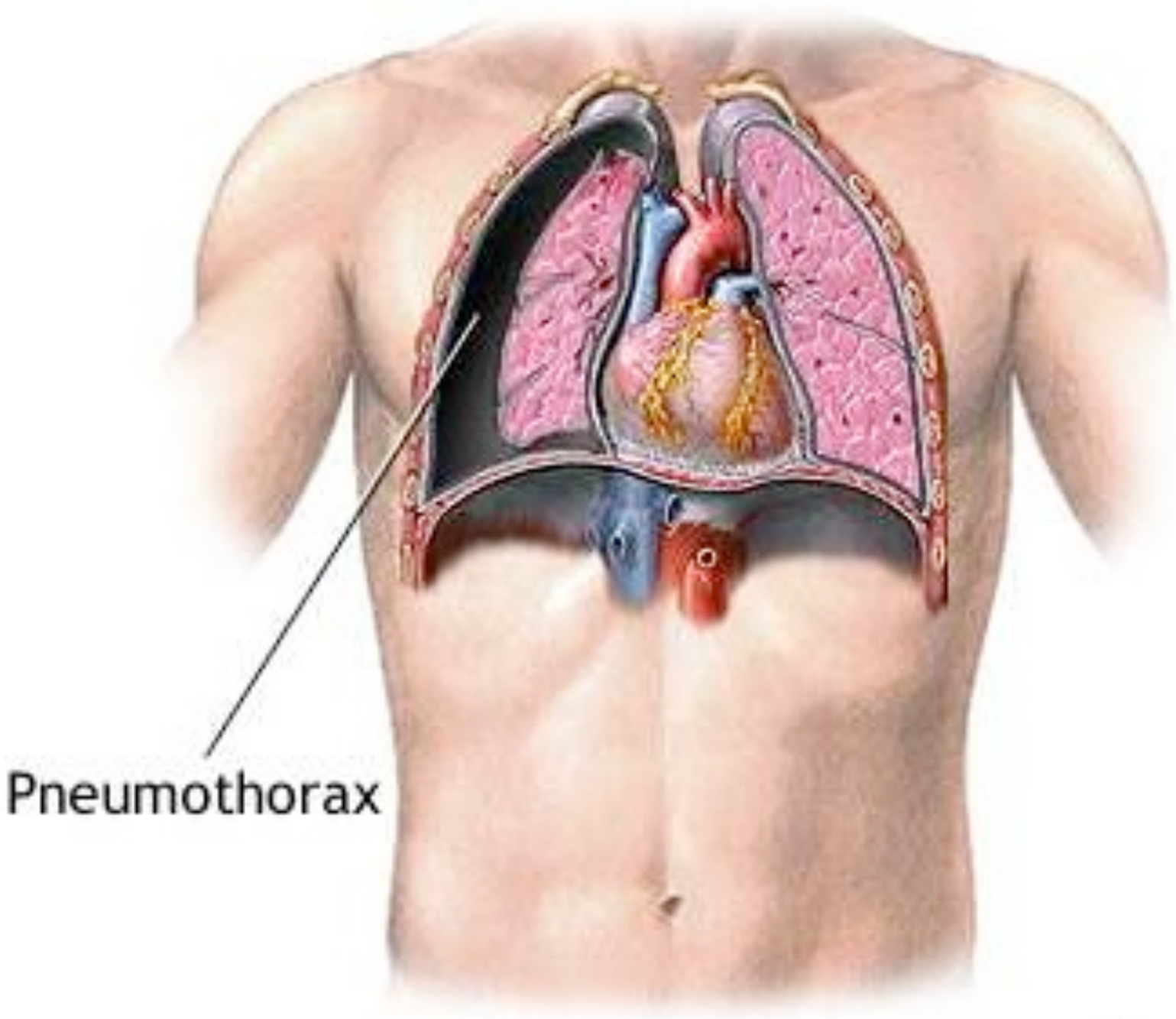

Tip of clamp grasps the chest tube

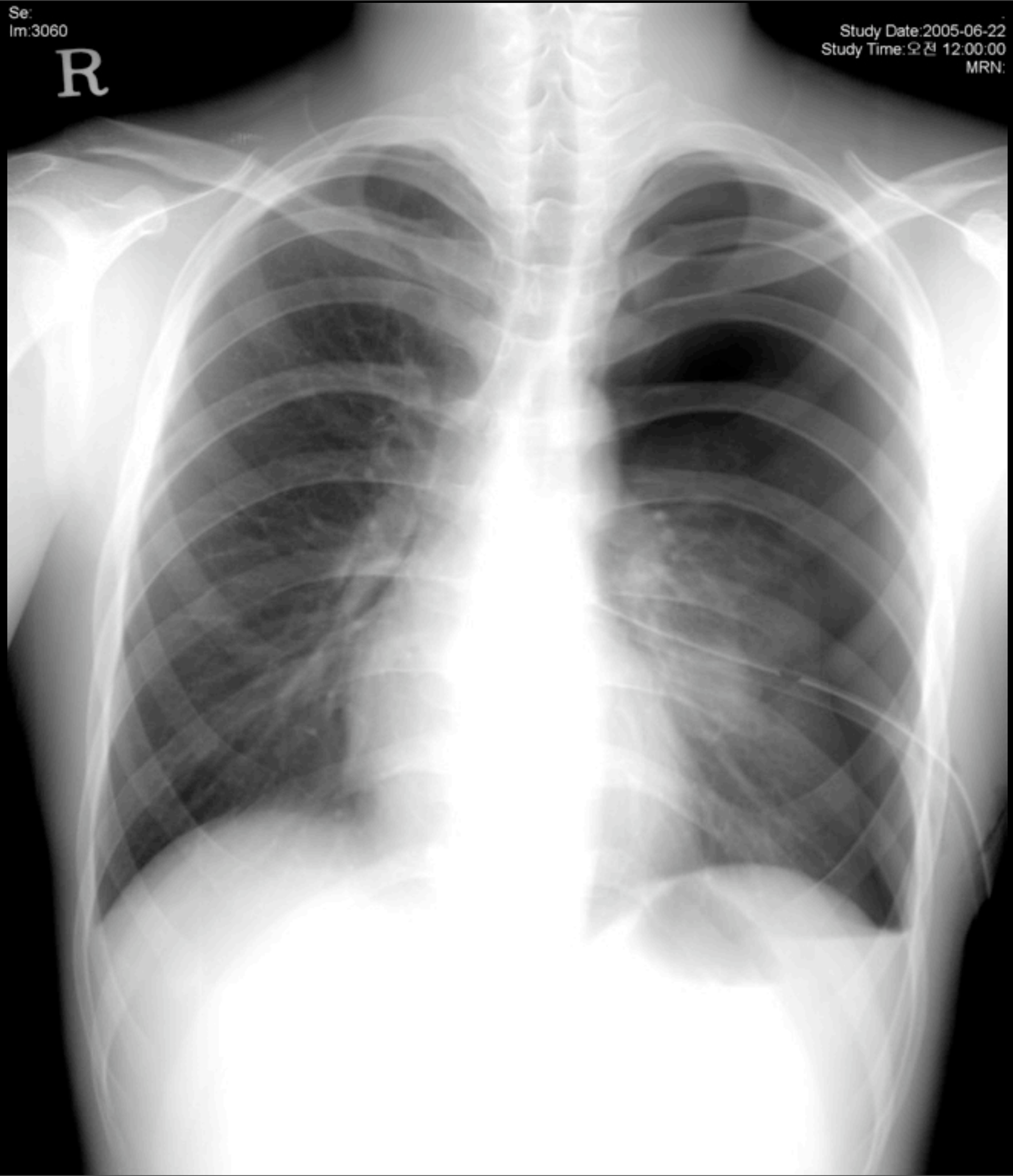

B
Liberal local anesthesia over entire one or two rib pathway


D
Insert a finger into the pleura to maintain the entry site and guide tube placement

Primary pneumothorax

- Etiology
  - ruptured subpleural bleb ... apex
  - local ischemia? / high transpulmonary pressure at apex?
- Clinical presentation
  - young age (20-30), tall & slender man
  - familial? - HLA A2B40
  - symptom - chest pain / dyspnea
  - recurrence - 25~40% / within 2 years
- Diagnosis
  - chest PA ... chest CT?


Pneumothorax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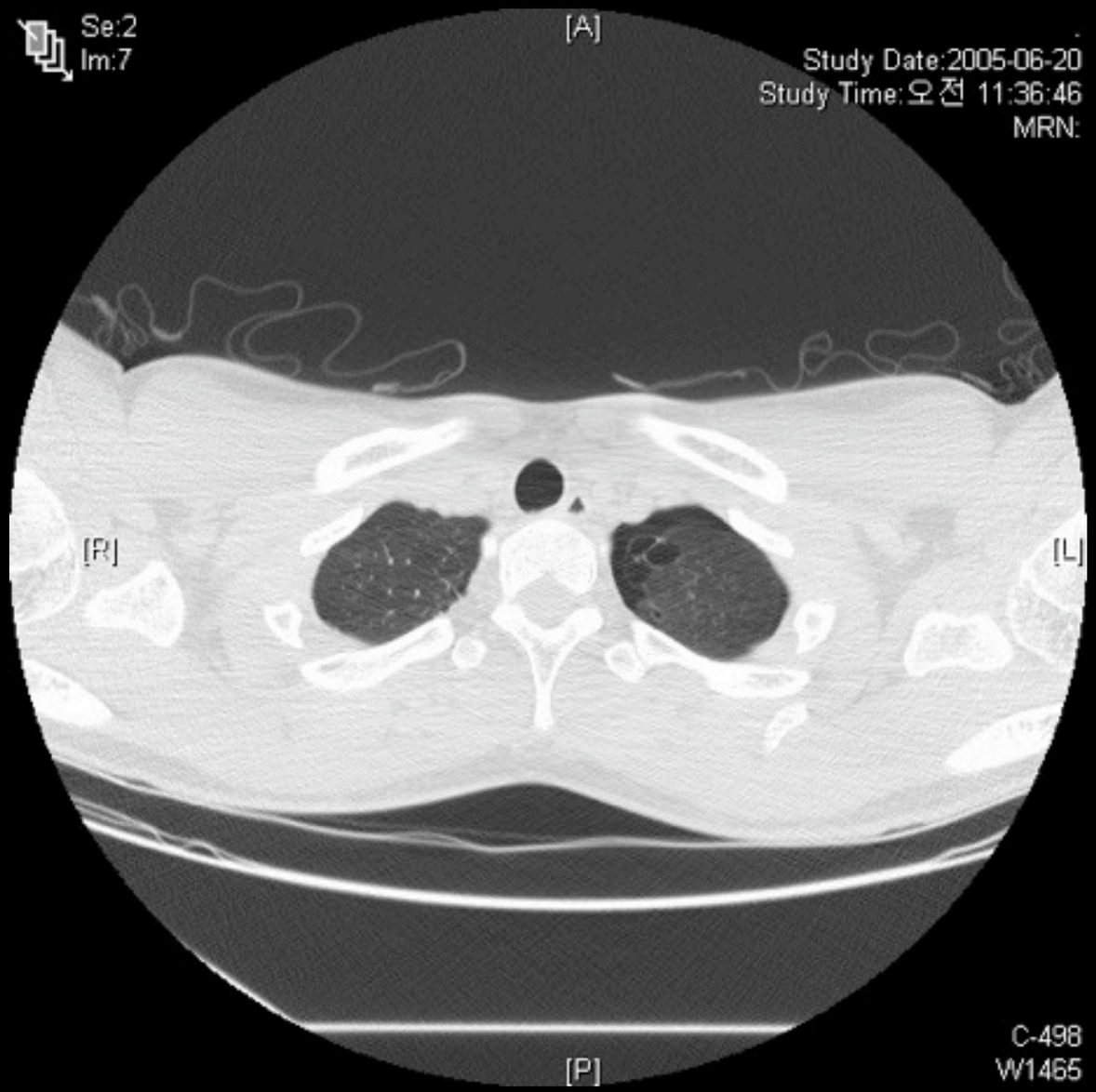
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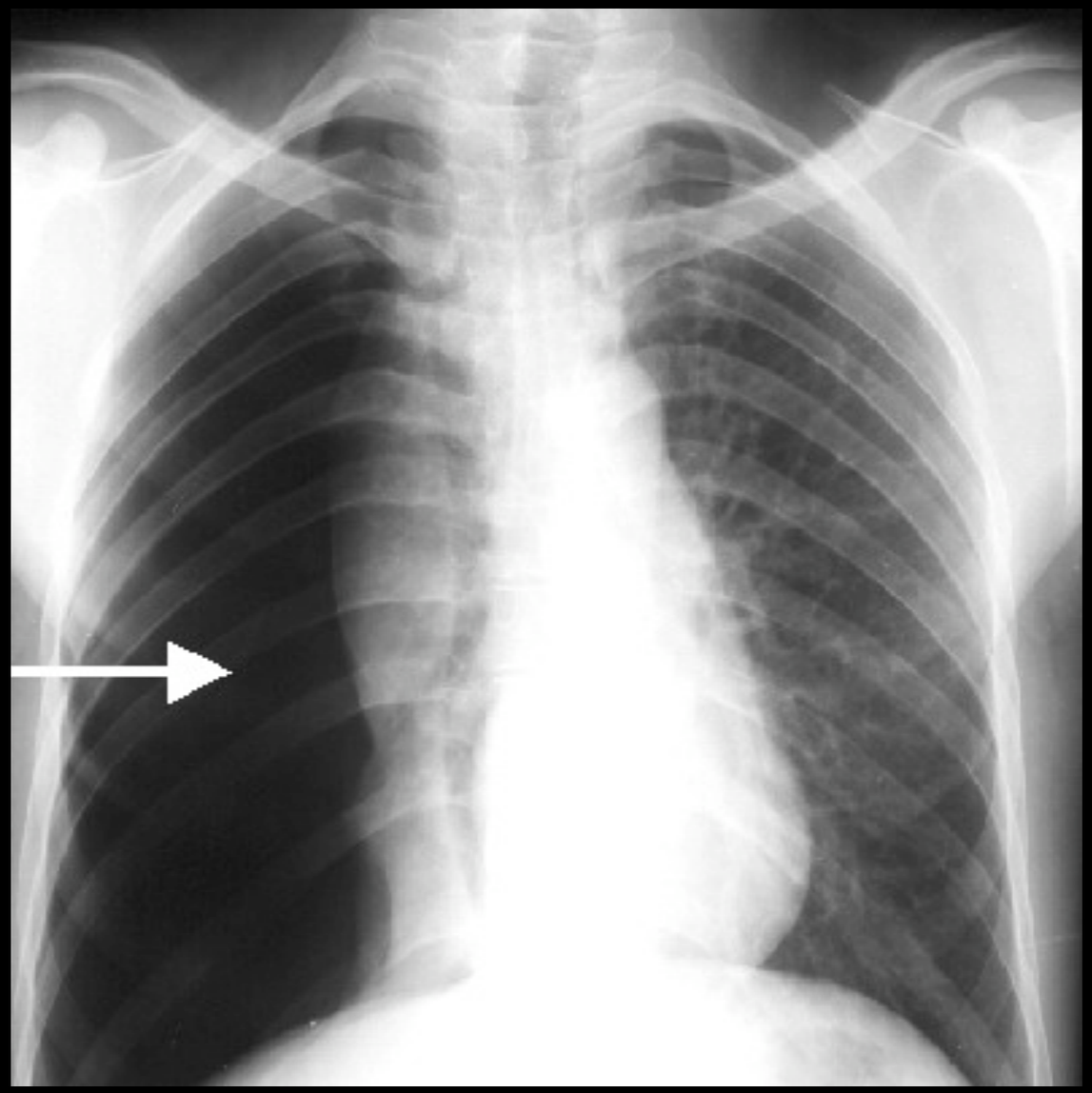
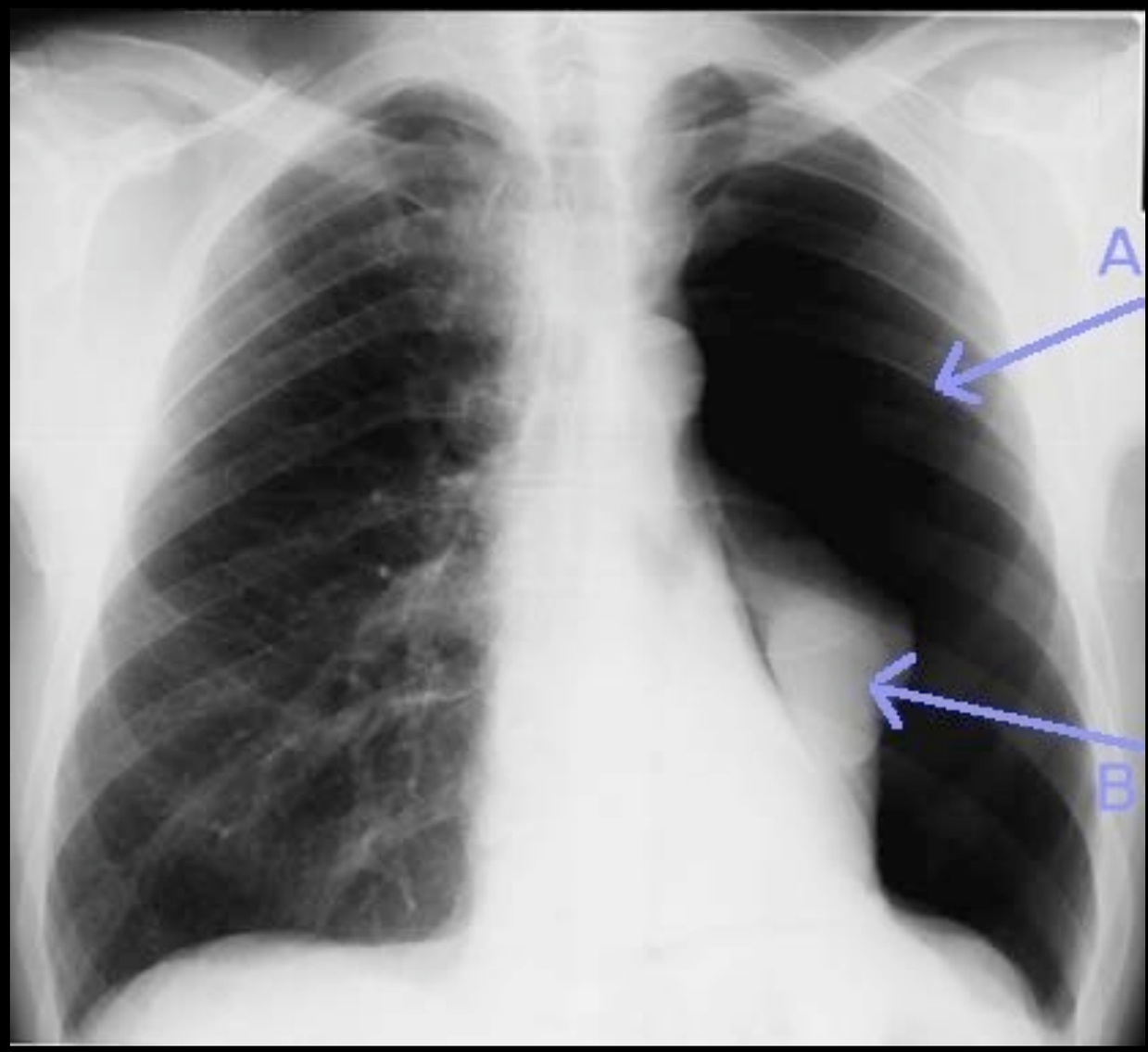
C-498
W1465

