


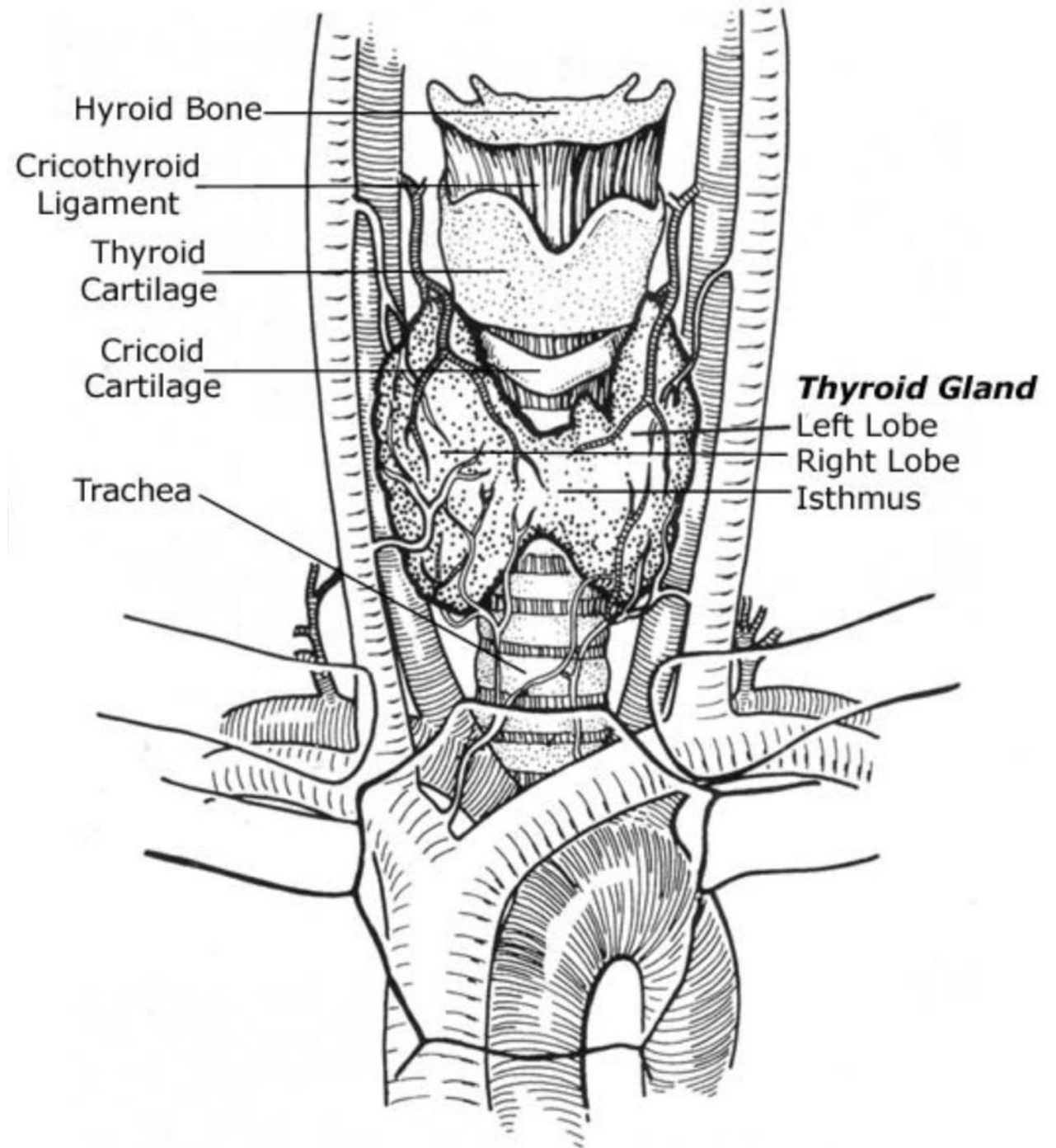


# Cut up techniques in Endocrine pathology

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London

- 
- Thyroid
  - Parathyroid
  - Adrenal

# Thyroid











# Indications

- **Cysts** (rapidly expanding or refilling)
- **Hyperplastic nodule**
- **Multinodular goitre**
- **Graves disease**
- **Hashimoto's thyroiditis**
- **THY3 nodule** (diagnostic lobectomy)
- **Adenoma**
- **Carcinoma**
- **Other tumours**
- *'Lymphoma'*

# Thyroid – types of specimen

- Lobectomy
- Lobectomy with isthmus / pyramidal lobe (hemithyroidectomy)
- Sub-total thyroidectomy
- Total thyroidectomy













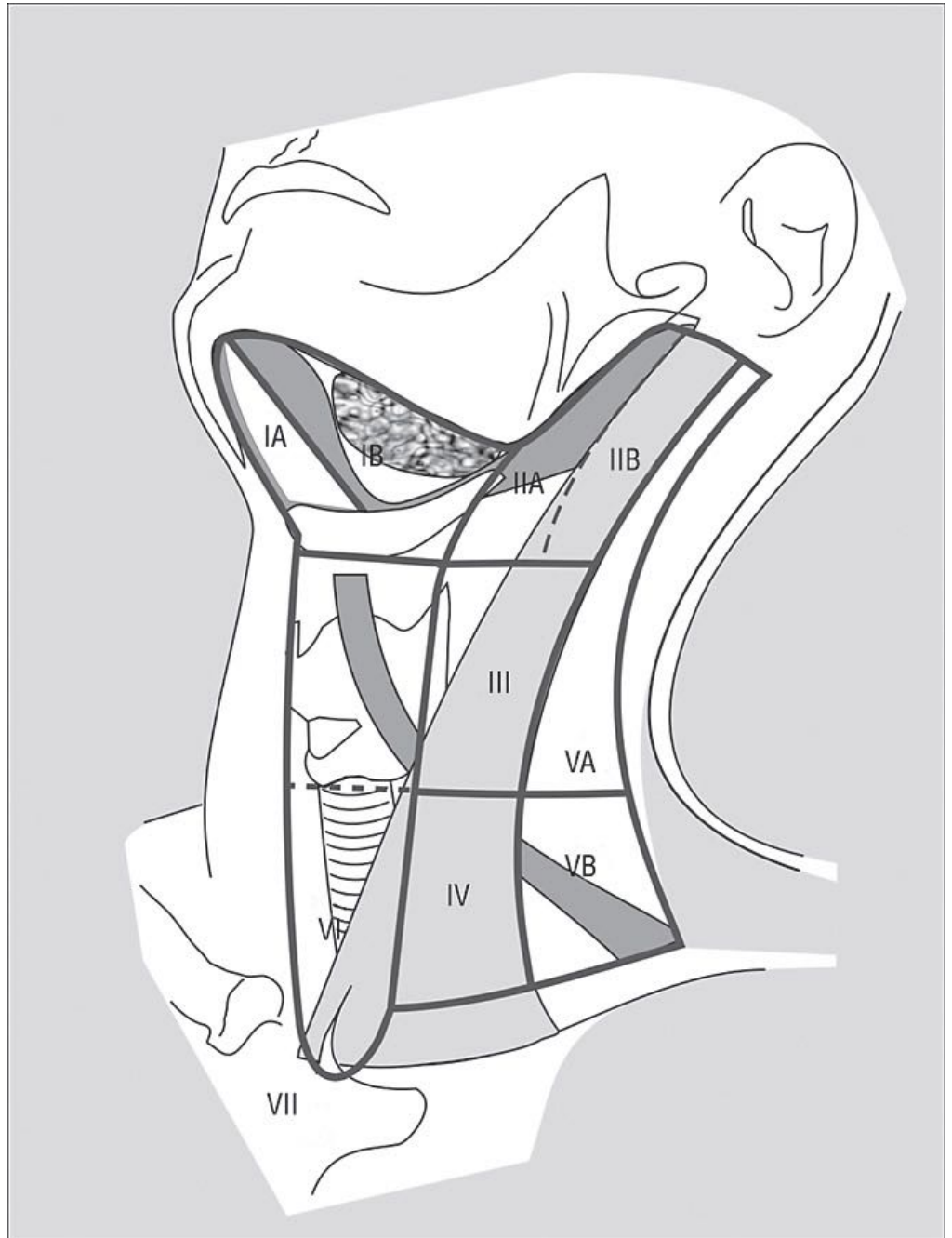
# Thyroid – types of specimen

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- Sub-total thyroidectomy
- **Total thyroidectomy**



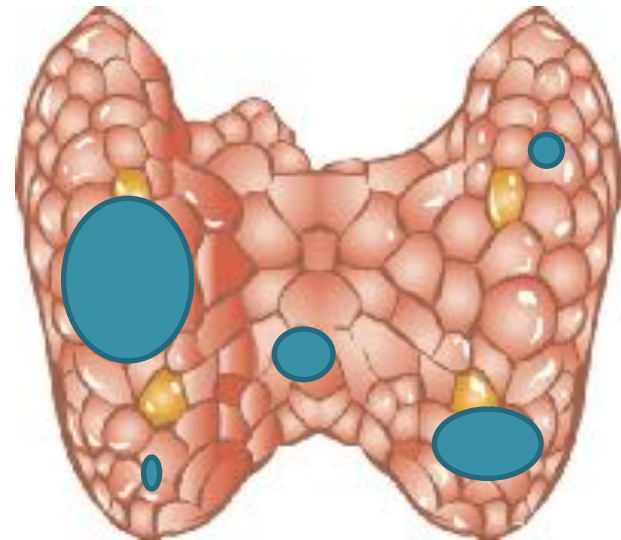
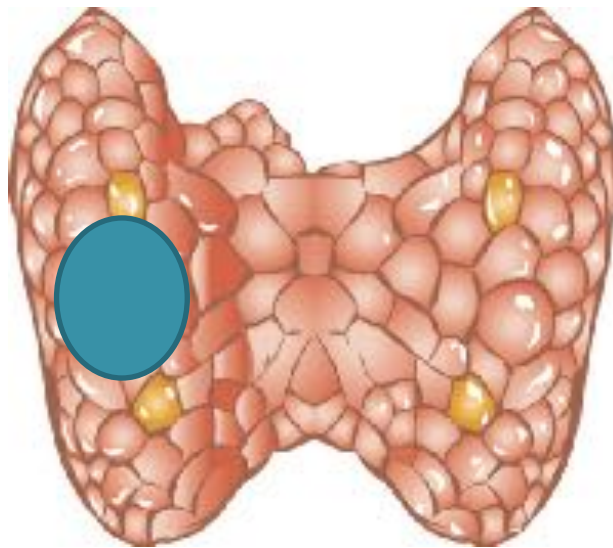
# Thyroid – Neck dissections

