



Lung cancer and pulmonary metastases *(presentation for english medical students)*

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I. case

Anamnestic datas, physical examination

- 53 years old male patient
- several times haemoptysis
- hypertension, myocardial infarction
- 1 pack/day cigarette for 15 years
- drinks alcohol occasionally
- No positive findings with physical examination

I. case

- ***What kind of diseases cause haemoptysis?***

*A, oropharyngeal origin/ distinguish
hematemesis*

B, pulmonary origin

*C, cardiovascular origin (high blood pressure,
mitral stenosis)*

D, haemostatic disorder

Pulmonary origins of haemoptysis

- Chronic inflammation (brochiectasis, TBC, lung abcess, pneumonia with necrosis)
- Malignant and benign tumours
- Malformations (AV malformations, bronchial telangiectasia)
- Systemic diseases pulmonary manifestation (vasculitis, haemostatic disorder)
- Others (pulmonary embolism, foreign body aspiration, iatrogenic, trauma)

Lung cancer symptoms

1. Incidentally diagnosed without any kind of symptoms(5-15%)
2. Symptoms:
 - cough (40-70%)
 - dyspnea (50-70%)
 - weight loss (30-60%)
 - hemoptysis (20-40%)
 - chest pain (30-40%)
 - atelectasis, pneumonia (20%)

Lung cancer syndromes

Paraneoplastic syndromes:

- Hematological: Trousseau syndrome (deep venous thrombosis+thrombophlebitis migrans), anaemia
- Endocrinological: Cushing-syndrome, SIADH, hypercalcaemia
- Neurological: peripheral neuropathy, myasthenia gravis (Lambert-Eaton syndrome)
- Musculoskeletal: hypertrophic osteoarthropathia, clubbing of the digits
- Other: fewer, acanthosis nigricans, retinopathy

Lung cancer symptoms

Other symptoms:

- hoarseness (n. recurrens involved)
- diaphragm paralysis (n. phrenicus involved)
- dysphagia (oesophagus involved)
- pleural effusion (carcinosis pleurae)
- pericardial effusion (pericardium involved)
- v. cava superior syndrome (v. cava superior involved)
- Pancoast tumor: Horner triad, chronic shoulder pain

I. case

- ***What kind of test would you choose?***
- *plain chest X-rays*
- *(otolaryngological consultation)*
- *(gastroenterological consultation)*
- *(cardiological consultation)*

