Edited past paper

ENDOCRINE SURGERY

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Rearranged by
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—February - 2025—

"كانَ يقولُ إذا صلَّى الصُّبحَ حينَ يسلِّمُ اللَّهمَّ إنِّي أسألُكَ عِلمًا نافعًا ورزقًا طيِّبًا وعملًا متقبَّلًا"

- Highlighted questions = repeated

- Sources of answers' explanations: Slides, Amboss, endocrine dossier , the_washington_manual_of_surgery_9

- I mentioned extra explanations, just in case if we need to read more... otherwise ignore the extra charts or infos.

- Don't hesitate to contact with us for any note

Our correction file!
https://docs.google.com/document/d/1-S8KJh7m1sbTFA14Uy4vh9u1EFjMLT7YkjL7g-_jA8Y/edit

بسم الله الرحمن الرحيم

1) All of the following findings are consistent with the diagnosis of Conn's syndromeEXCEPT:

a) Hypertension

B) Hypernatremia

C) High plasma renin

D) Hypokalaemia

e) Age <20

2)A 68-year-old woman underwent tracheostomy for prolonged intubation. 2 weeks later she developed brisk bright red bleeding from the tracheostomy site that resolved without intervention. Her Hb is 10.2 g/dL, & coagulation studies are normal. What is the most-likely diagnosis?

a) Pneumonia

b) Tracheitits

c) Bleeding of granulation tissue in the stoma

d) Tracheo-innominate fistula

e) Bleeding from the anterior jugular vein

Answer: C

Investigation of Conn's syndrome

A. *Serum Electrolytes*
1. Serum Potassium decreased
2. Serum Sodium increased (Mild)
3. Metabolic Alkalosis

B. Increased serum level of aldosterone
C. Greatly decreased serum level of renin
D. Sodium loading test

Answer: D

Bleeding around or from tracheostomy tube

- All bleeding should be evaluated by a surgical specialist.
- Localized surface bleeding: Consider tranexamic acid or epinephrine-soaked gauze.
- Blood within the tube
  - May indicate a tracheoinnominate fistula
  - Consider hyperinflation of the tracheostomy cuff as a temporizing measure.

Amboss

Categorising Tracheostomy Related Bleeding

The potential causes for tracheostomy related bleeding depend very much on the time that has passed since the formation of stoma and tracheostomy tube inserted.

Early bleeding (<4 days)

- Skin related bleeding
- Thyroid related bleeding
- Related to anticoagulant or antiplatelet therapy

Late bleeding (>4) days)

- Erosion into a large artery (e.g. trache-innominate fistula)
- Granulation tissue
- Mucosal trauma from suction catheters etc

Bleeding can be arbitrarily categorised into small (<10mls) or large (>10mls) volume bleeding. Small volume bleeding at a tracheostomy stoma may herald a major haemorrhage and the treating clinician must always thoroughly evaluate for the possibility of a trachea-arterial fistula.

Trache-innominate artery erosion is a rare late complication associated with high mortality rate. Erosion occurs in less than 1% of tracheostomy cases and is usually associated with:

- low placement of tracheostomy tube;
- excessive movement of the tube;
- over inflation of cuff; and/or
- suboptimal tracheostomy tube position.

From here

3) All are features that suggest a benign adrenal mass on CT scan with adrenal protocolEXCEPT:

a) Size of a 3 cm in diameter

b) Sharp margins, smooth & homogenous

c) Rich with fat component

d) Density more than 30 Hu (Hounsfield unit) on non-contrast images

e) Washout more than 60% at 15 min

4) What is the most common parotid tumour?

a) Mucoepidermoid carcinoma

b) Adenoid cystic carcinoma

c) Acinar cell tumour

d) Warthin’s tumour

e) Pleomorphic adenoma

Answer D

CT Adenoma Characteristics

- Sharp margins
- Smooth, homogenous, lipid rich
- Most <10 Hu on noncontrast images
- Washout >50% @ 15 min

(benign)

slides

Table 29.1
Imaging Characteristics of Adrenal Masses

Adrenal Mass	Typical Imaging Characteristics
Adrenocortical adenoma	Unilateral, <4-5 cm in diameter Round, homogeneous density with smooth border Low attenuation on CT scan (<10 HU) Rapid, intense contrast enhancement followed by early contrast washout (absolute percent washout >60%, relative percent washout >40%) Intracellular fat with signal loss on opposed-phase MRI images
Myelolipoma	Macroscopic fat on CT Calcification Hyperintense signal on T1 MRI
Pheochromocytoma	Hypervascularity with cystic areas in larger lesions Rapid, intense contrast enhancement with variable delayed washout High T2 MRI signal intensity (light-bulb sign)
Adrenocortical carcinoma	Unilateral, >4-5 cm Irregular shape, heterogeneous, central tumor necrosis, local invasion Calcification Increased attenuation on CT (>10 HU) Delay in contrast washout No loss of signal on opposed-phase MRI Elevated SUV on PET
Adrenal metastasis	Irregular shape, heterogeneous May be bilateral or with other metastatic disease Increased attenuation on CT (>10 HU) Delay in contrast washout No loss of signal on MRI Elevated SUV on PET

HU, Hounsfield units; PET, positron emission tomography; SUV, standardized uptake values.

washing tone

Answer E

more than morphology

Pleomorphic adenoma

- Most common.
- Peak age: 5° decade.

- Proliferation of: - epith.
  - myoepith.
  - stroma tissue → resemble cartilage and bone.

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Slides

5) For a patient with adrenal mass; all of the following are features suggestive of Cushing syndrome EXCEPT:

a) Moon face

b) Central obesity

c) Hypokalaemia

d) Diabetes mellitus

e) Hypertension

6) The most common cause of hypothyroidism is:

a) Multinodular goitre

b) Thyroid dyshormonogenesis

c) Follicular adenoma

d) Graves’ thyroiditis

e) Hashimoto's thyroiditis

Answer C

- Conn & Cushing are associated with hypokalemia → it's not specific

- Hypertension → both, but ...

Conn →

Typical findings

- ↑ Plasma aldosterone concentration (≥ 10 ng/dL)
- ↓ Plasma renin activity (< 1.0 ng/mL/hour)
- ↑ Aldosterone-to-renin ratio on a morning blood sample [22]

- **Hypertension**
  - Sustained systolic blood pressure > 150 mm Hg or diastolic > 100 mm Hg over three measurements on three different days
  - Systolic blood pressure > 140 mm Hg or diastolic > 90 mm Hg AND resistant to three-drug therapy with an adrenergic inhibitor, a vasodilator, and a diuretic
  - See "Secondary hypertension."
- **Features of hypokalemia**

Cushing →

Findings:

- ↑ Serum cortisol following a low-dose dexamethasone suppression test

Answer e

- **Primary hypothyroidism**: insufficient thyroid hormone production
  - **Hashimoto thyroiditis**
    - The **most common cause** of hypothyroidism in iodine-sufficient regions [2]
    - Associated with HLA-DR3 and other autoimmune diseases (e.g., vitiligo, pernicious anemia, type 1 diabetes mellitus, and systemic lupus erythematosus)
  - Postpartum thyroiditis (subacute lymphocytic thyroiditis) [2]
  - De Quervain thyroiditis (subacute granulomatous thyroiditis): often subsequent to a flu-like illness [2]
  - Iatrogenic: e.g., post thyroidectomy, radioiodine therapy, antithyroid medication (e.g., amiodarone, lithium)
  - Nutritional (insufficient intake of iodine): the most common cause of hypothyroidism worldwide, particularly in iodine-deficient regions
  - Riedel thyroiditis: occurs in IgG_4-related systemic disease
  - Wolff-Chaikoff effect
  - **Thyroid dysplasia**: a disorder of embryologic development characterized by abnormal development and/or location of thyroid tissue (e.g., lingual thyroid)
- **Secondary hypothyroidism**: pituitary disorders (e.g., pituitary adenoma) → TSH deficiency
- **Tertiary hypothyroidism**: hypothalamic disorders → TRH deficiency

Amboss

"**CUSHINGOID**" is the acronym for side effects of corticosteroids: **C**ataracts, **U**lcers, **S**triae/**S**kin thinning, **H**ypertension/**H**irsutism/**H**yperglycemia, **I**nfections, **N**ecrosis (of the femoral head), **G**lucose elevation, **O**steoporosis/**O**besity, **I**mmunosuppression, **D**epression/**D**iabetes.