- **Central compartment**
  - Level 6 (prelaryngeal [Delphian], paralaryngeal & paratracheal)
- **Level 7** (sup mediastinal)
- **Selective / Functional neck dissection**
- **Modified neck dissection** (internal jugular vein and/or SCM muscle spared)
- **Radical neck dissection**





# Unifocal vs Multifocal



# Thyroid staging – UICC/TNM7

- pTX: Cannot be assessed
- pT0: No evidence of primary tumor
- pT1: Tumor size 2 cm or less, limited to thyroid
  - **pT1a:** Tumor 1 cm or less in greatest dimension
  - **pT1b:** Tumor > 1 cm but not more than 2 cm in greatest dimension
- pT2: Tumor > 2 cm, but not more than 4 cm, limited to thyroid
- pT3: Tumor > 4 cm limited to thyroid **or any tumor with minimal extrathyroid extension (eg, extension to sternothyroid muscle or perithyroid soft tissues)**
- pT4a: Tumor of any size extending beyond the thyroid capsule to invade subcutaneous soft tissues, larynx, trachea, esophagus or recurrent laryngeal nerve
- pT4b: Tumor invades prevertebral fascia or encases carotid artery or mediastinal vessels

## *Anaplastic Carcinoma*

- **pT4a:** Intrathyroidal anaplastic carcinoma—surgically resectable
- **pT4b:** Extrathyroidal anaplastic carcinoma—surgically unresectable

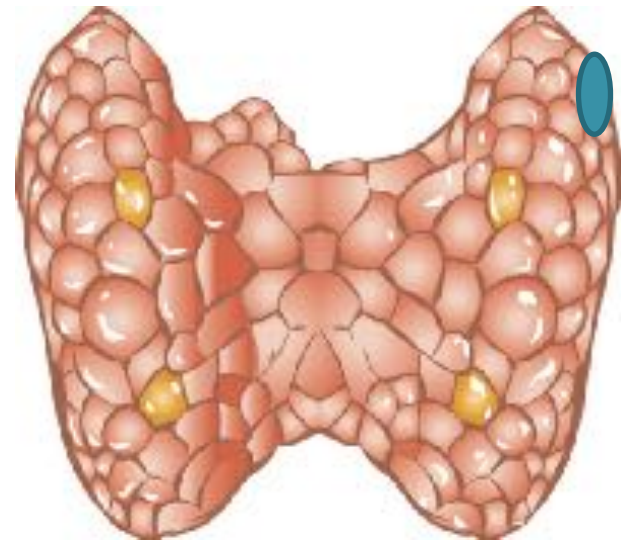
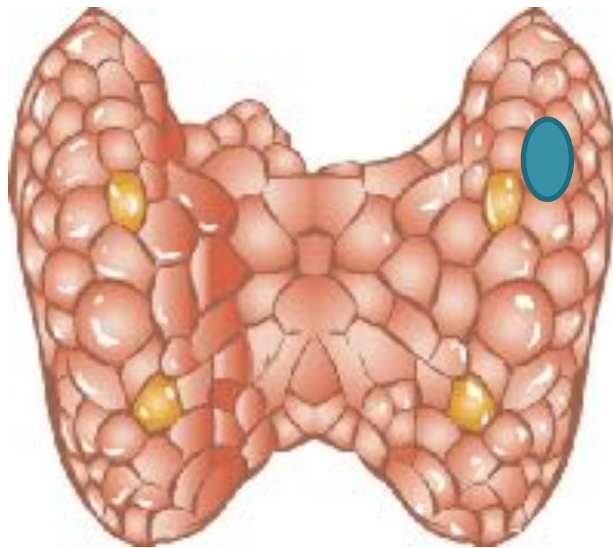
## Regional Lymph Nodes

- pNX: Cannot be assessed
- pN0: No regional lymph node metastasis
- pN1a:  
Nodal metastases to Level VI lymph nodes (pretracheal, paratracheal and prelaryngeal/Delphian)
- pN1b:  
Metastases to unilateral, bilateral or contralateral cervical (Levels I, II, III, IV, V) or retropharyngeal or superior mediastinal lymph nodes (Level VII).

## Distant Metastasis

- pM1: Distant metastasis

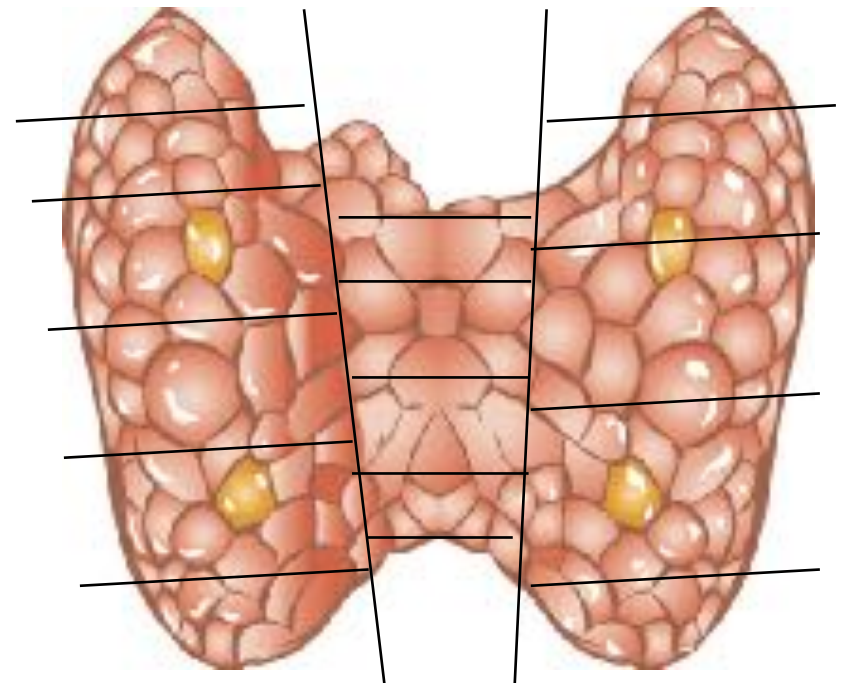
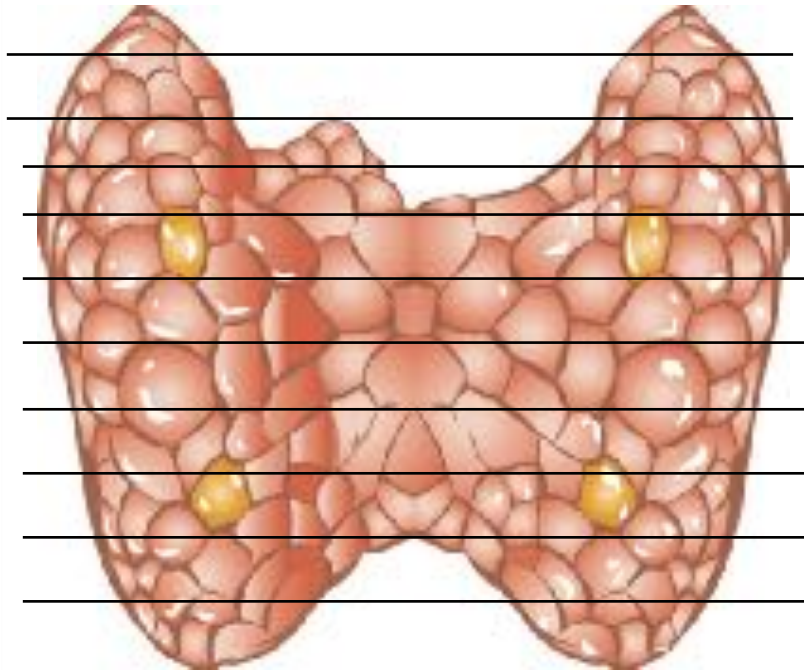
# pT1 vs pT3





# How to cut up

- Measure
- Ink
- Slicing for fixation





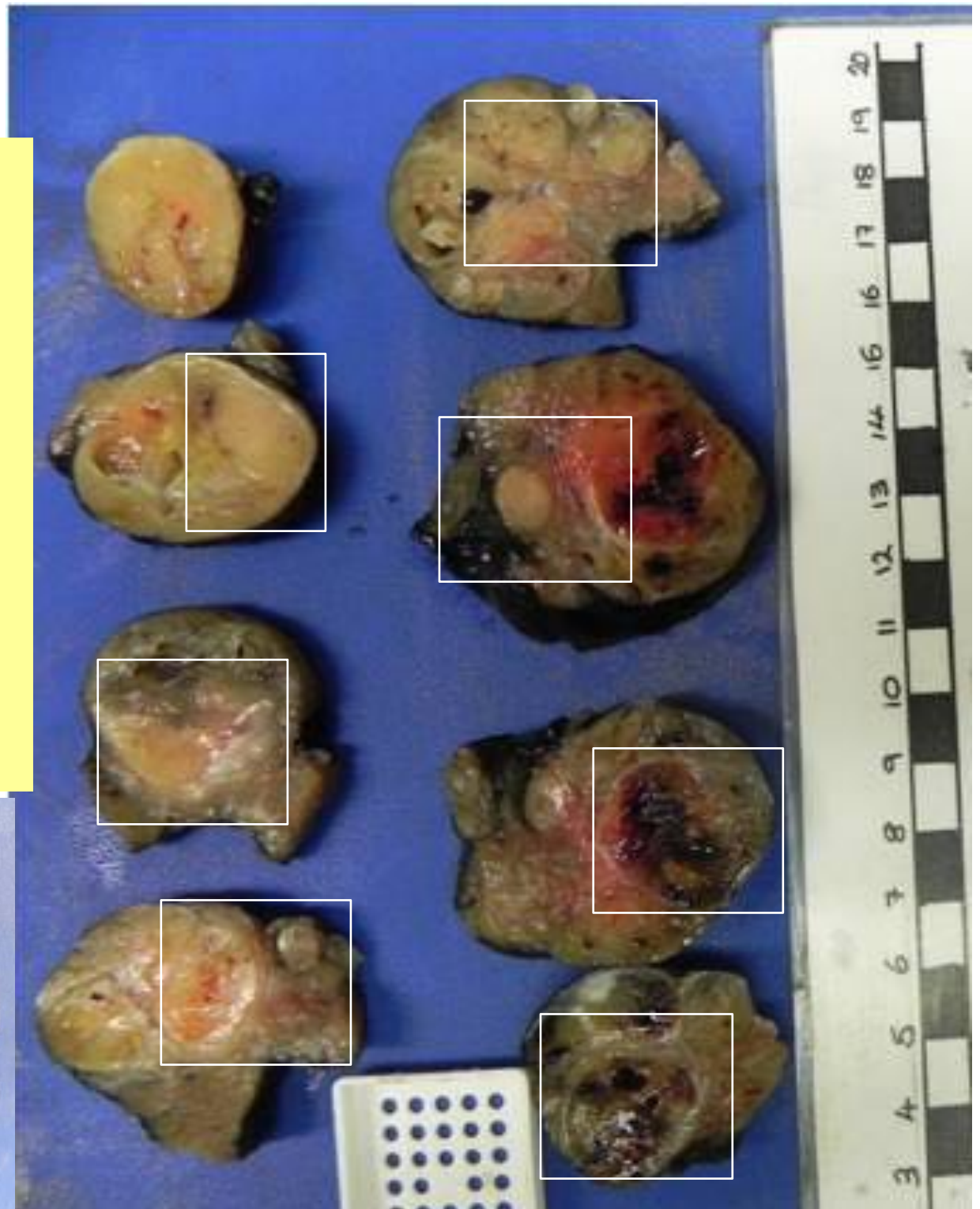
# How to cut up



# Blocks

## Multinodular Goitre

- 4 from each lobe
- 1 isthmus
- 1 pyramidal lobe
- Sample any cream nodules
- Look for lymph nodes – if present then sample them.





