Surgical Treatment of Lung Cancer

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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

- Right lung
- Left lung
- Upper lobe
- Middle lobe
- Lower lobe
- Mediastinum (between right and left lung)
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
EBUS (Endobronchial Ultrasound) Needle biopsy
Mediastinoscopy
Mediastinoscopy
Who gets surgery?
Surgery can have a role in treatment

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

- **Wedge Resection**: Removes a small portion of a lobe.
- **Segment Resection**: Removes a larger portion of a lobe.
- **Lobectomy**: Removes an entire lobe.
- **Pneumonectomy**: Removes the entire lung.
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?
Incisions for Lung Surgery

VATS

Thoracotomy
VATS
(Video Assisted Thoracoscopic Surgery)
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
The End