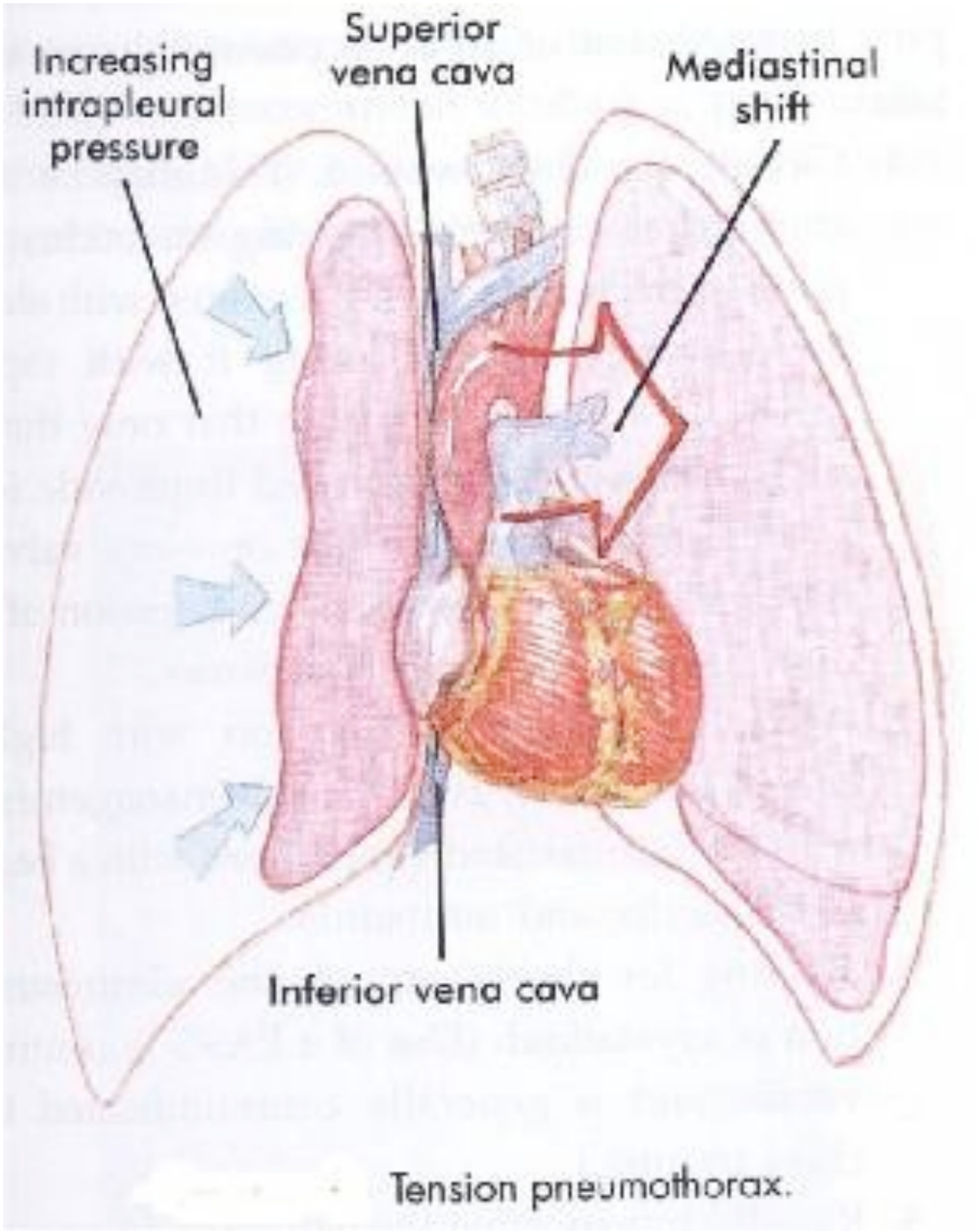
Quiz





A

B



Tension pneumothorax.

- Treatment options for pneumothorax

1. observation / high O2

2. needle aspiration (thoracentesis)

3. percutaneous catheter

4. tube thoracostomy (+ chemical pleurodesis)

5. VATS*

   thoracotomy*

- Indications for operative intervention* (wedge resection)

1. recurrent pneumothorax

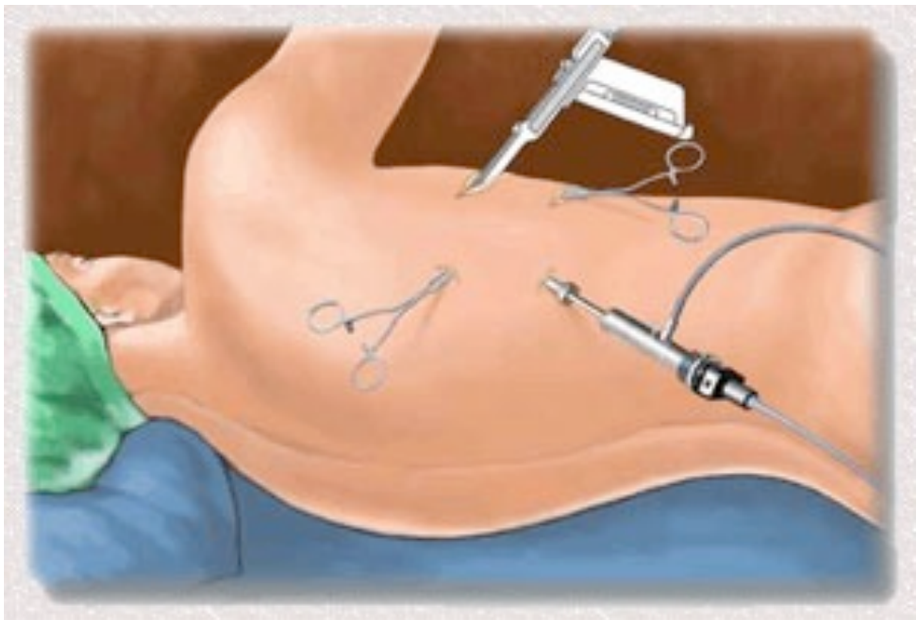
2. persistent air leak (> 5 days)

3. massive air leak that prevent re-expansion of the lung

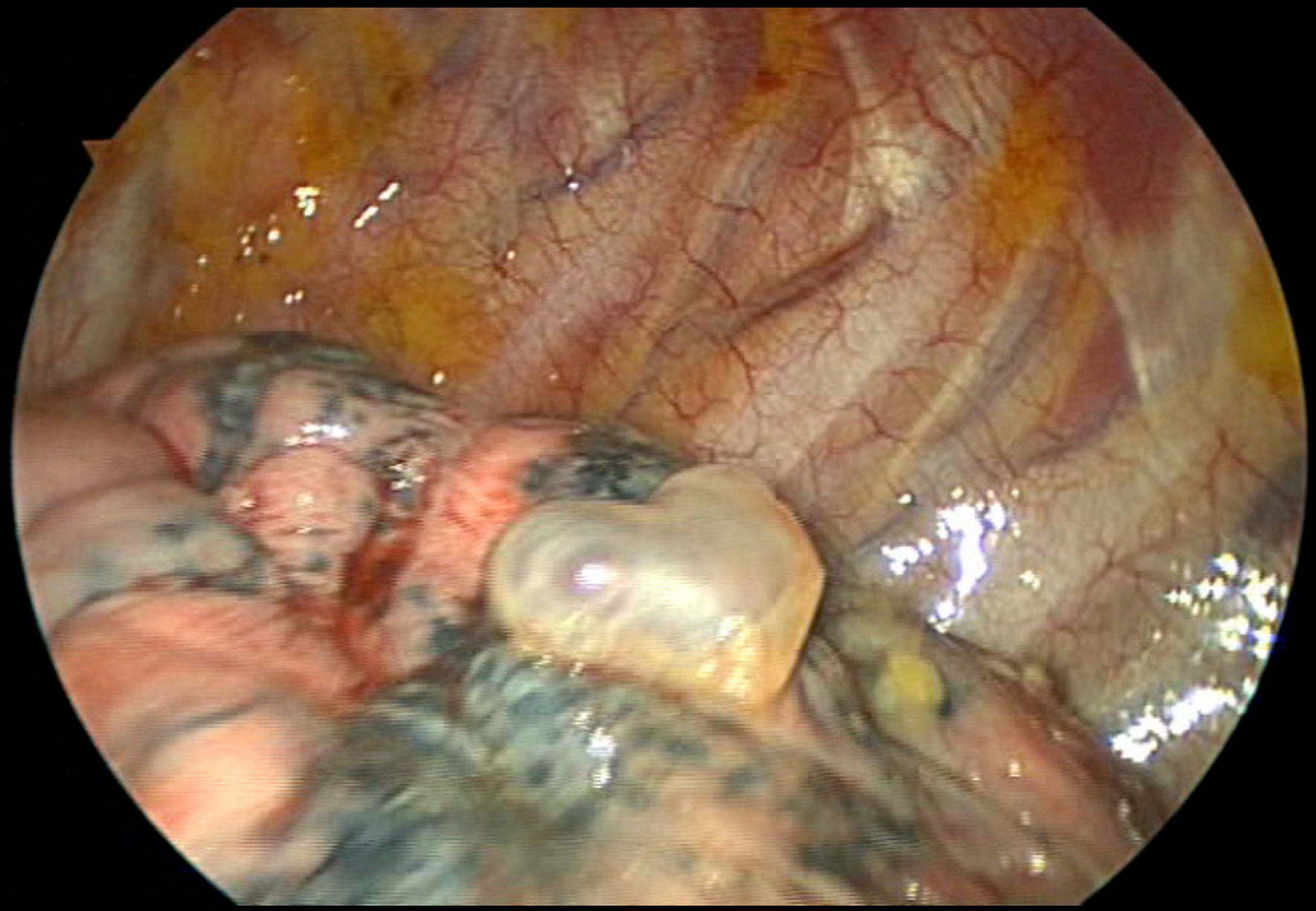
4. bilateral pneumothorax

5. first episode with occupational hazard (pilot, diver)

* Transaxillary minithoracotomy
  - 2nd/3rd ICS
  - lower recurrences (1-2%)
  - cost effective
  ... pain, wound problem



*VATS
  - no limitation of entry
  - less pain
  - cosmetic
  ... recurrence (3-4%)
    expensive



Empyema thoracis

- Definition

  - accumulation of pus in the pleural space

- Etiology

  - parapneumonic or postpneumonic*
  - lung abscess
  - from adjascent organ : liver abscess, esophageal perforation
  - thoracic trauma (foreign body, open wound)
  - generalized sepsis
  - post-surgical (lobectomy, pneumonectomy)

- Three phases of empyema (see text)
  1. acute, exudative phase
  2. subacute, fibrinopurulent phase
     . peel formation, loculation
  3. chronic, organizing phase
     . predisposing factors

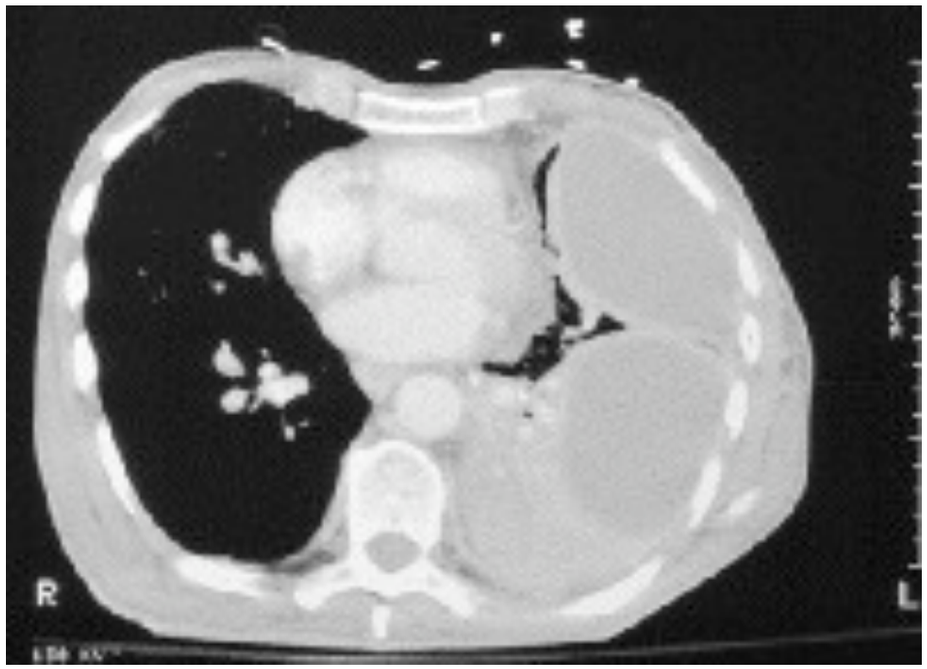
- Complications of empyema
  - empyema necessitatis
  - bronchopleural fistula
  - chondritis, osteomyelitis of the rib
  - metastatic abscess (brain, vertebra)
  - mediastinal abscess, pericarditis

- Management of empyema thoracis

goal... re-expansion of the lung c obliteration of dead space

methods

1. thoracentesis - avoid repeated thoracentecis
2. closed thoracostomy
3. decortication c empyemectomy - ideal method
4. thoracoplasty c/s myoplasty
5. Clagett's procedure
6. open drainage - tube, Eloesser's flap