I. case

Chest X-rays



I. case

Chest X-rays

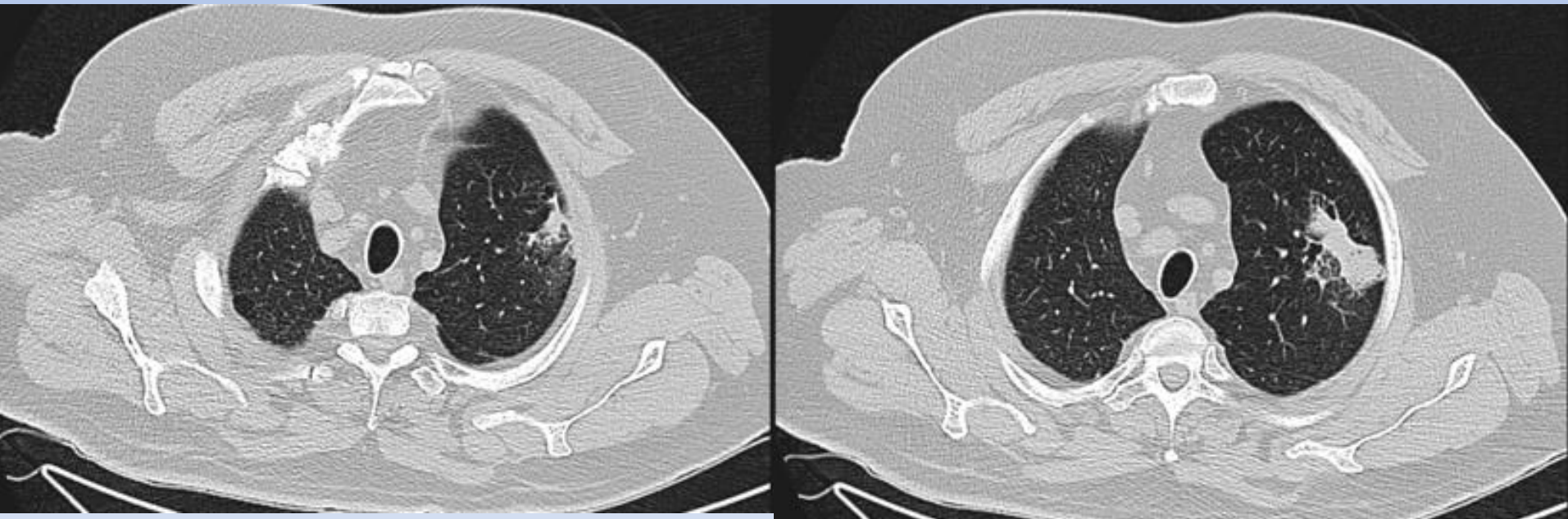


II. case

- *What kind of other tests would you choose and why?*
- Chest CT (morphology, localization, operability, lymph node involvement)
- Bronchoscopy (morphology, localization, operability, lymph node involvement, biopsy)

