



Lung Cancer

Presented by: Abdullah AlAsaad
King Saud Bin Abdulaziz University
for Health Sciences

Outline



- Epidemiology:
- Risk Factors
- Pathophysiology
- Types
- Diagnosis
- Treatment

Epidemiology



- Most common cause of cancer mortality of US
- Second most common cancer
- Median age of diagnosis is at 71

Risk Factors



**Smoking
(Tobacco)**

**Chemical
exposure
(Radon,
Asbestos)**

Diet

Gender

**Preexisting Lung
Disease**

Inheritance

HIV

Lung cancer



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graph TD; A[Lung cancer] --> B[Small cell cancer (15%)]; A --> C[Non-Small cell cancer (85%)]
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A hierarchical flowchart showing the classification of Lung cancer. The root node is 'Lung cancer' in a green box. It branches into two child nodes: 'Small cell cancer (15%)' and 'Non-Small cell cancer (85%)', both in blue boxes.

Small cell
cancer (15%)

Non-Small cell
cancer (85%)

Pathophysiology



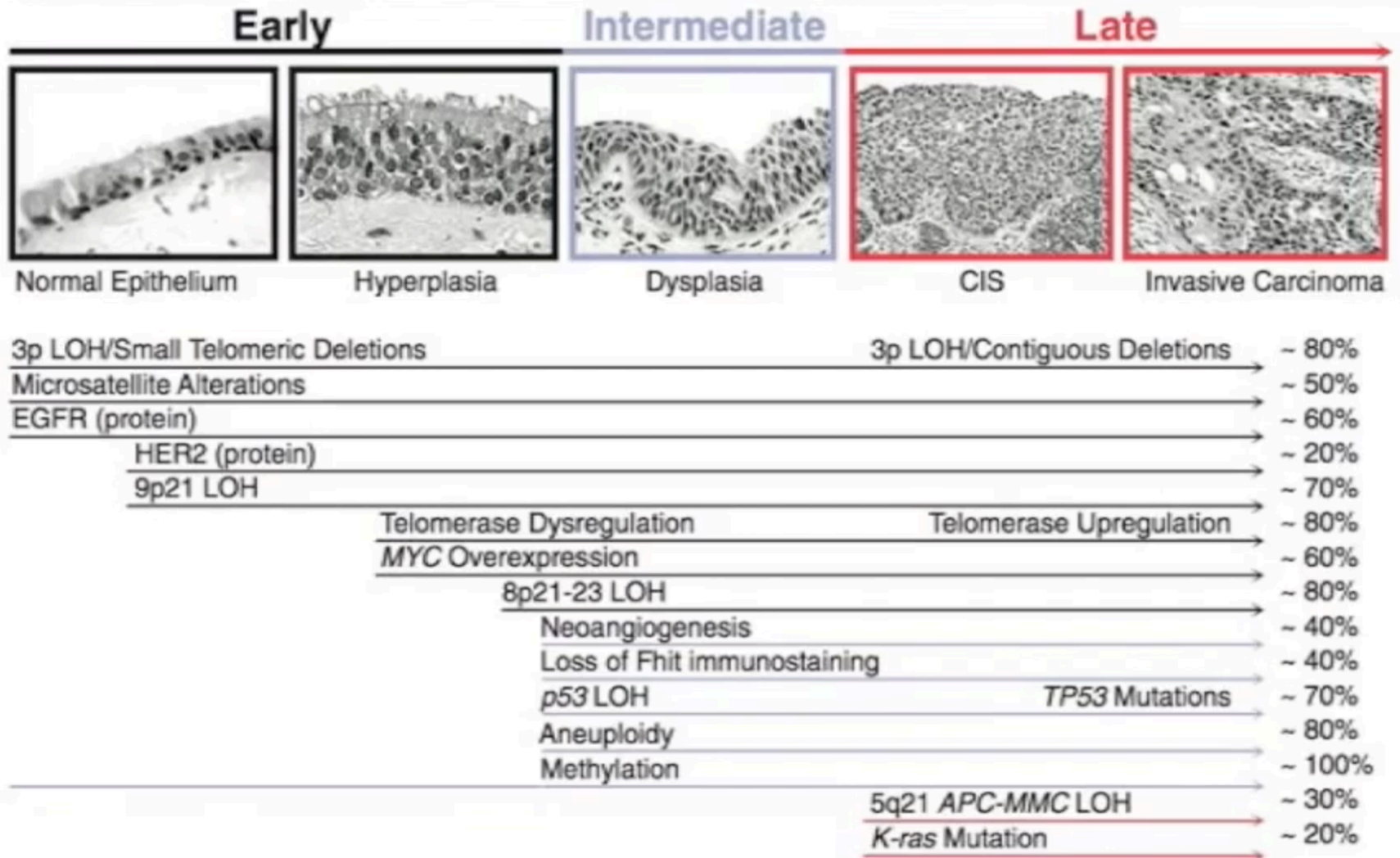
Normal

Hyperplasia

Dysplasia

Carcinoma
in situ

Invasive
Carcinoma



Genes Associated



K-ras point mutation	30 % of adenocarcinoma, bad prognosis
Myc-c gene alteration	SCLC
Bcl-2 overexpression	SCLC
HER2/ neu(ERBB2)gene activation	NSCLC
P53 mutation	<ul style="list-style-type: none">• In both SCLC(80 %) and NSCLC (50 %)• Seen in Para-neoplastic syndrome
Rb protein	<ul style="list-style-type: none">• Normally expressed in NSCLC and when it gets phosphorylated it causes uncontrolled cell division.• Deleted in SCLC
FHIT gene	<ul style="list-style-type: none">• Abnormal in both types of lung cancer.

Types



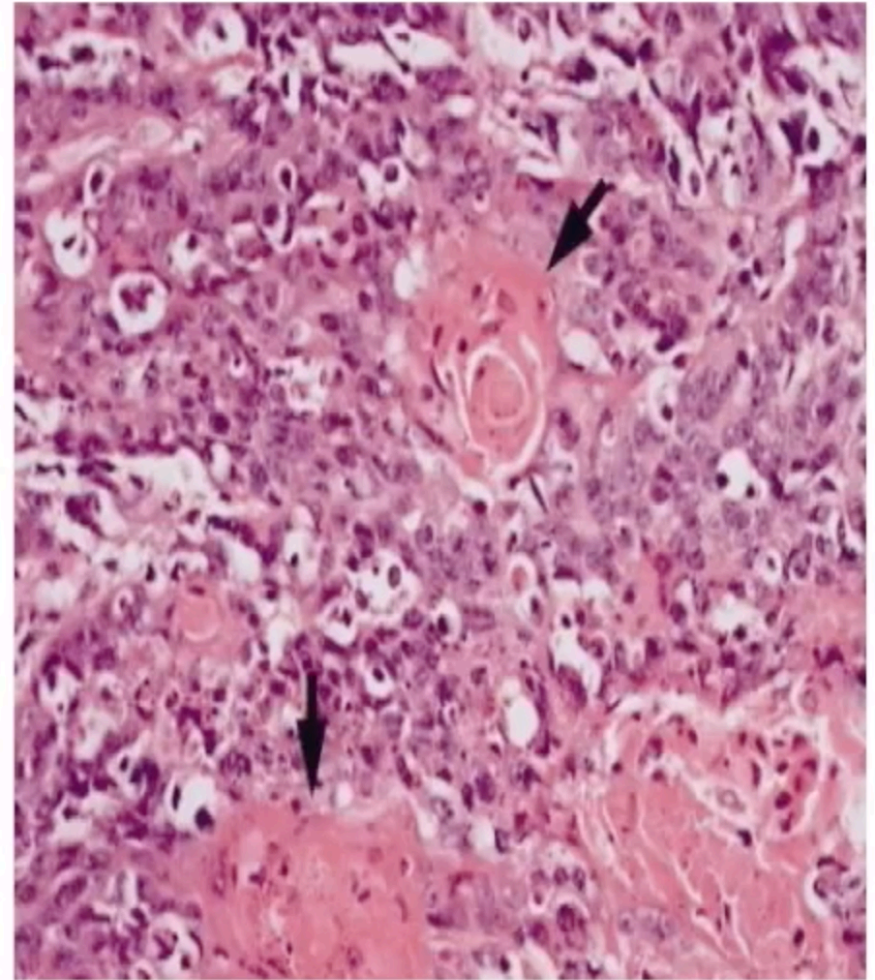
- ❖ Small cell lung cancer
- ❖ Non-Small cell lung Cancer:
 1. Adenoma carcinoma (40%)
 2. Squamous cell carcinoma (30%)
 3. Large cell carcinoma (10%)
 4. Carcinoid tumor (5%)