7)A 45-year-old woman has a 2-cm solitary, non-functioning thyroid nodule, & fineneedle cytology is Bethesda 4. This lady is considered to have:

a) Follicular neoplasm

b) Malignant cytology

c) Atypia of undetermined significance

d) Inadequate cytology

e) Benign cytology

8) Which of the following is NOT TRUE regarding the carotid body:

a) It is innervated through the glossopharyngeal and vagus nerves

b) It is stimulated by hypoxia

c) Carotid body tumour is malignant in 35% of cases

d) Carotid body tumour most commonly occurs in middle age group

e) Carotid body tumour best diagnosed by angiography

Answer A

Bethesda Category	Characteristics
Bethesda I Nondiagnostic or unsatisfactory	• Virtually acellular specimen; • Cyst fluid only; • Other (obscuring blood, clotting artifact, etc.).
Bethesda II Benign	• Consistent with a benign follicular nodule (includes adenomatoid nodule, colloid nodule, etc.) • Consistent with lymphocytic (Hashimoto) thyroiditis in the proper clinical context • Consistent with granulomatous (subacute) thyroiditis
Bethesda III Undetermined	• Atypia of undetermined significance or Follicular lesion of undetermined significance
Bethesda IV Undetermined	• Follicular neoplasm/suspicious for a follicular neoplasm • Specify if Hürthle cell (oncocytic) type
Bethesda V Suspicious for malignancy	• Suspicious for papillary carcinoma • Suspicious for medullary carcinoma • Suspicious for metastatic carcinoma • Suspicious for lymphoma

slides

Answer C

A benign, slow-growing neck swelling in the carotid triangle of the neck that arises from the chemoreceptor cells of the carotid body. Typically seen after the age of 40 years. Carotid body tumors may be functional and secrete catecholamines.

About 5% of carotid body tumors (CBTs) are bilateral and 5-10% are malignant, but these rates are much higher in patients with inherited disease. Apr 12, 2024

Medscape
https://emedicine.medscape.com › 1575155-overview

Carotid Body Tumors - Medscape Reference

❖ Lateral masses:

a. **Branchial cyst** (discussed previously)
b. **Carotid artery aneurysm**

c. **Carotid body tumor**
   - Carotid body tumors are **the most common paragangliomas of the skull base and neck region (60%).** These tumors develop at the carotid **bifurcation**.
   - Approximately **one-third** are inherited as part of a **genetic syndrome**.
   - They are **locally invasive**, **slow**-growing tumors that can remain **asymptomatic** for many years.
   - Carotid body tumors typically present as **painless**, gradually enlarging masses located in the upper part of the neck below the angle of the jaw. In later stages, pain, dysphagia, deficits of cranial nerves VII, IX, X, XI and XII, and hoarseness or a Horner's syndrome may result from pressure on the vagus or sympathetic nerves.
   - Physical examination discloses a rubbery non-tender mass in the lateral neck that is more freely movable in the horizontal plane than vertically, referred to as a positive ***Fontaine's sign***. Carotid body tumors are often pulsatile (it can transmit the carotid pulse, or it can have a pulse on its own), and a bruit can be heard on auscultation; however, the absence of a bruit does not rule out a carotid body tumor.
   - Diagnosis is usually made based on characteristic features demonstrated on **MRI/MRA** imaging. Duplex sonography typically indicates the mass to be hypervascular, although the absence of hypervascularity does not exclude the diagnosis
   - Treated with surgical excision and preoperative embolization

9) A 35-yaar-old male patient who is previously healthy presents with repeated episodes of headache, diaphoresis, & palpitations. His blood pressure was 200/160. All of the following measures are useful to evaluate him EXCEPT:

a) Serum renin levels

b) Serum glucose levels

c) Plasma free metanephrines

d) Clonidine suppression test

e) 24-hour urine catecholamine

10)submandibular lymph nodes belong to which cervical group of lymph nodes?

a) Group 1 cervical lymph nodes

b) Group 2 cervical lymph nodes

c) Group 3 cervical lymph nodes

d) Group 4 cervical lymph nodes

e) Group 5 cervical lymph nodes

Answer b

Pheo- The Diagnosis

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+ve = ممكن يكون عنده
-ve = ما عنده

- Plasma free metanephrines: most sensitive test seen 99% of patients
- 24 h urinary catecholamines (2x normal is diagnostic)
- VMA
- Clonidine suppression test (0.3mg oral, test 3 hrs later) >50% reduction catecholamines NO pheo

Investigation of Conn's syndrome

A. Serum Electrolytes

1. **Serum Potassium decreased**
2. **Serum Sodium increased (Mild)**
3. **Metabolic Alkalosis**

B. Increased serum level of aldosterone
C. Greatly decreased serum level of renin
D. Sodium loading test

Answer a

B. Deep cervical group: run along the course of the internal jugular vein within the carotid sheath. They are divided into 6 levels; I, II, III, IV, V & VI.

- **Group I:**
  - **Ia: submental nodes**; drain midline structures: → facial
    - Tip of the nose / Middle portion of upper and lower lips
  - **Ib: submandibular nodes**
    - Nose / Sides of the tongue → neck
- **Group II: upper jugular (Jugulo-digastric)**
  - Lie behind the posterior belly of digastric muscle
- **Group III: middle jugular (jugular omohyoid)**
  - Lie behind the omohyoid
- **Group IV: lower jugular (epithelio-cervical)**
  - Lie below the omohyoid
- **Group V: accessory**
  - Found in the posterior triangle of the neck, related to the accessory nerve.
  - Accessory lymph nodes drain the post-nasal space.

11) Regarding the sublingual gland, one is TRUE:

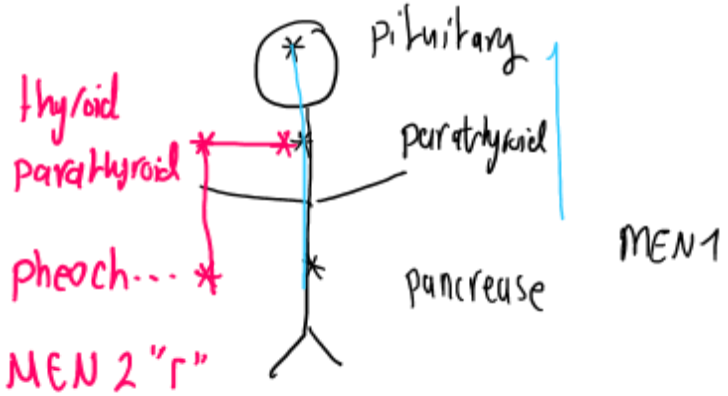
a) It is the commonest site of stone formation
b) It drains through the Wharton's duct
c) It is the least common site for malignancy
d) It is a single gland under the tongue
e) Unlikely to be involved with ranula

12) All of the following may be found as part of MEN 1 syndrome EXCEPT:

a) Gastrinoma
b) Facial angiofibroma
c) Parathyroid hyperplasia
d) Pituitary adenoma
e) Pheochromocytoma

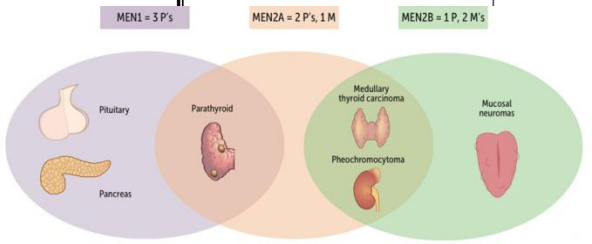
Answer: b

- Parotid: Stenson duct→ 2° molar tooth.
- Submandibular: Warton duct→ lateral to frenulum.
- Sublingual: in Warton duct.



