Pulmonary Neoplasm

Carcinoma of the bronchus is the most common malignancy in men and the most common (after carcinoma of the breast) in women. A number of neoplasms affects the airways and suspicion of carcinoma of the bronchus should prompt thorough investigation to make the diagnosis at an early and therefore treatable stage.

Benign Tumor

Benign tumors of the lung are uncommon and account for less than 15 % of solitary lesions seen on chest radiographs. A tumor is likely to be benign if it has not increased in size on chest radiograph for more than 2 years or has some degree of calcification. However, a tissue diagnosis is advisable as a non calcified solitary lesion may be a primary carcinoma.
Most benign nodules are granulomas (tuberculosis or histoplasmosis). Diagnosis (and definitive treatment) is achieved by excising the lesion.

Epithelial tumors

Epithelial tumors of the airways are particularly troublesome problem. The airways become infected with a papilloma virus at birth and small stalk-like papillomas develop, initially in the larynx and then down into the major airways. Regular endoscopic follow-up is required following bronchoscopic resection, because recurrence is common and malignant change may occur.

Fibroma

Fibroma is the most common mesodermal tumor and tends to occur in the bronchi rather than trachea. Fibromas are often pedunculated and therefore easily removed at bronchoscopy.

Hamartoma

Hamartoma is the most common benign pulmonary tumor and it is consist of disorganized mass of tissue within the lung substance containing respiratory structure. It is the result of a developmental abnormality and malignant change is rare.

Bronchial adenomas

Bronchial adenomas are mainly carcinoid tumors derived from the neuroendocrine cells of bronchial glands. Most (80%) are found in the major bronchi and characteristically slow growing and highly vascular. Occasionally these tumors secrete hormones [ACTH, melanocyte-stimulating hormone or insulin] This may be the first presentation but usually there are recurrent chest infection, hemoptysis and occasionally chest pain. Carcinoid tumors belong to a class of tumors that are benign at one end of the scale, to those that are locally aggressive and to the highly malignant oat cell carcinoma at the other end of the scale. Surgical excision is the appropriate treatment and regular follow-up is advised.

Bronchogenic carcinoma

Etiology

This is usually present from the fifth decade onwards and the principal risk factor is smoking, particularly cigarettes. The other but rare causes include exposure to arsenic, radon gas, bichromates and nickel ore.

Pathology

With the exception of alveolar cell carcinomas, which arise from cells lining the alveoli, primary lung cancers arise within the bronchial epithelium and are hence termed bronchogenic carcinoma. Nodal spread occurs to the inralobar, hilar and mediastinal nodes, and thence to the scalene nodes. Metastases occur in bone, brain, liver, and adrenals. Local direct spread may involve the chest wall, vertebrae, trachea, esophagus and great vessels.

Cell types and approximate frequencies are as follows:

- Squamous 35%
- Adenicarcinoma 25%
- Undifferentiated or some time called large cell 15%
- Small cell 20%
- Alveolar cell 5%

Patients with small cell cancer are not usually referred for surgery as the condition is regarded as a systemic disease at presentation and is, therefore, treated with chemotherapy. All other varieties are resected if possible, and bronchogenic carcinoma is, therefore, frequently split into tow functional categories: small cell and non small cell.

Clinical features

There may be no clinical features, but hemoptysis, pulmonary infection and weight loss are common presenting symptoms. Paraneoplatic syndromes are infrequent but well described, including ectopic hormone production ACTH, PTH, ADH and painful periosteal reaction affecting the joints and long bones, termed hypertrophic osteoarthropathy. Patient frequently have finger clubbing.

Diagnosis

Simple chest X-ray may show mass lesion or it may reveal changes indicating involvement of other structures, such as elevated diaphragm, indicating phrenic nerve involvement, bone metastases or direct invasion of the rib cage. Also it may show lobar collapse or consolidation, and pleural effusion. A contrast-enhanced thoracic and upper abdominal CT scan will clarify the nature and position of the pulmonary mass and should exclude other pulmonary lesions that might represent metastases or synchronous tumor. The diagnosis will often be confirmed by sputum cytology, bronchoscopy or CT guided needle biopsy.

Assessment for pulmonary resection

Surgical assessment addresses tow questions:

- Would the patient be fit for pulmonary resection?
- If so, is the disease potentially curable?

Fitness for resection

Fitness is determined by cardiorespiratory investigation. The forced expiratory volume in 1 second (FEV1). Patient with an FEV1 < 50% predicted, are likely to be not suitable candidates for surgical management. Also

patient with poor left ventricular function and/or unstable angina are not suitable for pulmonary resection.

Resection

Lung tumors are normally removed en block with the surrounding parenchyma and local draining lymphatics. This involves either lobectomy or pneumonectomy. Occasionally, in unfit patients, small cancers are excised within a wedge or segment of lung. The risk of local recurrence is greater in these lung sparing cases. An area of anterior chest wall directly invaded by tumor can be excised and replaced with acrylic patch. Patients who are found to have positive mediastinal lymph nodes following resection are routinely referred for adjuvant radiotherapy to the mediastinum in the view of the high risk of recurrence in that area. Post surgical chemotherapy may improve 5-year survival across all resected stages by approximately 5%.

Metastatic disease

Pulmonary metastases are the most common form of intrathoracic malignancy. A confirmatory diagnostic lung biopsy may be helpful for patient with no evidence of primary. A palliative pleurodesis in patients with associated pleural effusion can be achieved by instilling an irritant material into pleural cavity. Rarely, a solitary metastasis may be found in patient without any other evidence of disseminated disease. In these situations, surgery may be advised to remove the Metastatic lesion.