University of Cincinnati Cancer Institute

COMPREHENSIVE LUNG CANCER CENTER

Surgical Treatment of Lung Cancer

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Division of Thoracic Surgery

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Treatment of Lung Cancer

- Depends on:
  - Type of lung cancer
  - Stage of lung cancer
  - Condition of the patient

- Surgery is most commonly used when the cancer is confined to the chest

- If the tumor has already spread to other parts of the body, then surgery usually plays less of a role in the treatment of cancer

Types of Lung cancer

- Non-small cell lung cancer (NSCLC) - 85%
  - Adenocarcinoma
  - Squamous cell carcinoma
  - Large cell carcinomas
- Small cell lung cancer (SCLC) – 15%

Non-Small Cell Lung Cancer

- NSCLC treatment:

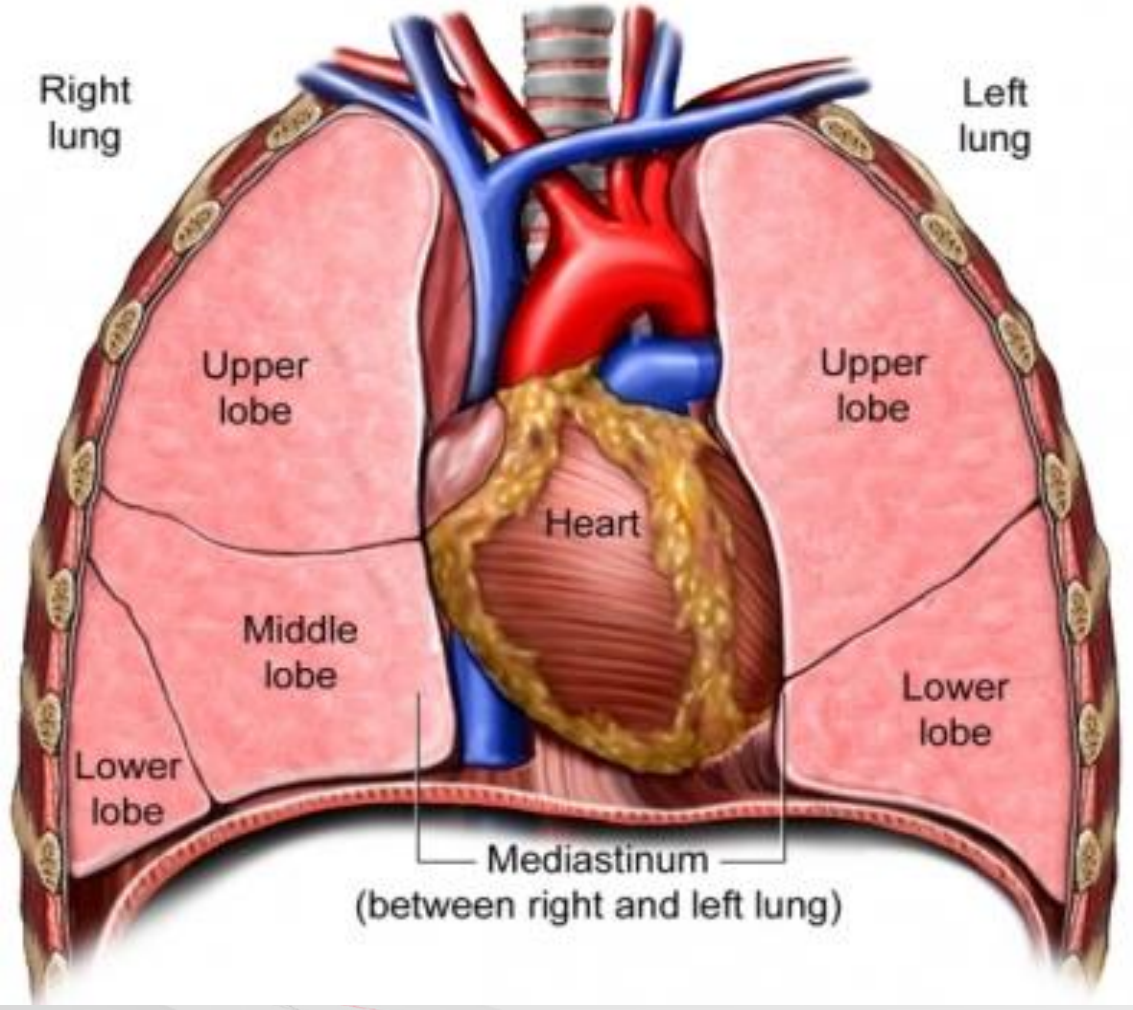
  - Surgery Alone
  - Chemotherapy and Radiation Alone
  - Combination of Chemo, Radiation and Surgery

- Treatment type is determined by the stage of the lung cancer

Stage of Lung Cancer

- Determined by size and location of tumor
- Involvement of lymph nodes and location of those lymph nodes
- If early stage, surgery is usually the primary treatment (Stage I, II)
- If more advanced, chemotherapy and radiation therapy is given before surgery (Stage III)

Lung Anatomy



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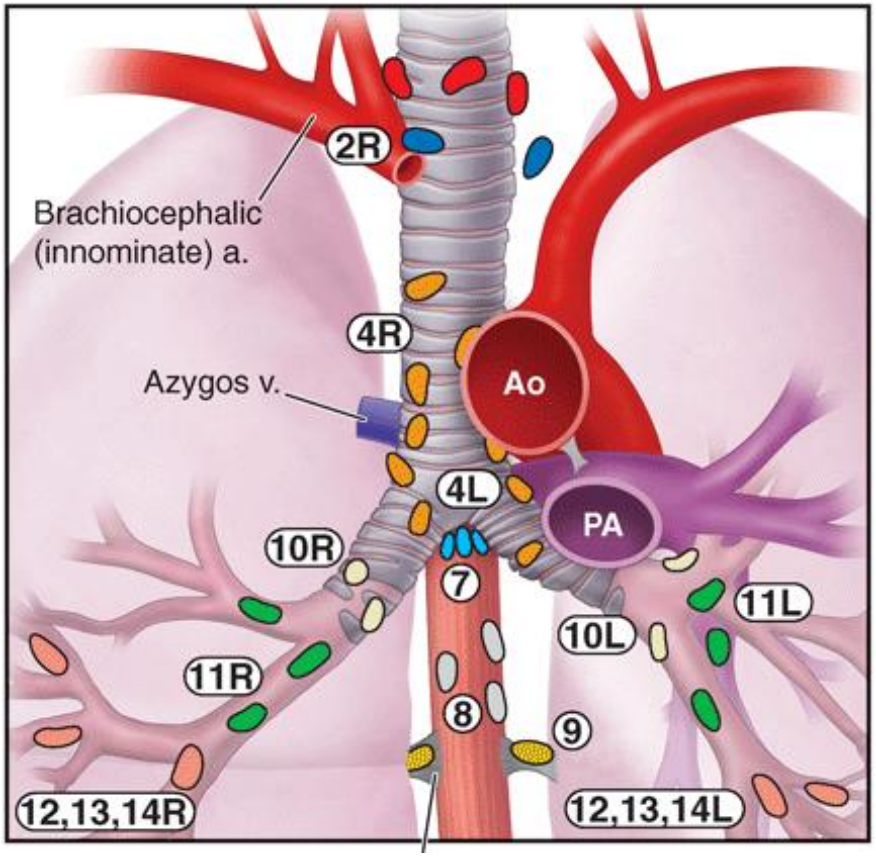
Lung Anatomy