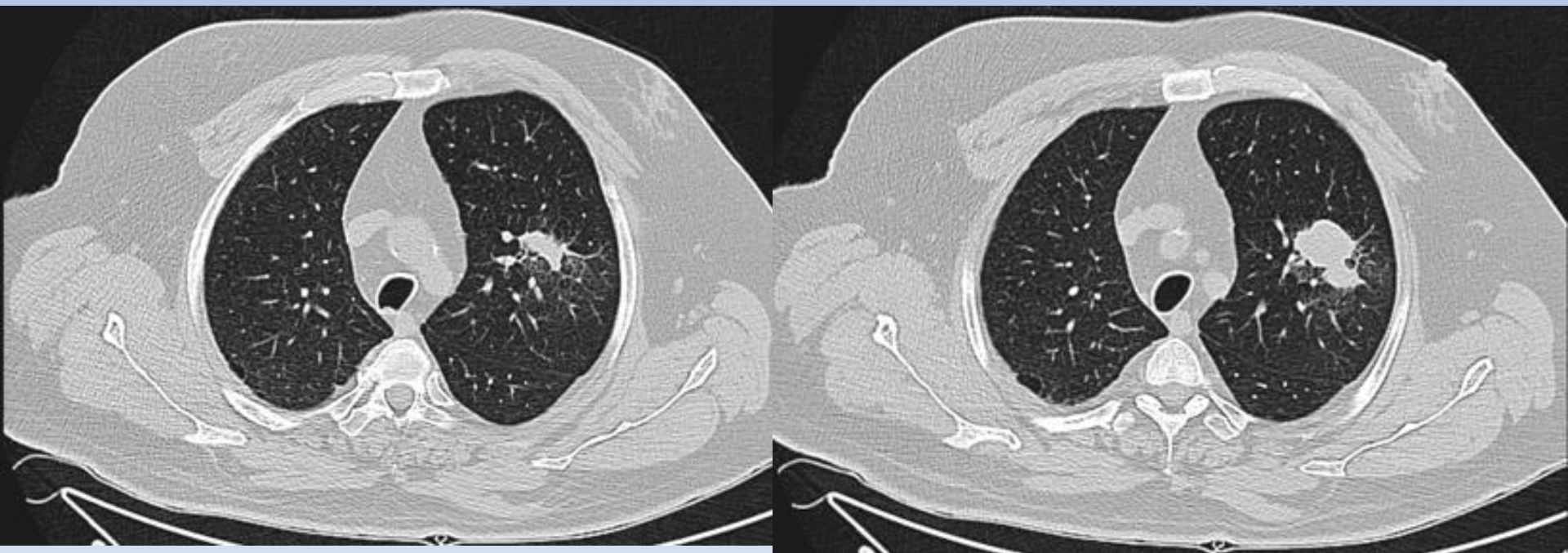
I. case

Chest CT



I. case

Chest CT



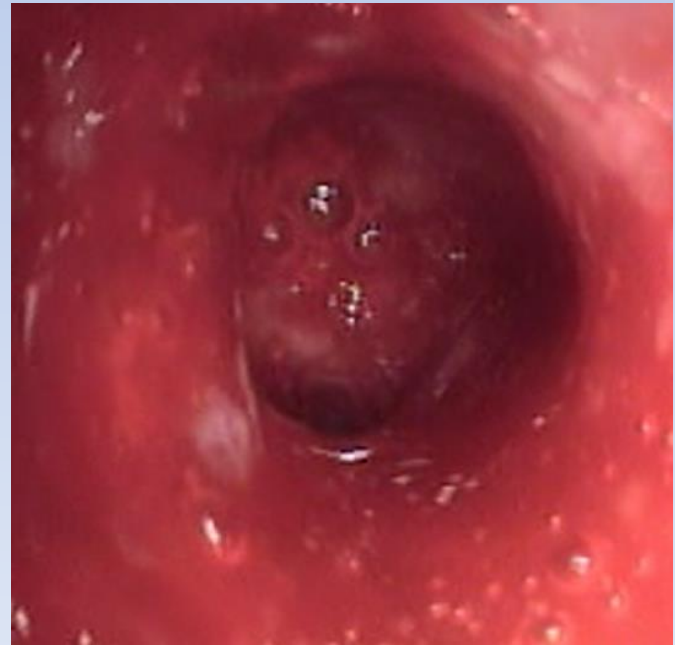
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Bronchoscopy

- Left upper lobe bronchus is full of blood, no direct tumor sign, brushing cytology from left upper lobe: malignancy



1. picture: normal bronchus



2. picture: bronchus with blood

Hystology

Benign tumors

- Epithelial tumours: adenoma, papilloma
- Dysontogenetic tumours: hamartoma, teratoma
- Neurogenic tumours: neurinoma, neurofibroma
- Mesodermal tumours: fibroma, lipoma, chondroma

Hystology

Malignant

Non small cell lung cancer (NSCLC)

- Adenocarcinoma (~40%)
- Squamosus cell carcinoma (~25%)
- Large cell carcinoma (~10%)
- Carcinoid tumours(~10%)
- Others: sarcomatoid, salivary gland tumours, not specified (~<1%)

Small cell lung cancer (SCLC) (~15%)

TNM staging (NSCLC)

	Diam	Scopy	Atelectasis	Invasion	Nodules
T1	T1a < 2cm T1b: 2-3cm	No invasion lobar bronchus			
T2	T2a: 3-5cm T2b: 5-7cm	> 2cm to carina	Lobar atelectasis or obstructive pneumonia to hilus		
T3	> 7cm	< 2cm to carina	Whole lung	Chest wall diaphragm mediast pleura pericard	Nodules in same lobe
T4		Tumor in carina		Heart great vessels trachea esophagus spine	Nodules in other ipsilateral lobes

TNM staging (NSCLC)

Regional lymph nodes (N)

N1 In ipsilateral peribronchial and/or ipsilateral hilar lymph nodes and intrapulmonary nodes

N2 In ipsilateral mediastinal and/or subcarinal lymph nodes

N3 In contralateral mediastinal, contralateral hilar, ipsilateral or contralateral scalene or supraclavicular lymph nodes

TNM staging (NSCLC)

Metastasis (M)			
M		Contralateral nodules pleural dissemination	→ M1a
		Distant metastases	→ M1b

Stages (NSCLC)

	T1a	T1b	T2a	T2b	T3	T4
N0	IA		IB	IIA	IIB	IIIA
N1	IIA		IIA	IIB	IIIA	IIIA
N2	IIIA		IIIA		IIIA	IIIB
N3	IIIB		IIIB		IIIB	IIIB

Staging (SCLC)

- TNM system is used!

But:

- Limited disease: Disease restricted to one hemithorax with/without metastases in ipsi- or contralateral regional lymph node; or ipsilateral pleural effusion
- Extensive disease: distant metastasis occurs outside the hemithorax

Treatment

Benigns tumours

- surgical resection (atypical surgical resection: wedge or enucleation) is sufficient
- sometimes anatomical resection needs
- why operate?: because of the tumour can cause symptoms in the future and for the appropriate histology

Treatment

Benign laesions- wedge resection



Treatment

NSCLC:

- **I-II/B stages** operation (anatomical resection = lobectomy, bilobectomy, pneumonectomy+ lymphadenectomy) then if it's needed chemoradiotherapy
- **III/A stage:** neoadjuvant chemotherapy. Then restaging and if there is regression in the lymph nodes, operation (anatomical resection + lymphadenectomy) then chemotherapy
- **III/B stage:** Chemoradiotherapy
- **IV stage:** Chemoradiotherapy. Rarely if there is isolated adrenal gland-, or intracranial- or liver metastases and there is a chance for the curative resection of the lung cancer it's possible to remove the metastases and the lung cancer as well.