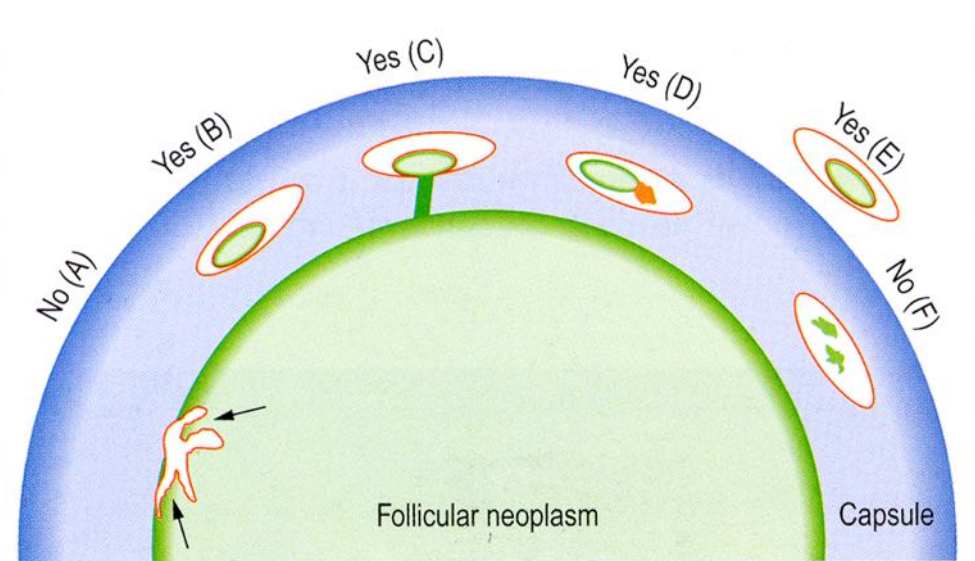
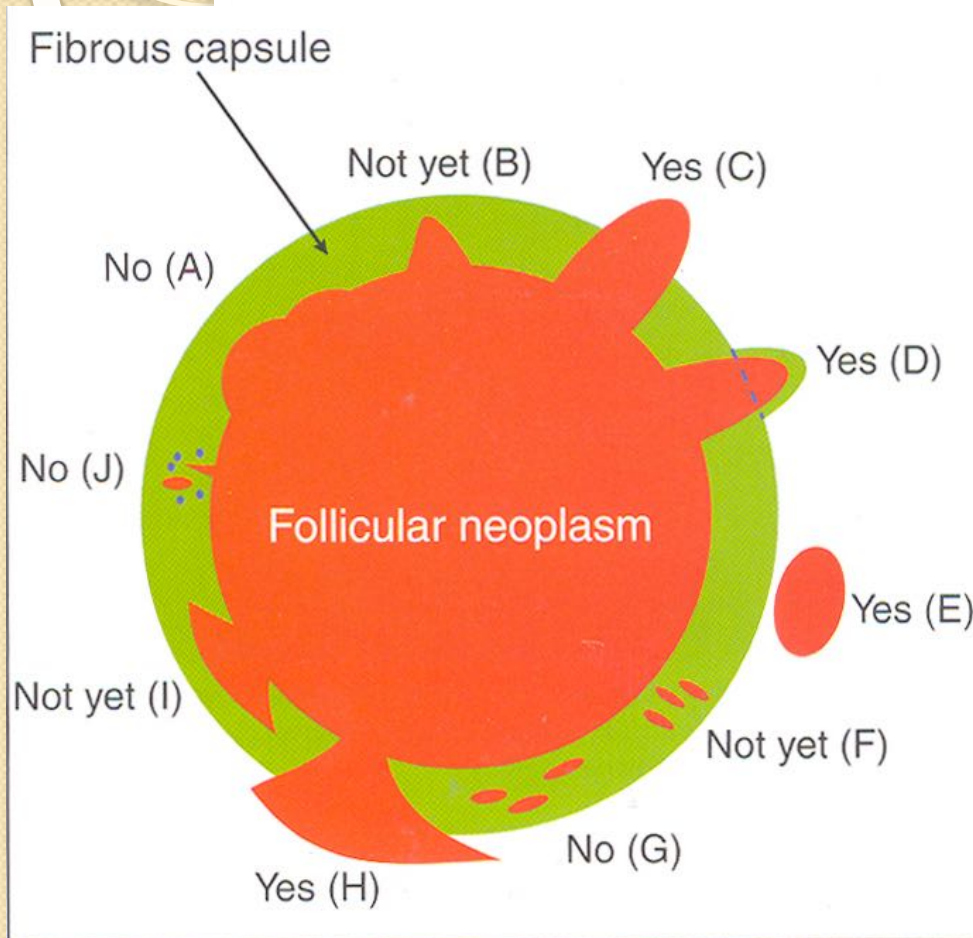
# Blocks

## Diagnostic lobectomy for a solitary nodule

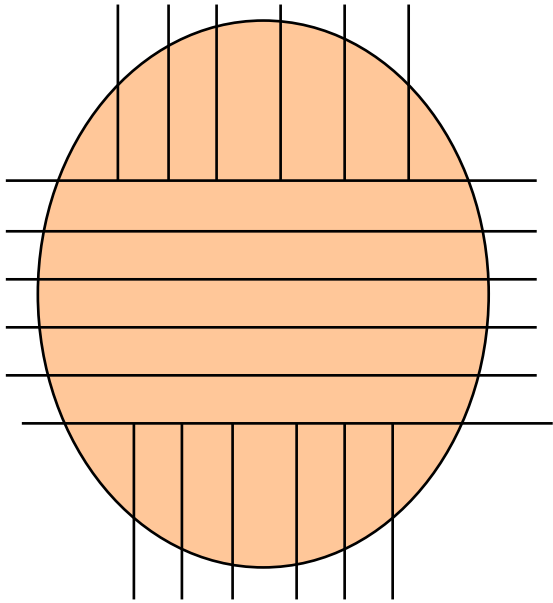
- <2 cms – sample entire nodule
- > 2 cms representative sections of lesion – sample entire capsular region if neoplasm



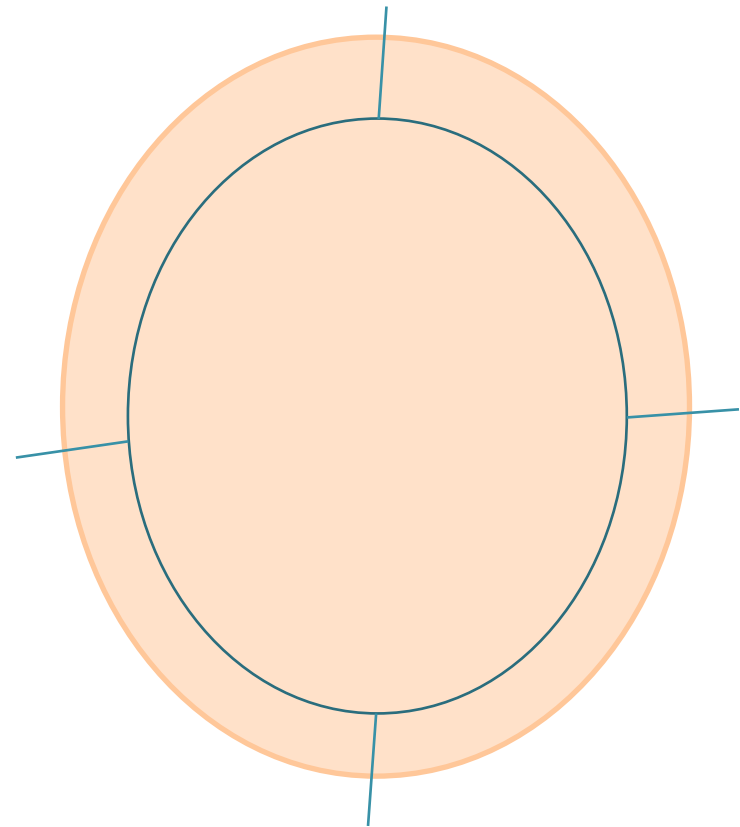
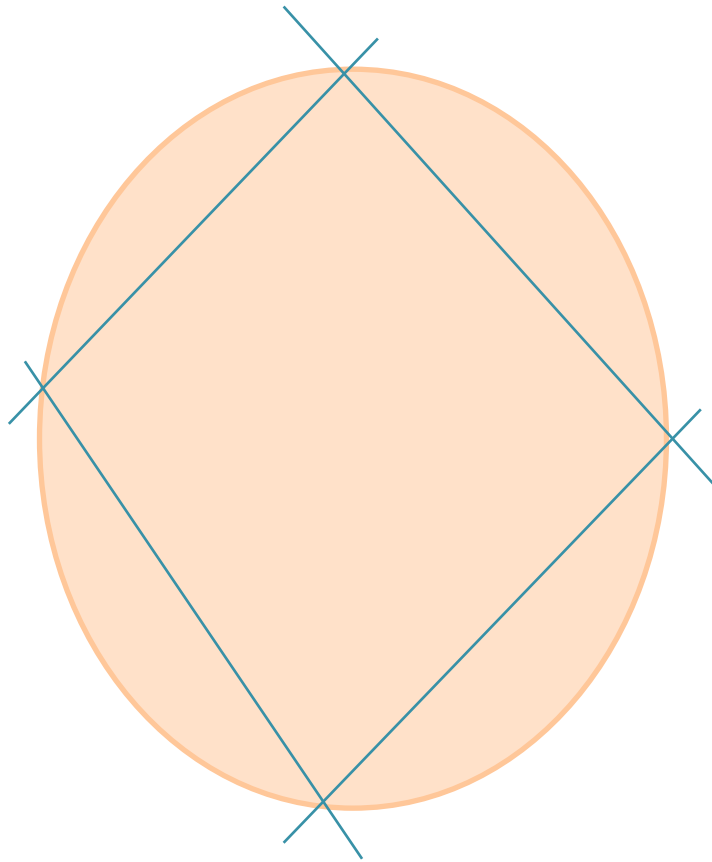
# Capsular & vascular invasion