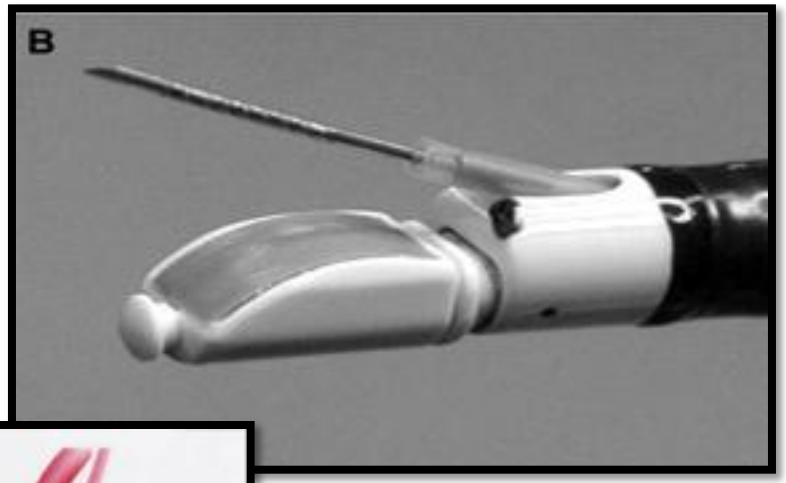
Procedures to Evaluate Lymph Nodes

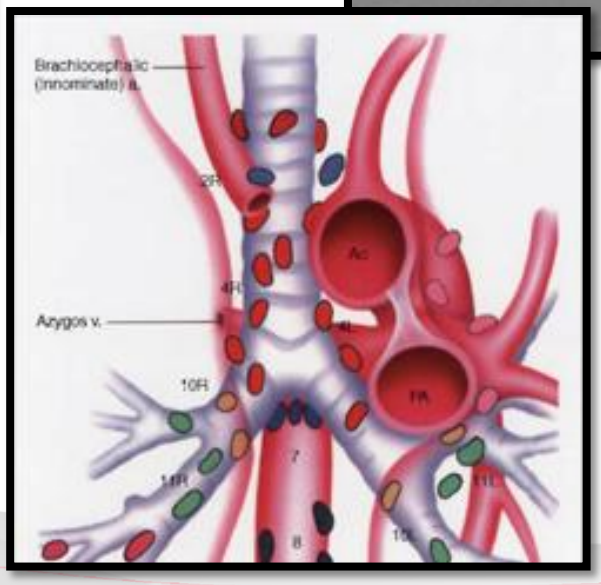
- If imaging shows findings concerning for lymph node involvement, further evaluation is needed with:

  - Bronchoscopy/ EBUS

  - Mediastinoscopy

EBUS (Endobronchial Ultrasound) Needle Biopsy





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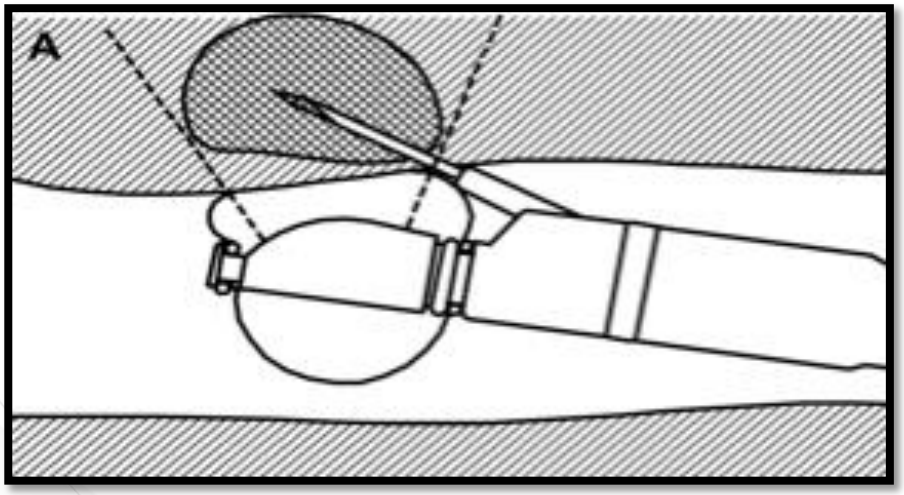
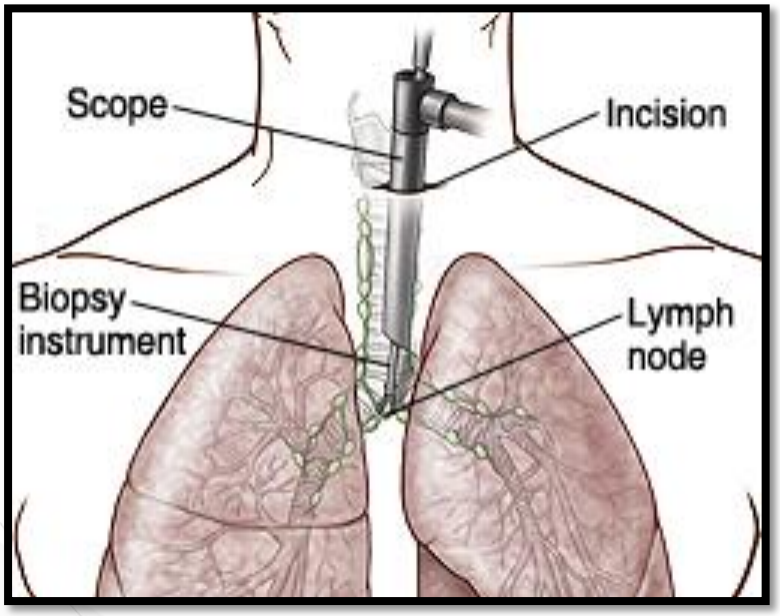
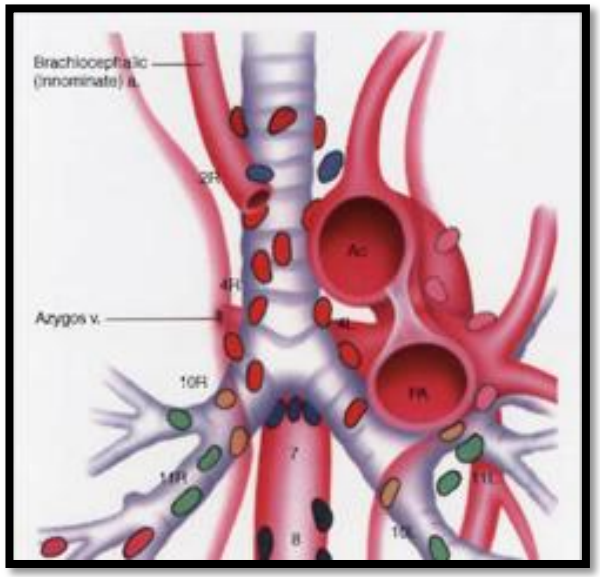
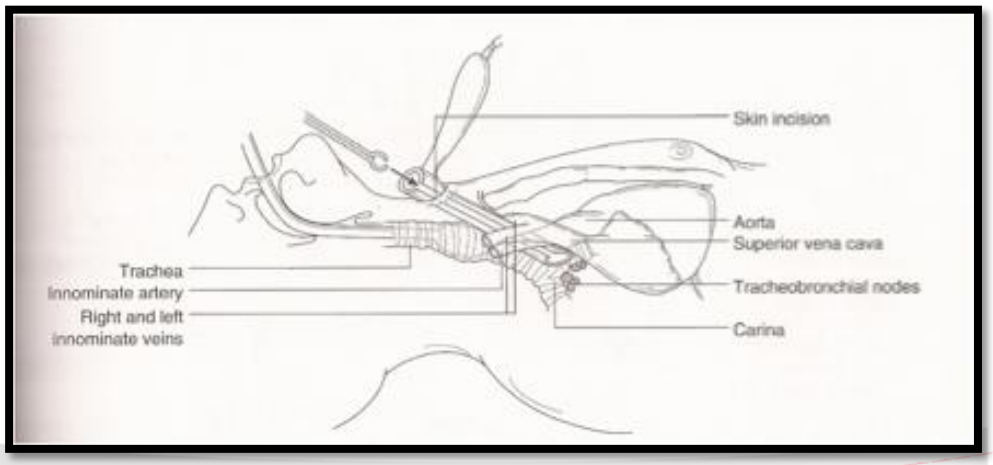
EBUS (Endobronchial Ultrasound) Needle biopsy