Treatment

SCLC:

- Treatment is generally chemoradiotherapy !
- Rarely surgical procedure, only in case of „very limited disease” (T1N0, T2N0)
- Before the operation, patients with negative N2 region in the chest CT should undergo diagnostic mediastinoscopy (exclude N2 cancer involvement)

Treatment

Malignant tumours-anatomical resection

- Why anatomical resection? : decreasing local tumour recurrence

Segmentectomy



Lobectomy



Pulmonectomy



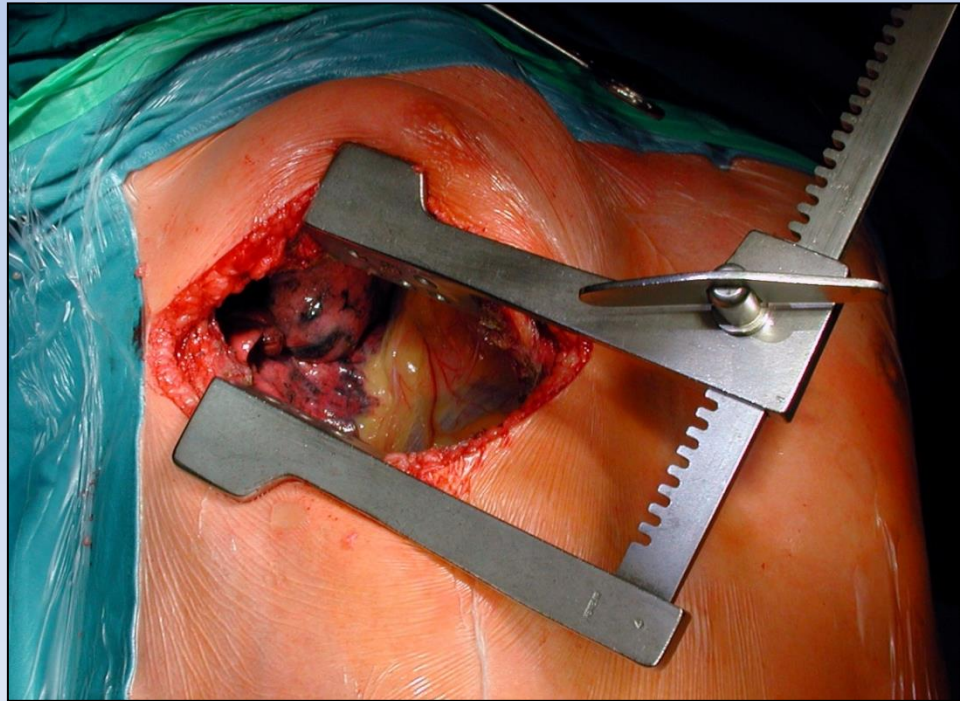
Treatment

Open surgical procedures (thoracotomy)

- Posteleolateralis or anterolateralis thoracotomy



1. picture: posteolateral thoracotomy



2. picture anterolateral thoracotomy

Treatment

Video assisted thoracoscopy (VATS)

- Atypical or anatomical resection as well!



Treatment

Video assisted thoracoscopy (VATS)