Answer: E

	MEN 1 Wermer's syndrome	MEN2	
		MEN 2A Sipple's syndrome	MEN 2B
Genetics	Altered menin protein expression	Altered expression of the RET proto-oncogene → elevated tyrosine kinase activity	
Main disease	Primary hyperparathyroidism (~ %90 of cases)	Medullary Thyroid Cancer (almost %100 of cases)	
Other manifestations	• Endocrine pancreatic tumors (~ 50–80% of cases) such as gastrinoma (most common) and insulinoma • Pituitary adenoma (~ 30–50% of cases): most commonly prolactinoma • Carcinoid tumors (~ 10–15% of cases)	Pheochromocytoma (around %40 of cases) Primary hyperparathyroidism (%20-%30)	*Multiple neurinomas *Marfanoid habitus (more than %95)



13) All of the following are true regarding insulinoma EXCEPT:

a) It improves upon giving glucose

b) Hypoglycaemic symptoms occur after fasting or exercise

c) It is a benign tumour in most of the cases

d) It is associated with low C-peptide

e) Must rule out sulfonylurea

14) All of the following findings are consistent with the diagnosis of Addison's diseaseEXCEPT:

a) Fever
b) Hypertension
c) Dehydration
d) Nausea
e) Vomiting

Answer D

DIAGNOSIS

- It can be difficult to distinguish insulinomas from other causes of hypoglycemia such as hormonal deficiencies, hepatic insufficiency and medications.
- The most sensitive test is a fasting test, in which insulin, proinsulin, C-peptide and blood glucose are measured in 1 to 2 hour intervals. The diagnosis can be established if inappropriately high insulin concentrations are found as well as increased levels of C peptide and proinsulin during hypoglycemia.
- Elevated C-peptide can help exclude factitious hypoglycemia, which is caused by insulin injections.
- After diagnosis of insulinoma, imaging techniques are used. Transabdominal ultrasound is the preferred initial test. CT and MRI may be used as well.
- Endoscopic ultrasound and selective arterial calcium stimulation are more invasive imaging modalities.

Answer B

Primary adrenal insufficiency (Addison disease)

Damage to the adrenal gland leads to the deficiency in all three hormones produced by the adrenal cortex: androgen, cortisol, and aldosterone.

- **Hypoandrogenism**
  - Loss of libido
  - Impaired spermatogenesis (in men)
- **Hypocortisolism** leads to:
  - ↑ **ACTH** → ↑ production of POMC (in order to increase ACTH production) → ↑ melanocyte-stimulating hormone (MSH) → hyperpigmentation of the skin (bronze skin) [11]
  - ↑ ADH level → retention of free water → dilutional hyponatremia
  - ↓ Expression of enzymes involved in gluconeogenesis → ↓ rate of gluconeogenesis → hypoglycemia
  - Lack of potentiation of catecholamines action → hypotension
- **Hypoaldosteronism** → hypotension (hypotonic hyponatremia and volume contraction), hyperkalemia, metabolic acidosis

15) Which of the following is the most common functional neuroendocrine tumour of the pancreas?

a) Insulinoma

b) Glucagonoma

c) Gastrinoma

d) VIPoma

e) Somatostatinoma

16) The most common pancreatic neuroendocrine tumour in MEN 1 is:

a) Insulinoma
b) Somatostatinoma
c) Glucagonoma
d) Gastrinoma
e) VIPoma

Answer A

Insulinoma

INTRODUCTION

Definition: An insulinoma is a type of pancreatic endocrine tumor that produces insulin.

Epidemiology: Insulinomas are the most frequent type of functioning pancreatic endocrine tumors. Their incidence is about 2-4 cases per million per year. Women are slightly more likely to be affected than men.

Answer D

	MEN 1 Wermer's syndrome	MEN2	
		MEN 2A Sipple's syndrome	MEN 2B
Genetics	Altered menin protein expression	Altered expression of the RET proto-oncogene → elevated tyrosine kinase activity	
Main disease	Primary hyperparathyroidism (~ %90 of cases)	Medullary Thyroid Cancer (almost %100 of cases)	
Other manifestations	• Endocrine pancreatic tumors (~ 50–80% of cases) such as gastrinoma (most common) and insulinoma • Pituitary adenoma (~ 30–50% of cases): most commonly prolactinoma • Carcinoid tumors (~ 10–15% of cases)	Pheochromocytoma (around %40 of cases)	
		Primary hyperparathyroidism (%20-%30)	*Multiple neurinomas *Marfanoid habitus (more than %95)

17) MIBG (metaiodobenzylguanidine) scan is useful in the diagnosis of which of the following?

a) Conn’s disease
b) Hyperandrogenism
c) Cushing syndrome
d) Pheochromocytoma
e) Virilising adrenal tumour

18) A 45-year-old gentleman presented with a right parotid mass of 2-year duration. Hisphysical examination was normal. What is the most likely diagnosis?

a) Adenocarcinoma
b) Squamous cell carcinoma
c) Pleomorphic adenoma
d) Warthin’s tumour
e) Mucoepidermoid carcinoma

Answer D

iv. In patients with biochemical evidence of pheochromocytoma and negative CT and MRI, functional imaging can help identify occult tumors and metastatic pheochromocytoma.

a. **68-Ga DOTATATE positron emission tomography** scanning has the highest sensitivity and can be helpful in identifying occult tumors or suspected metastatic disease.

b. **Scintigraphic scanning** after the administration of ^{123}I-meta-iodobenzylguanidine provides a functional and anatomic test of hyperfunctioning chromaffin tissue that is very specific for both intra- and extra-adrenal pheochromocytomas but is expensive and less frequently utilized.

Answer C

more than morphology

Pleomorphic adenoma

- Most common.
- Peak age: 5° decade.
- Proliferation of: - epith.
  - myoepith.
  - stroma tissue→resemble cartilage and bone.

ممكن يكون فيه

19) What is the most common malignant tumour of the parafollicular cells of the thyroid gland?

a) Follicular carcinoma
b) Hurthle cell carcinoma
c) Lymphoma
d) Medullary carcinoma
e) Papillary carcinoma

20) Which of the following best describes primary Hyperparathyroidism?

a) Elevated PTH & low calcium
b) Elevated phosphate & high PTH
c) Elevated chloride & calcium
d) Elevated PTH & magnesium
e) Elevated calcium & PTH

Answer : D

1. Papillary Adenocarcinoma:
Mutations in the genes encoding for the proteins in the MAPK pathway, like RET/PTC or BRAF
2. Follicular Adenocarcinoma:
Monoclonal origin including RAS mutations, PAX-PPAR gamma 1or others, but rarely with RET/PTC or BRAF.
Follicular thyroid cancer can be a part of familial neoplastic syndromes like Cowden (PTEN).
4. Medullary Carcinoma:
A neuroendocrine tumor of the parafollicular or C cells of the thyroid gland. Most are sporadic but approximately 25% are familial as part of MEN2 (RET proto-oncogene)
5. Anaplastic Carcinoma:Undifferentiated tumors of the thyroid follicular epithelium. Some studies suggest that it arises from well-differentiated thyroid cancers that have accumulated a huge amount of mutations. These cancers arise form RAS-mutation positive differentiated cancers.

