

Lung Cancer

Definition of lung cancer

- Malignancy arising from lung tissue

Epidemiology of lung cancer

- Commonest malignancy in western world
- Commonest cause of death in men and women in the UK
- Approximately 38 000 new cases diagnosed annually in the UK
- 90% are smoking-related

Types of lung cancer

- Non- Small cell lung cancer (NSCLC)
 - Approximately 75-80% of all lung malignancy
 - Squamous cell carcinoma
 - Commonest primary lung malignancy
 - Associated with hypercalcaemia
 - Usually presents as a mass on CXR
 - Adenocarcinoma
 - Not necessarily associated with smoking
 - Can be primary or metastatic
 - Alveolar cell carcinoma
- Small cell lung cancer (SCLC)
 - Approximately 20-25%
 - Most aggressive
 - Frequent sites of metastases are liver, bone, adrenals and brain
 - Associated with syndrome of inappropriate ADH (SIADH)
 - Chemosensitive and radiosensitive

Rarer types of lung cancer

- Carcinoid
 - 1% all tumours – 60% visible from bronchial tree
 - Vascular, tend to bleed
 - Originate from APUD
 - Only a small number lead to carcinoid syndrome
 - 5 year survival 90% with surgery
- Mesothelioma (sometimes classified as a 'lung cancer')
 - Causes - Asbestos
 - M>F
 - Presentation: Pleuritic chest pain, Pleural effusion, Anorexia, night sweats
 - Treatment: Chemo/RT, treatment of pleural effusions

Risk factors for lung cancer

- Smoking
- Scarring
- Asbestos
- Air pollution including biofuels

Presentations of lung cancer

- Local tumour effects
 - Persistent cough or change in usual cough
 - Haemoptysis
 - Chest pain
 - Shortness of breath
 - Hoarse voice – invasion of left recurrent laryngeal nerve
 - Unresolving pneumonia
 - Pleural effusion
 - Raised hemidiaphragm – phrenic nerve paralysis
- Metastatic tumour effects
 - Lymphadenopathy
 - Bone pain/ pathological fracture
 - Neurology secondary to cerebral mets
 - Hypercalcaemia effects – bony mets
- Paraneoplastic syndromes
 - Hypercalcaemia (NSCLC – especially squamous cell)
 - Due to parathyroid hormone related peptide (PTHrP)
 - SIADH (SCLC)
 - Cushing's (SCLC)
 - Due to ectopic ACTH production
 - Gynaecomastia
 - Hypertrophic pulmonary osteo-arthropathy
 - More common in squamous and adeno
 - Lambert-Eaton Myaesthenic syndrome - LEMS (SCLC)
 - Proximal limb and trunk weakness. Associated with autonomic symptoms and hyporeflexia.
 - Glomerulonephritis

Differential diagnosis of lung cancer (mass on CXR)

- Metastases
- Hamartoma
- Granuloma (TB, sarcoid)
- Abscess
- Cyst
- AV malformation
- Skin tumour

Investigation of lung cancer

- Blood
 - FBC, U&E, LFT, Ca, clotting
- Sputum cytology
 - Good for SCLC and squamous
- Urine
 - Protein (?membranous GN)
- CXR

- Can be normal. Will show location of lesion, secondary pneumonia, pleural effusion, rib destruction, mediastinal lymphadenopathy
- Diagnostic pleural tap or FNA of lymph nodes
- CT (contrast enhanced)
 - Shows local spread and secondaries
 - Include brain, liver and adrenals
- PET
 - Good for imaging mediastinum, esp to see if enlarged node are malignant
- Pulmonary function tests (for treatment)
 - FEV1<1.5 is a contraindication for surgical resection
- Bronchoscopy
 - Good for defining anatomy and taking biopsy
- Percutaneous aspiration and biopsy (under CT guidance)
 - Good for getting a sample of a peripheral tumour not accessible using bronchoscopy. 25% chance of pneumothorax so contra-indicated if FEV1 < 1

Staging of lung cancer (TNM staging System)

