

114. Primary Lung Cancer

Etiology/Pathophysiology

- Second most common malignancy (170,000 new cases/year in U.S.)
- Most common cause of cancer-related death (25% of all cancer deaths)
- Smoking is the primary etiology in >80% of lung cancers
- 15% of smokers will develop lung cancer
- Small cell lung cancers (SCLC) tend to grow rapidly and metastasize early
 - Small cell carcinoma (20% of lung cancers): Undifferentiated, centrally located, and usually presents with advanced disease
 - Carcinoid tumors (5% of lung cancers): Differentiated, neuroendocrine tumors that arise from bronchi, centrally located, and rarely metastasize
 - Neuroendocrine carcinoma or atypical carcinoid (1% of lung cancers): Less differentiated, more peripheral, and more aggressive
- Non-small cell lung cancers (NSCLC)
 - Adenocarcinoma (40% of lung cancers): Glandular, peripheral, nodal/distant metastases are common, non-smokers/women
 - Bronchoalveolar cell carcinoma (2% of lung cancers): Glandular adenocarcinoma, variable, non-smokers/women
 - Squamous cell carcinoma (25% of lung cancers): Usually central, usually localized with regional nodal spread, may be cavitary
 - Large cell carcinoma (7% of lung cancer): More peripheral

Differential Dx

- Benign lung lesions
 - Non-neoplastic lesions (e.g., granuloma, atelectasis, abscess, AV malformation)
 - Benign neoplastic lesions (e.g., hamartoma)
- Pulmonary metastasis
- Other malignancy

Presentation/Signs & Symptoms

- 90–95% of patients are symptomatic (versus <50% of patients with benign lesions)
- Cough, dyspnea, wheezing, and hemoptysis are common presentations
- Fever (postobstructive pneumonia)
- Pleural effusion and chest wall pain may indicate regional spread
- Paraneoplastic syndromes occur in 10–15% of cases, usually SCLC (e.g., SIADH, Eaton-Lambert syndrome, Trousseau's syndrome, ectopic PTH)
- Less common presentations include superior vena cava syndrome, Horner's syndrome (miosis, ptosis, anhidrosis), Pancoast's tumor, phrenic nerve/vagus nerve/esophagus involvement

Diagnostic Evaluation

- History and physical exam
- Chest X-ray has a limited detection of lesions <7 mm
- CT scan is the cornerstone of evaluation to determine tumor size and extent, mediastinal node involvement, and liver/adrenal metastases
- CT or MRI of brain and bone scan to evaluate metastases
- Pre-operative histologic diagnosis by sputum cytology, bronchoscopic biopsy (central), fluoroscopic FNA, or CT-guided biopsy (peripheral)
- Staging of mediastinum with mediastinoscopy, CT-guided biopsy, PET scan, or bronchoscopic directed biopsy
- Pre-operative determination of whether the patient will be able to tolerate lobectomy or pneumonectomy
 - Pulmonary function studies and differential V/Q scans (calculated postoperative FEV₁ should be >0.8)
 - ABG showing pCO₂ >45 or pO₂ <60 suggest a high risk for complications

Treatment/Management

- SCLC management is almost exclusively non-surgical
 - Responds well to combination chemotherapy
 - Radiation to symptomatic sites for palliation
 - Prophylactic brain radiation is often used as >80% of patients develop brain metastases
 - Surgery is indicated only for isolated lesions without metastases (rare)
- NSCLC
 - Stage I/II disease are resectable: Lobectomy is preferred but pneumonectomy, segmentectomy, and non-anatomic resections may be used; adjuvant chemotherapy increases survival
 - Surgery has limited or no role in stage III/IV disease; radiation treatment may be used palliatively
 - Primary and adjuvant chemotherapy (long-term response 5–15%)

Prognosis/Complications

- 15% overall 5-year survival for all lung cancers
 - NSCLC stage I: 60–70% 5-year survival
 - NSCLC stage II: 40% 5-year survival
 - NSCLC stage III/IV: <15% 5-year survival
 - Untreated SCLC survival <6 month
 - Chemotherapy-treated SCLC <10% 5-year survival (however, 50% of patients have an initial positive response)
- Complications of unresectable tumors include pleural effusion, post-obstructive pneumonia, airway obstruction, bronchopleural fistula, and metastases
- Complications of resected tumors include local or distant recurrence, empyema, bronchopleural fistula, and post-thoracotomy pain