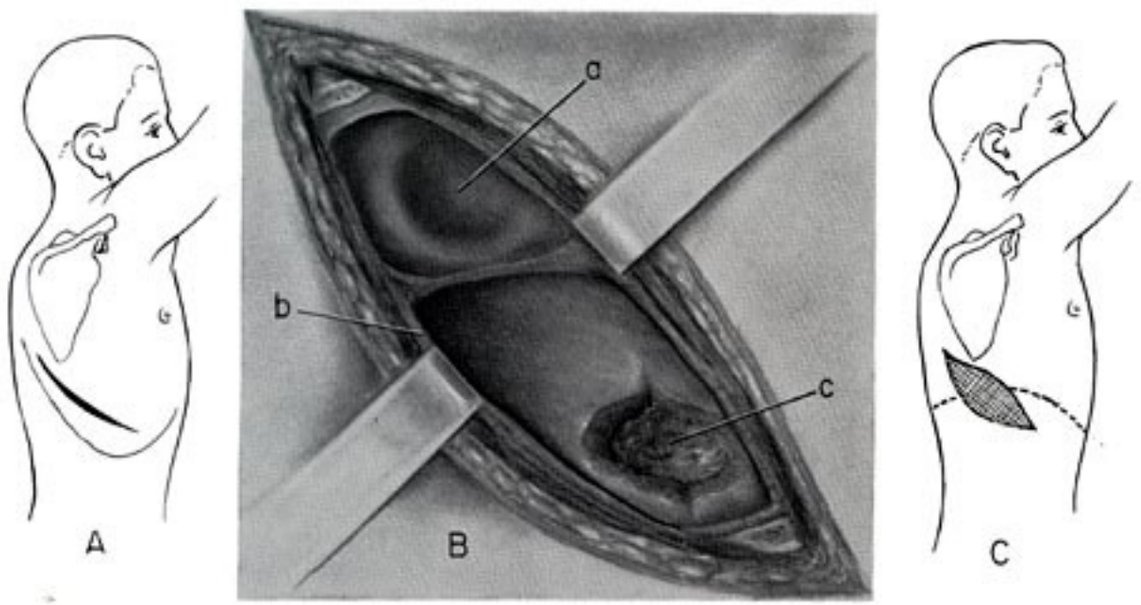


FIGURE 17.—Combined drainage of chronic empyema and liver abscess following thoracoabdominal wound. A. Site of incision. B. Transphrenic deroofing of liver abscess with drainage of liver abscess and localized chronic empyema through same wound: Empyema pocket (a), divided diaphragm (b), and deroofed liver abscess (c). (Performed at 160th General Hospital thoracic surgery center.)

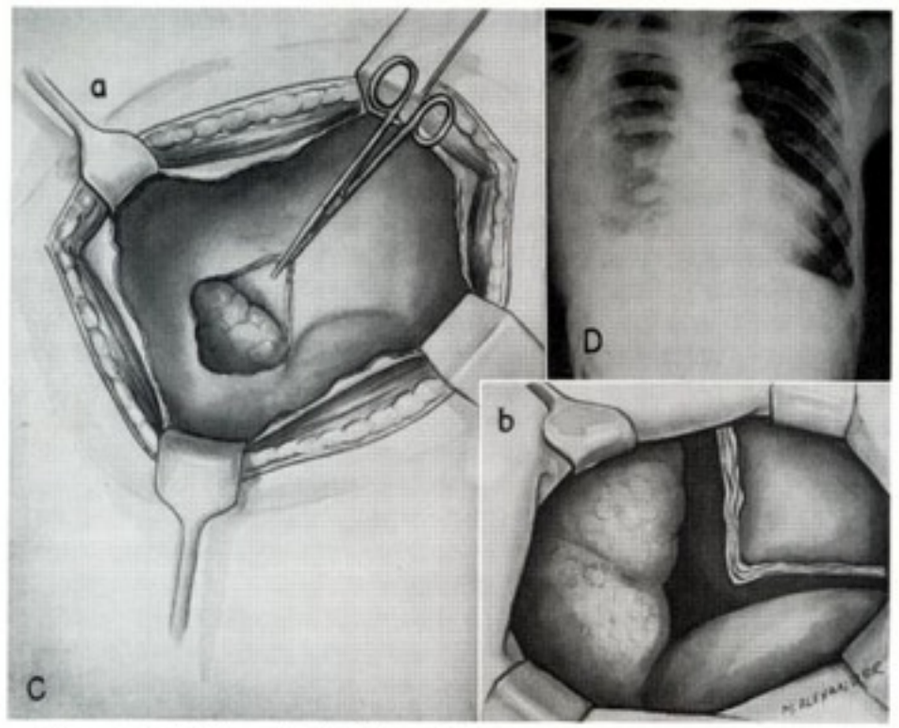
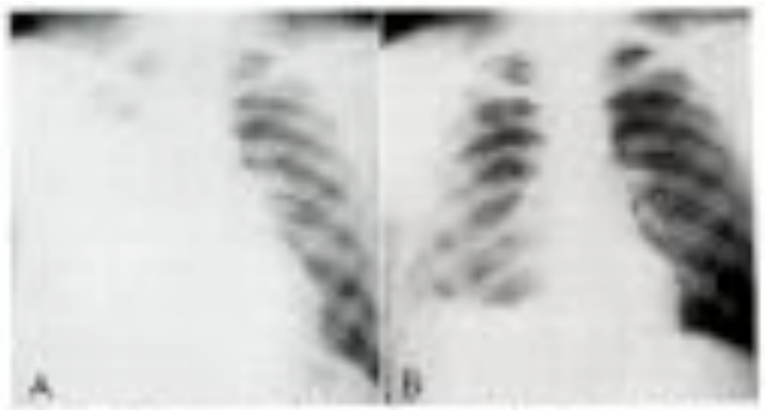


FIGURE 121.—Continued. C. Technique of right pulmonary decortication: (a) Appearance of totally collapsed right lung, which is completely immobilized by thick sheet of organizing fibrin and exudate, so that individual structures are scarcely discernible. After initial sharp dissection, a small flap of thick, organizing peel has been elevated by blunt dissection. Positive pressure has caused a slight herniation of lung through opening. (b) Mobilization of lung and diaphragm after complete decortication of visceral pleura. Visceral pleura is essentially normal and lung is expansile but not yet completely reexpanded. The ridge represents line along which thickened fibrous rind was reflected from visceral onto parietal pleurae. D. Posteroanterior roentgenogram 14 days after decortication. All drainage has ceased, and lung now completely fills pleural cavity.



Mediastinum

Anatomy

- Definition

  - the portion that separate both lungs within thorax

  - border

    . superior ... thoracic inlet

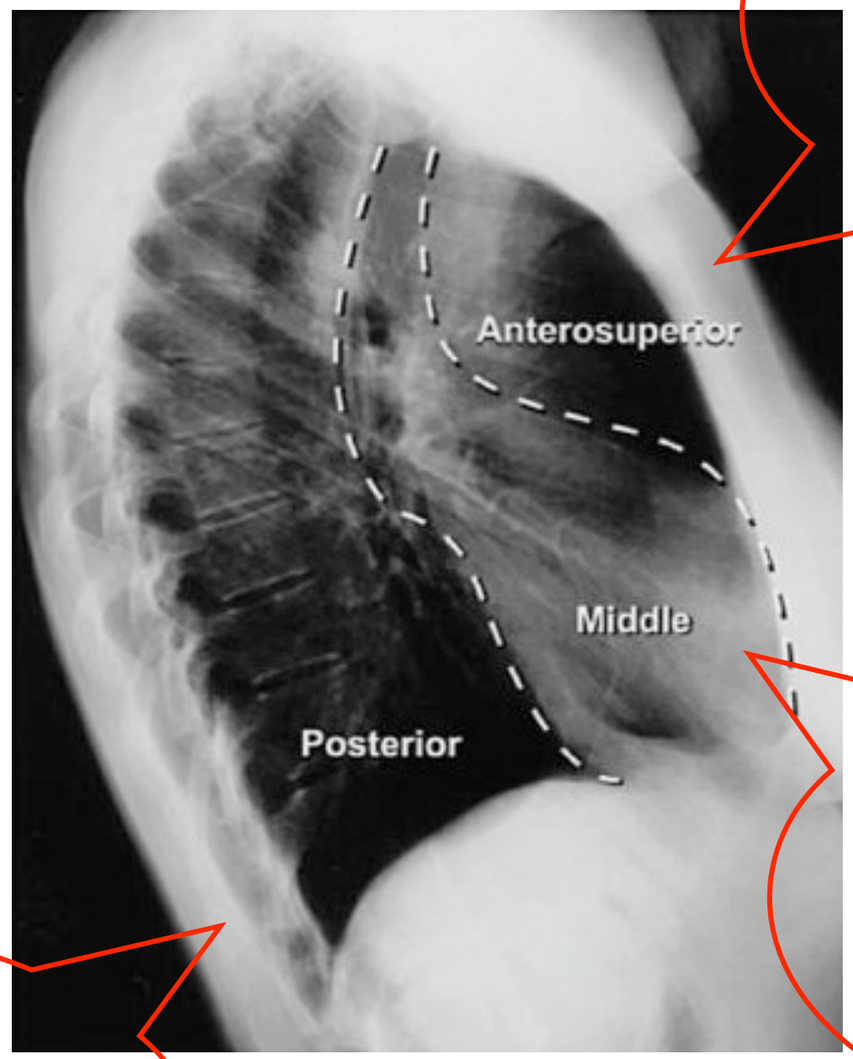
    . inferior ... diaphragm

    . anterior ... sternum

    . posterior ... thoracic vertebra

    . lateral ... parietal pleura

- Subdivision



thymus
lymphatic duct
aortic arch
loose areolar tissue

heart
pericardium
phrenic nerve
main bronchus

esophagus
sympathetic chain
descending aorta
azygos vein

Pneumomediastinum

- Air in the mediastinum
- Source of air ; tracheobronchial tree / esophagus / neck / abdomen
- Etiology

  traumatic (blunt, barotrauma etc)> spontaneous, pathologic
- Symptoms

  substernal pain, crepitus .... SVC compressive symptom
- Diagnosis ; CXR
- Treatment

  conservative. (surgery according to the etiology)


R


P

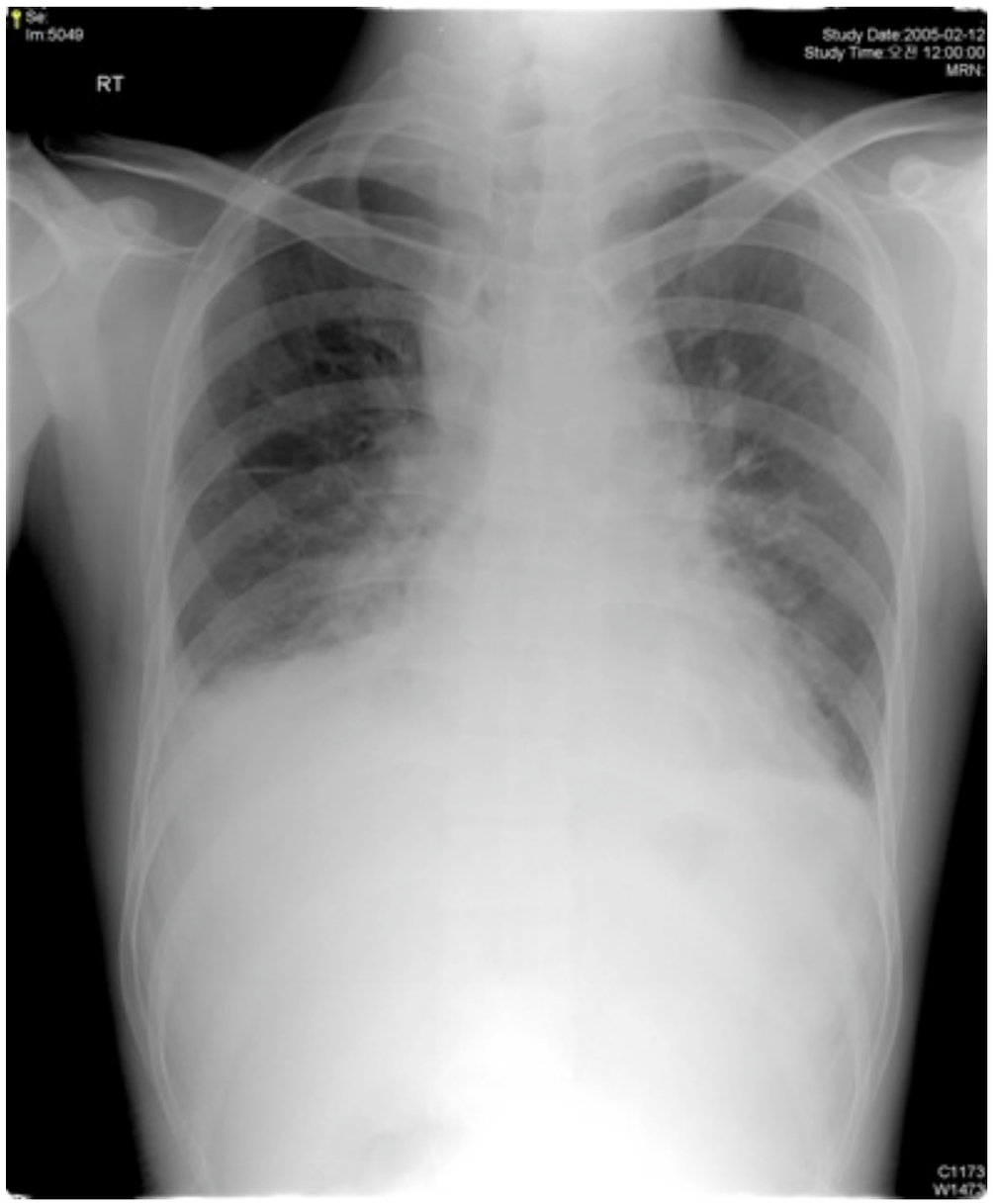
Mediastinitis

- Characteristics
  - rapid progression (loose areolar tissue)
  - acute fulminant infection → lethal
- Etiology
  - OHS with median sternotomy*
  - esophageal perforation
  - head & neck infection
  - subphrenic infection
  - blunt & penetrating trauma

- Clinical manifestation
  - chest pain, dysphagia, dyspnea, high fever
  - not evident on early CXR
  - delay in Dx/Tx → sepsis & death

- Treatment principles
  - assessment of primary focus
  - prompt control of primary focus
  - adequate drainage of abscess
  - antibiotics (covering anaerobes)
  - nutritional support

Case.