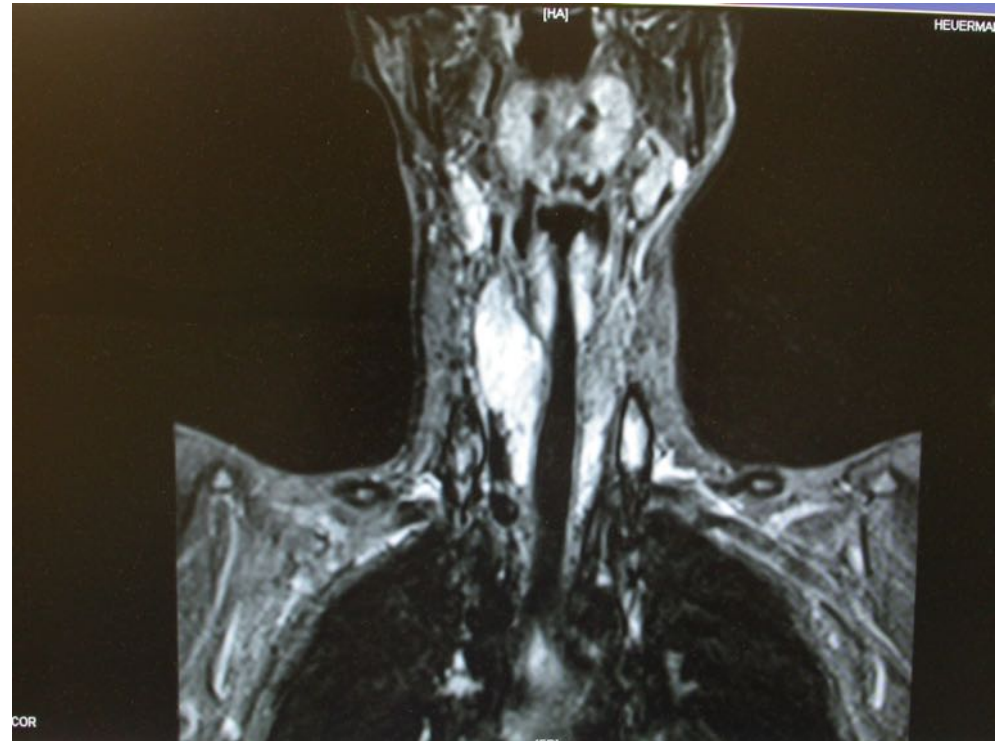


# Larger nodules – capsule sampling techniques



# Blocks – malignant lesions

- Tumour
- Margins
- Soft tissue extension
- Adjacent thyroid + other lesions
- Lymph nodes





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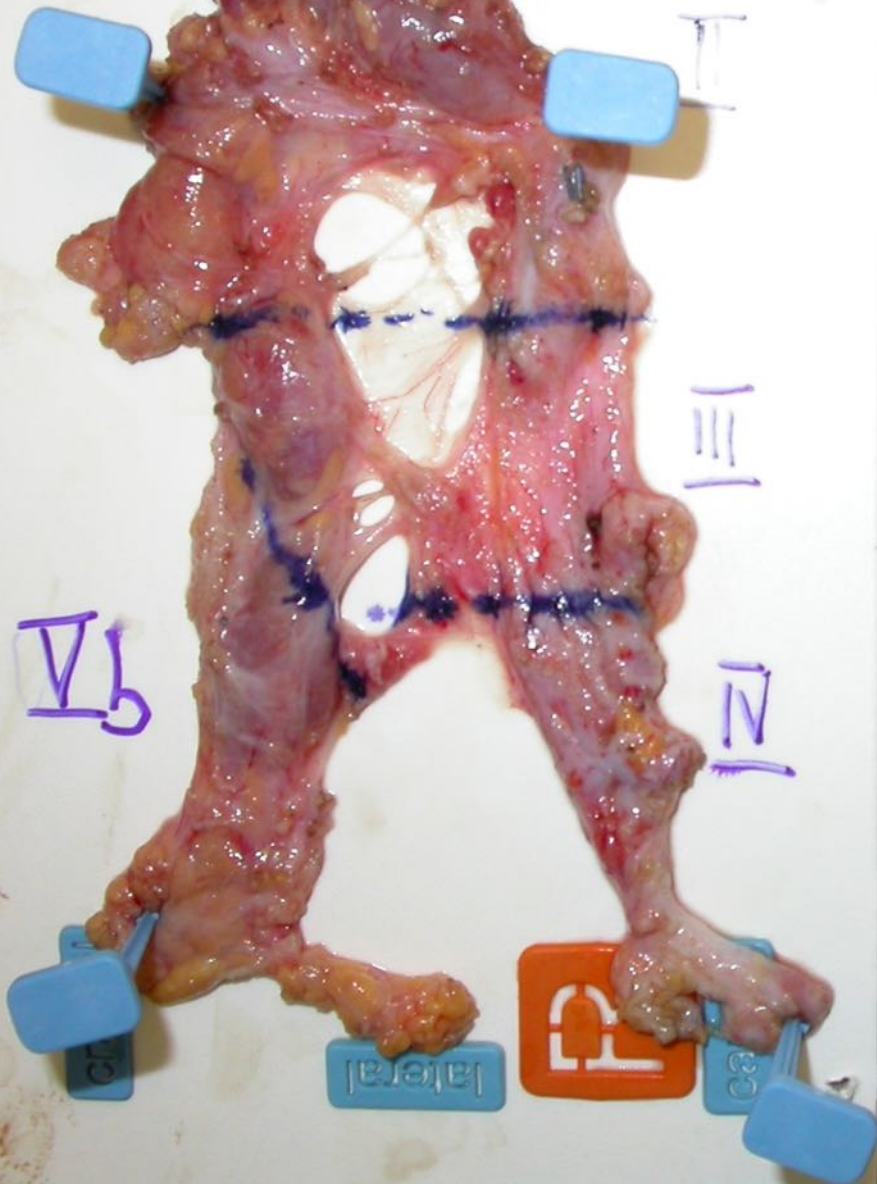
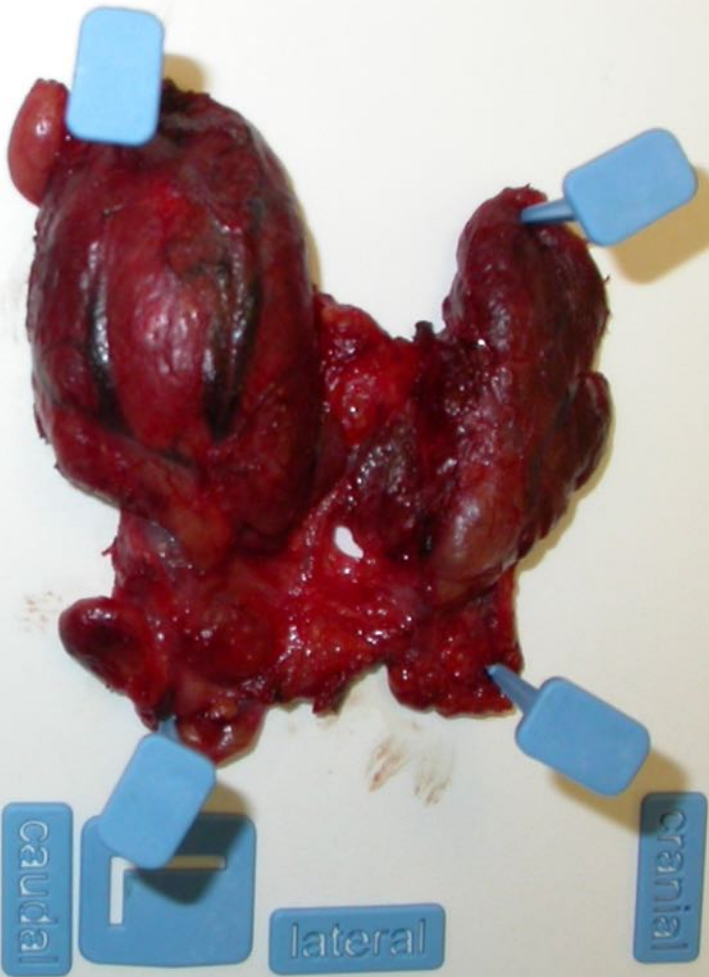
KLINIKA Medical GmbH  
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medial