Types

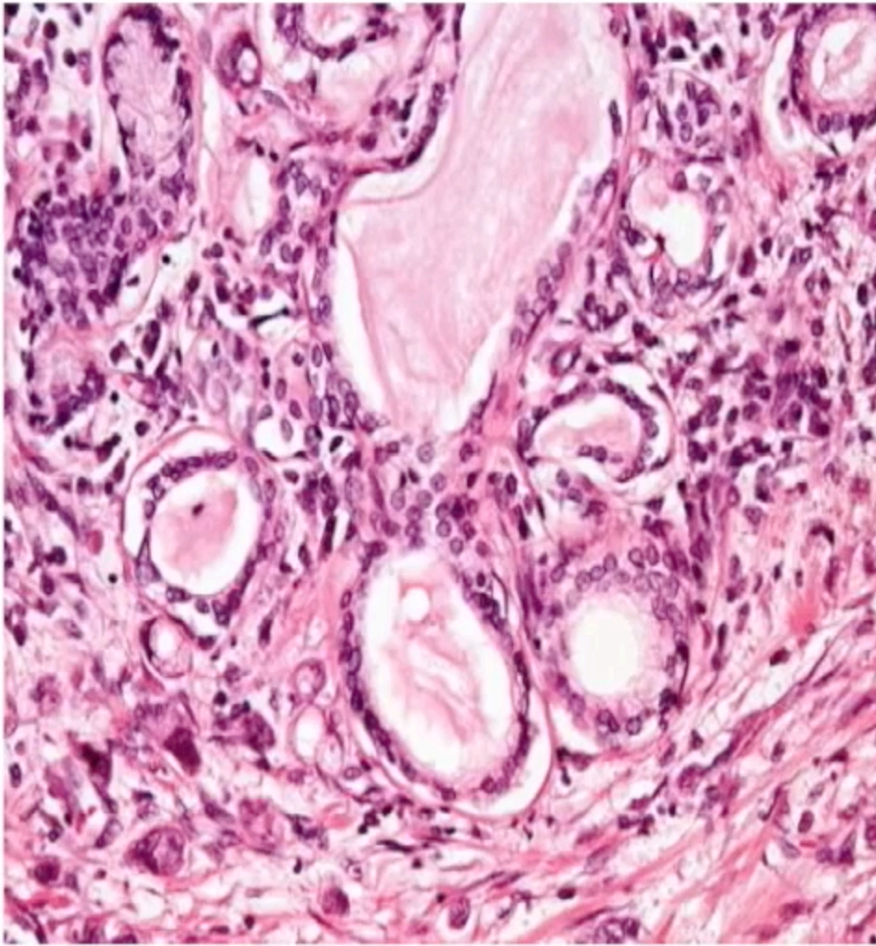


Cancer	Histology	Association	Location	Comment
Small cell carcinoma	<ul style="list-style-type: none"> • Neuroendocrine • Poorly differentiated 	Male Smoker	Central	Paraneoplastic syndromes
Squamous cell carcinoma	<ul style="list-style-type: none"> • Keratin pearls • Intercellular bridges 	Male Smokers	Central	May produce PTHrP (Hypercalcemia)
Adenocarcinoma	<ul style="list-style-type: none"> • Glands • Mucin 	Non smoking, Female smokers	Peripheral	
Large cell carcinoma	No signs or adenocarcinoma or Squamous cell	Smoking	Central or peripheral	Poor prognosis