M/36

periodontal abscess
→ dental clinic

dysphagia
chest tightness
mild chilling

fever (+)
mild leukocytosis

Se:4
Im:3

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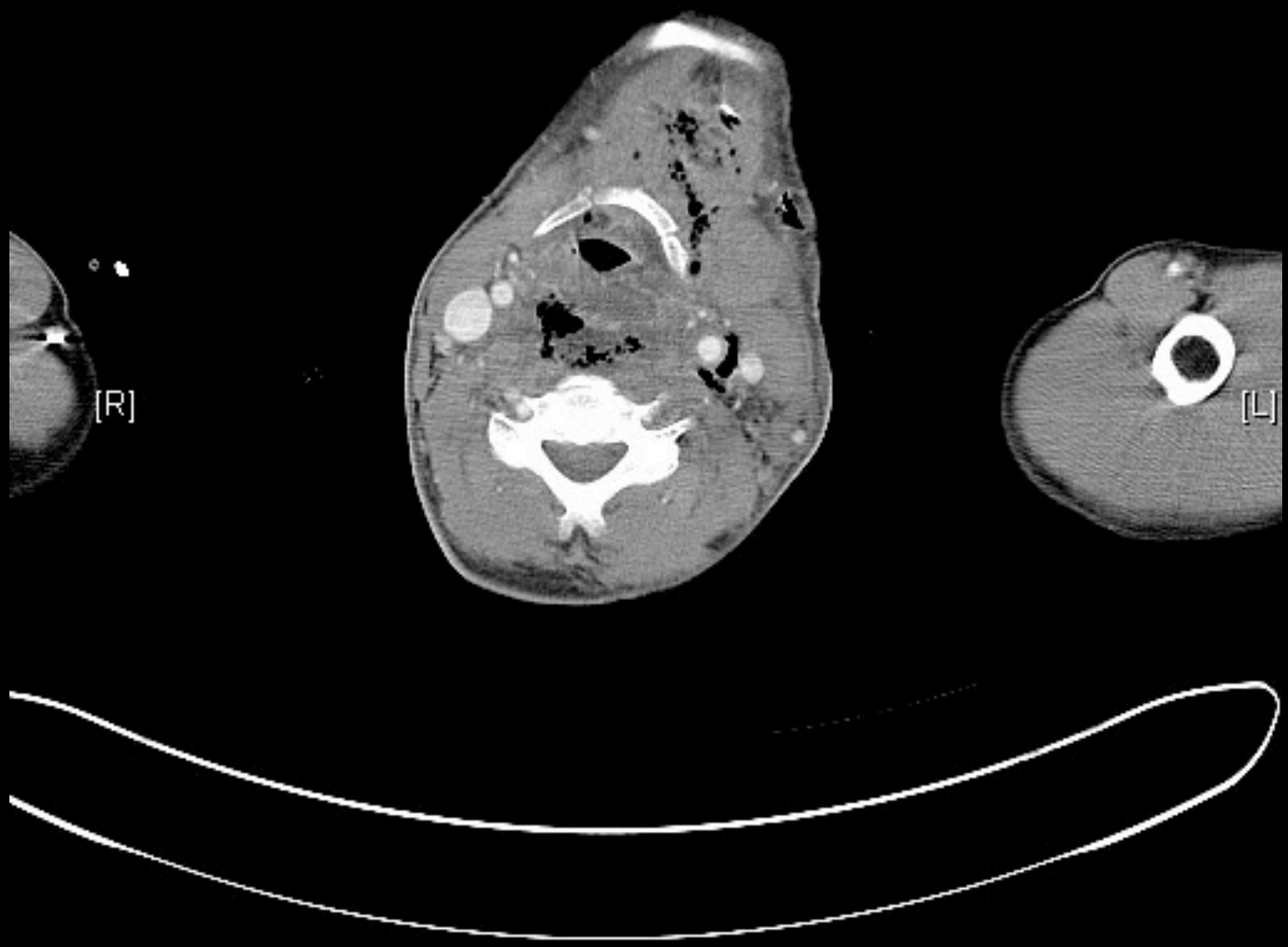

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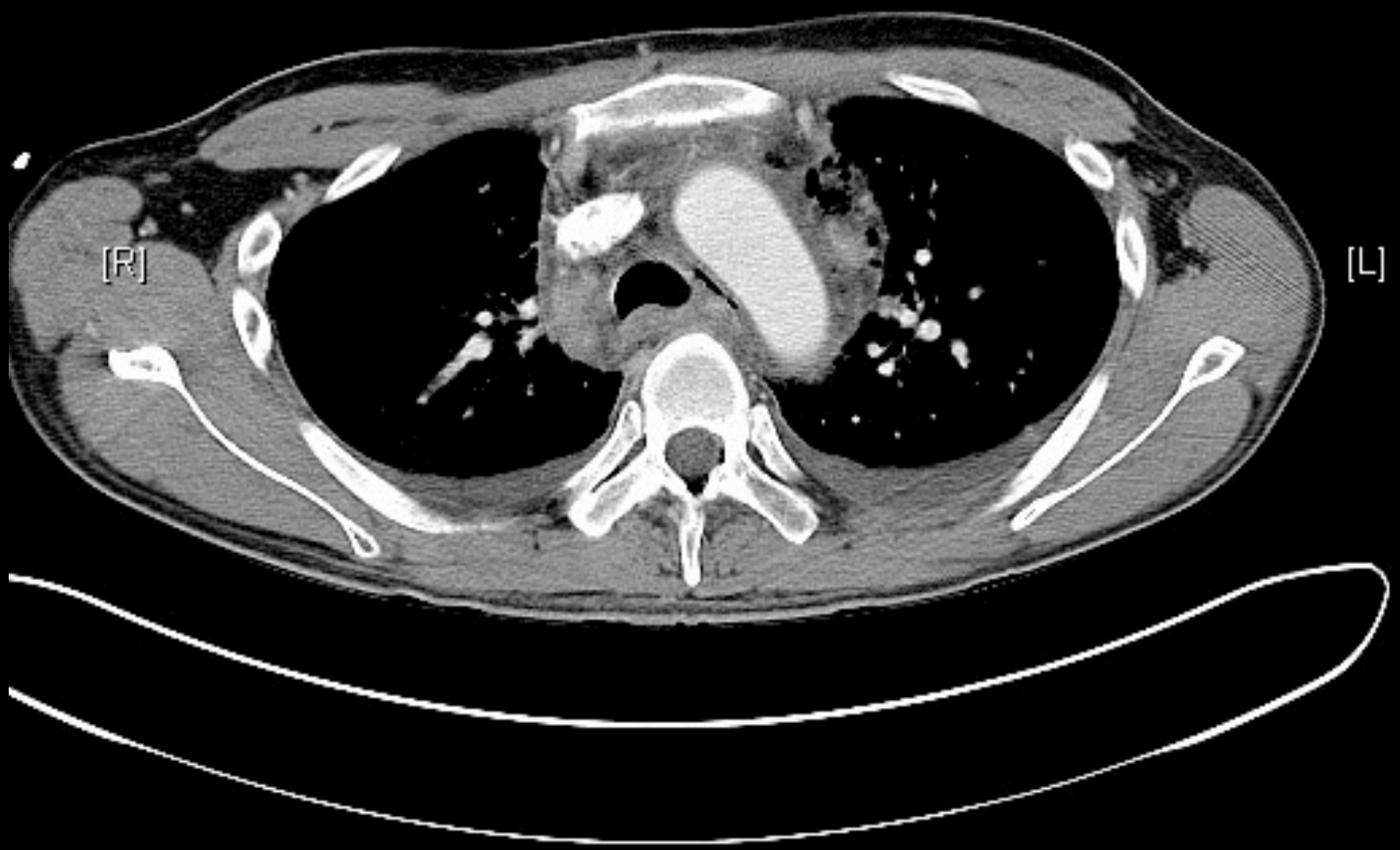

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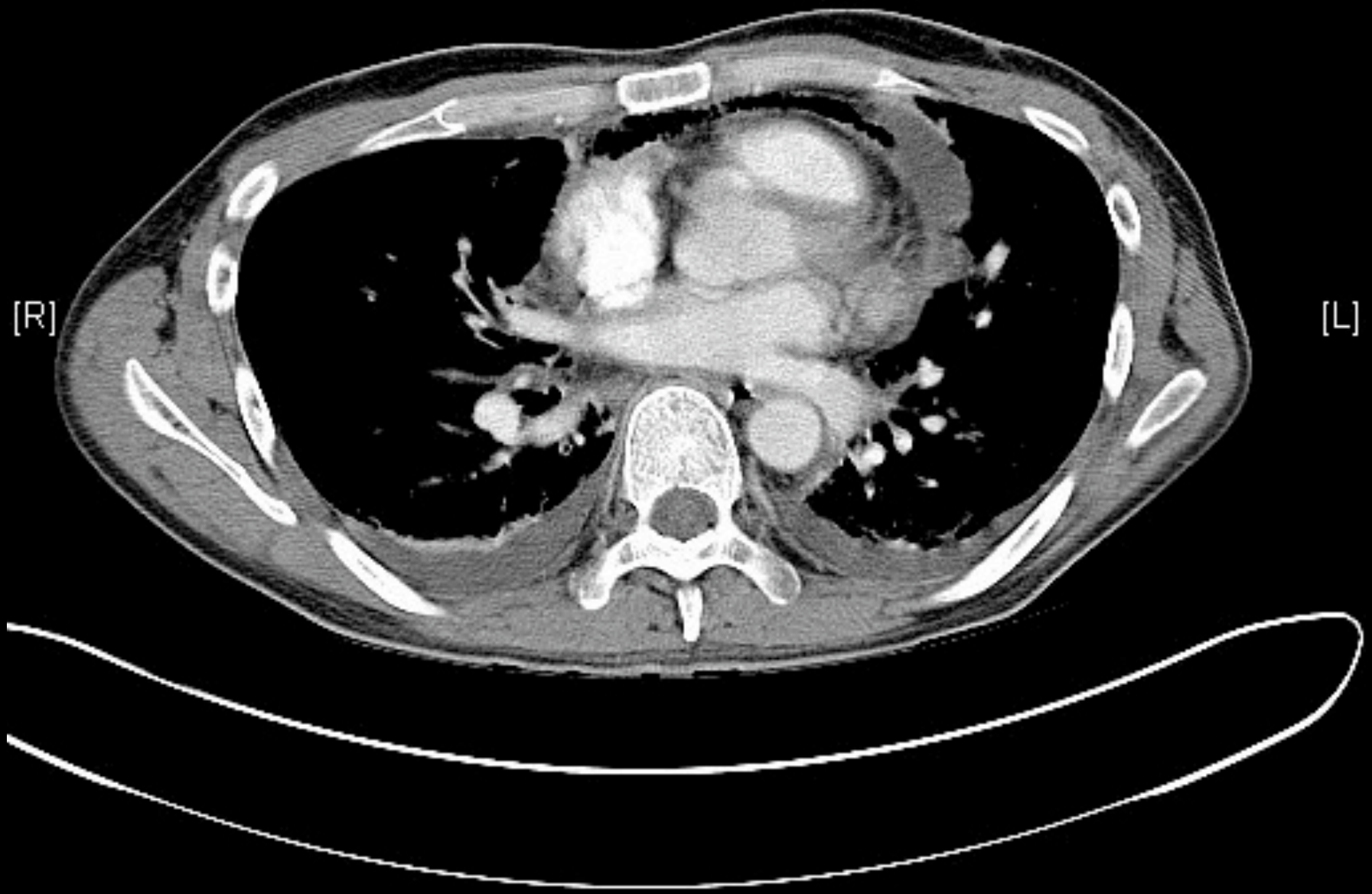

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Tumor / Cyst

- Incidence of primary mediastinal tumor
  - overall, neurogenic tumor>thymoma>cyst>lymphoma
  - 25-40% malignancy (malignant lymphoma>)
  - in children,

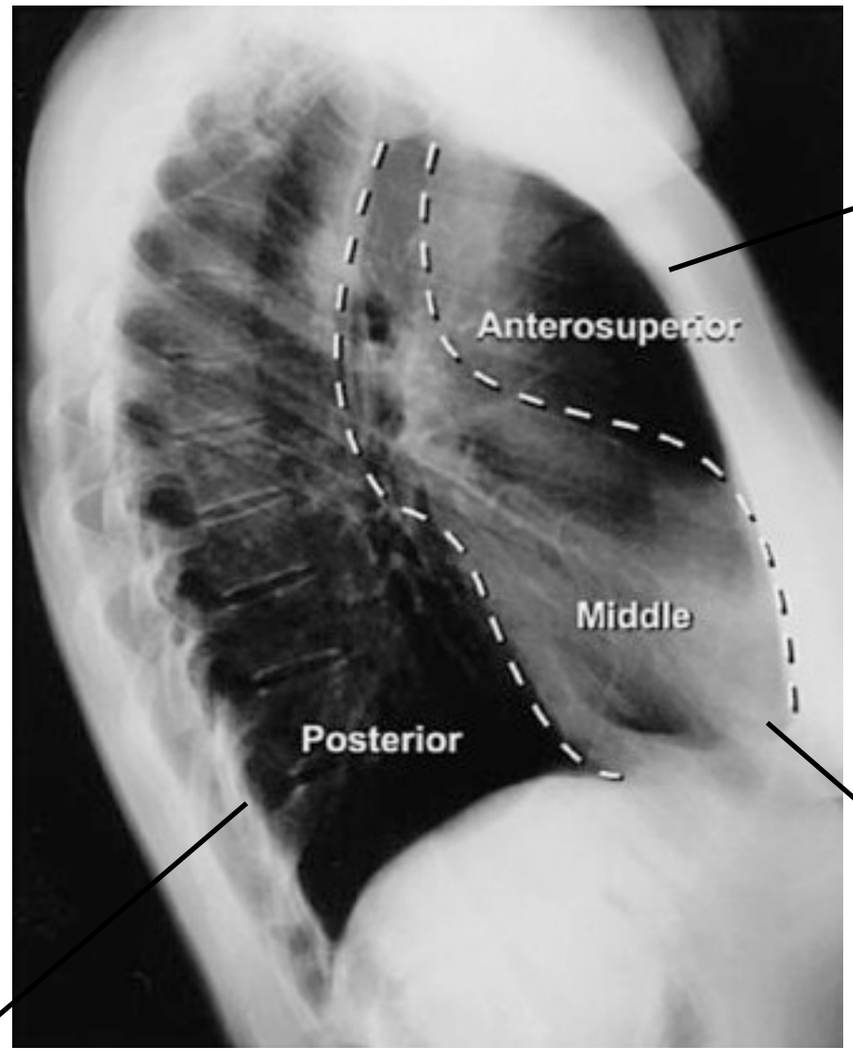
    neurogenic tumor(40%)>lymphoma>cyst>GCT>thymoma

    .... 1/2 malignancy (neuroblastoma)
  - in adult,

    neurogenic tumor>cyst>thymoma>lymphoma,GCT

    .... 1/3 malignancy

- Location of the tumor



thymoma
lymphoma
GCT

lymphoma
pericardial cyst
bronchogenic cyst

neurogenic tumor
enteric cyst
esophageal tumor

- Treatment of mediastinal tumor

  - Surgery is recommended due to:

    1. benign tumor,

       . size↑ → compressive Sx

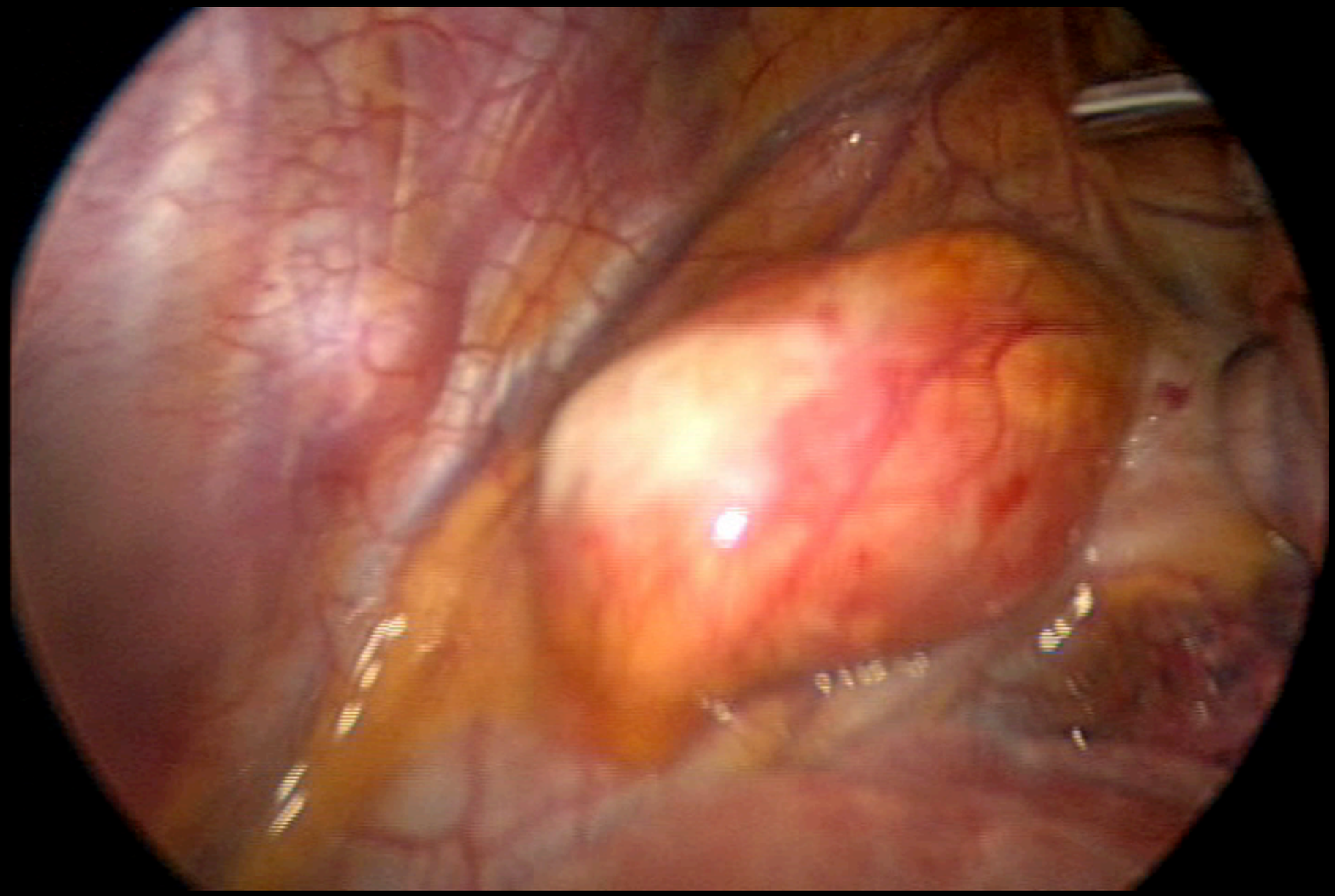
       . possibility of malignant degeneration