Answer : E

A. Epidemiology/etiology/classification
   1. **Primary hyperparathyroidism (HPT)**
      a. Incidence of 0.25 to 1 per 1,000 in the US
      b. Especially common in postmenopausal women
      c. Usually sporadic but can be inherited alone or as a component of familial endocrinopathies, including **multiple endocrine neoplasia** (MEN) types 1 and 2A
      d. PTH and calcium levels are high.
   2. **Secondary HPT**
      a. Most commonly caused by renal failure
      b. Decreased serum calcium is a terminal feature of kidney dysfunction, which becomes evident through phosphate retention, decreased vitamin D activation, and poor calcium absorption.
      c. Intestinal malabsorption of calcium or vitamin D can also result in elevated PTH levels and secondary HPT.
      d. Patients with secondary HPT have high PTH levels and low calcium levels.
   3. **Tertiary HPT**
      a. Seen in patients who have undergone prior kidney transplant for renal failure
      b. Typically, parathyroid gland function returns to normal within 1 year after kidney transplant, but in patients with tertiary HPT, the parathyroids fail to respond to normal signals for PTH secretion.
      c. Both PTH and calcium levels are high.

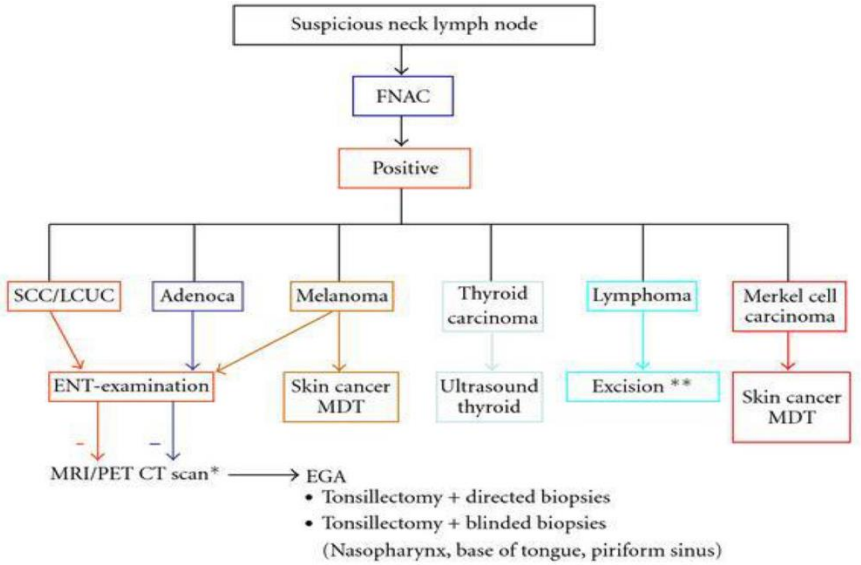
21) A 68-year-old male patient presented with an enlarged upper deep cervical lymphnode. He is a smoker & his physical exam was unremarkable. The next step in the management should be:

a) Fine needle aspiration cytology from the node
b) CT scan of the neck
c) MRI of the neck & chest
d) Excisional biopsy
e) Neck dissection

22) When should feeding be started after thyroid surgery?

a) One hour after surgery
b) 12 hours after surgery
c) 24 hours after surgery
d) When the patient passes flatus or has bowel sounds
e) On full recovery

Answer A



(a) Algorithm of a diagnostic procedure for a suspicious lymph node in the neck, emphasizing the pivotal role of (Ultrasound) Fine Needle Aspiration Cytology [(US)FNAC]. (b) Algorithm of a diagnostic procedure for a suspicious lymph node in the neck with emphasis on further steps to be taken after positive FNAC results. EGA: examination under general anaesthesia; LCUC: large cell undifferentiated carcinoma; MDT: multidisciplinary team; SCC: squamous cell carcinoma; *CT scan can serve as an acceptable alternative; **Excision indicated if FACS (Fluorescence activated cell sorting by Flow Cytometry) reveals monoclonal lymphoid proliferation.

Slides

Answer E

23) Which of the following tumours is more common in iodine deficient areas?

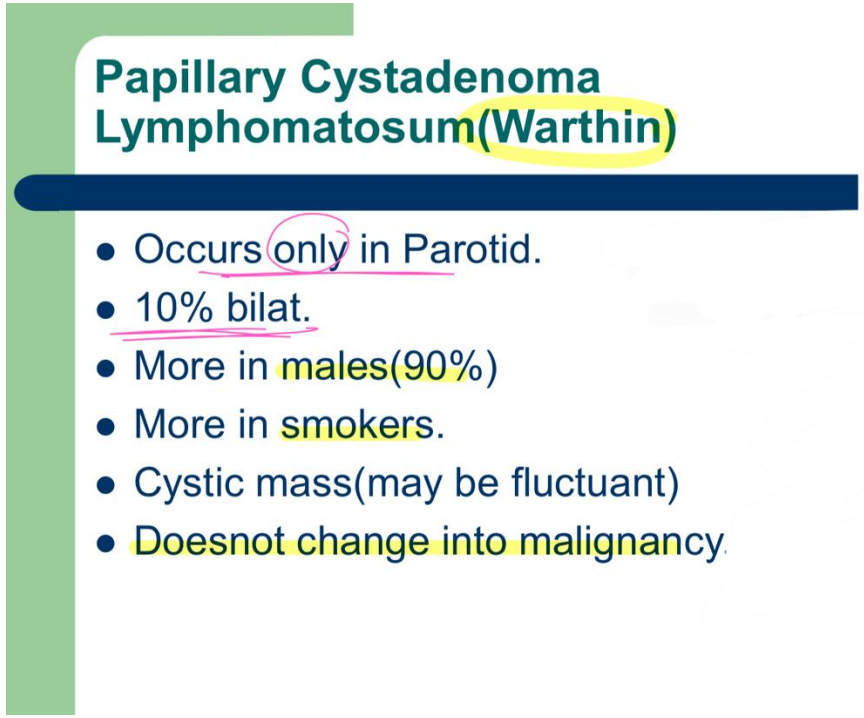
a) Medullary neoplasms
b) Papillary neoplasms
c) Follicular neoplasms
d) Thyroid Lymphoma
e) Anaplastic neoplasms

24) All are features of salivary Warthin's tumour (papillary cystadenoma lymphomatosum)EXCEPT:

a) More common in males
b) Always in Parotid gland
c) Bilateral in 10 % of cases
d) It transforms into a malignant tumour in 20% of cases
e) It is related to smoking

Answer: C

Answer: D



25) Because of the anatomy & physiology of the submandibular gland, it is commonly involved with which of the following?

a) Recurrent infection
b) Malignant tumours
c) Stone formation
d) Warthin’s tumour
e) Hyperplasia of the gland

26) All of the following are clinical findings of Addison’s disease EXCEPT:

a) Weakness
b) Intolerance to stress
c) Generalized oedema
d) Irritability & restlessness
e) Hyperpigmentation of the skin

Answer: C

Sialolithiasis

- Most common in the duct of submandibular salivary glands.

Content → protein more
& depth → back flow of saliva

- Intermittent obstruction→ chronic sialadenitis → dilatation of the ducts and atrophy of acinar cells→superimposed infection and microabscesses .

