Thoracic Surgery; An Overview
James P. Locher, Jr, MD
Methodist Cardiovascular and Thoracic Surgery

Thoracic Surgery
What we see
- Lung cancer
- Mets
- Fungus and TB
- Lung abscess and empyema
- Pleural based disease
- Trauma: hemothorax
- Benign: Interstitial lung disease

Diagnostic Testing; Resectability and Operability
- Preoperative risk assessment
- Spirometry
- Arterial Oxygenation (rest and exercise esp RA)
- DLCO
- Ventilation Perfusion Scans
- Exercise Testing (arterial desaturation and MVO2)

Spirometry
- FEV1 (calculated with VQ scan): less than 40% pred greater than 50% mortality/need absolute minimum 800 cc
- FEV1 best predictor of death in pneumonectomy patients
- DLCO: more sensitive indicator of post op complications/decreased in COPD, pulm HTN, ILDz/<60% best predictor of mortality

Guidelines
- FVC <50% pred
- FEV1 <50% pred
- FEV1 <2.0 liters
- DLCO <60% pred
- PAP >35 mmHg MVV <50% of pred

Diagnosis
- Bronchoscopy: Transbronchial biopsy, washings and cytology, resectability (location)
- CT guided FNA: positive result helpful/negative still suspicion, risk of pneumothorax and bleeding
- Sputum eval/cytology
- Mediastinoscopy
Lobe Anatomy

Thoracic Surgical Options
- VATS (video assisted thoracic surgery): small thoracotomy with video assistance vs complete thoracoscopy, familiar to most thoracic surgeons; Lose lot of manual feel and dexterity (esp for deep lesions and SPN)
- Open: Maintain manual dexterity and feel
- Robotic: Advantage over VATS is more instrument dexterity

Lung Resection

Wedge Resection; When and How
- Peripheral nodules (undiagnosed)
- Metastasis (colon, renal etc)
- Carcinoid (SPN) if peripheral
- Fungal (histoplasmosis, blastomycosis) if SPN and peripheral
- SPN deep in parenchyma may require lobectomy even for diagnosis

Thoracic Surgery Techniques
- VATS lobectomy controversy over completeness of resection esp LN’s
- Is "completeness of resection" improved with Robotics?
- Steep learning curve with VATS lobectomy/Steeper with Robotics
- Robotics cost higher but ? Faster recovery
- Complex large lesions still with open technique

Pneumonectomy
Lung Cancer; Epidemiology
- 190,000 new cases in year 2000
- 5 year survival 1981-1987 13%/1950-1954 6%
- Second most frequent cause of death after ischemic heart disease
- Death due to ischemic heart disease decreasing/lung cancer increasing
- Long latent period (decreased incidence of smoking but seeing result of past patterns)

Lung Cancer; Causes
- Cigarettes: 90% of patients
- 2nd hand smoke: 25% increased risk/more carcinogenic per weight
- Industrial exposure: most common asbestos
Lung Cancer: Symptoms and Presentation

- Cough (75%)
- Hemoptysis (33%)
- Pain (50%) poor prognostic sign
- Anorexia and weight loss (poor prognostic sign)
- Shortness of breath
- Hoarseness
- Pleural effusion (if malignant, nonoperable)

Lung Cancer: Staging

- TNM classification
- T (size and location)
- N (lymph nodes): N0 no nodes positive, N1 ipsi, N2 mediastinal, N3 contra
- M (metastasis): M0 none, M1 distant
- Stage I and II operable; Stage III ?operable with neoadjuvant tx; Stage IV non operable

Lung Cancer; Pathology

- Squamous Cell Carcinoma: 40-70%, central, more common men, local spread
- Adenocarcinoma: 5-15%, peripheral, more common women, distant spread
- Undifferentiated: Large Cell (aggressive), Small cell (non surgical, frequent mets)
- Bronchoalveolar: variant of adenocarcinoma, better prognosis

Lung Cancer: CT scan

Lung Cancer Treatment

- Surgery: The only cure; Lobectomy, pneumonectomy, wedge with complete lymph node dissection
- Neoadjuvant tx: ? for N2 disease/?better disease free survival
- Primary rad tx esp for solitary pulmonary nodules
- Palliative chemotherapy

Lung Cancer: Survival

- Stage Ia: 67%
- Stage Ib: 57%
- Stage Ila: 55%
- Stage IIb: 39%
- Stage IIIa: 23%
- Recurrence: 80% within 2 years
Lung Abcess and Empyema

- Lung abcess causes: aspiration, post pneumonic, post obstructive (cancer).
- Most lung abcesses can be treated medically. Surgery for complications. Usually requires lobectomy
- Empyema: Accumulation of pus in pleural space. Causes ½ pneumonia, other post surgical (esophageal or lung), trauma
- Empyema: treat drainage (chest tube early) vs decortication (later)

Empyema; CT scan

Decortication

Pleural Based Diseases

- Malignant pleural effusion: Tx with recurrent thoracentesis, bedside talc pleurodesis (or other agent), VATS talc and drainage (lung must expand), Shunt (PleurX catheter)
- Mesothelioma: Poor prognosis. En bloc resection, chemo, rad tx
- Chylothorax: Injury or obstruction of Thoracic duct (tumor, trauma)

Malignant Pleural Effusion

Malignant Pleural Effusion; Tumor “Studding”
### Fungus and TB
- Establish a diagnosis
- Failure of medical tx
- Lung cancer vs fungal disease
- 3 most common: Histoplasmosis, Coccidiomycosis, Blastomycosis. Mainstay of tx is Amphotericin B
- Can present with pneumonia, lung abcess, mass, empyema etc…

### Benign Interstitial Lung Disease
- BOOP, UIP, LIP, GIP etc…
- Drug induced toxicity
- Carcinoma with lymphatic spread
- Sarcoidosis
- Radiation
- CHF
- Our role is to make diagnosis; often with VATS
- Mortality with surgery may be high if disease is advanced