Obligated tests before lung resection

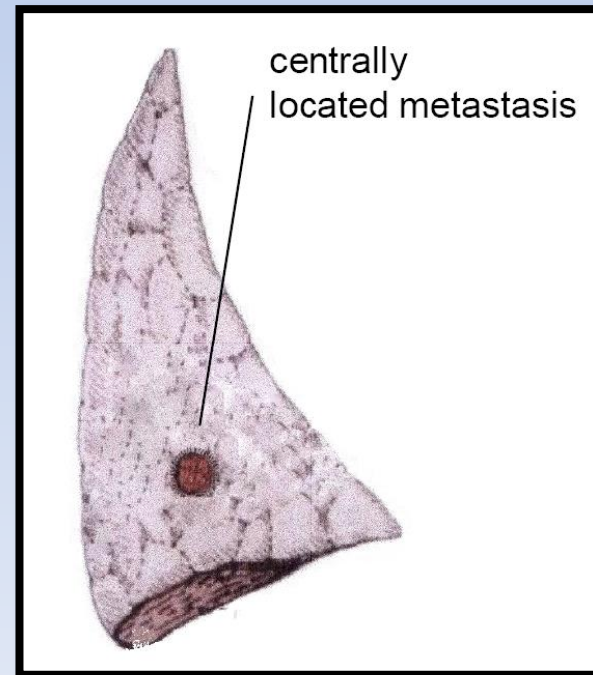
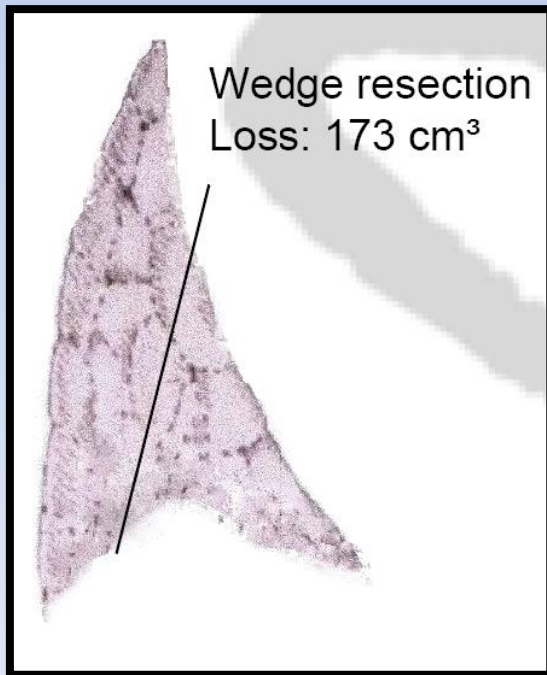
- Laboratory tests (blood count, coagulogram, liver and kidney function, CRP, blood type and antibody)
- Chest CT (or PET-CT)
- Bronchoscopy
- Lung function test
- Arterial astrup test
- In case of pulmonectomy lungscintigraphy
- Head CT
- Abdominal ultrasound
- Consultations (most frequently with cardiologist)

Lung metastases

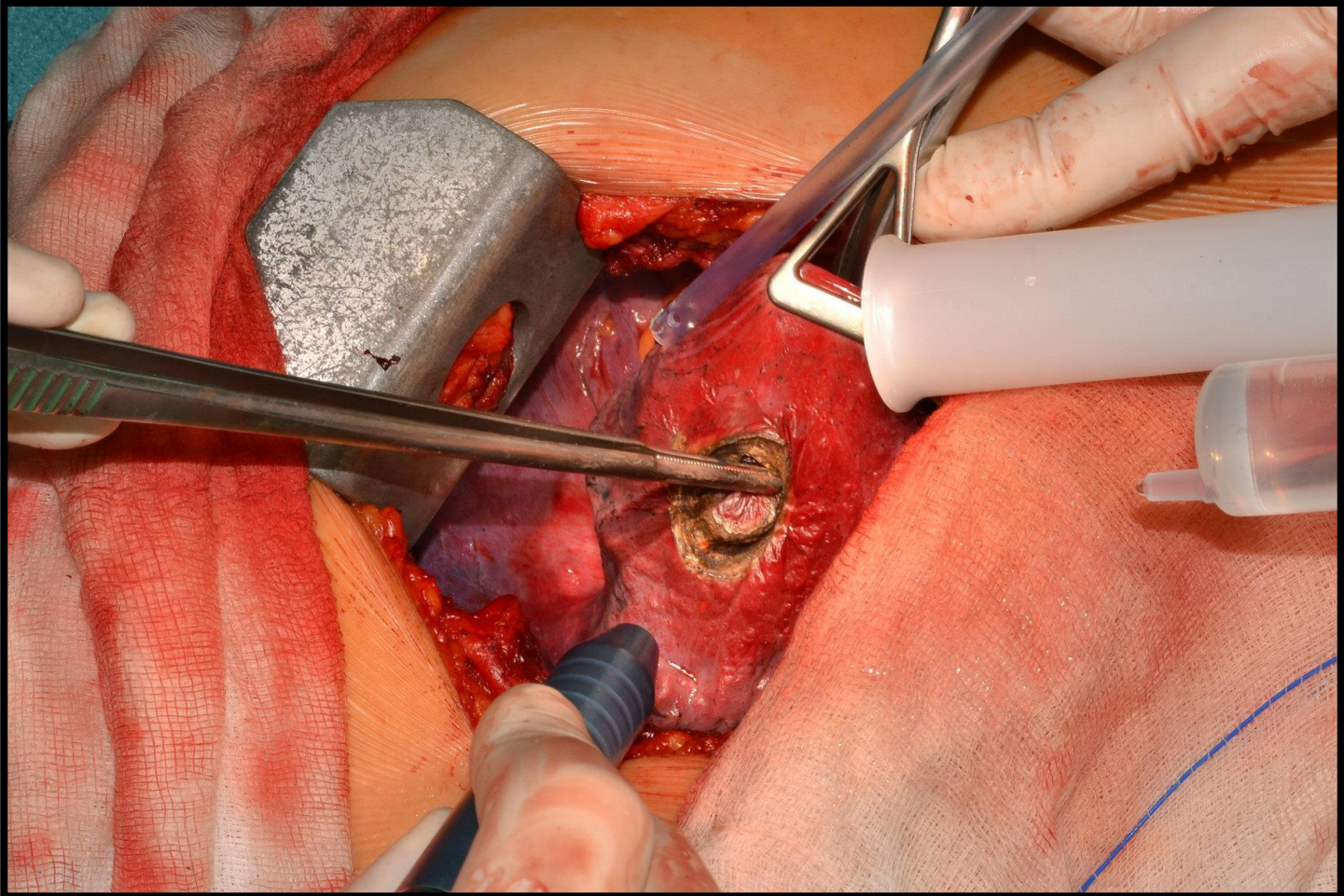
- Lung metastases are not equal with palliative chemoradiotherapy!!!!
- If the primary tumour is under control and there is no metastases in other organs, or the other organs metastases are controlled by surgery , and if there is a chance for complete resection, they could surgically removed
- No limit of number
- Mainly colorectal, renal, non seminomatous germ cell tumours, and sarcomas