       . possibility of misdiagnosis

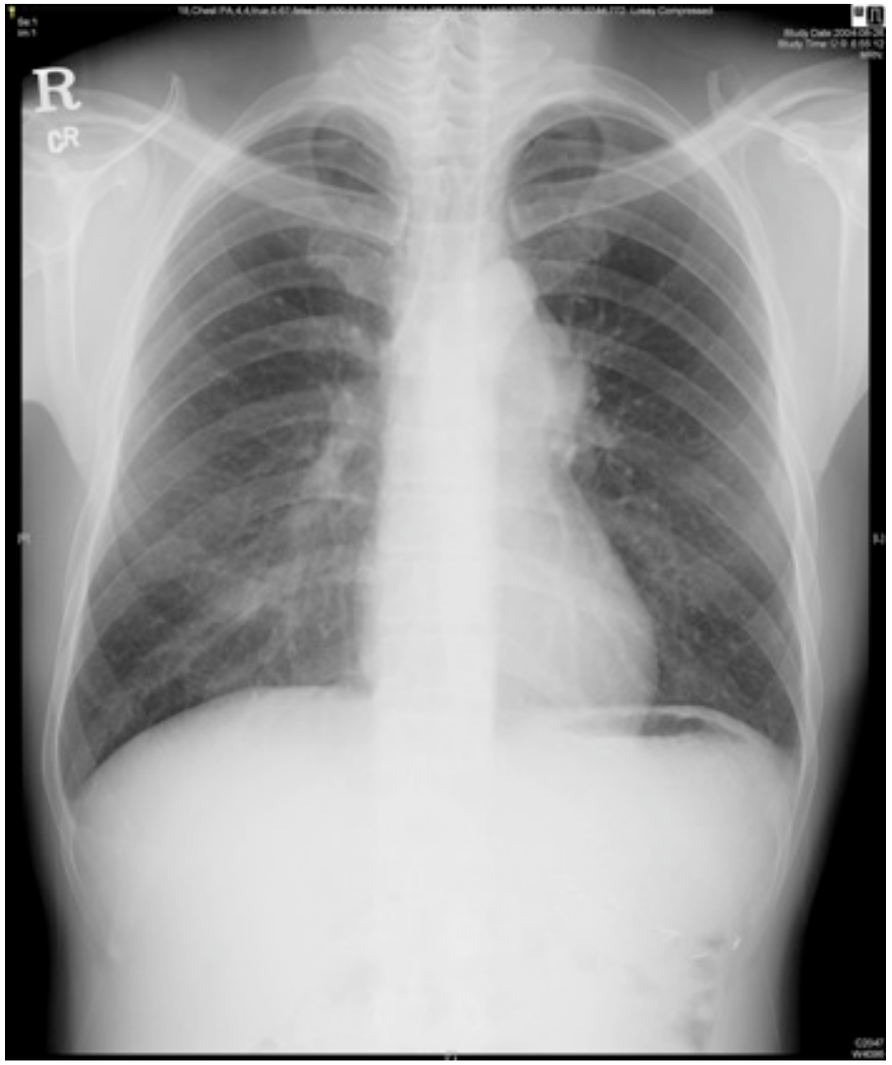
    2. malignant tumor

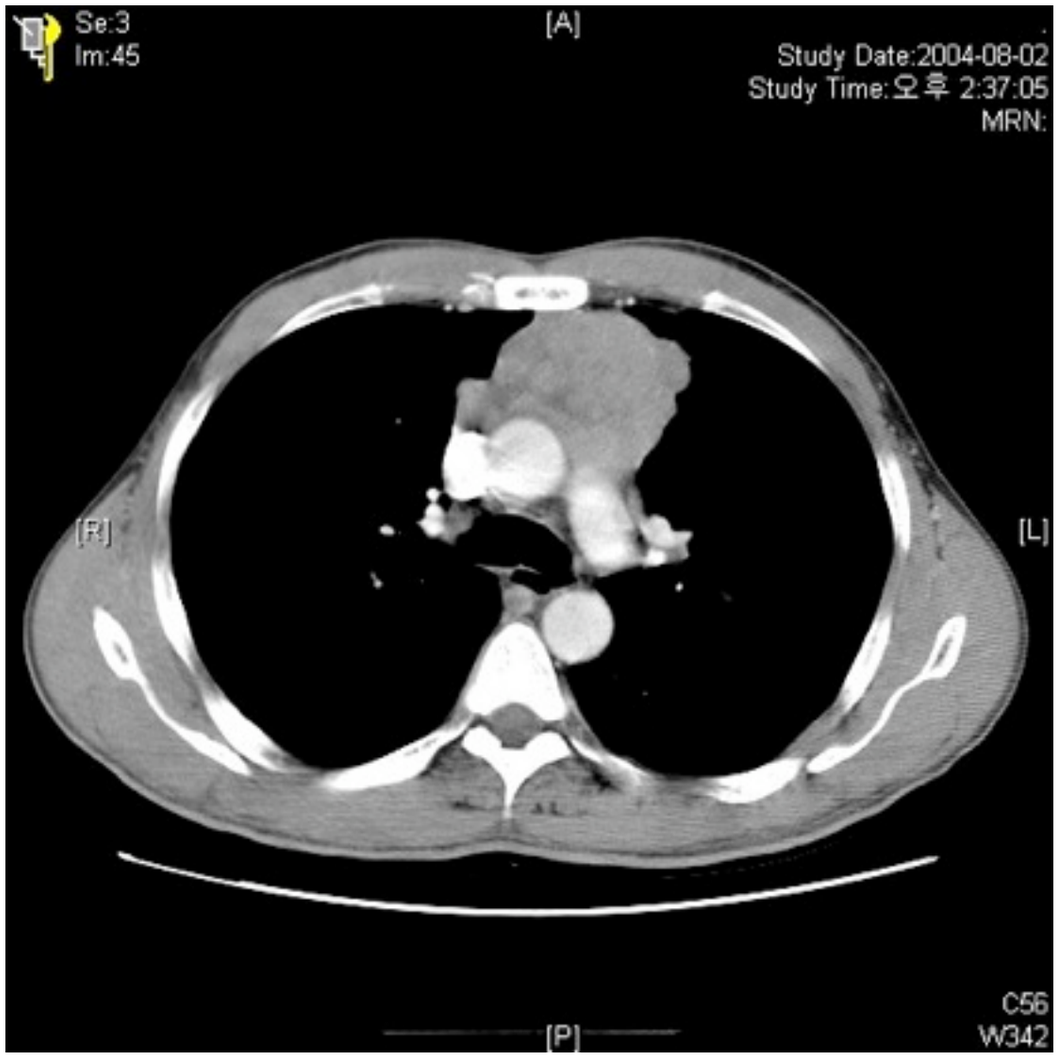
       . early diagnosis & surgery → better outcome

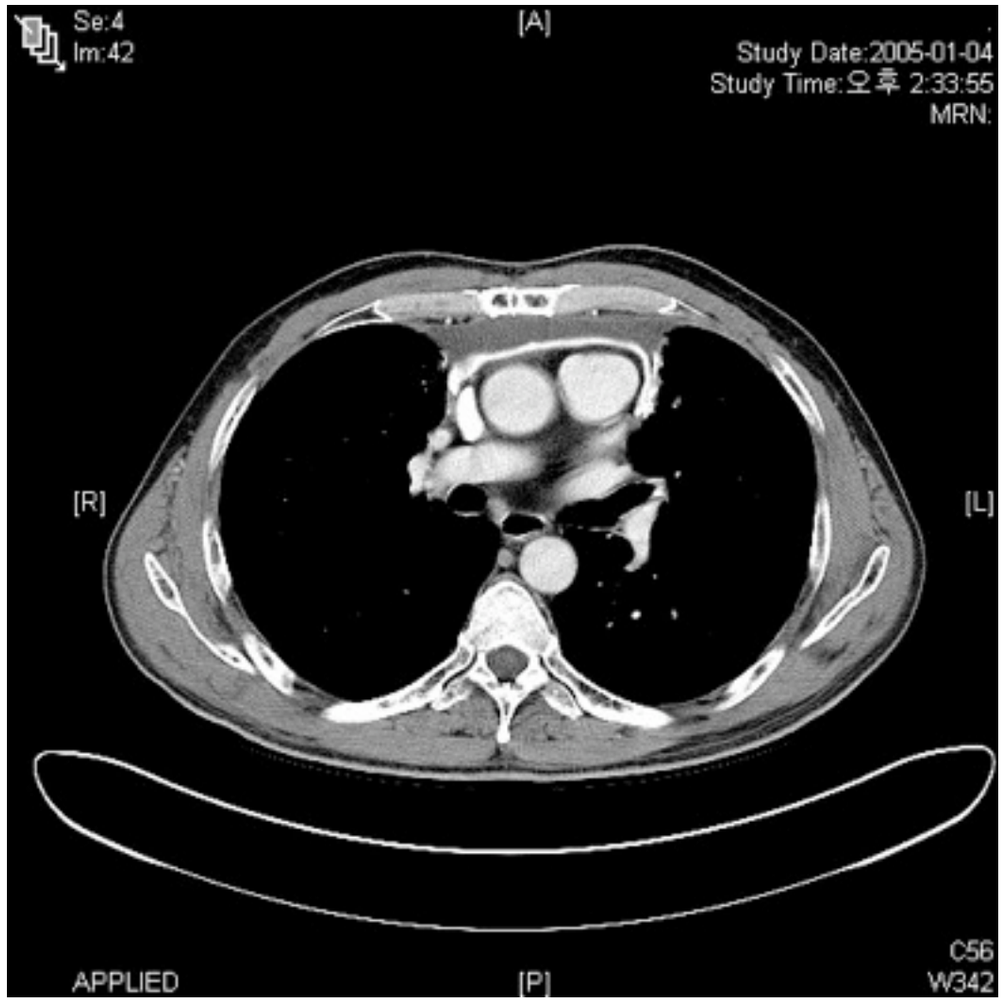
    3. low morbidity & mortality of the procedure