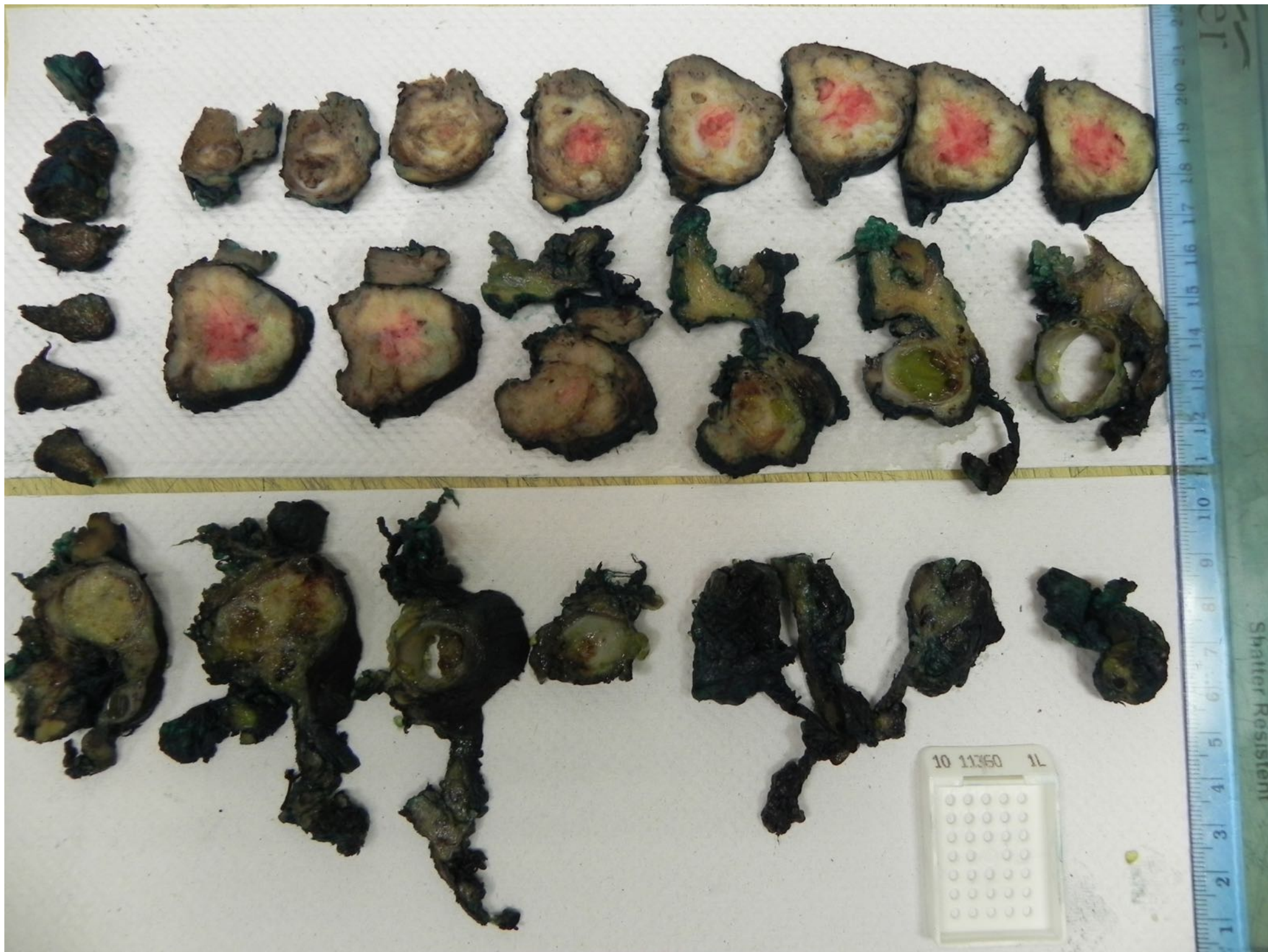
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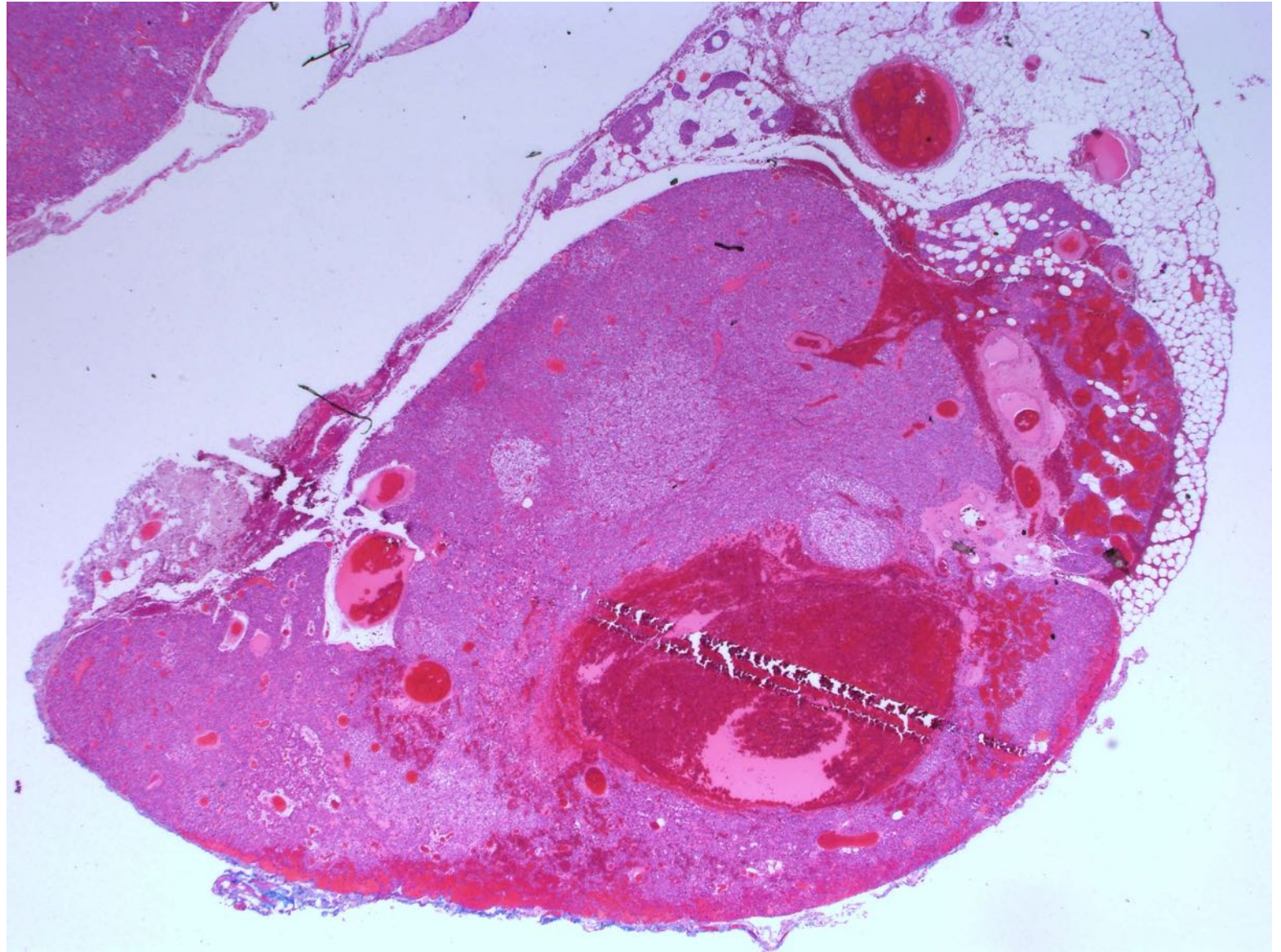








# Parathyroid



# Indications & type of specimen

- Hyperplasia
- Adenoma



- Parathyroidectomy
  - Single gland
  - Multiple glands
  - Part of a gland

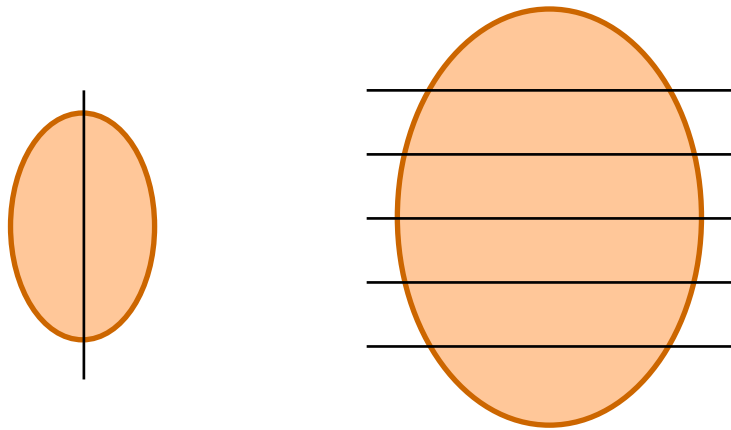
- Carcinoma



- En block resection

# Benign lesions

- Measure
- Weigh
- Bisect / bread loaf
- Submit entirely





# Parathyroid carcinoma staging

- No officially accepted system
- MSKCC proposed system

Stage I: T1N0M0

Stage II: T2N0M0

Stage IIIA: T3N0M0

Stage IIIB: T4N0M0

Stage IIIC: Any T, N1, M0;

Stage IV: Any T, Any N, M1

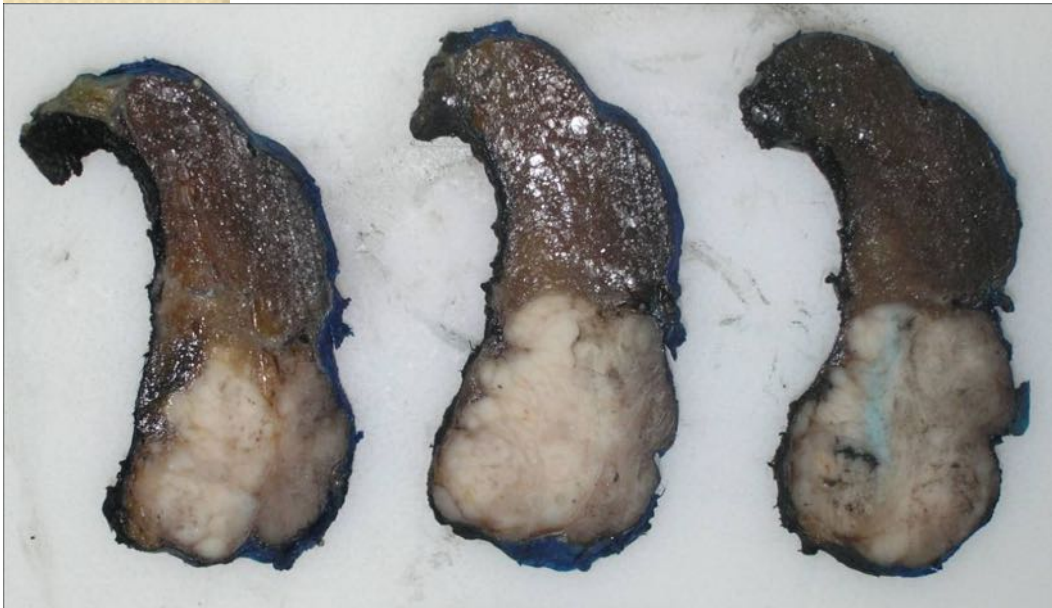
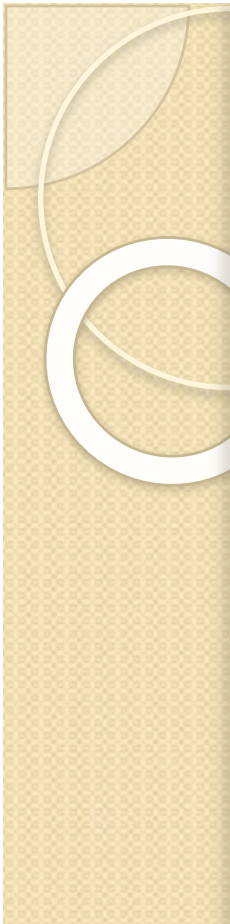
- T1= Primary tumor < 3 cm.
- T2= Primary tumor > 3 cm.
- T3= Primary tumor of any size with invasion of the surrounding soft tissues, such as the thyroid gland, strap muscles, etc.
- T4= Massive central compartment disease invading the trachea and esophagus or recurrent parathyroid carcinoma.
- N0= No regional lymph node metastases.
- N1= Regional lymph node metastases.
- M0= No evidence of distant metastases.
- M1= Evidence of distant metastasis.