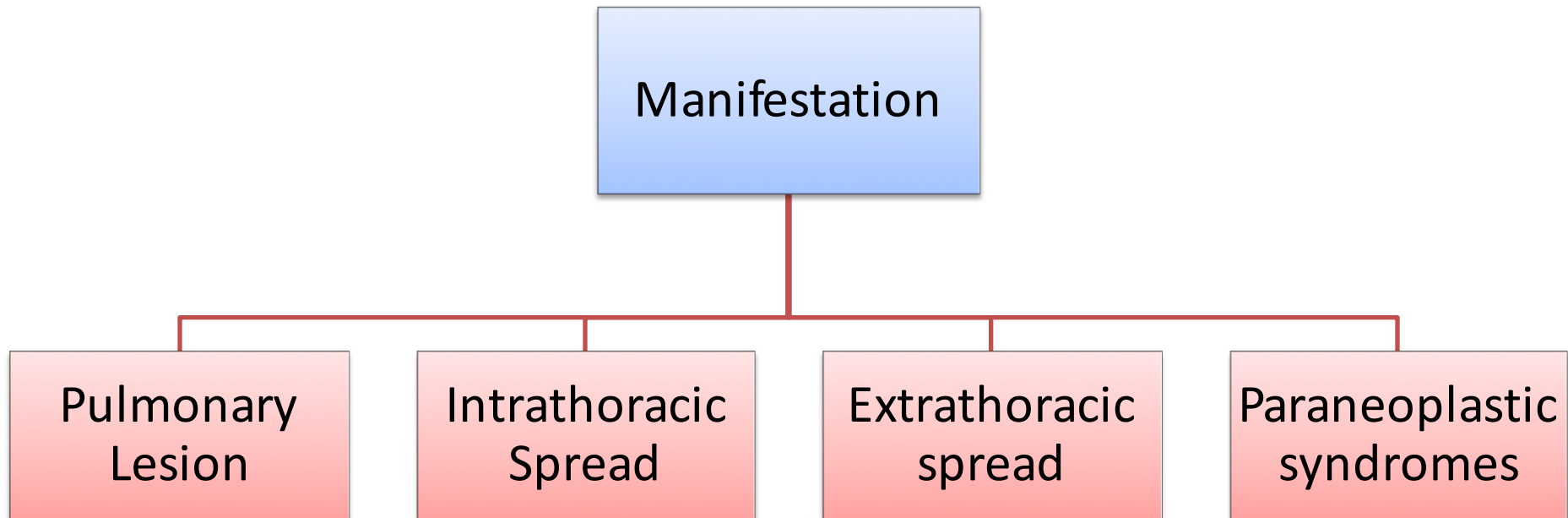
Squamous Cell Carcinoma



Adenocarcinoma



Signs and Symptoms



Symptoms and signs	Range of frequency (%)
Cough	8–75
Weight loss	0–68
Dyspnoea	3–60
Chest pain	20–49
Haemoptysis	6–35
Bone pain	6–25
Clubbing	0–20
Fever	0–20
Weakness	0–10
Superior vena cava obstruction (SVCO)	0–4
Dysphagia	0–2

Diagnosis



- X-Ray reveals a solitary nodule (Coin-lesion)
- Biopsy is necessary for Diagnosis
- CT scan
- PET
- MRI

Benign vs Malignant Lung Nodule



Benign	Malignant
Age < 35	Age > 45-50
Nonsmoker	Smoker
No change from old films	New or enlarging lesions
Central, uniform, or popcorn calcifications	Absent or irregular calcification
Smooth margins	Irregular margins
Size < 2cm	Size > 2cm

Staging & Treatment



Stage	Primary treatment	Adjuvant Therapy
1	Surgical resection	Chemotherapy
2	Surgical resection	Chemotherapy
3A	Preoperative chemotherapy then surgery	Chemotherapy +- Radiation
3B	Chemotherapy + Radiation	None
4	Chemotherapy with 2 agents*	None

Stage	Primary treatment	Adjuvant treatment
Limited disease	Chemotherapy with radiation	None
Extensive disease	Chemotherapy	None

Lung cancer:
CXR

History, physical examination, and blood tests

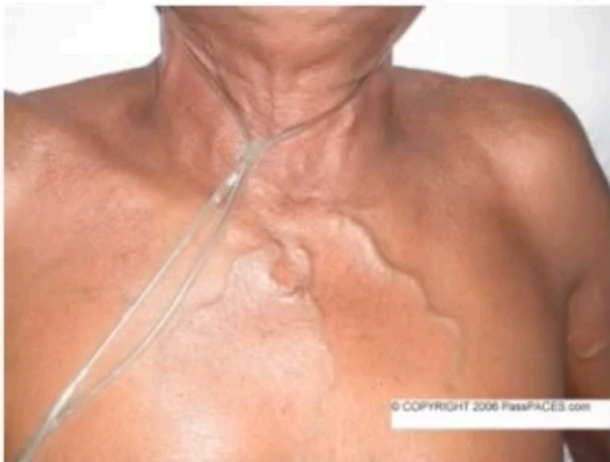
CT and if not conclusive do PET scan or surgery

- 1- Metastatic: do biopsy for the most accessible site.
- 2- Non-metastatic:
 - Central lesion: Bronchoscopy
 - Peripheral lesion: percutaneous needle biopsy

Case



- 65 y/o male with a 30-pack-year Hx, presenting to you with a 2 week history of facial and abdominal swelling. On physical examination you noticed signs and symptoms of SVC syndrome.





- What is the most probable Dx? Why?
- You confirmed the Dx by biopsy and it showed SCLC. What is the mainstay treatment?



References:

- Goldman's Cecil Medicine, 24th Edition
- Fundamentals of Pathology (Pathoma)
- Step up to Medicine
- USMLE First Aid Step 2 CK 8th edition.
- USMLE Step 2 recall by Micheal Rayan 2nd edition.
- Robbins Basic Pathology.
- ABC of Lung Cancer 2009.



For any questions or comments
please contact us at:

info@letstalkmed.com