Lung metastases

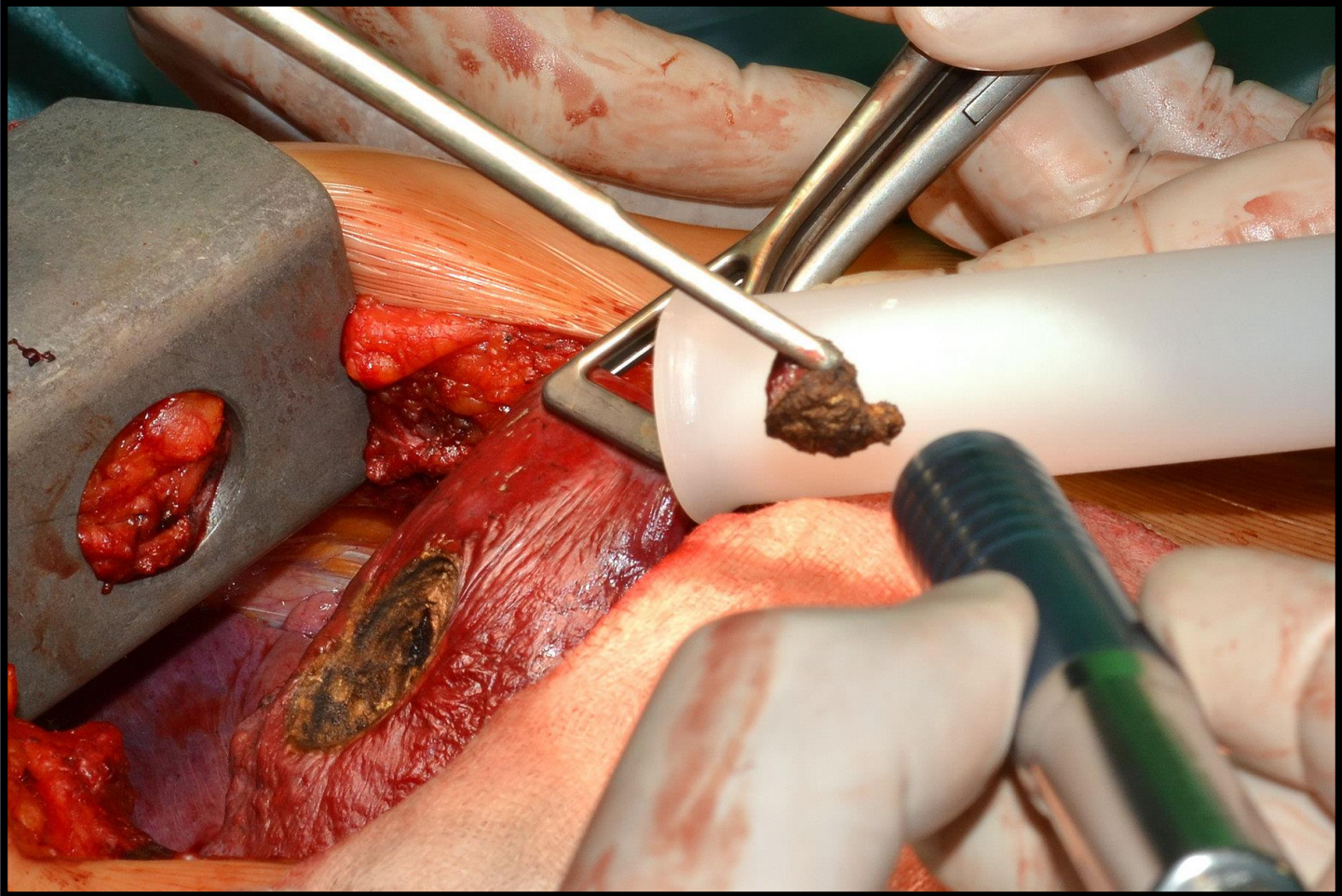
- Always atypical „lung saving” resections
 - wedge resection
 - laser metastasectomy