# Malignant lesions – en bloc resections

- Orient if possible
- Measure
- Ink
- Serially slice
- Blocks
  - Tumour
  - Margins
  - Soft tissue extension
  - Lymph nodes
  - Thymus









# Adrenal





# Indications

- Unilateral hyperplasia
- Adenoma
  - Conn's
  - Cushing's
  - Virilizing syndromes
- Adrenocortical carcinoma
- Phaemochromcytoma
- Neuroblastic tumours
- Metastasis

# Type of specimen

- Adrenalectomy
- Adrenalectomy with nephrectomy
- Adrenalectomy with kidney + other organs





# Type of specimen

- Adrenalectomy
- Adrenalectomy with nephrectomy
- Adrenalectomy with kidney + other organs



# Staging for Adrenocortical carcinoma – UICC / TNM7

## Primary Tumor

- pTX : Primary tumor cannot be assessed
- pT0 : No evidence of primary tumor
- pT1: Tumor 5 cm or less in greatest dimension, no extra-adrenal invasion
- pT2: Tumor > 5 cm, no extra-adrenal invasion
- pT3: Tumor of any size with local invasion, but not invading adjacent organs
- pT4: Tumor of any size with invasion of adjacent organs

*Adjacent organs include kidney, diaphragm, great vessels, pancreas, and liver.*

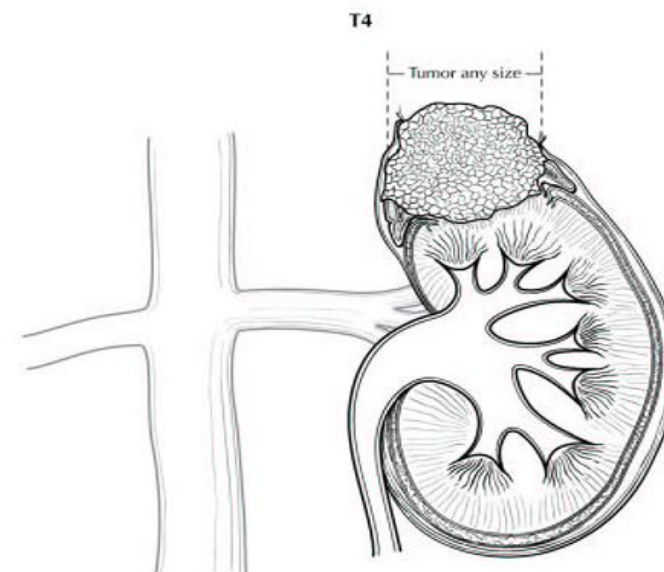
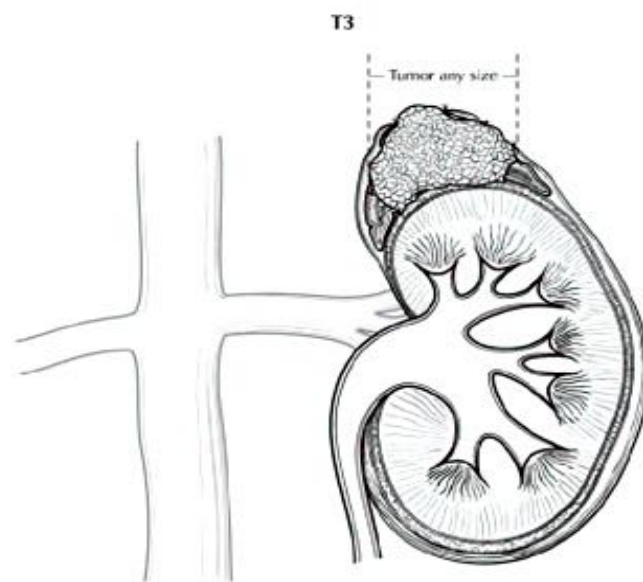
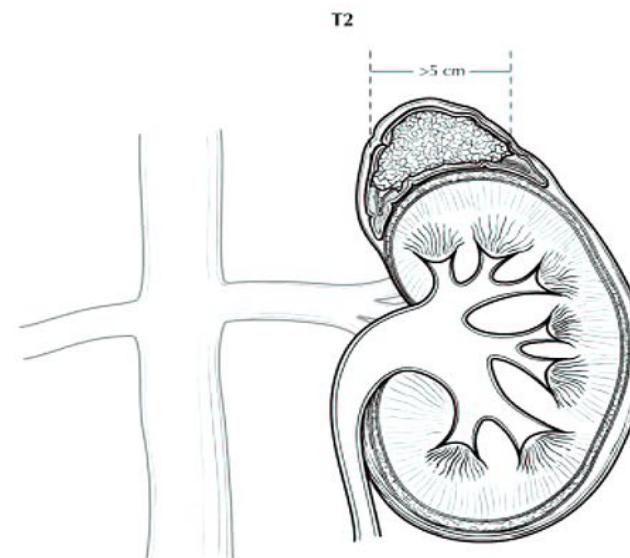
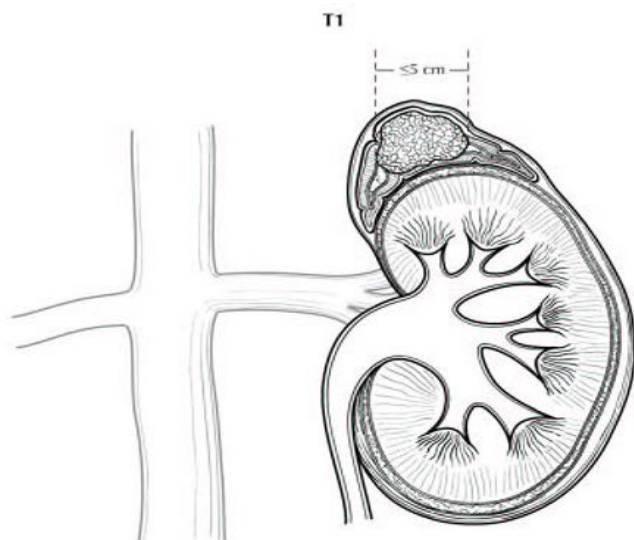
## Regional Lymph Nodes

- pN0: Negative regional nodes
- pN1: Positive regional nodes

*Regional lymph nodes include aortic (para-aortic and peri-aortic) and retroperitoneal (peri-nephric and peri-adrenal).*