Answer: C

Adrenal insufficiency

Hormonal changes	Clinical features
Hypoaldosteronism	• **Hypotension** • Salt craving
Hypocortisolism	• Weight loss, anorexia • **Fatigue, lethargy**, depression • Muscle aches • Weakness • **Gastrointestinal complaints** (e.g., nausea, vomiting, diarrhea) • Sugar cravings • **(Orthostatic) hypotension**
Hypoandrogenism	• Loss of **libido** • Loss of axillary and pubic hair
Elevated ACTH	• **Hyperpigmentation** of areas that are not normally exposed to sunlight (e.g., palmar creases, mucous membrane of the oral cavity)

27) Midline neck masses in children can include all of the following EXCEPT:

a) Lymphadenopathy
b) Branchial Cyst
c) Thyroglossal duct remnants
d) Thymus cysts
e) Dermoid cysts

28)Anxiety, tremor, & palpitations seen in patients with insulinoma are usually due to:

a) Hypoglycaemia
b) High catecholamines
c) High glucagon
d) High growth hormone
e) High cortisol

Answer B

Branchial Cyst

❖ **Types:**

1. **Branchial cyst:**
   - Branchial cysts are painless, firm, mobile swellings that occur on the lateral aspect of the upper neck along the sternocleidomastoid muscle, has a smooth and globular surface (can be aspirated). It has a deep tract that travels between the internal and external carotid artery to the tonsillar fossa.
   - They account for almost 20% of pediatric neck masses and **1/3 of congenital masses**.

- Age of presentation:
  - They usually present in **late childhood or early adulthood** when a previously unrecognized cyst becomes infected. Only a very small percentage first present in adulthood.

وعاسية الاذن

Answer B

CLINICAL FEATURES

Patients with an insulinoma commonly present with fasting hypoglycemia symptoms (Whipple's triad: hypoglycemic syndromes, blood glucose <50 mg/dL during attack and symptoms relived by IV glucose) and neuroglycopenic symptoms including diplopia, blurred vision, abnormal behavior and amnesia. The secretion of catecholamines results in sweating, weakness, tremor, anxiety, tachycardia, hunger, anxiety and palpitations.

42

29) An 11-year-old male patient came to your clinic with a neck mass. He has no history of radiation exposure & a negative family history of thyroid cancer. Further assessment revealed a solid mass on sonogram, & cold nodule on scan. You suspect a thyroid neoplasm.This patient most probably has:

a) Papillary thyroid tumour
b) Medullary thyroid tumour
c) Follicular thyroid tumour
d) Anaplastic thyroid tumour
e) Hurthle cell neoplasm

30) Congo red stain is used in histopathological diagnosis of which thyroid tumours?

a) Papillary thyroid tumour
b) Medullary thyroid tumour
c) Follicular thyroid tumour
d) Anaplastic thyroid tumour
e) Thyroid lymphoma

Answer A

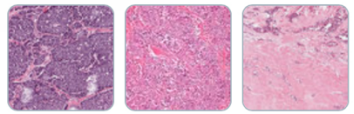
Papillary Ca

- Most common, Best prognosis
- 10 year survival around 85 %
- At younger age group.
- Spreads by lymphatics
- Can be multifocal.
- Can be familial.
- Usually sensitive to RAI Radioactive iodine

Answer B

Medullary carcinoma

- Ovoid cells of C cell origin and therefore without follicle development
- Amyloid in the stroma (stains with Congo red)



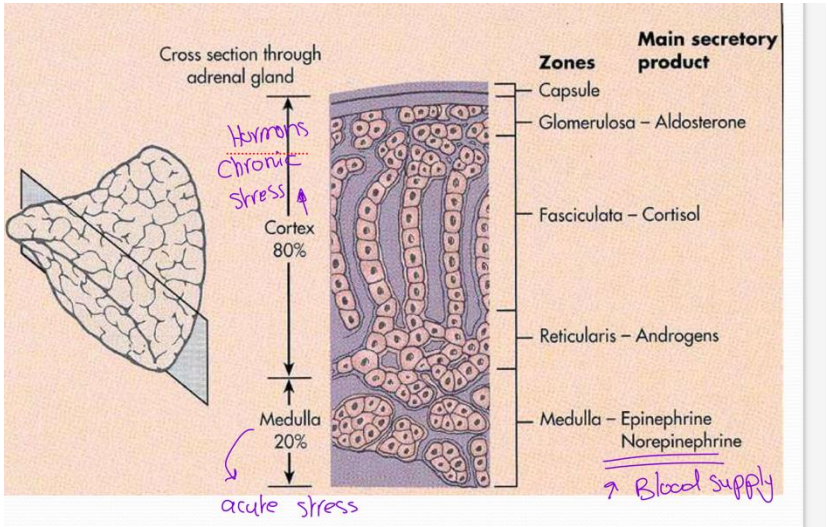
Medullary carcinoma is composed of **C**-cells producing **C**alcitonin and is characterized by amyloid a**CC**umulation staining with **C**ongo red.

Characteristic features of thyroid cancer [4]

Carcinoma	Differentiation	Characteristics	Distribution	Peak incidence
Papillary thyroid carcinoma		• **Most common type of thyroid cancer** • Palpable lymph nodes due to metastatic spread (often detected before primary tumor) • May be multifocal • Very good prognosis	• ~ 80% of cases [5]	• 30–50 years of age

31) In the adrenal glands, which hormone is produced by the zona glomerulosa?

a) Aldosterone
b) Cortisone
c) Androstenedione
d) Adrenaline
e) Estradiol



Answer: A

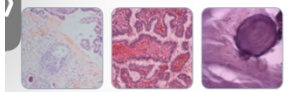
32) Psammoma bodies are typically found in which of the following thyroid cancers?

a) Papillary
b) Follicular
c) Medullary
d) Anaplastic
e) Lymphoma

Papillary thyroid cancer

Psammoma bodies

- **Morphology**: concentric lamellar calcifications
- **Occurrence**: seen in diseases associated with calcific degeneration
  - Papillary thyroid carcinomas (evidence of psammoma bodies in thyroid tissue should always raise suspicion of malignancy)
  - Serous papillary cystadenocarcinoma of ovary and endometrium
  - Meningiomas
  - Mesotheliomas



"Orphan Annie" eyes nuclei

- **Morphology**: empty-appearing large oval nuclei with central clearing
- **Occurrence**
  - Papillary thyroid carcinomas
  - Autoimmune thyroiditis (e.g., Hashimoto disease, Grave disease)

Nuclear grooves [24]

- **Morphology**: longitudinal invaginations of nuclear bilayer
- **Occurrence**: papillary thyroid carcinomas

"**Papi** and **Moma** adopted **Orphan Annie**:" **papi**llary thyroid cancer is histologically characterized by psam**moma** bodies and **Orphan Annie**-eye nuclei.

Answer: A

33) Which of the following is NOT an operative indication for primaryhyperparathyroidism?