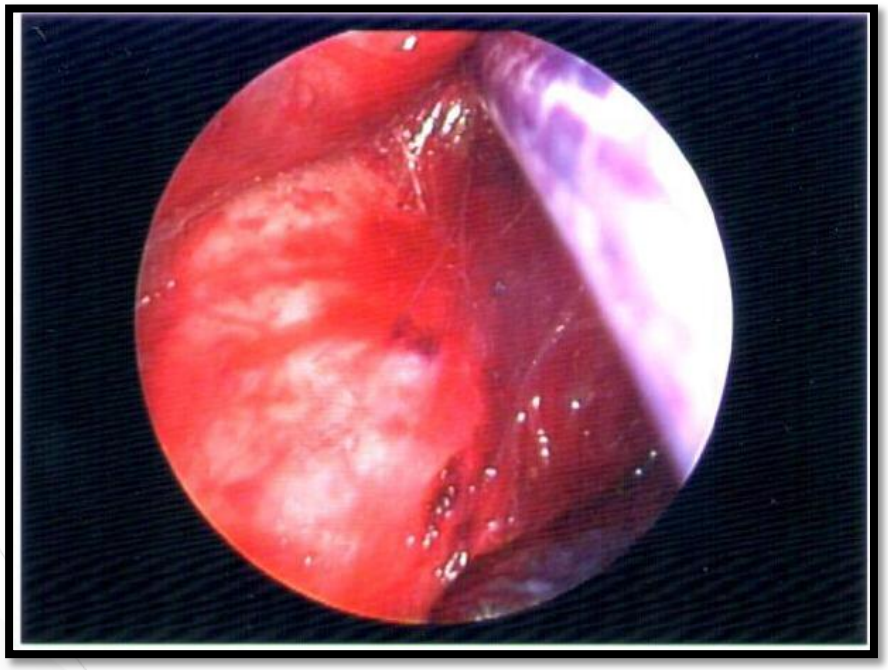
Mediastinoscopy

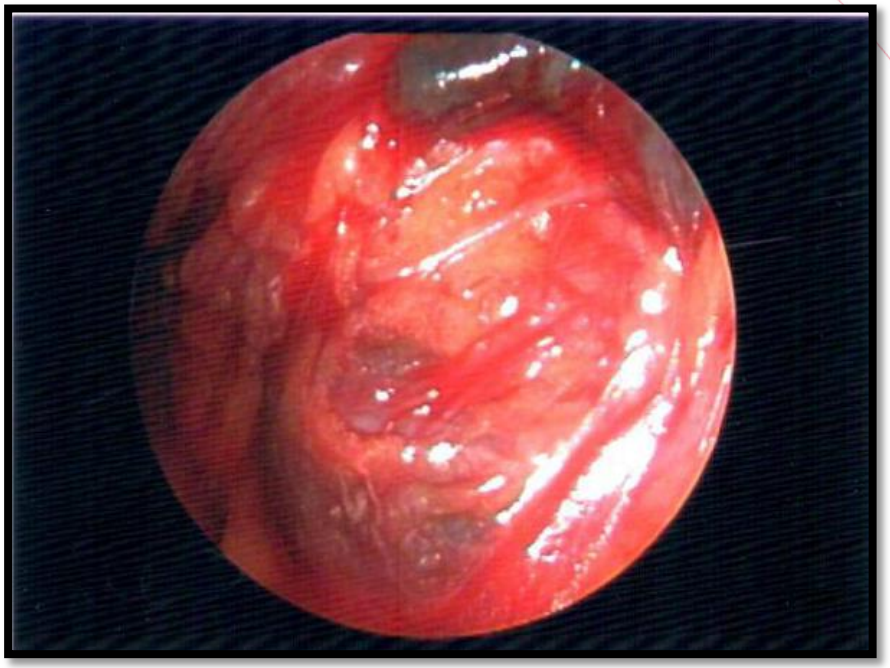


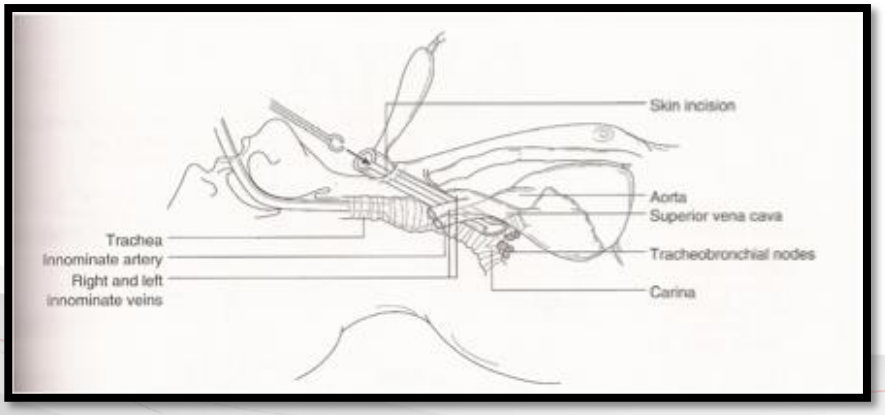




Mediastinoscopy







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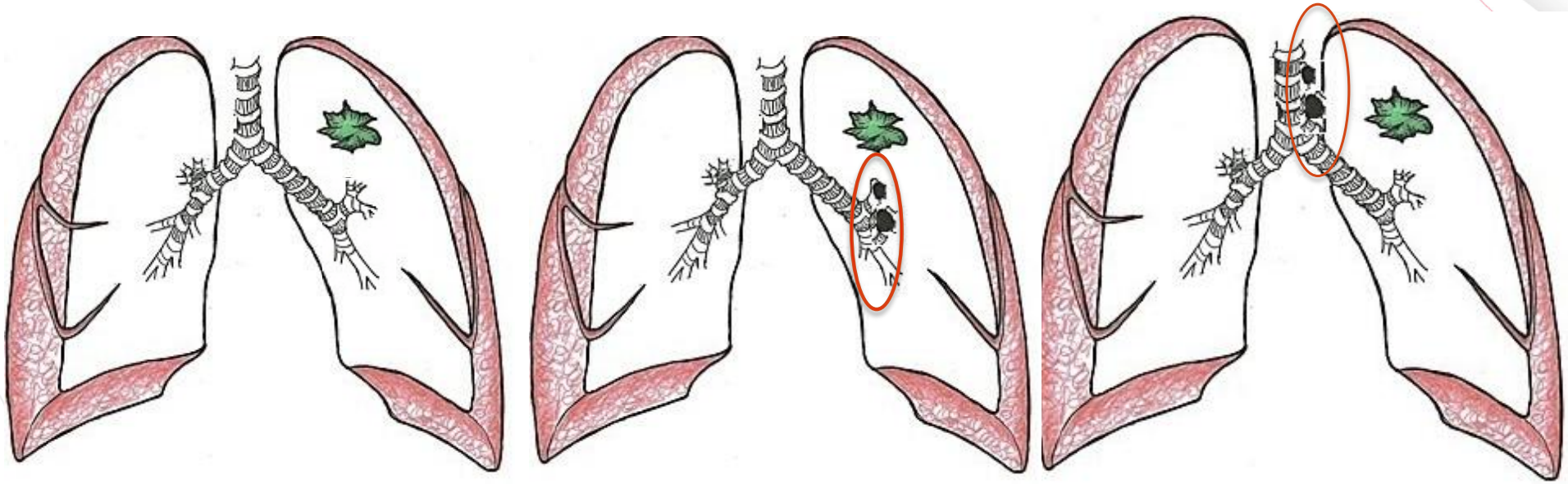
Who gets surgery?

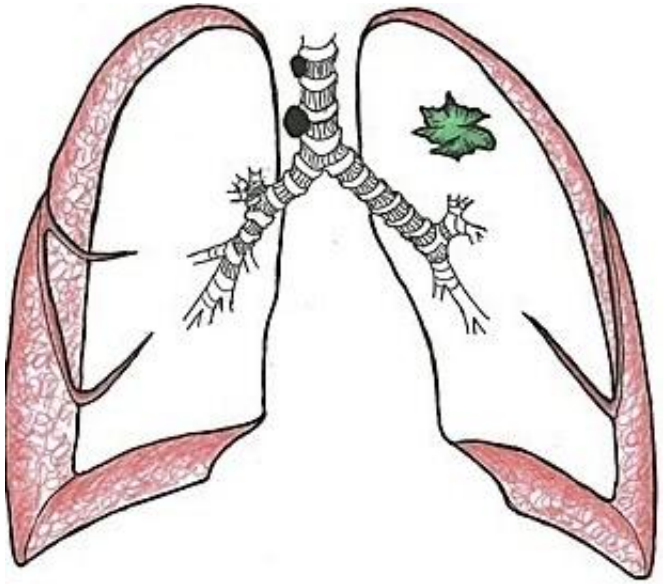
Surgery can have a role in treatment



N0 **N1** **N2**

If lymph nodes on the same side as the cancer have tumor cells in them, surgery will be performed upfront or after receiving chemoradiation

Surgery has no role in treatment



If lymph nodes on the opposite side of the cancer have tumor cells in them, surgery does not play a role