## Distant Metastasis

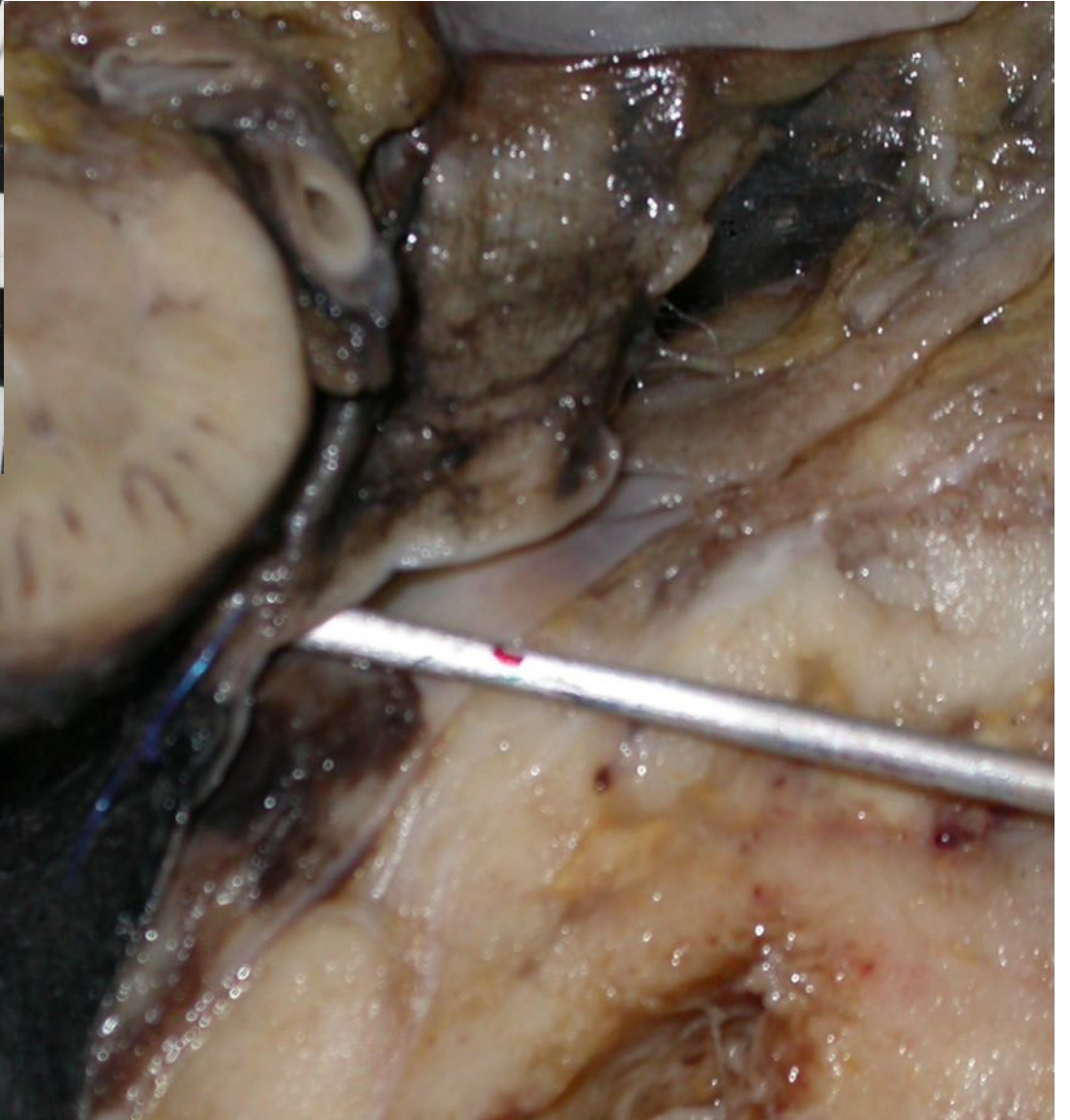
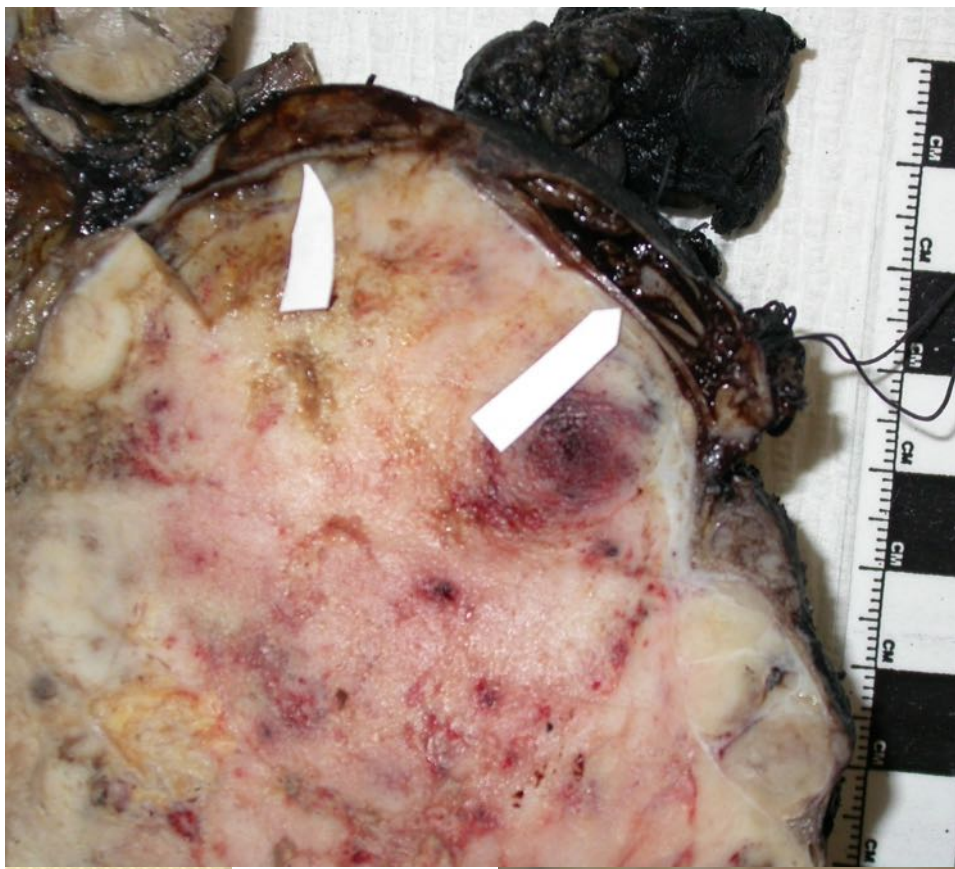
- pM0: No distant metastasis
- pM1: Distant metastasis





# ENSAT system of staging

	UICC / TNM7			ENSAT system		
	Criteria	5 year survival rate		Criteria	5 year survival rate	
		Ref 3	Ref 4		Ref 3	Ref 4
Stage 1	pT1 N0 M0	82%	74%	Same as TNM7	82%	74%
Stage 2	pT2 N0 M0	58%	64%	Same as TNM7	61%	64%
Stage 3	pT1-2 N1 M0 pT3 N0 M0	55%	57%	Tumour with any one of the following: •Involved lymph nodes •Extradrenal tissue infiltration •Venous tumour thrombus in renal vein or IVC	50%	44%
Stage 4	pT3 N1 M0 pT4 N0 M0 pT1-4 N0-1 M1	18%	12%	Any tumour with distant metastasis	13%	7%

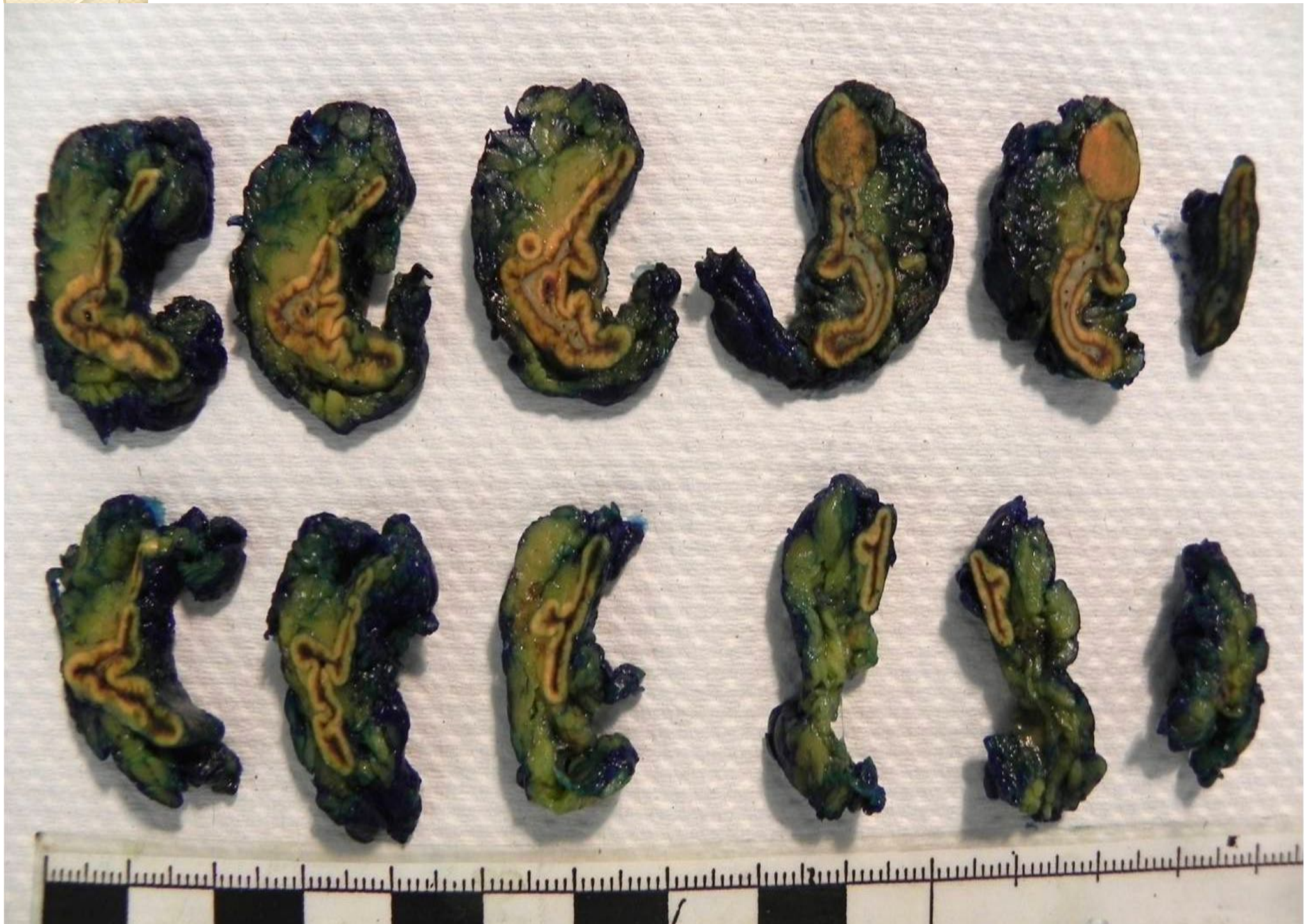




# Cut up

- Adrenal + periadrenal fat
- Adrenal medullary vein
- Remove vascular clamp / staple
- Measure (entire + tumour dimensions [if possible])
- **Do not separate fat from adrenal**
- If tumour capsule visible – document for breaches.
- Ink
- Serially slice
- Measure tumour







# Blocks - benign

- Hyperplasia – multiple representative
  - + adjacent adrenal (cortex + medulla)
  - + lymph nodes
  - + peri-adrenal fat (if needed)





- Solitary mass lesion < 3 cms:  
Submit entirely

- Solitary mass lesion > 3 cms:  
Representative of lesion ( at least 1 /  
cm)

+ adjacent adrenal (cortex + medulla), + lymph nodes, + peri-adrenal fat (if needed)