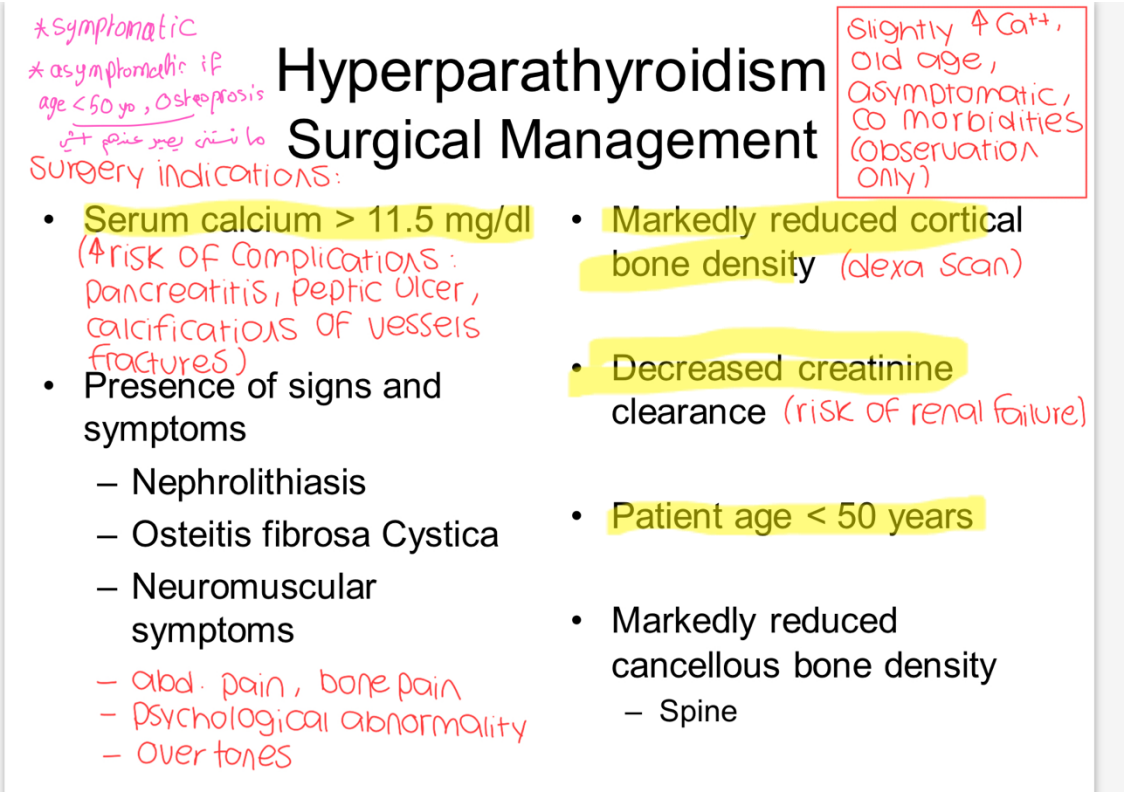
a) Serum calcium of 11.1 mg/dL
b) Very low bone density
c) Renal impairment
d) Age of 40 years old
e) Renal stones

34) All of the following may be found as part of MEN 1 (multiple endocrine neoplasia)syndrome EXCEPT:

a) Gastrinoma
b) Facial angiofibroma
c) Parathyroid hyperplasia
d) Pituitary adenoma
e) Pheochromocytoma

Answer A

Answer E



Hyperparathyroidism Surgical Management

*symptomatic
*asymptomatic if age < 50 yo, osteoprosis
ما تستنى يصير عندو اشي

Slightly ↑ Ca++, old age, asymptomatic, co morbidities (observation only)

Surgery indications:

- Serum calcium > 11.5 mg/dl (↑risk of complications: pancreatitis, peptic ulcer, calcifications of vessels fractures)
- Presence of signs and symptoms
  - Nephrolithiasis
  - Osteitis fibrosa Cystica
  - Neuromuscular symptoms
  - abd. pain, bone pain
  - psychological abnormality
  - over tones
- Markedly reduced cortical bone density (dexa scan)
- Decreased creatinine clearance (risk of renal failure)
- Patient age < 50 years
- Markedly reduced cancellous bone density
  - Spine

35) All of the following statements about solitary thyroid nodules are true EXCEPT:

a) They are more prevalent in women

b) In the adult population, more than 90% are benign

c) Fine needle aspiration is indicated when the size is less than 10 mm

d) When it extends retro-sternum, it is less likely to be malignant

e) The risk of a hot nodule being malignant is very small

36) Regarding carcinoid tumours, all of the following are true EXCEPT:

a) They are neuroendocrine tumours

b) Carcinoid tumours arising in the appendix are usually malignant

c) They are found as part of the MEN 1 syndrome

d) The carcinoid syndrome is usually due to the release 5-hydroxy-indoleacetic acid

e) Carcinoid syndrome is commonly associated with tumours arising in bronchus

Answer C

FNA should be performed in nodules ≥**1 cm** (as determined by largest dimension) if they are solid and hypoechoic or have one or more of these suspicious sonographic features:

- •Irregular margins
- •Microcalcifications
- •Taller than wide shape → retrosternum extention
- •Rim calcifications

Appendiceal Tumors

Tumor	Features	Characteristics
Neuroendocrine tumor	Most common appendiceal tumor	Release serotonin; carcinoid syndrome if metastasized beyond first pass effects of liver
Appendiceal mucinous neoplasms	Low-grade (LAMN) vs. high-grade (HAMN), mucinous adenocarcinoma	Appendiceal rupture leads to pseudomyxoma peritonei
Adenocarcinoma	Mucinous, intestinal, signet ring, goblet cell	Rare

Answer E

Carcinoid tumor

Summary

Carcinoids are small, slow-growing neuroendocrine tumors. Th

Clinical biochemistry

- ↑ 5-hydroxyindoleacetic acid (**5-HIAA**) in 24-hour urine collection
- Fasting plasma 5-HIAA concentration

	MEN 1 Wermer's syndrome
Genetics	Altered menin protein expression
Main disease	Primary hyperparathyroidism (~ %90 of cases)
Other manifestations	• Endocrine pancreatic tumors (~ 50–80% of cases) such as gastrinoma (most common) and insulinoma • Pituitary adenoma (~ 30–50% of cases): most commonly prolactinoma • Carcinoid tumors (~ 10–15% of cases)

Tumor location [2]

- **GI tract** (55% of cases): carcinoid
  - Small intestine (esp. the ileum): 45%
  - Rectum: 20%
  - Appendix: 17%
  - Colon: 11%
  - Stomach: 7%
- **Pancreas** (15% of cases)
  - Insulinoma
  - Glucagonoma
- **Bronchopulmonary system** (10% of cases)
  - Carcinoid lung tumor
  - Small cell carcinoma
- **Thyroid**: medullary carcinoma
- **Adrenal glands**: pheochromocytoma

] common

37) Regarding the minor salivary glands, which of the following is true?

a) They have a high malignant potential

b) They are unlikely to be affected by radiation therapy

c) They are scattered from oral cavity down to the vocal cords

d) They have a defined duct for drainage

e) Their secretion is not affected by atropine

38)A 35-year-old woman with epigastric pain, which did not improve on proton pump inhibitors, is found to have a non-healing pyloric channel ulcer on upper endoscopy. Her serum calcium level is 12 mg/dL. What is the most likely diagnosis?

a) WDHA syndrome

b) Zollinger-Ellison syndrome

c) MEN 1

d) MEN 2B

e) MEN 2A

Answer A

Risk of malignancy:

عكسي مع الحجم

20% in Parotids.

40% in submandibular.

60% in minor salivary glands

Answer C

Gastrinoma (Zollinger-Ellison Syndrome)

INTRODUCTION

Definition: A gastrinoma is a gastrin-secreting tumor that can occur in the pancreas, although it is most commonly found in the duodenum. Zollinger-Ellison syndrome is a condition that includes non-beta islet cell pancreas tumors (gastrinoma), recurrent ulcers in the stomach duodenum or atypical sites despite adequate treatment.

Epidemiology: Gastrinomas are the second most common type of functioning pancreatic endocrine tumors. ZES is more common in men, with a mean age of 38 at symptom onset.