Pre-operative considerations

- Can an operation be tolerated
  - Are there other significant medical problems
- Is there sufficient pulmonary reserve
- Can the tumor be completely removed (margins, LN basins)

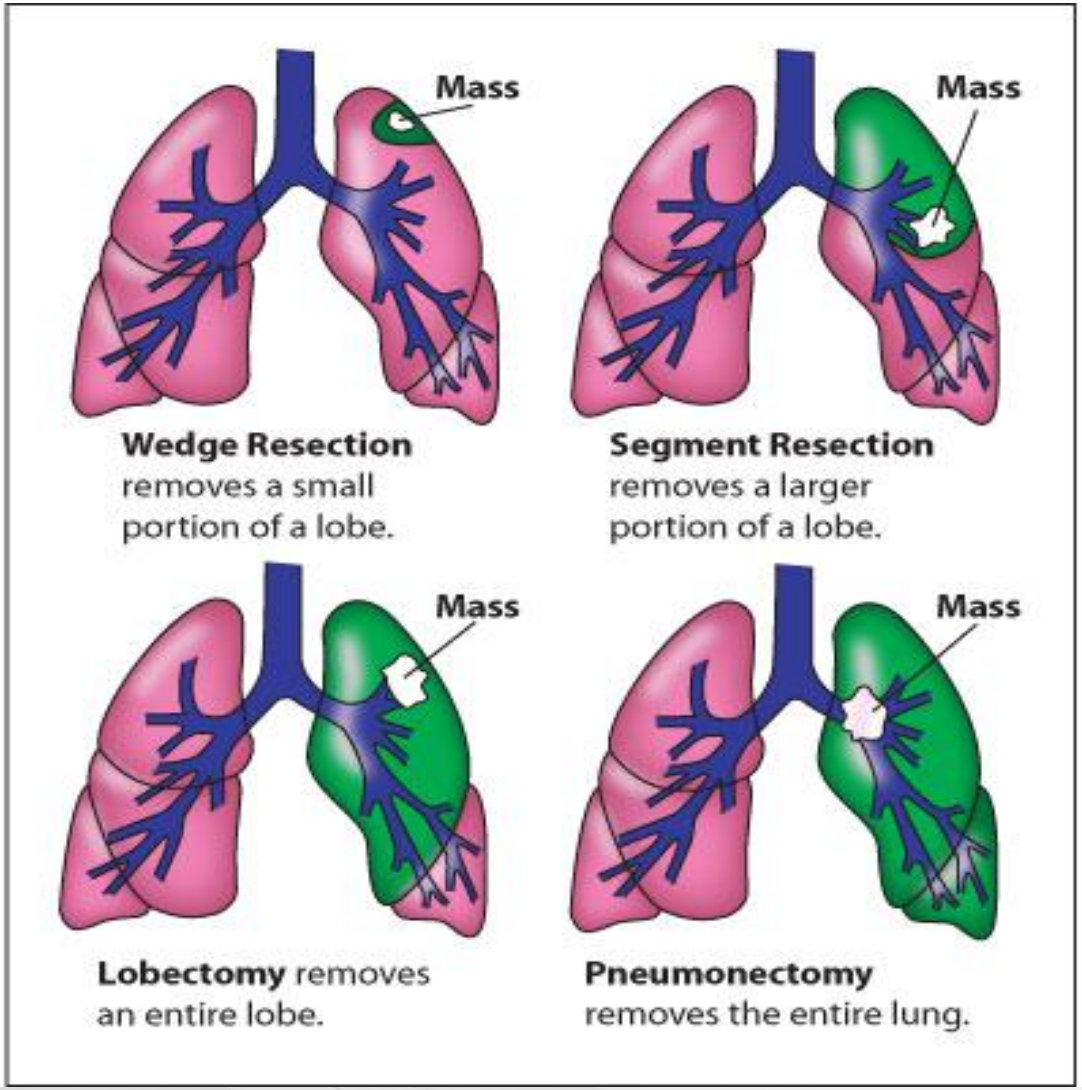
What are the goals of surgery?

What are the types of surgeries?

Goals of Surgery

- Remove main tumor completely
- Remove all draining lymph nodes on the side of the cancer
- Preserve lung function so that a patient can maintain a good quality of life

Types of Lung Surgery



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How much lung can be removed?