Case1. M/46 ... dysarthria

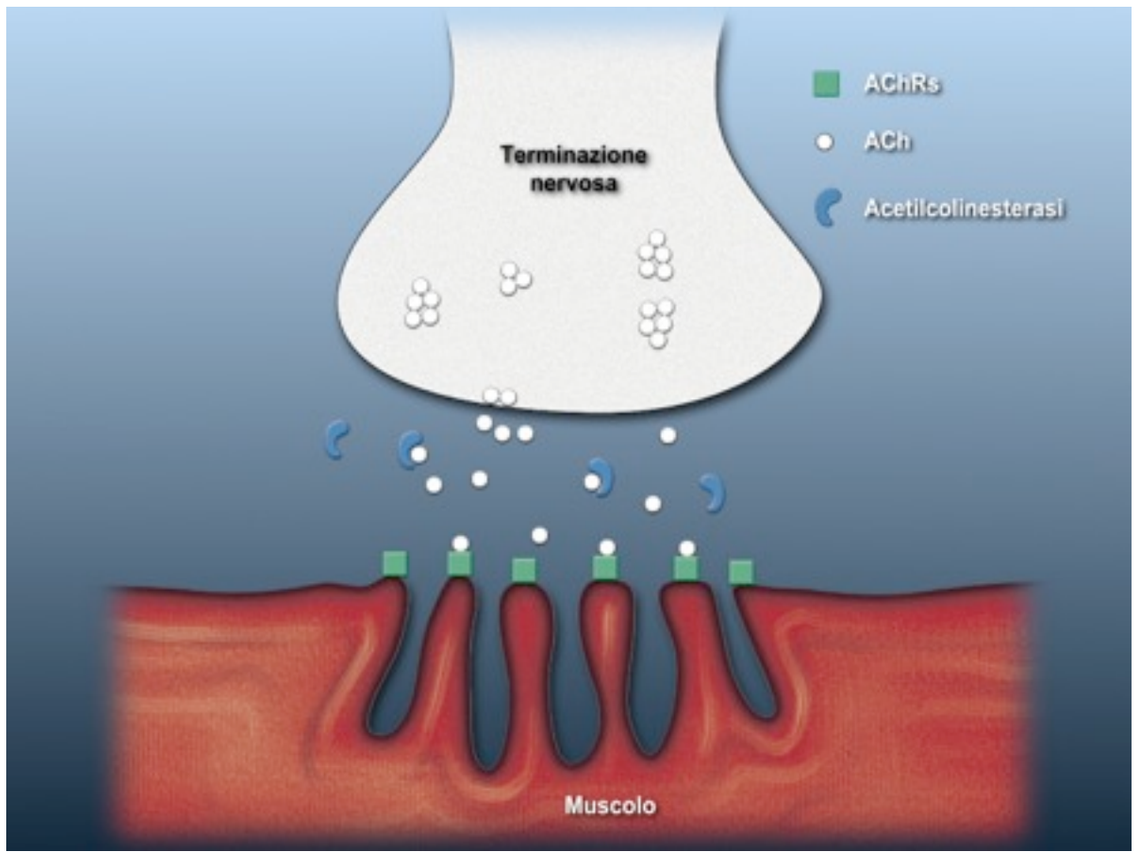


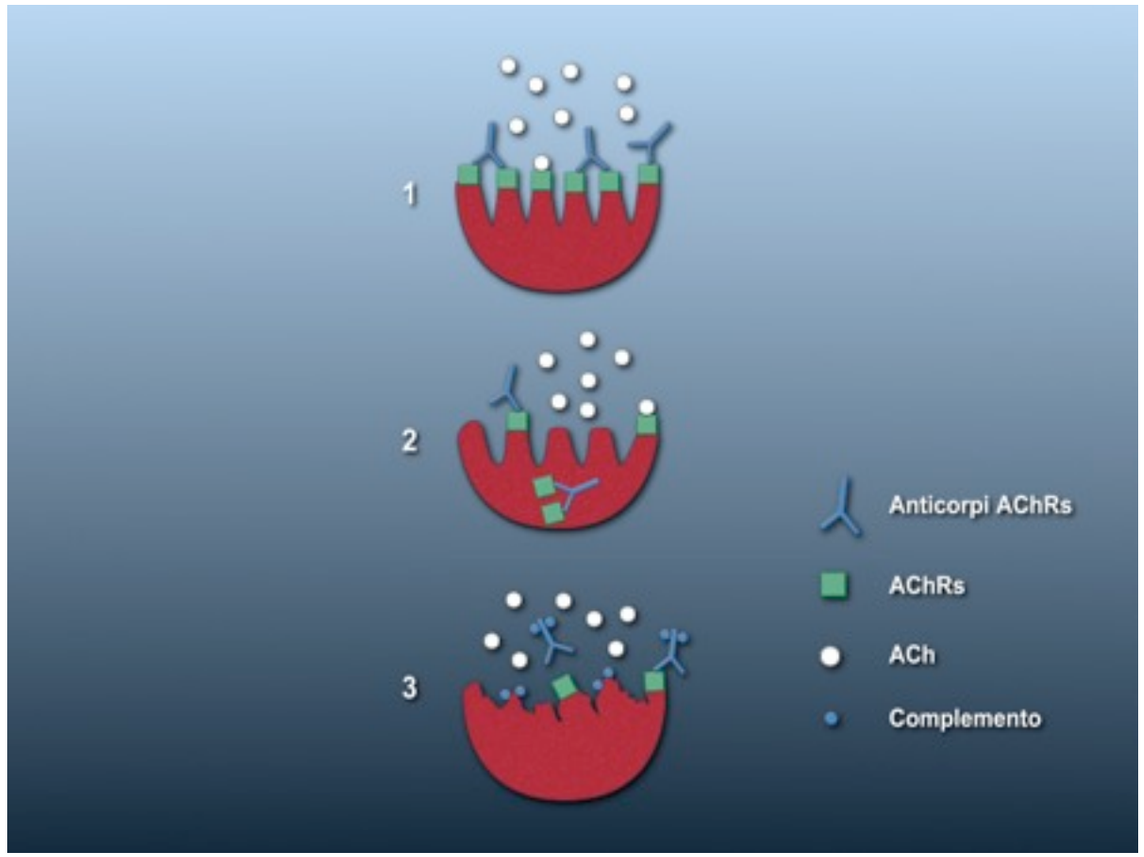


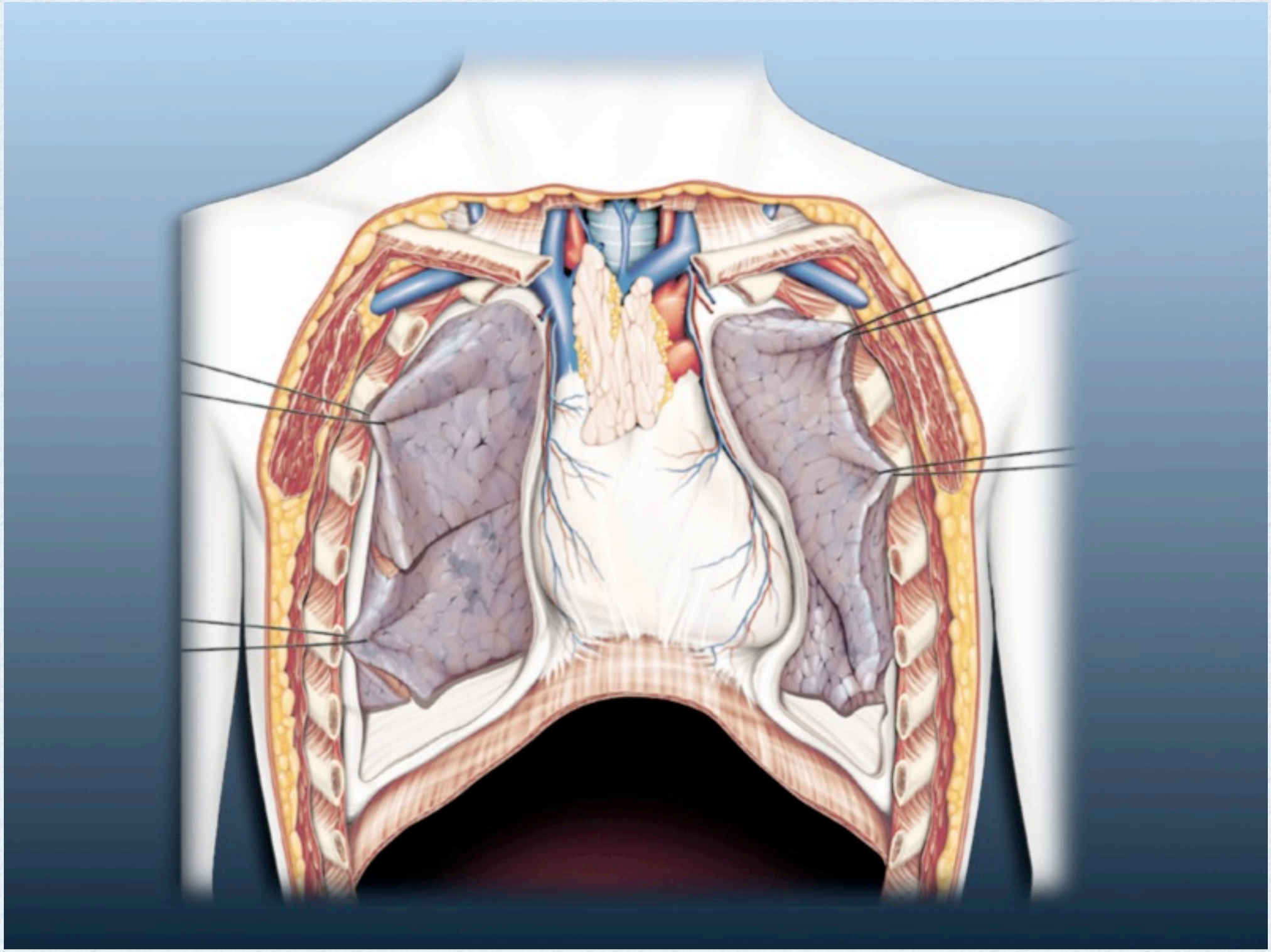


WHO type B3
Masaoka stage III
R1 resection (phrenic n)
↓
postop RTx

Myasthenia Gravis







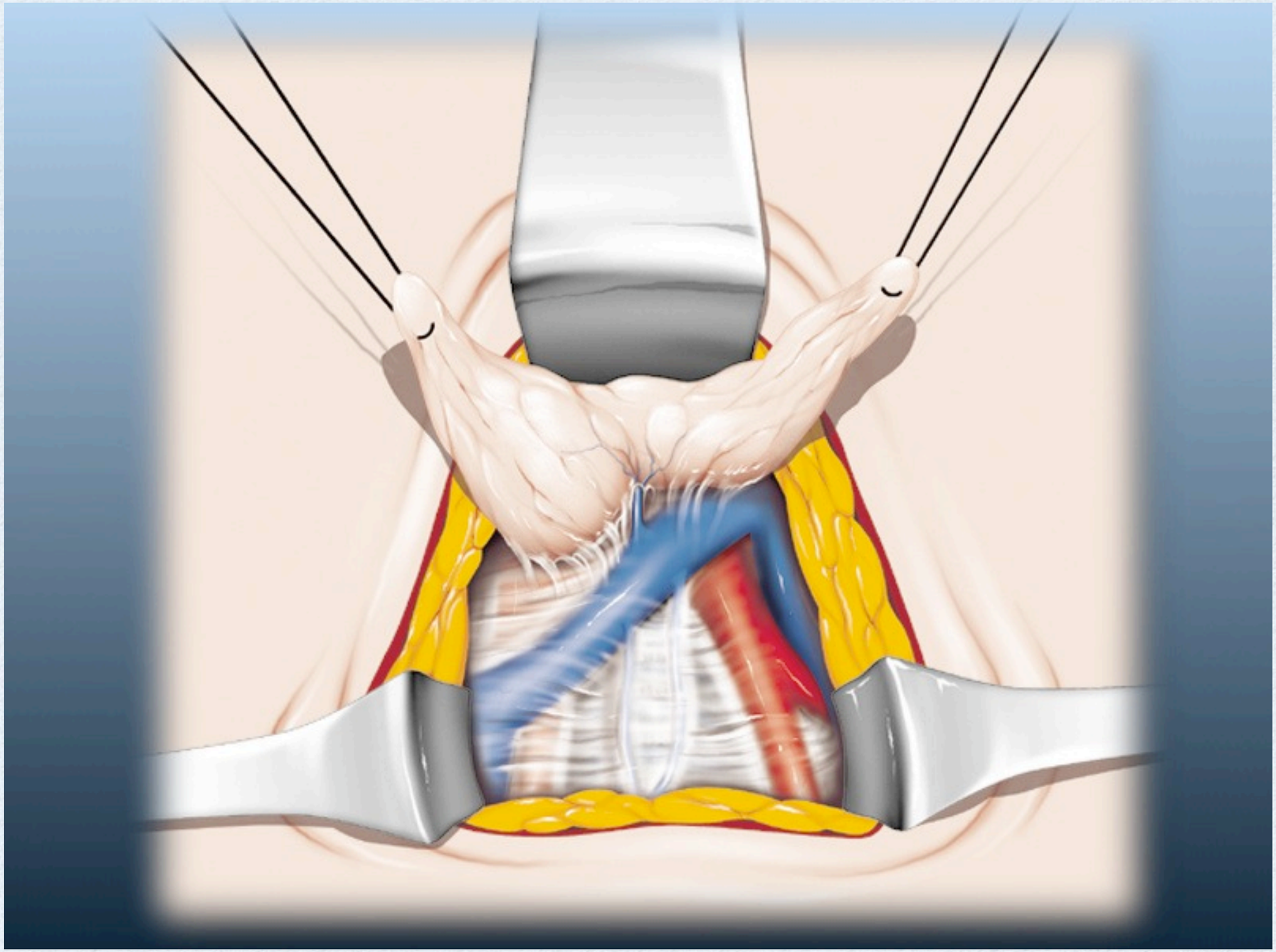
- Surgical options

  Cervical thymectomy (basic)