+ increase Ca^{++} → due to ↑↑ PTH

primary hyperparathyroidism

39) Serum calcium level is usually elevated in all of the following EXCEPT:

a) Hyperparathyroidism due to ectopic adenoma
b) Primary hyperparathyroidism
c) Tertiary hyperparathyroidism
d) Secondary hyperparathyroidism
e) Vitamin D intoxication

40) The term plunging ranula refers to which clinical entity:

a) A serous cyst originating from the parotid gland that is potentially malignant
b) A mucous retention cyst originating from the submandibular & sublingual glands that reaches the neck
c) A benign salivary mass involving the parotid & submandibular glands
d) A malignant congenital salivary mass arising from the submandibular gland
e) A midline neck mass which moves on tongue protrusion

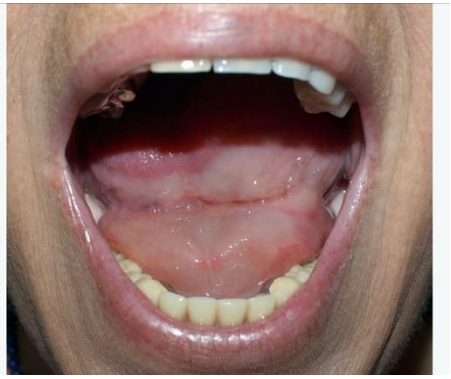
Answer D

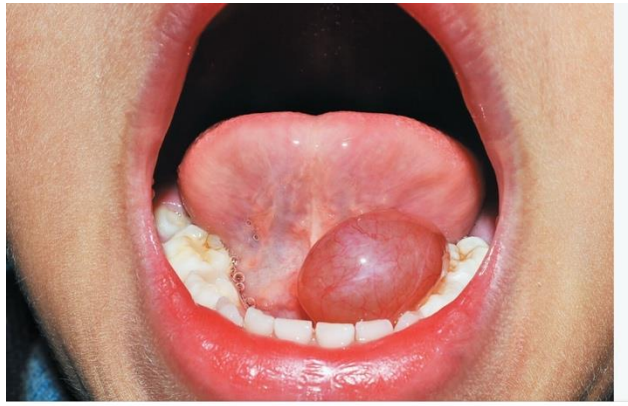
A. Epidemiology/etiology/classification
   1. **Primary hyperparathyroidism (HPT)**
      a. Incidence of 0.25 to 1 per 1,000 in the US
      b. Especially common in postmenopausal women
      c. Usually sporadic but can be inherited alone or as a component of familial endocrinopathies, including **multiple endocrine neoplasia** (MEN) types 1 and 2A
      d. PTH and calcium levels are high.
   2. **Secondary HPT**
      a. Most commonly caused by renal failure
      b. Decreased serum calcium is a terminal feature of kidney dysfunction, which becomes evident through phosphate retention, decreased vitamin D activation, and poor calcium absorption.
      c. Intestinal malabsorption of calcium or vitamin D can also result in elevated PTH levels and secondary HPT.
      d. Patients with secondary HPT have high PTH levels and low calcium levels.
   3. **Tertiary HPT**
      a. Seen in patients who have undergone prior kidney transplant for renal failure
      b. Typically, parathyroid gland function returns to normal within 1 year after kidney transplant, but in patients with tertiary HPT, the parathyroids fail to respond to normal signals for PTH secretion.
      c. Both PTH and calcium levels are high.

Answer B

Ranula

A retention cyst (mucocele) that arises in the sublingual gland. Presents as a translucent, blue swelling below the tongue. Large ranulas can cause problems swallowing and speaking.





41) All of the following suggest a familial form of medullary thyroid carcinoma (MTC) EXCEPT:

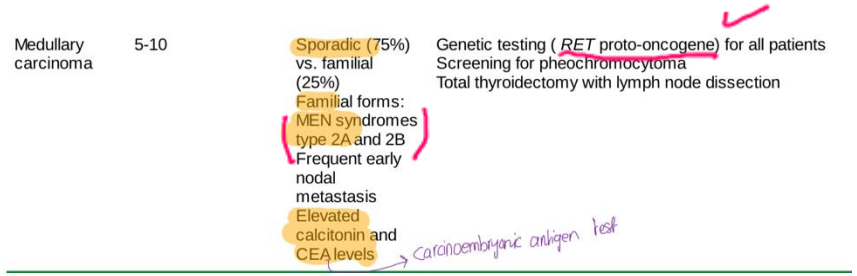
a) The tumour is multifocal

b) Positive B-Raf mutation

c) The tumour is bilateral (foci of tumour are present in both thyroid lobes)

d) Positive Ret-oncogene mutation

e) The presence of C-cell hyperplasia in the pathologic examination of the resected



Medullary carcinoma	5-10	Sporadic (75%) vs. familial (25%) Familial forms: MEN syndromes type 2A and 2B Frequent early nodal metastasis Elevated calcitonin and CEA levels	Genetic testing (*RET* proto-oncogene) for all patients Screening for pheochromocytoma Total thyroidectomy with lymph node dissection

carcinoembryonic antigen test

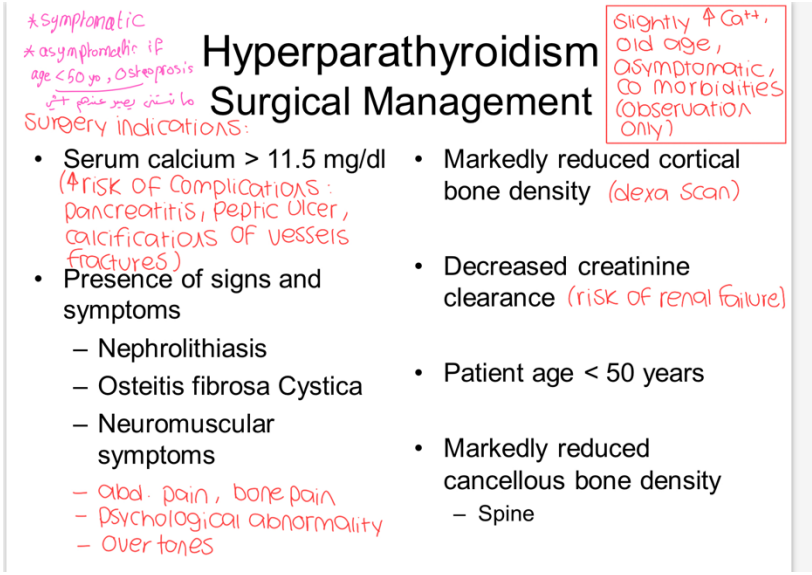
4. Medullary Carcinoma:
A neuroendocrine tumor of the parafollicular or C cells of the thyroid gland. Most are sporadic but approximately 25% are familial as part of MEN2 (RET proto-oncogene)

1. Papillary Adenocarcinoma:
Mutations in the genes encoding for the proteins in the MAPK pathway, like RET/PTC or BRAF

Answer: B

42) Indications for operation in a patient with primary hyperparathyroidism include all of the following EXCEPT:

a) A substantial decline in renal function
b) A substantial decline in bone mass
c) Nephrolithiasis
d) Age older than 60
e) Depression & fatigue



Answer: D

43) All of the following are true about follicular cancer EXCEPT:

a) It disseminates via haematogenous

b) It is less common than papillary cancer

c) Bone is a site for metastasis

d) It usually presents in the old age

e) It is frequently multicentric

Thyrocytes	**Follicular thyroid carcinoma**	**Well differentiated**	• Hematogenous metastasis especially to ◦ Lungs ◦ Bone (lytic lesions) • Rarely multifocal • Vascular and capsular invasion • Good prognosis	• ~ 10% of cases [6]	• 40–60 years of age

Answer: E

44) Elevation of serum C-peptide is useful for diagnosing which of the following neuroendocrine tumours?