- Most of us have enough lung tissue that if we had an operation to remove part of the lung, we could still breathe and maintain our quality of life
- Some people may have decreased lung function due to damage caused by cigarette smoke
- How much of the lung that can be removed safely is determined by pulmonary function studies (PFT)
- Most people who have lung surgery do not need to be on oxygen for the rest of their life

How is surgery performed?

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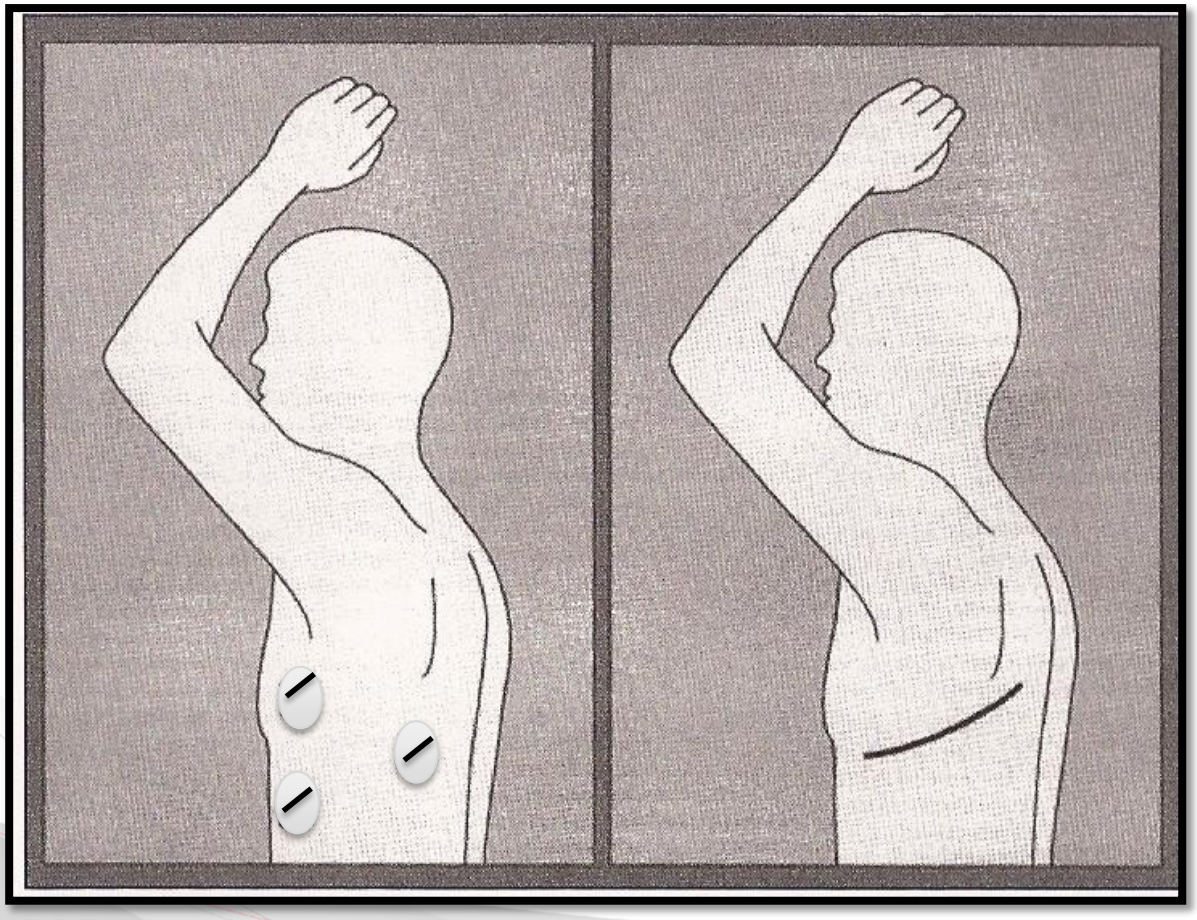
Incisions for Lung Surgery