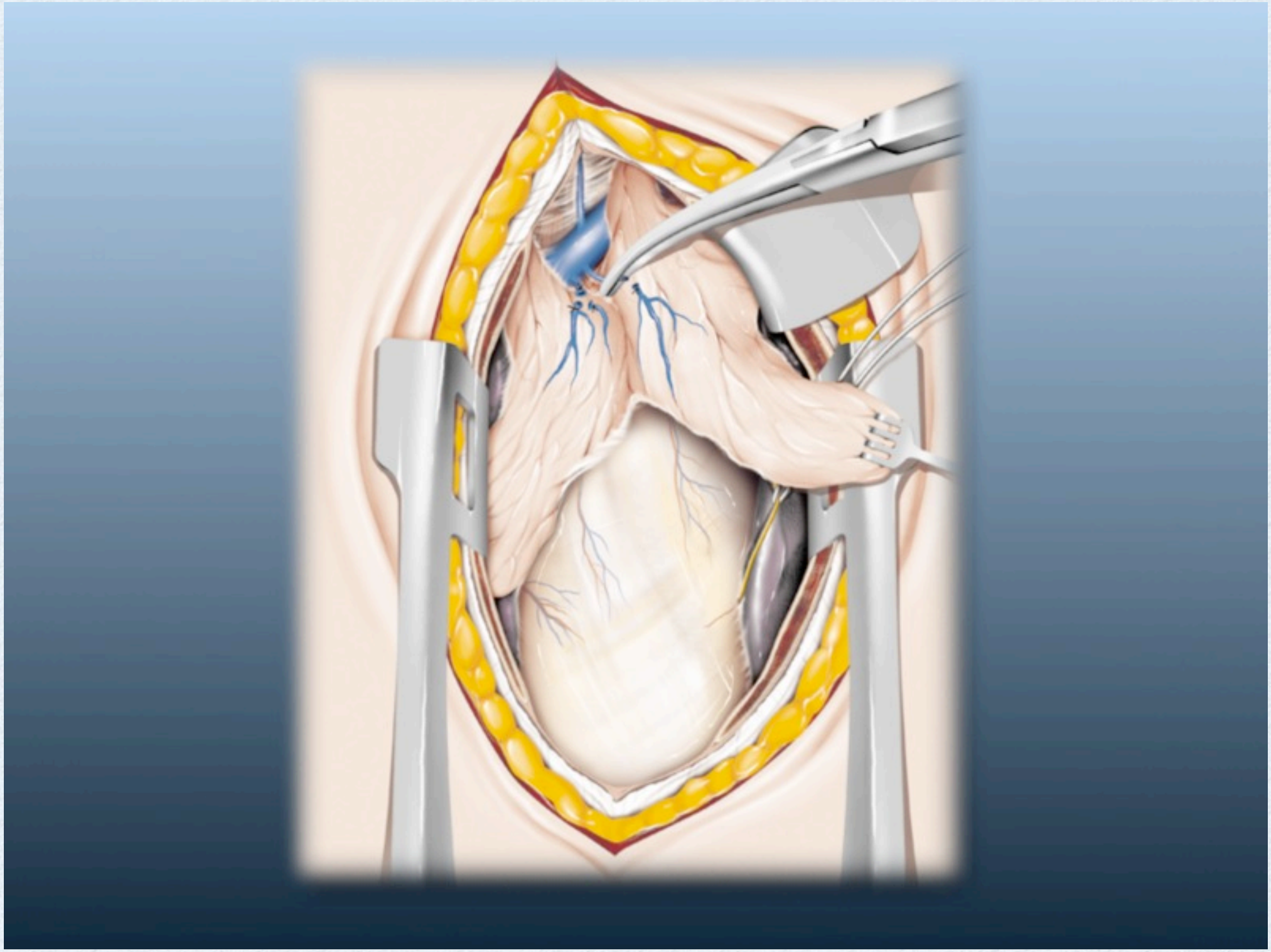
  Trans-sternal thymectomy

  VATS thymectomy

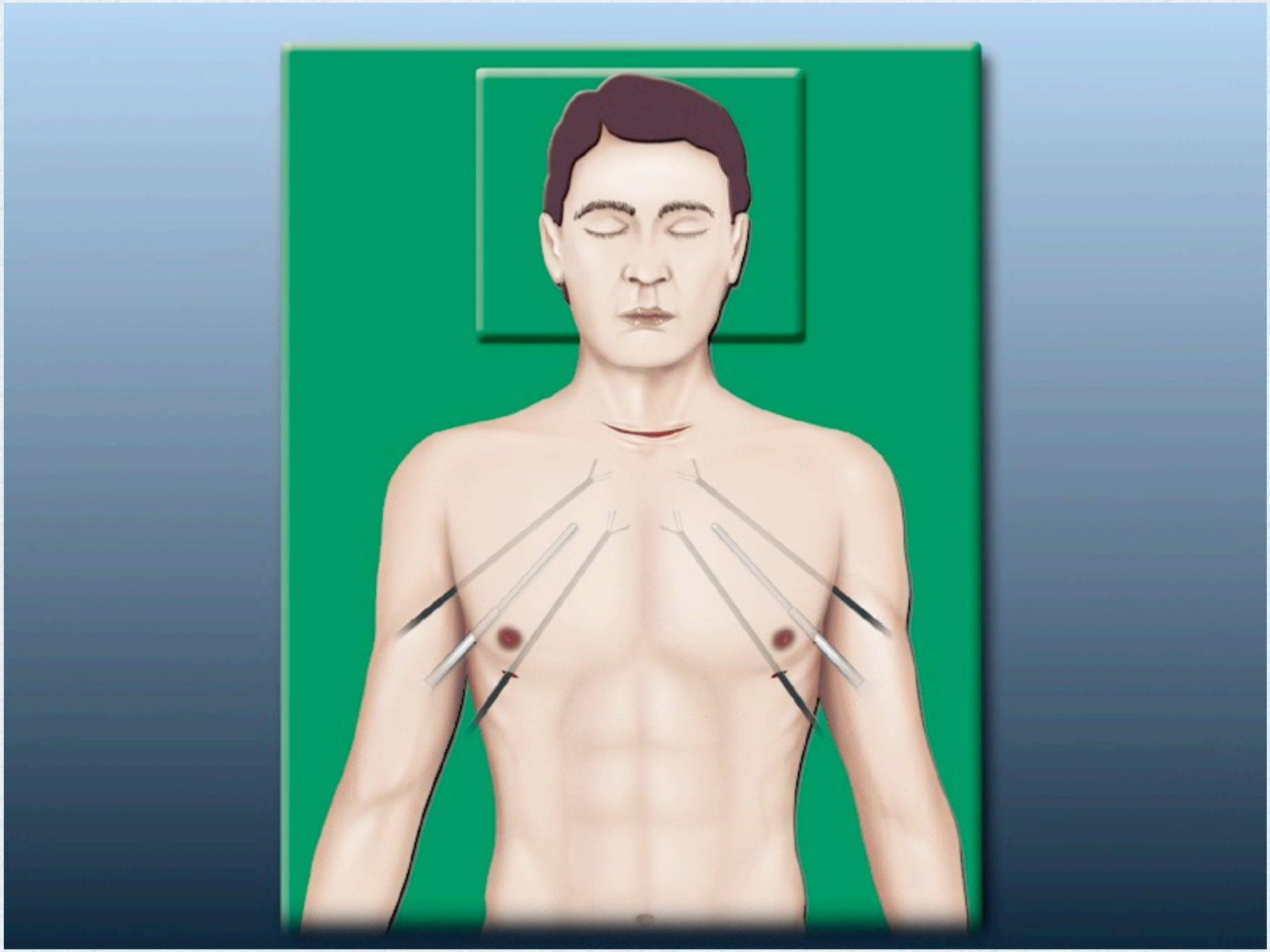
  Robot-assisted thymectomy



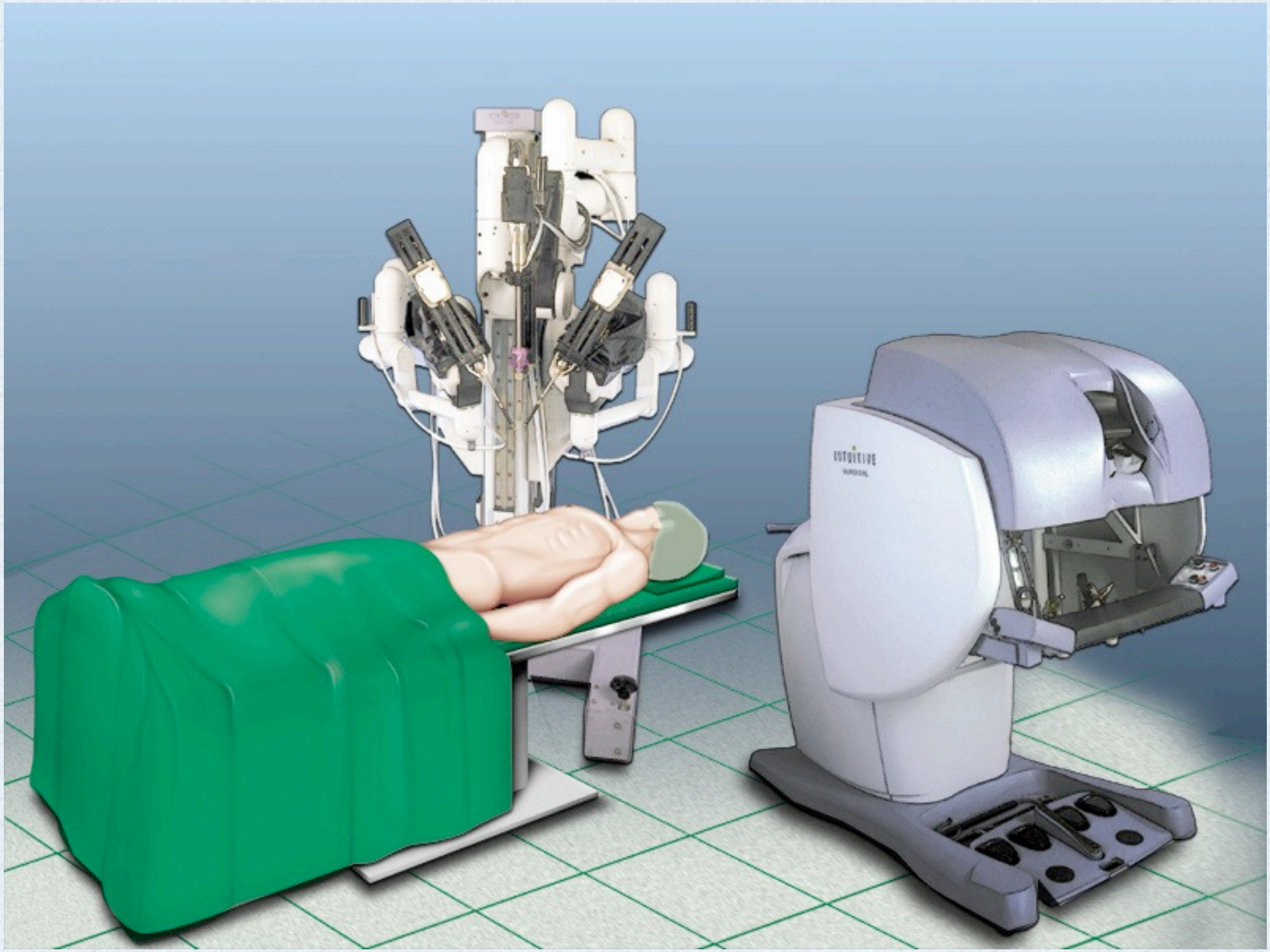
trans-cervical



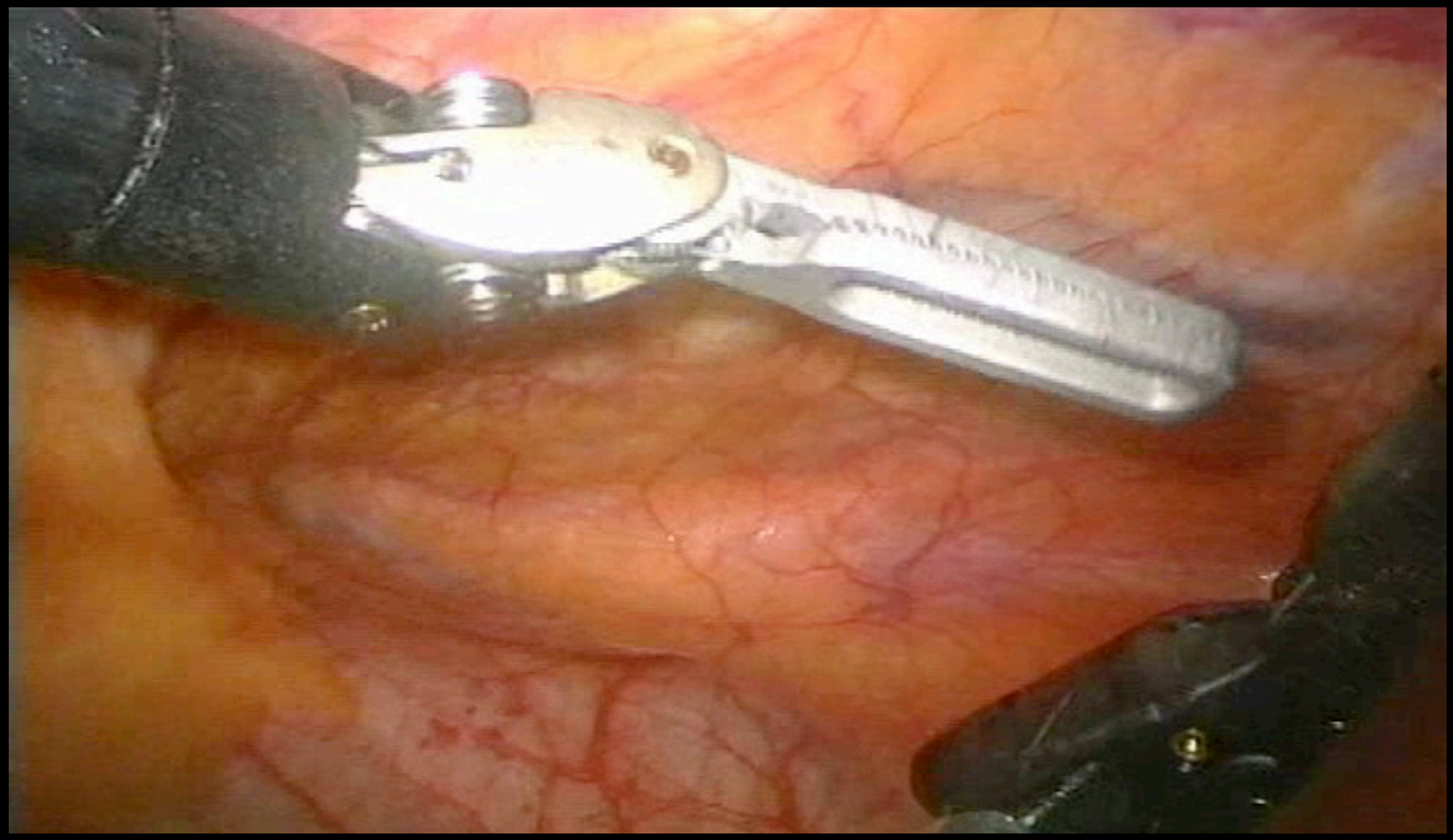
Trans-sternal



VATS



Robot-assisted



Lung

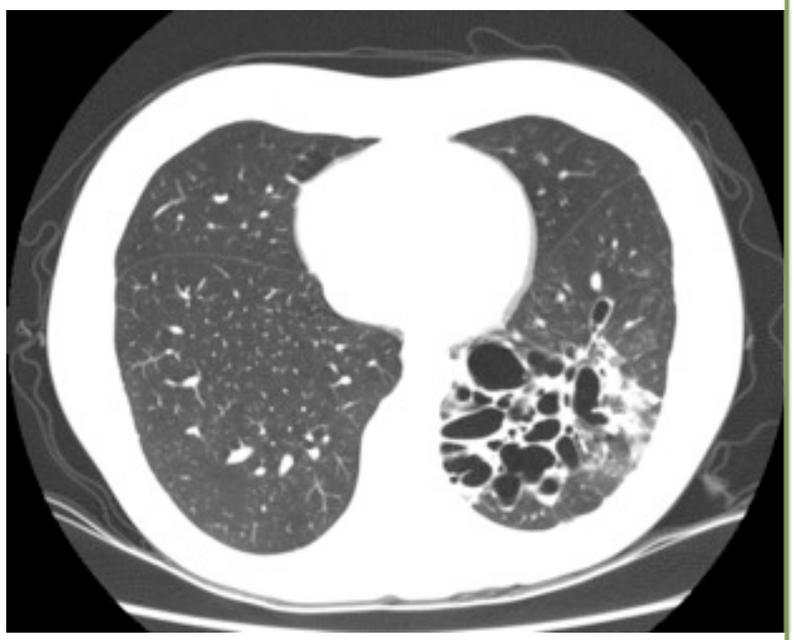
- Inflammatory Lung Diseases
  - Bronchiectasis
  - Pulmonary tuberculosis
  - Aspergilloma

- Tumors of the Lung
  - Benign
  - Malignant

- Interstitial Lung Diseases

Bronchiectasis

- "Chronic dilation of the bronchi marked by fetid breath and paroxysmal coughing, with the expectoration of mucopurulent matter."
- Indications of Surgery
  - failure of medical treatment
  - massive hemoptysis
  - localized bronchiectasis
  - adequate pulmonary reserve



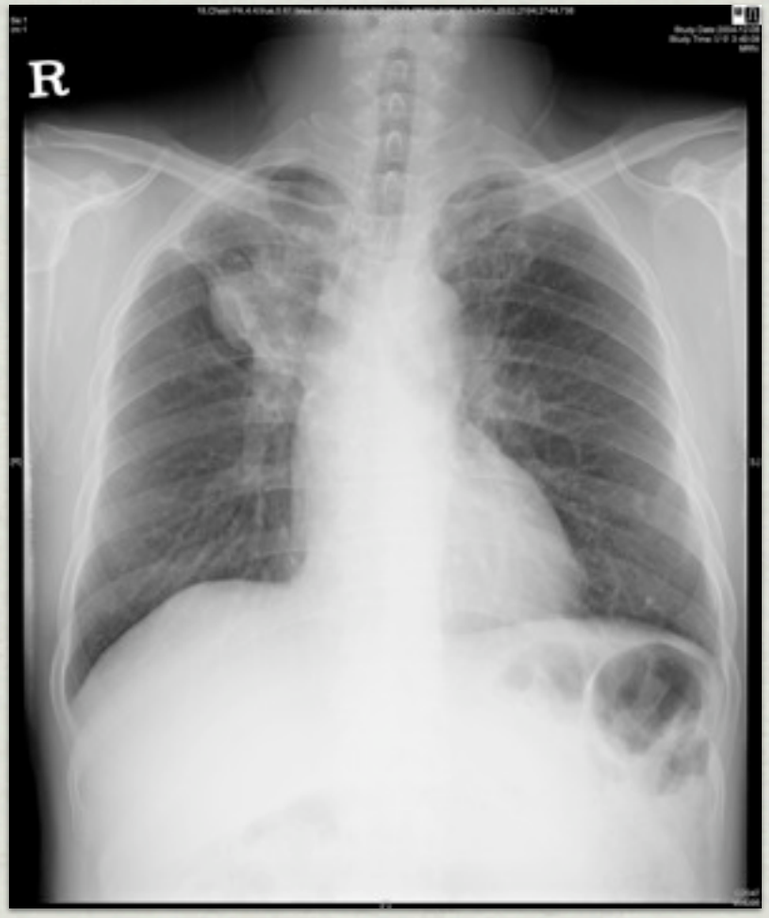
Pulmonary Tuberculosis

- Indications of Surgery
  - failure of medical treatment
  - destroyed lobe or lung
  - massive pulmonary hemorrhage
  - persistent cavity with sputum
  - multi-drug resistant (mdr) tbc
  - mechanical complications (BPF etc)

