Lung Tumours

Classification

Primary

- Benign
  - **Adenoma** – Rare (1% of all), slow growing, central, 90% carcinoid, 10% cylindromas.
  - **Hamartoma** – disorganised normal pulmonary tissue.
- Malignant
  - **Small-cell lung cancers (SCLC)**, 25% of malignant cases - Oat cell cancer, v. aggressive, central, early mets, ectopic endocrine secretion.
  - **Non-small-cell lung cancers (NSCLC)**, other 80%, including:
    - **Squamous** (30% of cases) - Central, variable differentiation, may cavitate
    - **Adenocarcinoma** (30%) - Less smoking related, small, peripheral, ?scars
    - **Large cell** (15%) - Giant cell (aggressive, multinucleated cells) & Clear cell (uncommon, smaller, relatively benign). Both tend to be peripheral.
    - **Mesothelioma** – see below
- Lymphomas and leukaemias may also involve the lung.

Secondary:

- Solitary or multiple (cannon ball) nodules: colon, breast, renal, testis, TCC, melanoma
- Diffuse: prostate, stomach, pancreas, lymphoma, thyroid (follicular cell)

Malignant mesothelioma

Epidemiology

Usually occurs in the pleura (80-90% of all cases), 3M:1F. Aged 40 - 70yrs.
Associated with occupational asbestos exposure withup to 45yr latent period.

Clinical features - Similar to other primary lung tumours

Investigations - Diagnosis is made on histology, following a pleural biopsy or at post-mortem.

CXR: pleural thickening/effusion.
MRI scan/laparoscopic thoracoscopy: assess extent of the disease.
Pleural fluid aspiration: Bloody.

Staging

Stage I: Within capsule of parietal pleura: ipsilateral pleura, lung, pericardium, & diaphragm.
Stage II: All of stage I with intrathoracic (N1 or N2) lymph nodes
Stage III: Local extension into: chest wall or mediastinum; heart or through the diaphragm, peritoneum; with or without extrathoracic or contralateral (N3) lymph node involvement.
Stage IV: Distant metastases.

Management

Surgical cure only for extremely localized (stage I) mesothelioma.
Extrapleural pneumonectomy may lengthen time to recurrence.
Pleurectomy and decortication may provide palliative relief from pain and pleural effusions.
Chemotherapy disappointing generally, but radiation therapy can help pain.
Neither DXR or chemotherapy currently improves survival.

Prognosis

Generally very poor.

Median survival is 11 months. It is almost always fatal.

Primary Malignant Lung Tumours

Epidemiology

Commonest male cause of cancer death in M, 2nd commonest in F (after breast Ca)
M>F but F incidence increasing faster. Usually >40

Risk Factors

- Smoking (90% of deaths) 30-60x risk > non-smokers or ex for >15yr. Passive smoking
- Sustained asbestos exposure (<5%),
- Radon gas, uranium, nickel, chromium and gold mining, arsenic, iron oxides, soot, tar
- CAL, pulmonary fibrosis, marijuana
- Family history
- Scar cancers (e.g. from TB)

Presentations

Resp symptoms: cough, dyspnoea, chest pain, haemoptysis, wheezing/stridor, recurrent LRTI.
Other: wt loss, fever, anorexia all common, also see complications (below).
Chest signs: sometimes none, else fixed wheeze, consolidation, collapse, pleural effusion.

Complications

Local: Recurrent laryngeal palsy, phrenic nerve palsy, Horner's syndrome, Pancoast's syndrome (SqCC), SVC obstruction, rib erosion, pericarditis, AF
Metastatic: Liver (hepatomegaly), Brain (confusion, fits, focal neurological deficit, cerebellar syndrome), Bone (bone pain, hypercalcaemia), LN, Adrenals (Addison's).
Non-metastatic (paraneoplastic)

- Endocrine (12%): inappropriate ADH secretion or Cushing syndrome (SCLC), non-metastatic hypercalcaemia (PTH) or ↓BSL (SqCC), gynaecomastia, hyperthyroidism
- Neuromuscular: subacute sensory neuropathy, mononeuritis multiplex, Eaton-Lambert syndrome, encephalomyelitis, necrotising myelopathy
- Skeletal: clubbing (30%), hypertrophic osteoarthropathy– usually adenoCa - (10%)
- Renal: glomerulonephritis, nephrotic syndrome
- Collagen/vascular: dermatomyositis, polymyositis, vasculitis, SLE
- Haematological: Anaemia, thrombocytosis, thrombocytopenic purpura, DIC, DVT/PE.
- Cutaneous: acanthosis nigricans, thrombophlebitis migrans, pruritus, urticaria, etc.

Differential Diagnosis

Coin Lesions (Extract from Miscellaneous Respiratory Topics - Pulmonary Nodules)

- Solitary secondary [rarely calcify and are round & well defined]
- Benign –hamartoma [rare, sharp, calcified, "popcorn"], adenoma, chrondroma
- Infectious – granuloma (TB [cavitation, calcification, apical], fungal - aspergilloma), round pneumonia [paeds], abscess, Nocardia, hydatids [lower lobes, water-lily sign]
- Non-infective – RA [peripheral, ±cavitation], Wegener's granulomatous
- Vascular – AVM, infarct, haematoma
- Congenital – bronchial atresia, sequestration
- Other – artefact, FB, pseudotumour (fissure fluid)

Investigations:

Chest x-ray: Coin lesion, hilar enlargement, consolidation, pleural effusion or bony mets
CT Chest+contrast: for Dx & staging. Before any biopsy & including the liver and adrenals.
Cytology: sputum and pleural fluid. Sputum cytology only if central & unable to bronchoscope.
Percutaneous transthoracic needle biopsy: for Dx of peripheral lesions and superficial LN.
Bronchoscopy: histological Dx and assess operability. For central lesions.
Surgical biopsy: if less invasive methods of biopsy unsuccessful/impossible. Primary or mets.
PET scan: For solitary pulmonary nodules if a biopsy is impossible or failed.
Lung function tests.
Radionuclide bone scan: for suspected bone metastases.

Staging:

TNM for NSCLC

- Stage I - Intrapulmonary tumour,
- Stage II - Intrapulmonary LN mets
- Stage IIIa - Limited extension of 1° to mediastinum or ipsi-mediastinal LN mets
- Stage IIIb - Extensive mediastinal spread +/- vertebrae or contralateral LN spread
- Stage IV - Distant mets

Two stage system for SCLC

- Limited - confined to 1 hemithorax or incl contralateral supraclavicular/mediastinal LN
- Extensive stage - Contralateral lung or distant metastases.

Management

Generally:

- For NSCLC– 25-30% amenable to surgery. More if SqCC (60%)
    - Early detection may allow surgery (Stages I-IIIa).
    - Radiotherapy (Stages I-III).
    - Chemotherapy (Stages III-IV).
- For SCLC – Usually spread before Dx. So chemo surgery not normally considered.
    - Chemotherapy - up to 6 cycles platinum-based, multi-drug chemotherapy.
    - Radiotherapy (Thoracic+cranial-if responding to Rx).

Treat paraneoplastic syndromes
Palliative care

Prognosis:

SCLC - Almost all die <1yr.
NSCLC: Overall 13% survival.

- Stage I – Good: 60 - 85% 5 year survival
- Stage II – Moderate: 40 - 50% 5 year survival
- Stage III – Poor: 10% 5 year survival
- Stage IV – Dire: 15% 1 year survival