VATS Thoracotomy



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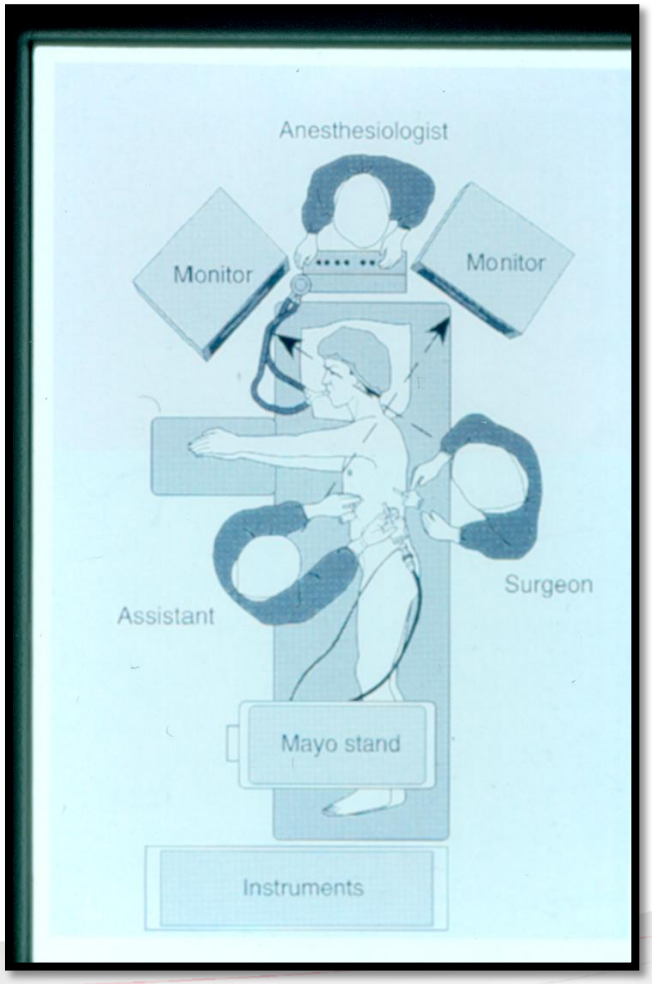
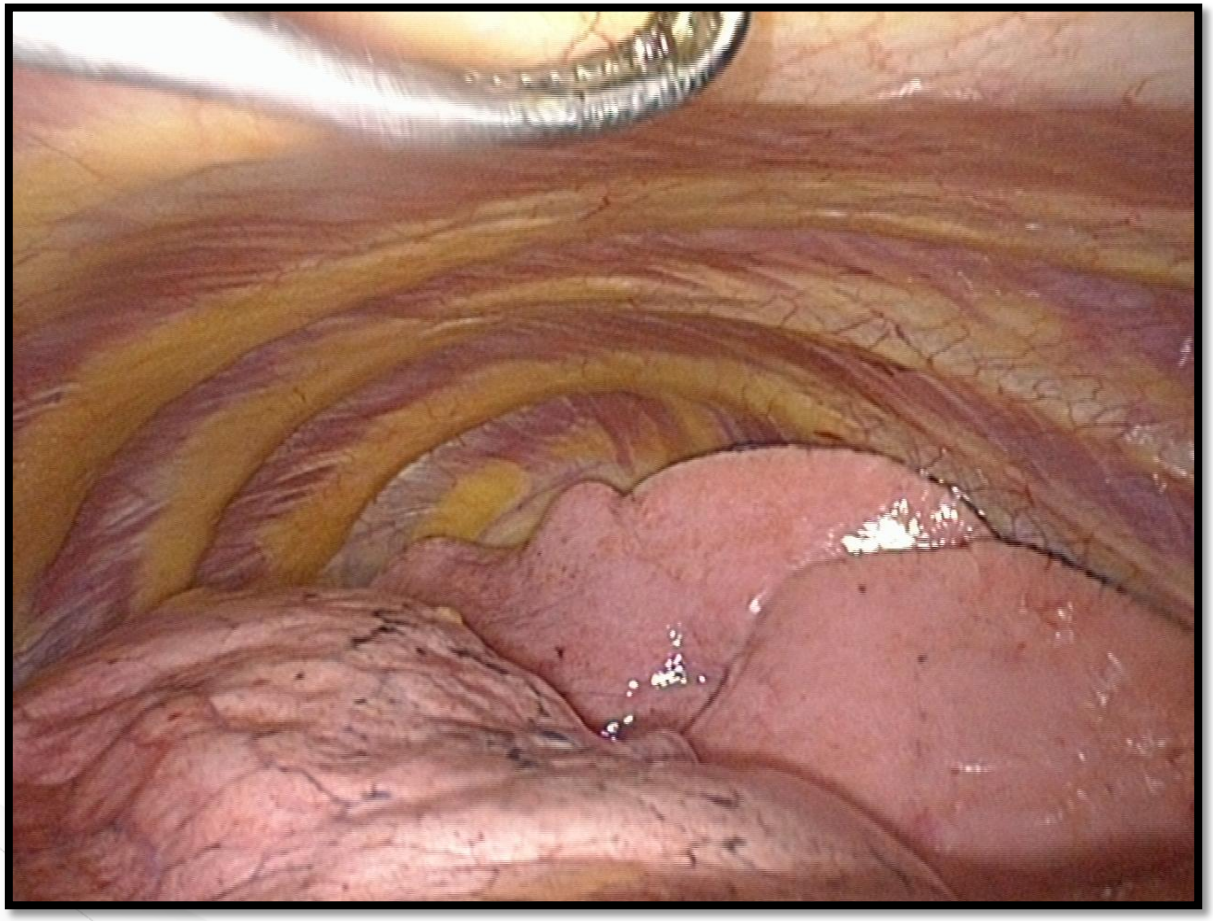
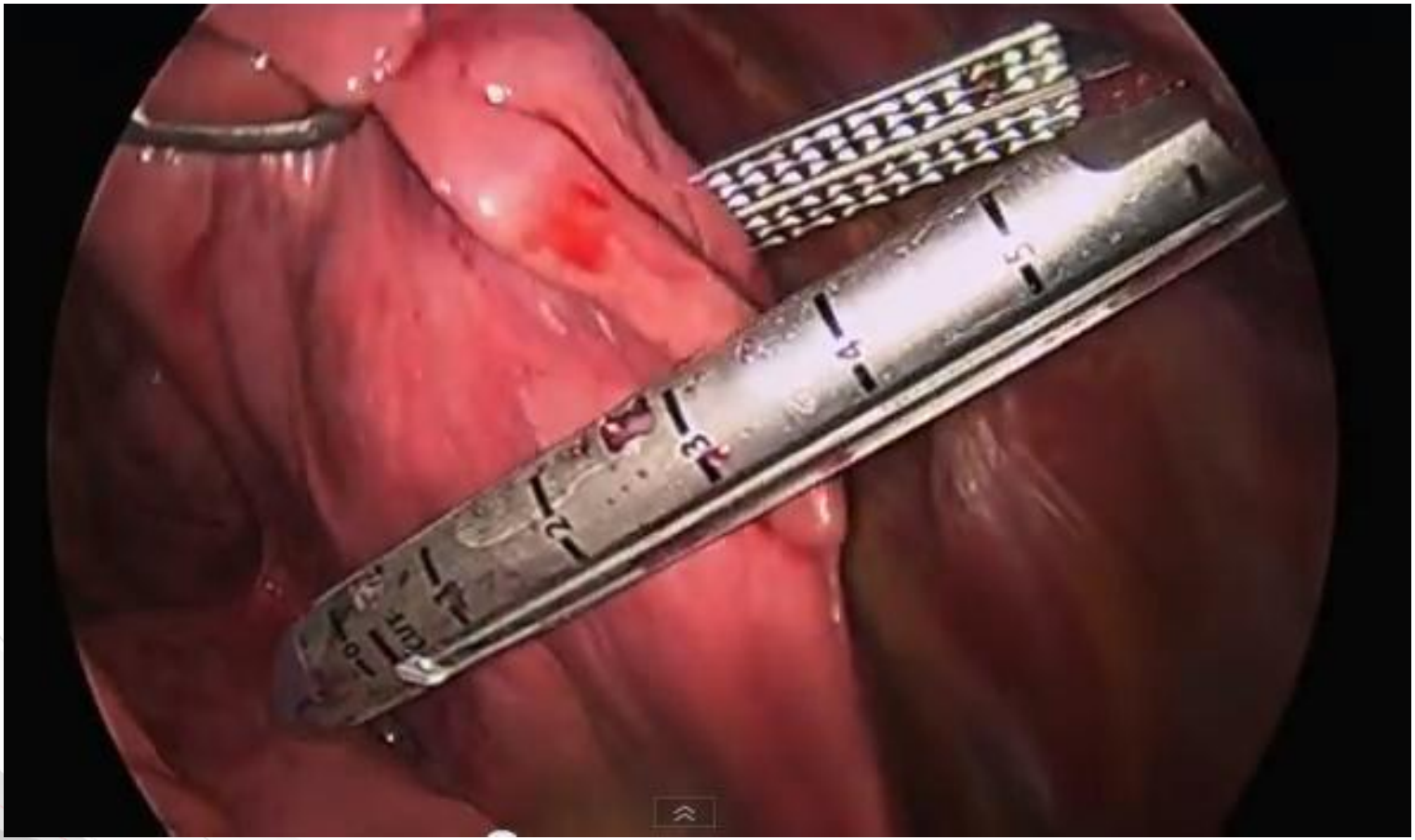
VATS
(Video Assisted Thoracoscopic Surgery)