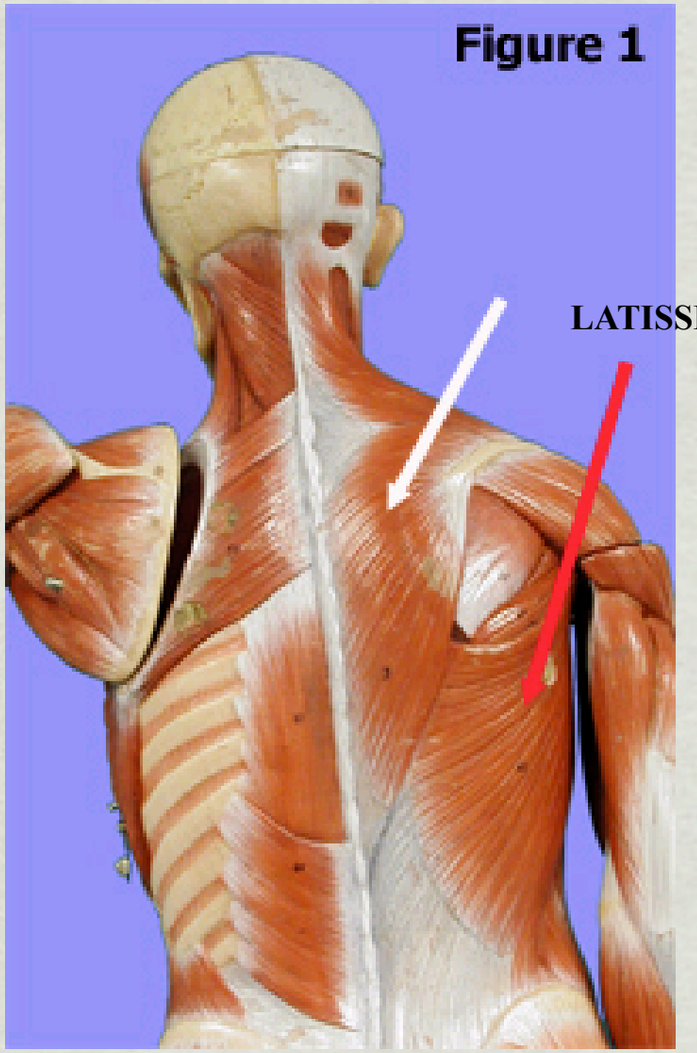
MAJOR PULMONARY RESECTION

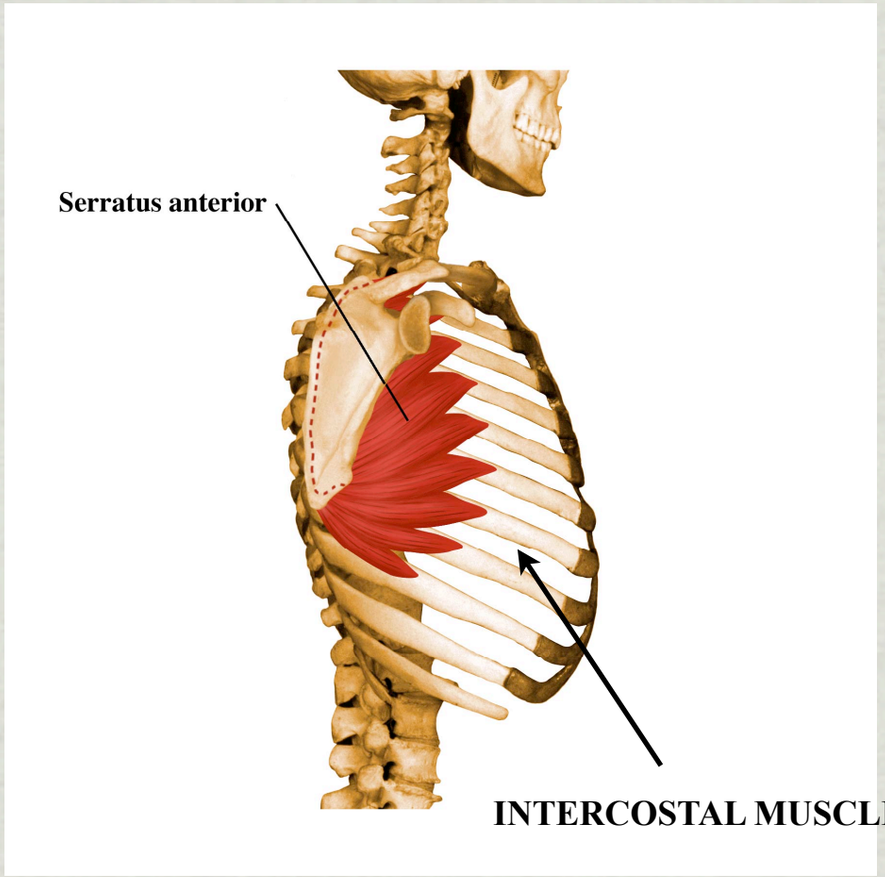
I. Lobectomy / Bilobectomy

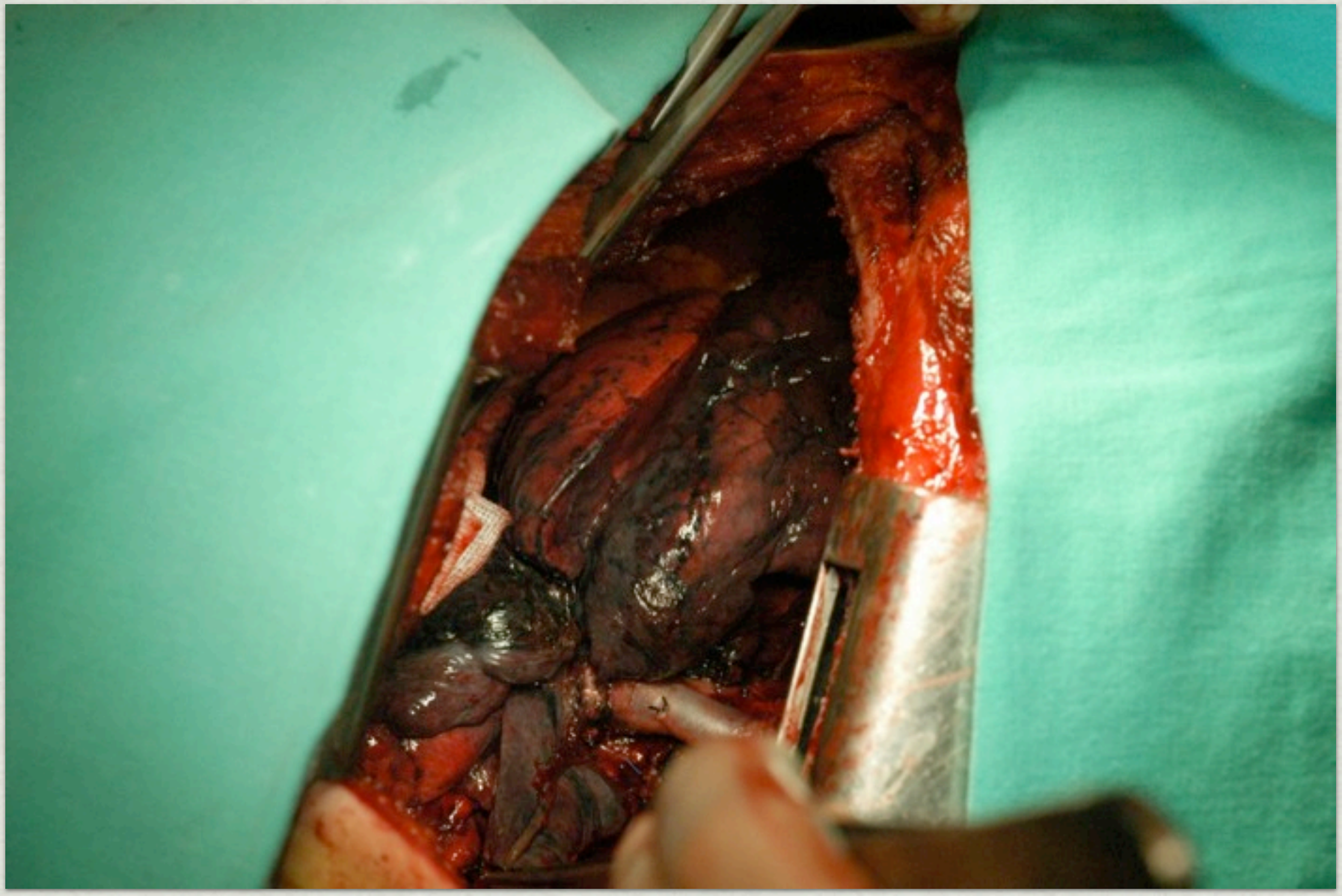
2. Pneumonectomy



THEY REQUIRE THORACOTOMY







What are the Changes after Pulmonary Resection?

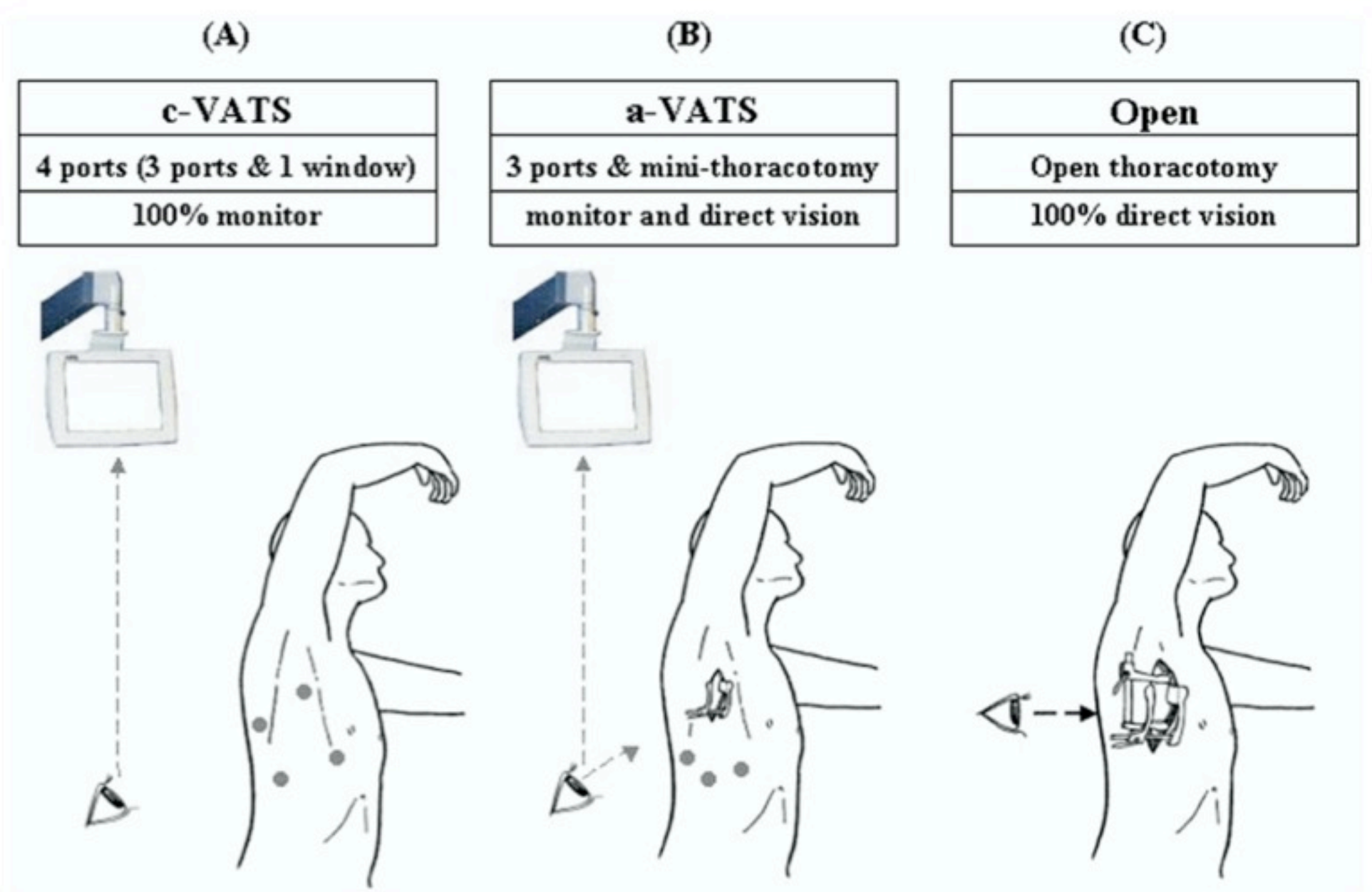
PHYSIOLOGIC EFFECTS OF PULMONARY RESECTION

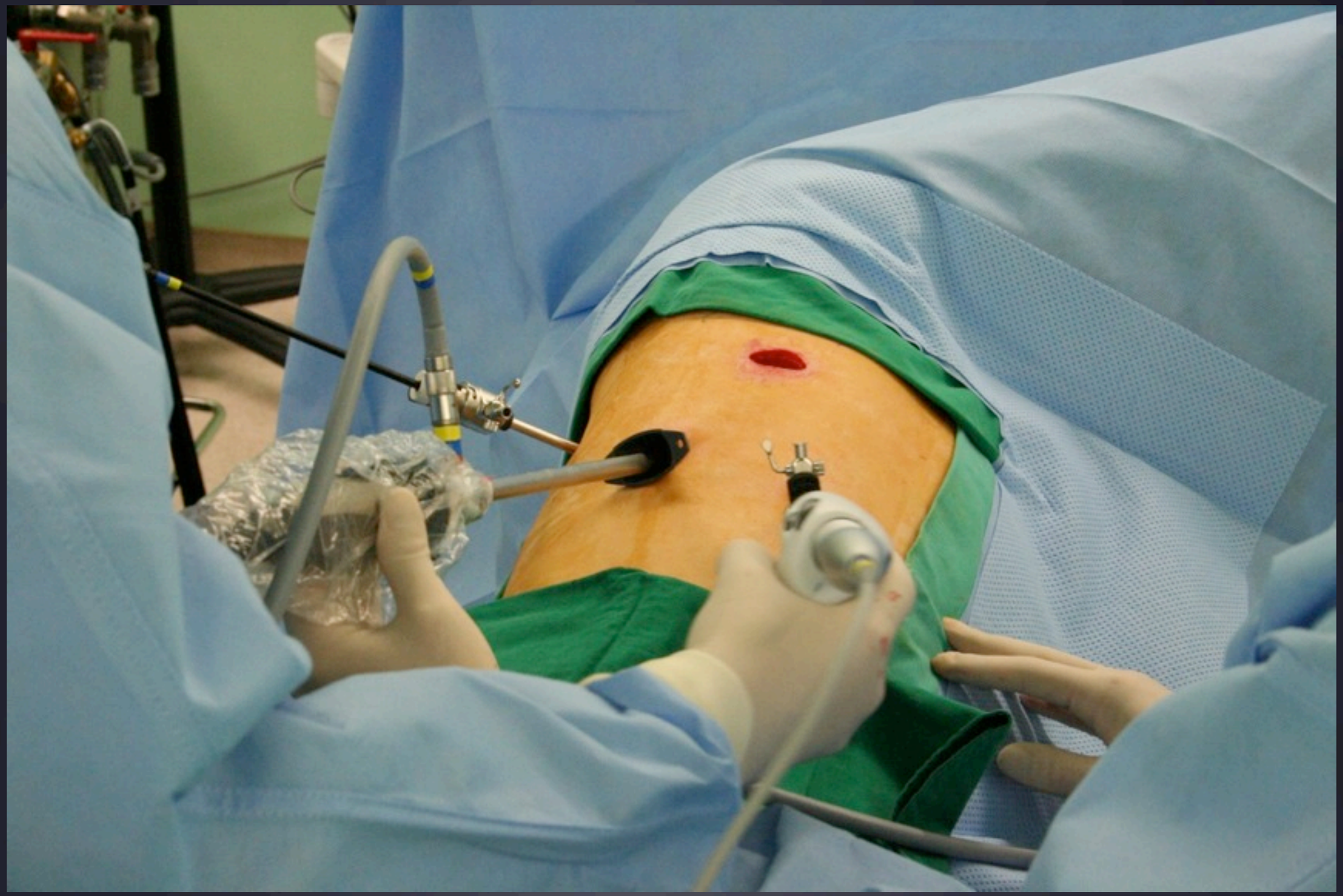
- Decreased Lung Volume
  - Resection of normal lung tissue
  - Respiratory muscle dysfunction
  - Respiratory depression by opiates
- Disturbed Gas Exchange
  - V/Q mismatch
  - Pulmonary edema
  - Underlying lung disease
- Increased Cardiac Afterload
  - Atrial arrhythmia
  - Right heart failure

EFFECTS OF THORACOTOMY

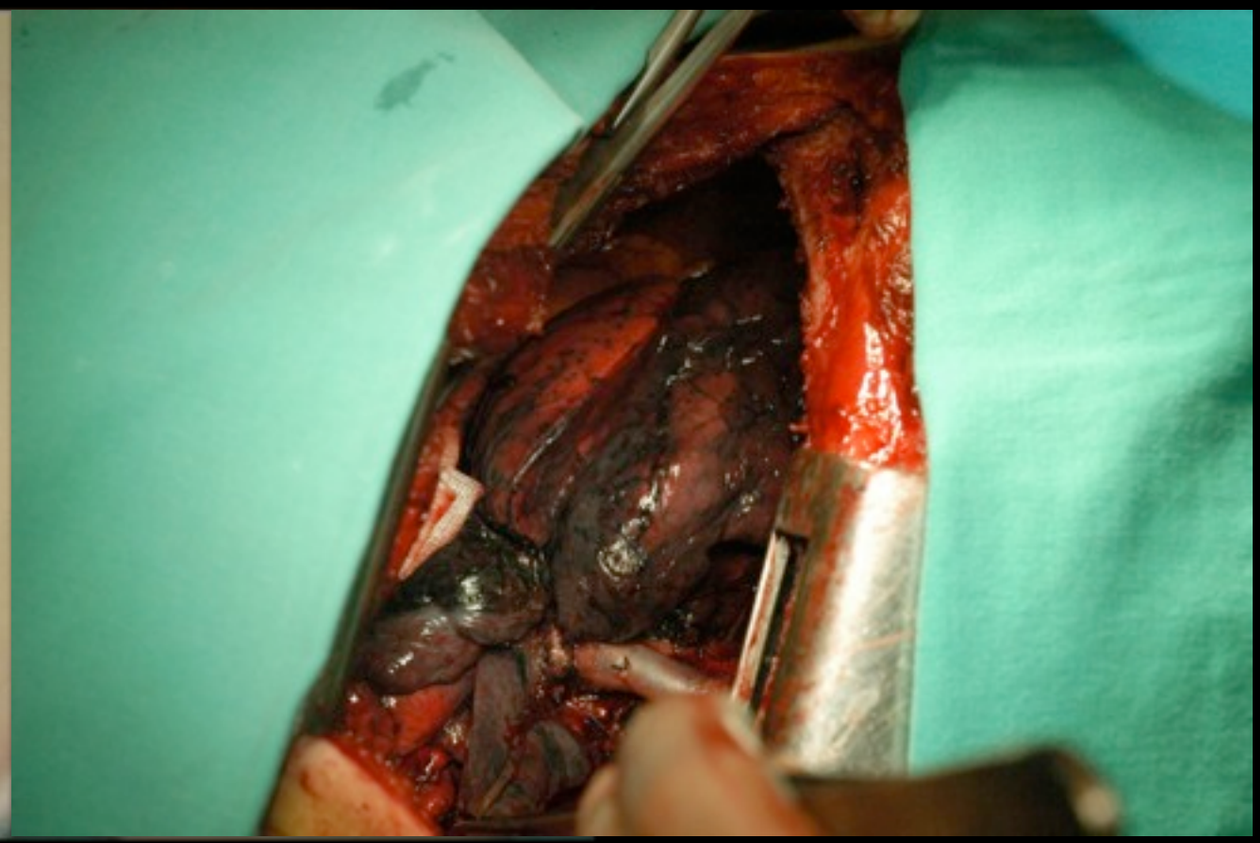
- Division of Intercostal & Serratus anterior m.
  - Dysfunction of respiratory mechanics
  - Alveolar hypoventilation
  - Retained secretion
  - Atelectasis, pneumonia
- Division of Latissimus dorsi m
  - LOM of upper extremity

EVOLUTION OF MINIMAL ACCESS SURGERY





Right upper lobectomy



CONCERNS OVER VATS LOBECTOMY

- Is it safe? YES !
  - operative mortality
  - urgent thoracotomy conversion
  - major postoperative complications

- Any advantages over conventional thoracotomy? YES !
  - less postoperative pain, shorter hospital stay
  - preserved lung function
  - QoL

- Is it adequate for cancer surgery? YES !
  - quality of mediastinal LN dissection
  - long-term survival

Summary

Spontaneous pneumothorax	c/m; surgical iindications
Empyema thoracis	treatment
Pneumomediastinum	etiology
Mediastinitis	etiology; fatal
Mediastinal tumors or cysts	location
Bronchiectasis & pulmonary tbc	surgical indications
Major pulmonary resection	affect; VATS