- Tumour (T)
 - T1 – Contained within the lung and is <3cm
 - T1a<2cm, T1b 2-3cm
 - T2 – Between 3 and 7cm across **or** has grown into the main bronchus >2cm below the carina **or** has invaded the visceral pleura **or** lobar collapse
 - T2 tumours that are 5cm or smaller are classed as T2a and those larger than 5cm are T2b
 - T3 (extrapulmonary) – larger than 7cm **or** has grown into one of the following structures:
 - Chest wall, pleura, diaphragm, pericardium, Main bronchus <2cm from carina
 - T4 (extrapulmonary) – into one of the following structures:
 - Mediastinum, large vessels, trachea, oesophagus, spine, laryngeal nerve
- Nodes (N)
 - N0 – no nodes
 - N1 – nodes nearest the affected lung
 - NB – will be removed with pneumonectomy
 - N2 – Mediastinal nodes on same side
 - N3 – Nodes on other side or above clavicles
- Metastases (M)
 - M0 – no mets
 - M1a – mets in both lungs **or** a malignant pleural effusion or pericardial effusion
 - M1b – mets elsewhere

Management of lung cancer

- Surgery
 - Mainly for NSCLC
 - Curative only in T1M0N0 non-small cell disease
 - About 5-10% of cases.
 - Operative mortality in over-65s exceeds 5-year survival

- Contraindications
 - SVC obstruction
 - Tumour within 2cm of either main bronchus (as not enough resection margin for pneumonectomy)
 - FEV1<1.5
- Survival improved with adjuvant chemo
 - For SCLC the median survival is 16 months. Full response rate in 40-50%, partial in a further 40%.
- Chemotherapy
 - For SCLC
- Radiotherapy
 - High dose radiotherapy can be curative in patients with slow-growing squamous carcinoma
 - Causes some (often asymptomatic) pulmonary fibrosis
 - Can use chemoradiotherapy for advanced disease
- RT with palliative Intent
 - Can be used to treat haemoptysis, bone pain and SVC obstruction in the short term
 - Generally called CHART (continuous hyperfractionated RT)
 - Adjuvant chemo **chemo-RT** can extend median survival in non-small cell disease
 - Laser ablation, Interbronchial brachytherapy and bronchial stents can be used to treat occlusion of bronchi by tumour.
 - Other palliative treatments include:
 - Prednisolone to improve appetite
 - Morphine for pain
 - Regular laxatives
- Treatment of oncological emergencies
 - Superior Vena Caval Obstruction (SVCO)
 - ABC approach
 - Steroids – Dexamethasone 8mg bd
 - Radiotherapy/ chemo to treat cause
 - Intra-luminal stents
 - Cord compression
 - Steroids – Dexamethasone 4mg qds
 - Radiotherapy
 - Surgical decompression
 - Hypercalcaemia
 - Isotonic saline hydration – 3L in 24 hours at least (250ml/hr)
 - Avoid overload. Can use furosemide to increase calcium excretion
 - Steroids
 - Bisphosphonates e.g. Pamidronate 30-60mg over 2 hours, Zoledronic acid 4mg over 2 hours.

Complications of lung cancer

- Tumour
 - Local
 - Recurrent laryngeal nerve palsy
 - Phrenic nerve palsy
 - Brachial plexus invasion
 - Horner's syndrome
 - Distant
 - Mets
 - Brain, bone, liver

- Adrenal symptoms (Addisons)
- Endocrine
 - SIADH – **small cell**
 - Concentrated urine (Na >20mmol; osm > 500)
 - No hypovolaemia, oedema or diuretics
 - ACTH (Cushings) – **small cell**
 - PTH - **squamous cell**
 - Actually PTHRP
 - Can lead to hypercalcaemia
- Neurological
 - LEMS (pre-synaptic calcium channel Abs)
 - Neuropathy (anti-Hu)
 - Cerebellar degeneration (anti-Yo or Purkinje)
- Muscular
 - Polymyositis
 - Proximal myopathy
 - HPOA

Prognosis of lung cancer

- SCLC: untreated, the prognosis is 6 weeks
- Others depend of type, stage and grade

Common questions concerning Lung Cancer

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- Presentation - Pleuritic chest pain, Pleural effusion, Anorexia, night sweats
 - Treatment – Chemo/RT, treatment of pleural effusions
- What is a Pancoast's Tumour?
 - An apical tumour that can cause Horner's Syndrome (miosis, ptosis, enophthalmos and anhidrosis) and weakness of small muscles of the hand (C5/6 and T1 motor loss).
- What is lymphangitis carcinomatosa?
 - Infiltration of pulmonary lymphatics by tumour. Causes cough and shortness of breath. CXR shows fine linear shadowing throughout both lung fields. Treatment with steroids. Poor prognosis.
- What are the complications of lung cancer?
 - Tumour-related
 - Local
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 - Phrenic nerve palsy
 - Brachial plexus invasion
 - Horner's syndrome
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 - Mets
 - Brain, bone, liver
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