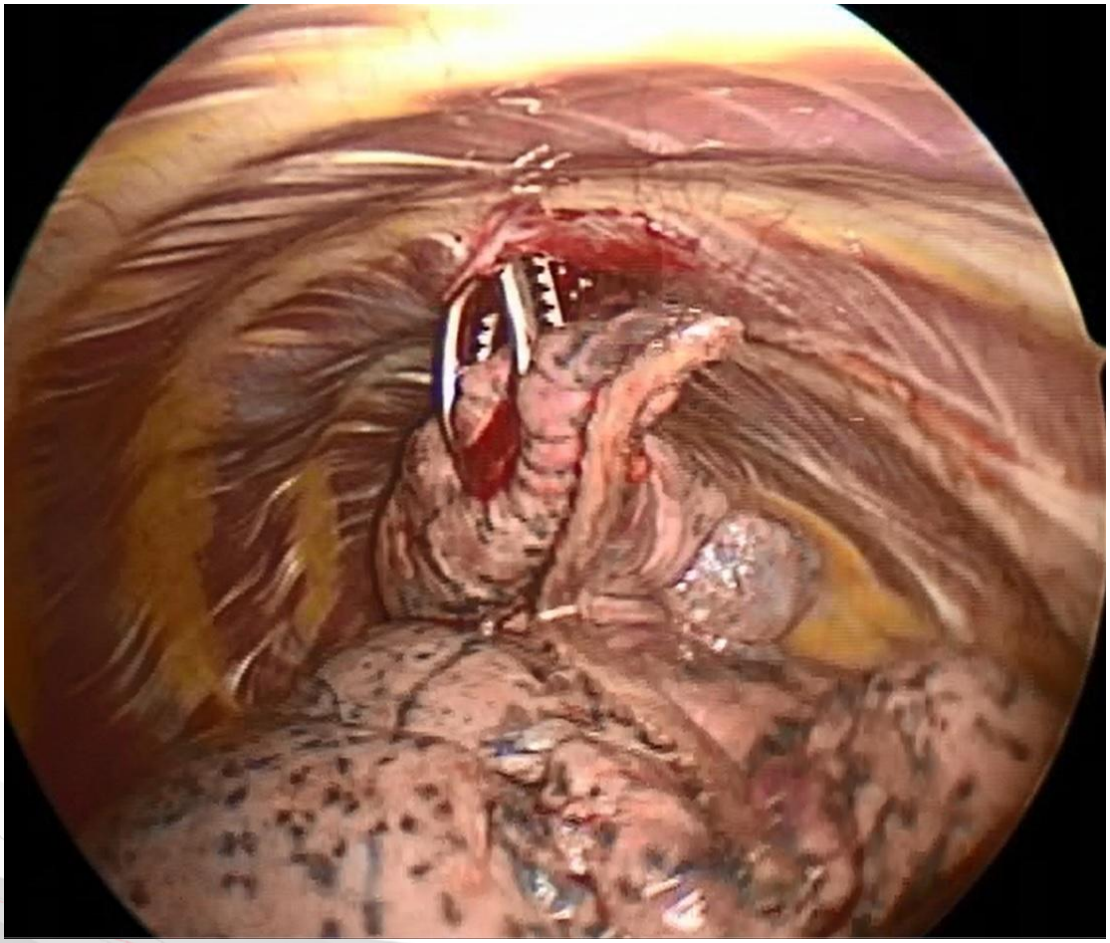
Right Sided VATS



VATS wedge resection

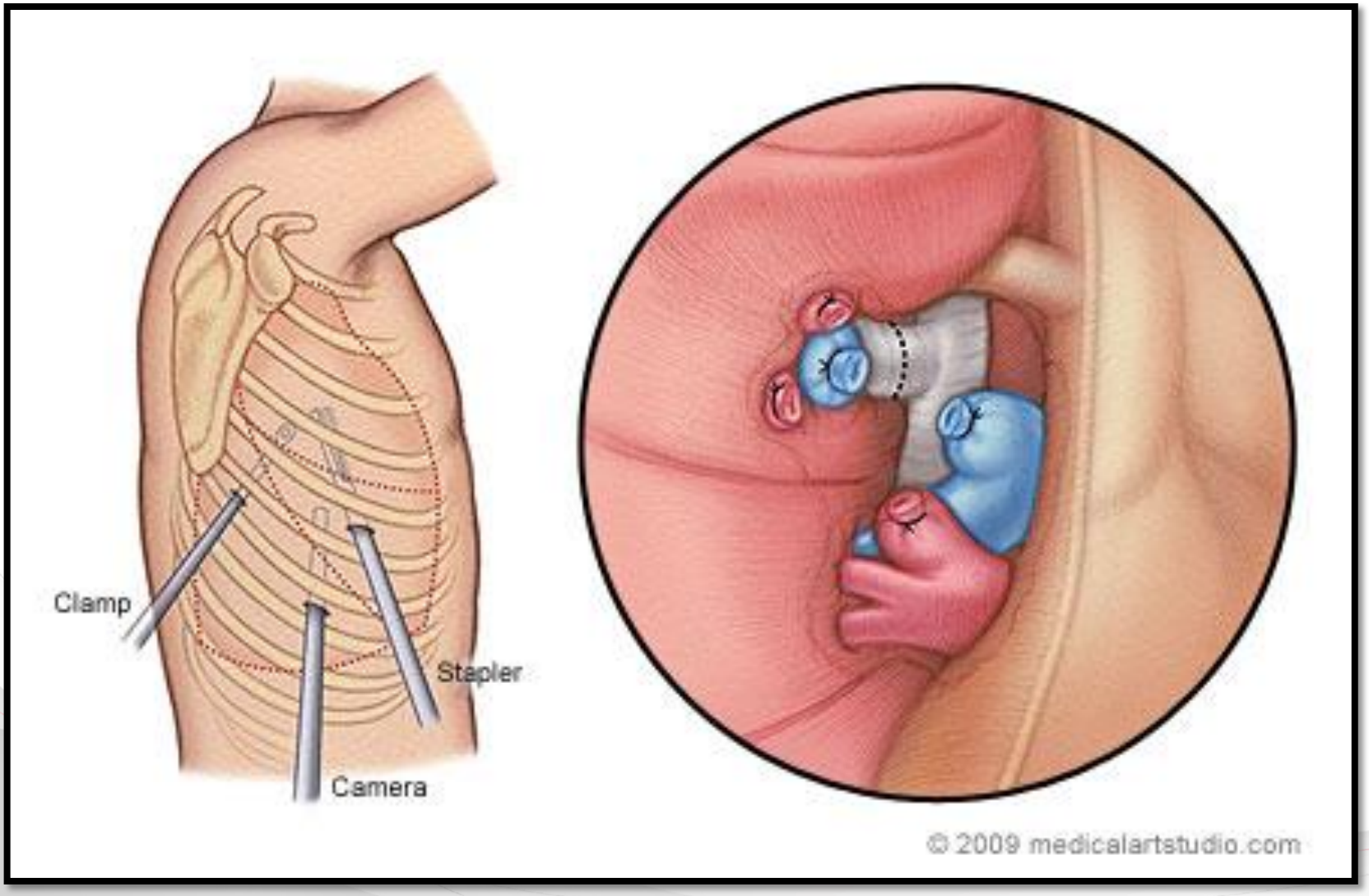


VATS wedge resection

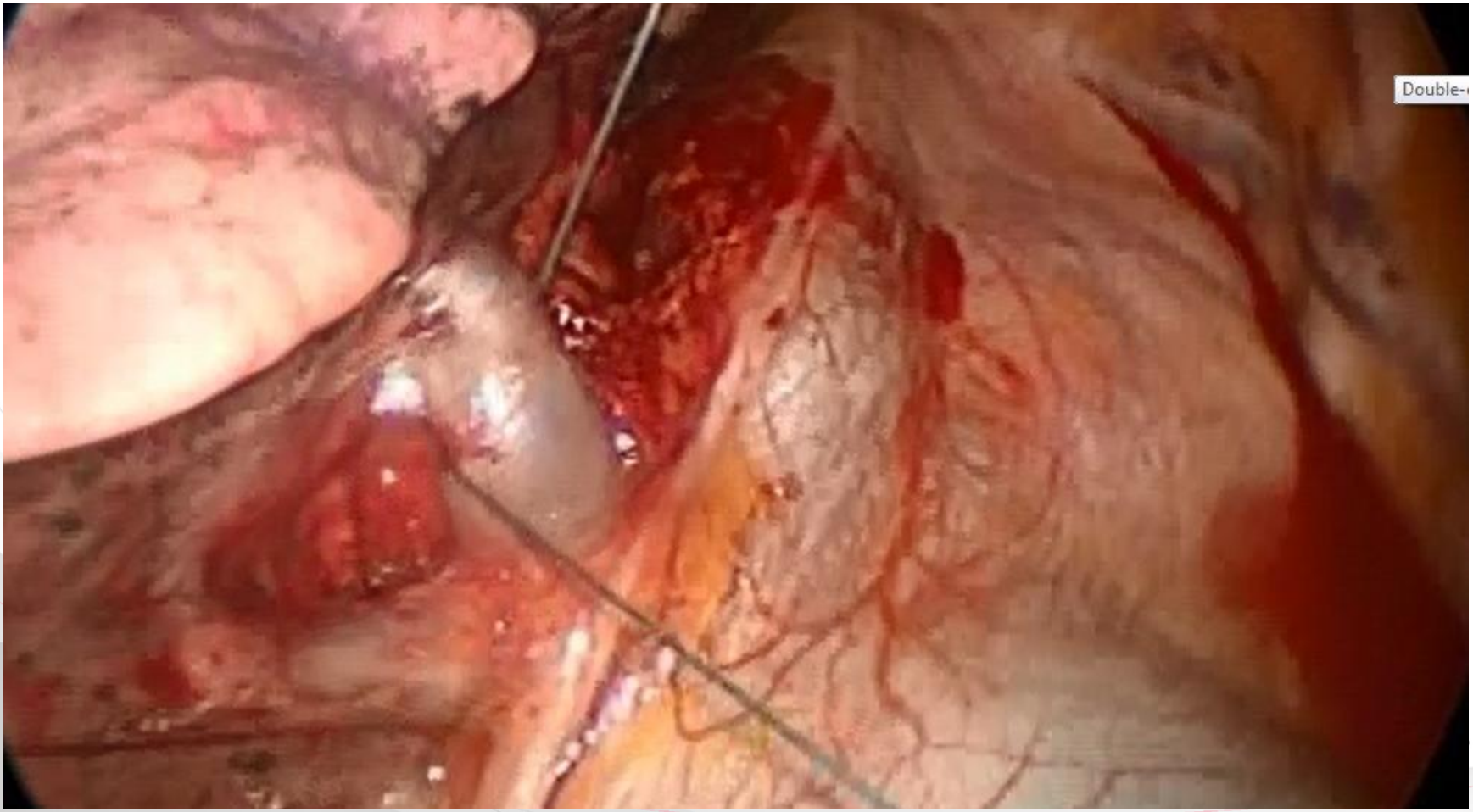


Lung tissue removed

VATS Lobectomy



Division of Pulmonary Vein



Division of Pulmonary Artery

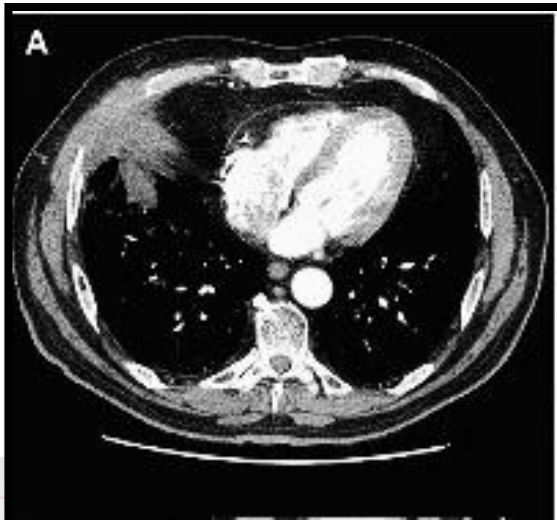
Chest Wall Resection

Performed for:

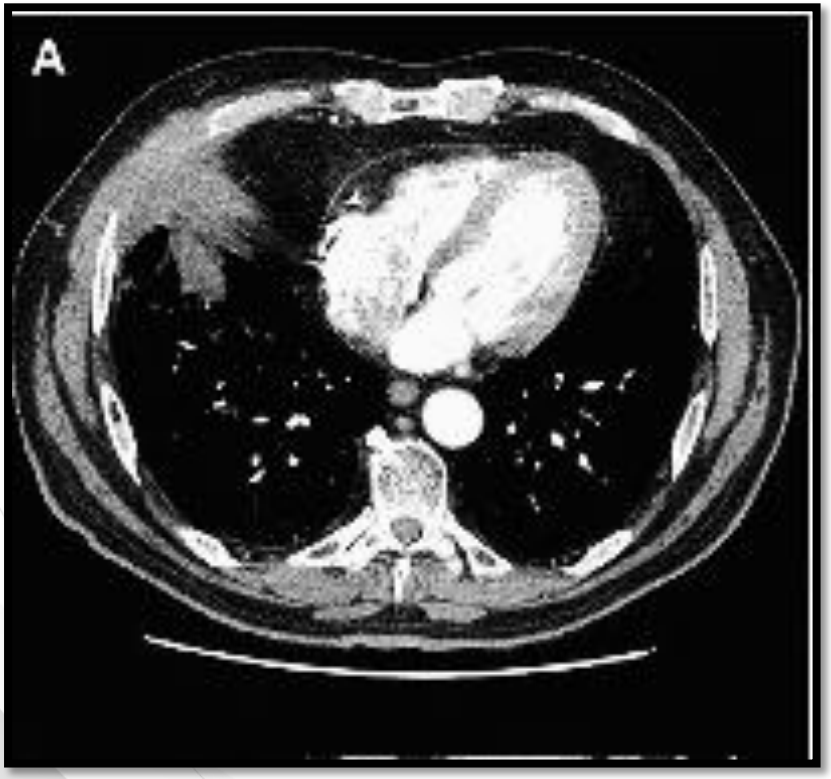
- Local invasion of an underlying adjacent tumor

- Chest wall resection:

  - Includes the ribs, muscles between the ribs and sometimes muscles outside the ribs



Chest Wall Resection



Removal of more than 4 ribs or defects larger than 5 cm will require chest wall reconstruction

Chest Wall Reconstruction

- Meshes and patches- (i.e. PTFE or Gortex)

- Sutured to adjacent ribs to cover surface of the chest wall defect

What to expect after surgery?

- Chest tube
  - Typically removed in 2-3 days
- Respiratory therapy
  - Breathing exercised to prevent pneumonia
- Physical therapy
  - Out of bed to chair on Day 1
  - Ambulate
- Pain control
  - Epidural
- Home
  - 2-3 days after VATS
  - 5-7 days after thoracotomy

Summary

- The use of surgery to treat lung cancer depends on the type of lung cancer, the stage of the cancer and the overall condition of the patient
- Surgery is most commonly used when the cancer is confined to the chest and when confined to the lymph nodes on the side of the cancer
- Lobectomy and removal of all associated lymph nodes is the standard operation when adequate lung function is present

Summary

- VATS is associated with shorter LOS and pain
- Chest wall resection or pneumonectomy may be required for complete resection
- Chemotherapy and/or radiation therapy may be needed prior to or after surgery to completely treat the lung cancer

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The End

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