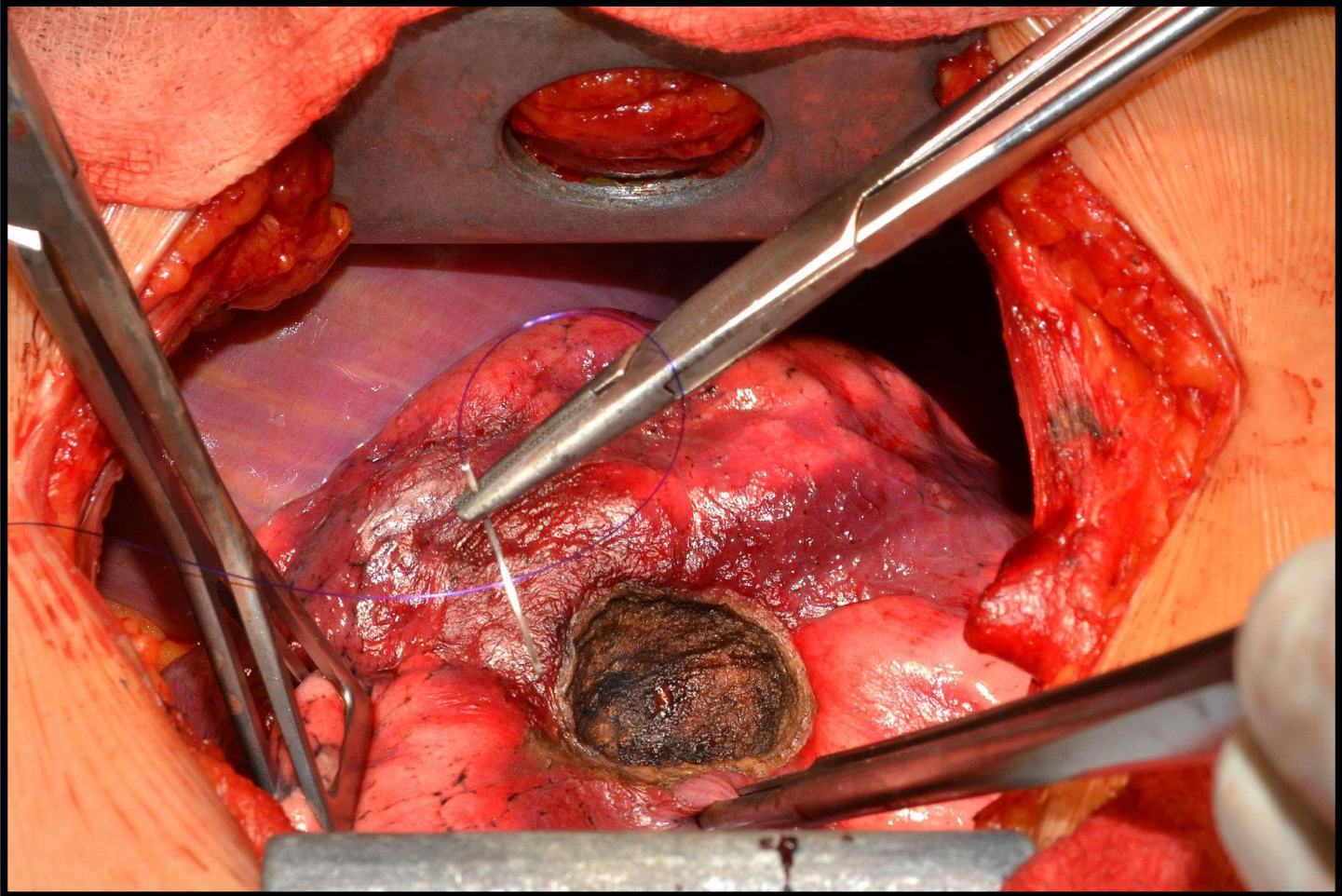
Lung metastases laeser metastasectomy



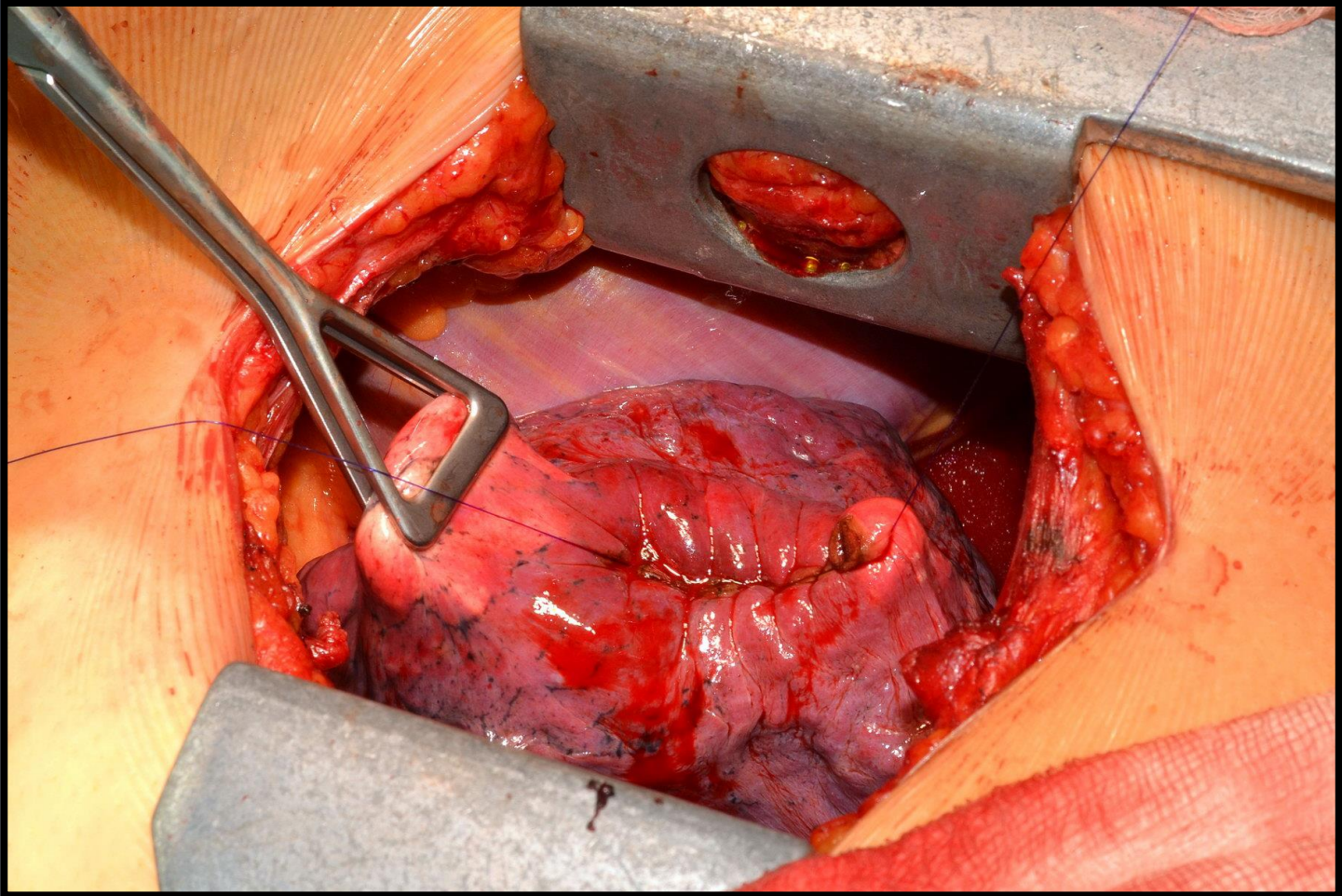
Lung metastases laeser metastasectomy



Lung metastases laeser metastasectomy



Lung metastases laeser metastasectomy



Thank you for your attention!