# Phaeochromocytoma











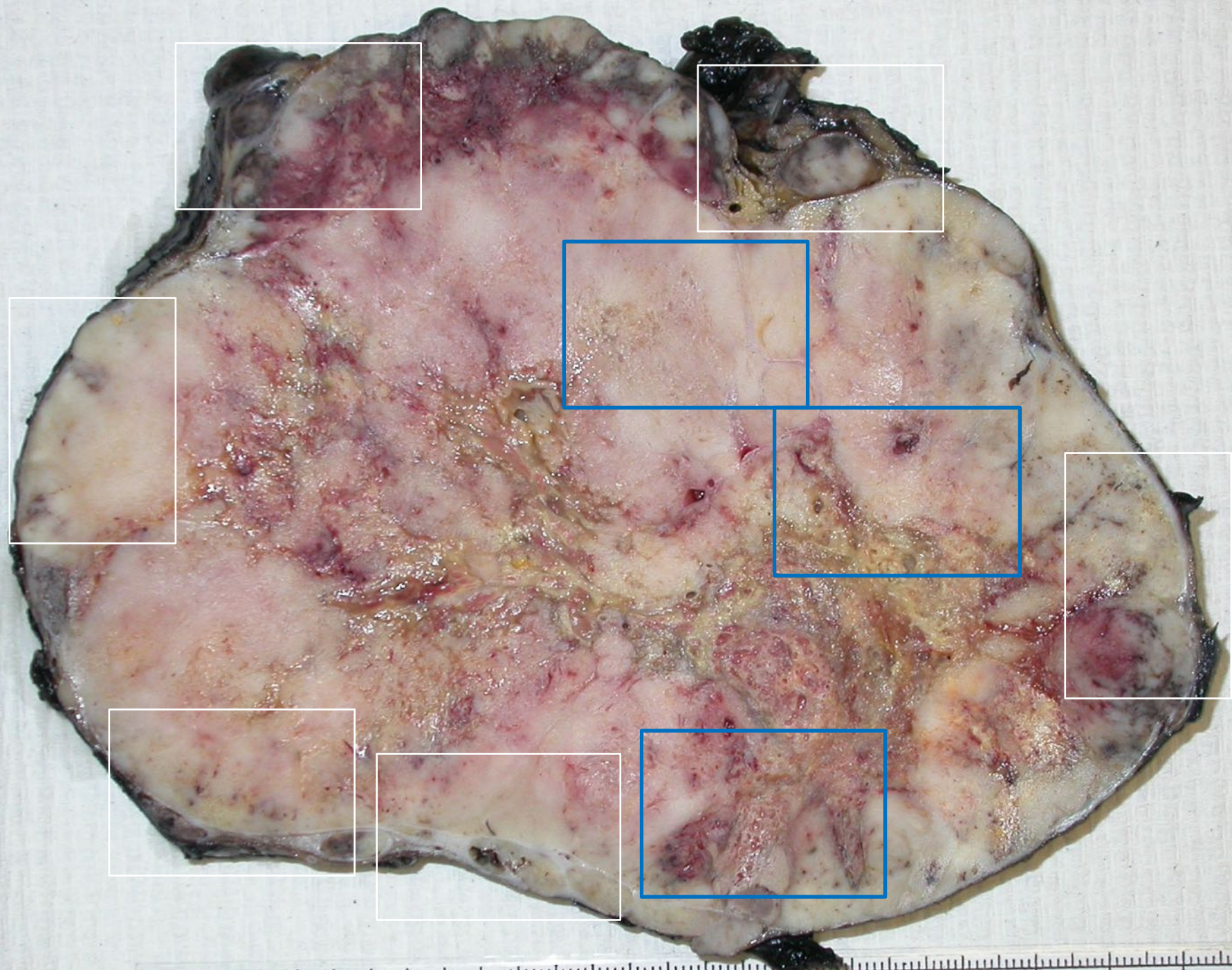
# Blocks - malignant

- Tumour (at least 1 / cm)
- Sample areas with differing appearances including some of necrotic zones.
- Capsule
- Extra-adrenal extension
- Margins
- Vessels
- Venous tumour thrombi
- Lymph nodes
- Soft tissue deposits

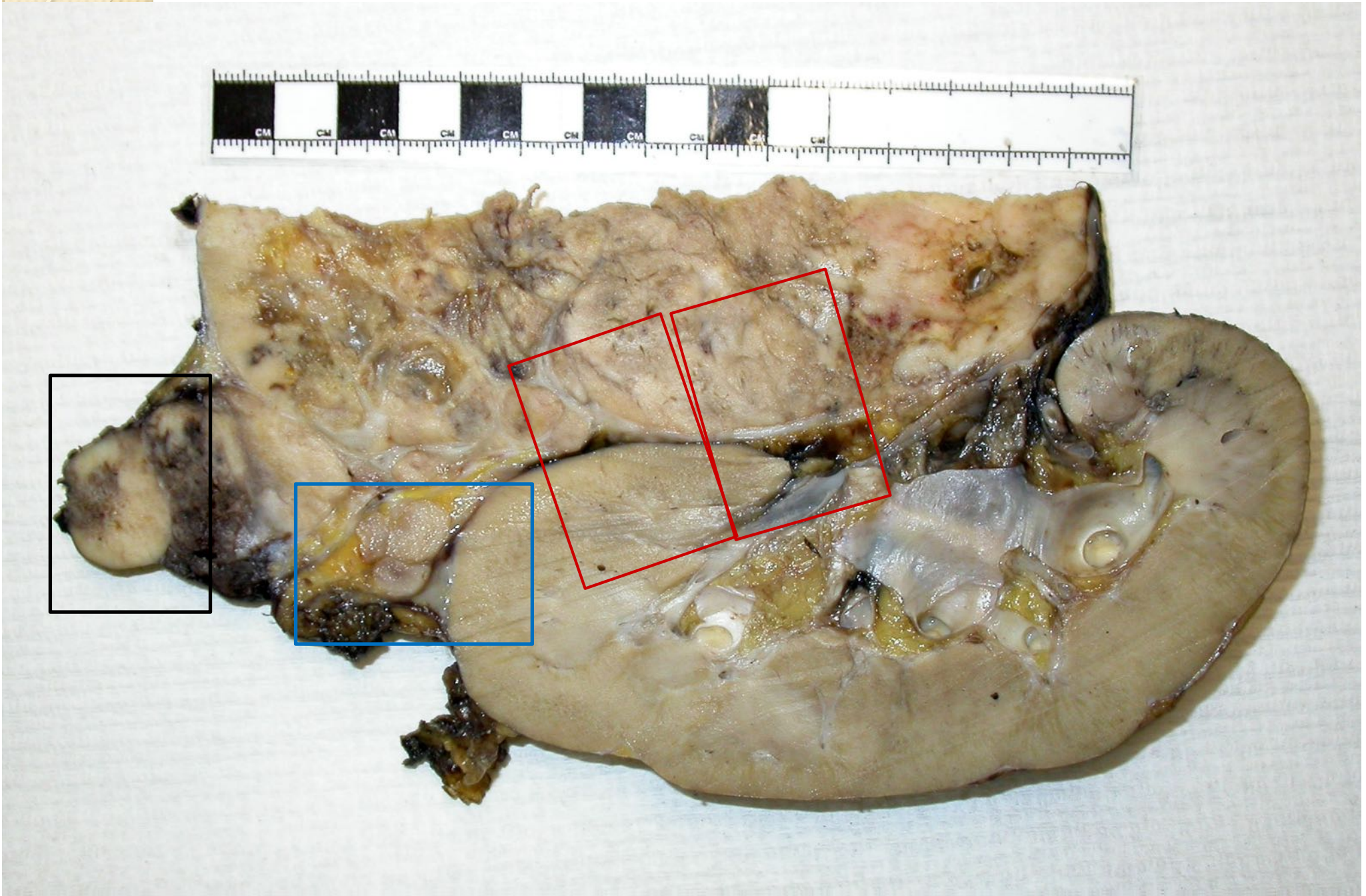
# Malignant masses



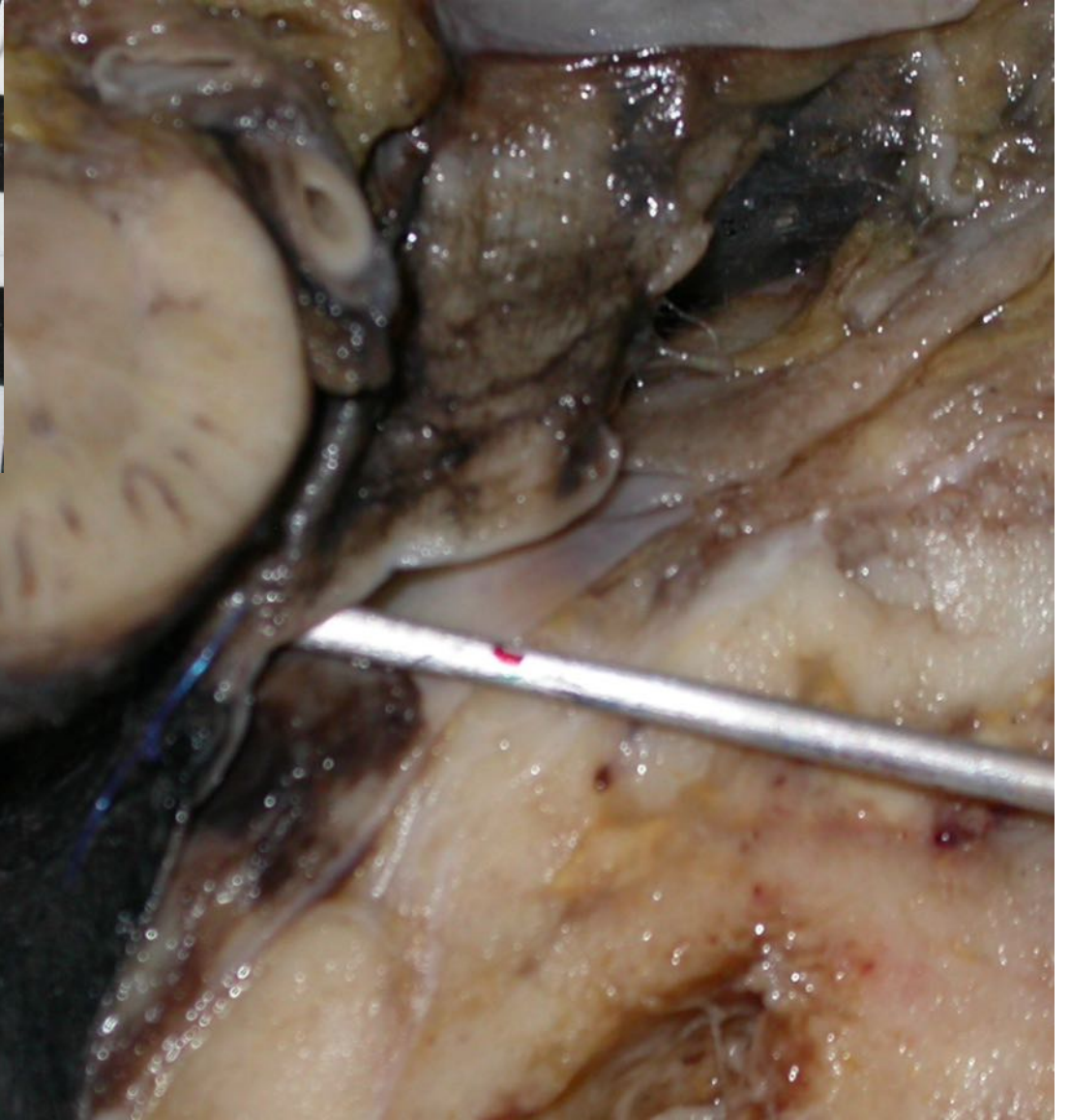


















# Resources

- RCPATH datasets
  - Thyroid
  - Parathyroid
  - Adrenal

- College of American Pathologists Cancer checklists
  - Thyroid
  - Adrenal
- <http://www.cap.org>