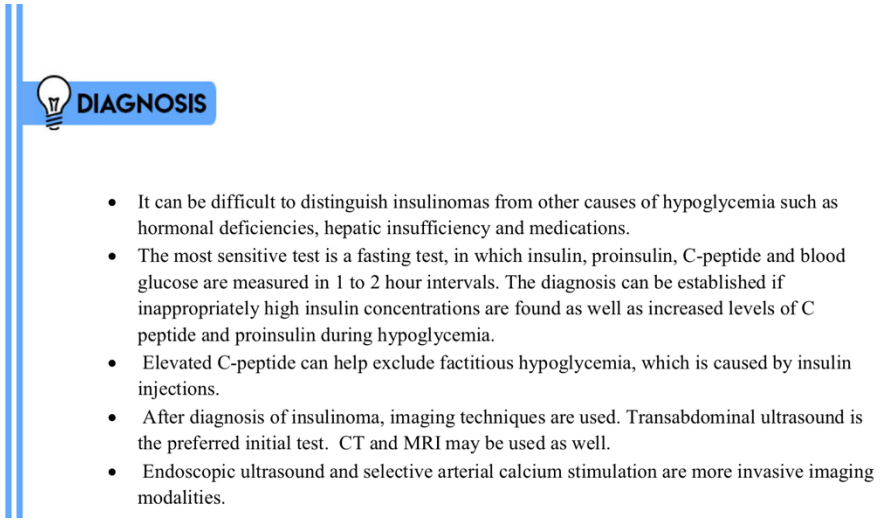
a) Glucagonoma

b) VIPoma

c) Somatostatinoma

d) Insulinoma

e) Gastrinoma



Answer: D

45) Diagnostic hemi-thyroidectomy is done for which of the following?

a) 2 cm nodule with FNA consistent with papillary cancer

b) 2 cm nodule with FNA consistent with follicular cancer

c) 2 cm nodule with FNA consistent with medullary cancer

d) FNA consistent with degenerative changes

e) FNA that is inadequate

46) Which of the following is true regarding salivary glands?

a) Mucoepidermoid is the most common malignant tumour

b) Most of the parotid swellings are non-neoplastic

c) Pleomorphic adenoma is the most common benign neoplasm of the salivary glands in children

d) Sonography is the gold standard in the evaluation of a parotid mass

e) Adenoid cystic carcinoma has a good prognosis

Answer : B

DIAGNOSIS

Evaluation and work up of thyroid nodules have already been discussed.
It is essential to take a complete history and perform an adequate physical exam on the patient. As previously mentioned, family history and radiation exposure are very important. Regional lymph nodes should be palpated, and thyroid function should be assessed.
Ultrasound should be performed to look for suspicious features. For suspicious or indeterminate lesions, fine needle aspiration is performed. If medullary thyroid cancer is suspected, calcitonin levels may be obtained by doing the pentagastrin-stimulated calcitonin test.
In thyrotoxic patients, radioiodine uptake scan is done. Cold nodules require further assessment, such as FNA.
For follicular adenocarcinoma, FNA alone is not sufficient, as it is hard to distinguish from benign follicular adenoma just by histology. For this reason, tissue structure is needed for an accurate diagnosis.

الدوسيه

Answer : A

Malignant Tumors

- Mucoepidermoid: most
  - -most common.
  - -usually in parotid,2° site is palate.
  - -peak age 5° decade.
  - -high or low grade.
  - - involve LN / no LN

Pleomorphic adenoma

- Most common.
- Peak age: 5° decade.

b. Diagnosis/testing
   i. FNA
   ii. CT for surgical planning
c. Treatment: Parotidectomy, with possible facial nerve sacrifice, possible neck dissection, possible adjuvant radiation

47) The most sensitive test for localization in primary hyperparathyroidism is:

a) High-resolution ultra sound

b) CT with contrast

c) Sestamibi scan

d) MRI

e) CT without contrast

48) A 22-year-old lady came to the clinic complaining of palpitations & shortness of breath. Her workup revealed that she is hypertensive & hypokalemic. Imaging showed bilateral masses on adrenals. You suspect that she has primary hyperaldosteronism. What is the best next step?

a) FNA

b) Bilateral adrenalectomy

c) MIBG

d) Venous sampling

e) Bilateral radiotherapy

Answers: C

most cases are Uniglandular disease (مش كل ال parathyroid مصابين)

Pre-Operative Imaging-Localization

- High-resolution ultrasound
  - Sensitivity 65-85% for adenoma
  - Results suboptimal in pts with multinodular thyroid disease, pts with short thick neck, ectopic glands (15-20%)
  - May be useful in detecting sestamibi scan negative adenomas
- CT with contrast/thin section (if it's needed)
  - Sensitivity of 46-87%
  - Good for ectopic glands in the chest
- MRI (if it's needed)
  - Sensitivity of 65-80%
  - Good for ectopic glands
- Sestamibi → most sensitive most specific
  - 85-95% accurate in localizing adenoma in primary HPT
- Sestamibi-SPECT(single photone emission CT)
  - Sensitivity 60% for enlarged gland and 98% for solitary adenomas

Answers: D

B. Causes

1. Adrenal adenoma (in two-thirds of the cases)—aldosterone producing adenoma (**Conn syndrome**)
2. Adrenal hyperplasia (in one-third of the cases)—almost always bilateral
3. Adrenal carcinoma (in <1% of the cases)

3. To diagnose the cause of primary aldosteronism:
   a. Adrenal venous sampling for aldosterone levels—A high level of aldosterone on one side indicates an adenoma. High levels on both sides indicate bilateral hyperplasia.

E. Treatment

1. For adenoma—Surgical resection (adrenalectomy) is often curative.
2. For bilateral hyperplasia
   a. Spironolactone inhibits the action of aldosterone.
   b. Surgery is not indicated.

49) Which thyroid neoplasm is known to be multifocal?

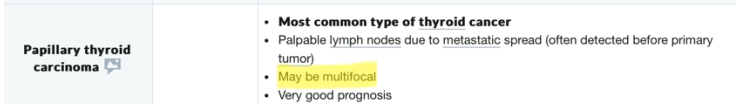
a) Medullary cancer

b) Follicular cancer

c) Papillary cancer

d) Anaplastic cancer

e) Follicular adenoma



THYROID CANCER

Epidemiology/etiology/classification

1. **Papillary thyroid cancer** (PTC)
   a. Accounts for 85% of thyroid carcinomas
   b. Often multifocal and metastasizes to lymph nodes
   c. Features associated with worse prognosis
      i. Male gender
      ii. Primary tumor > 4 cm
      iii. Gross local invasion or extrathyroidal extension
      iv. Age > 45 years
      v. Lymphovascular invasion
      vi. Certain histologic subtypes: Tall cell, follicular, hobnail
      vii. Known metastatic disease

Answer: C

50) Which of the following is true regarding medullary thyroid carcinoma?

a) It is related to irradiation

b) 75% of cases are sporadic

c) It arises from follicular cells of the thyroid

d) It is sensitive to RAI (radioactive iodine therapy)

e) Familial cases are positive for B-Raf mutation

3. **Medullary thyroid cancer** (MTC)
   a. Arises from parafollicular C cells
   b. May occur sporadically or as part of MEN types 2A and 2B or familial medullary thyr carcinoma syndrome
   c. Can spread early to cervical lymph nodes and metastasize to liver, lung, or bone

Calcitonin test

Sporadic (75%) vs. familial (25%)

Familial forms:

Answer: B

51) All of the following are true regarding Hurthle cell carcinoma EXCEPT:

a) It is also called oxyphilic cell carcinoma

b) It is more aggressive than papillary & follicular carcinoma

c) It is considered a variant of follicular carcinoma

d) It shows abundant eosinophils under the microscope

e) It is usually multifocal

52) Psammoma bodies are associated with which type of thyroid cancer?

a) Papillary carcinoma

b) Follicular carcinoma

c) Medullary carcinoma

d) Anaplastic carcinoma

e) Fibrolymphovascular tumours

- **Hurthle cell carcinoma**
  - 3–10% of all well-differentiated thyroid cancers
  - Often classified as subtype of follicular carcinoma
  - Thyroid histopathology: hypercellularity with a predominance of **Hurthle cells** (large, polygonal epithelial cell with eosinophilic granular cytoplasm as a result of numerous altered mitochondria)
    - Hurthle cells are nonspecific and also observed in Hashimoto thyroiditis, Graves disease, previously-irradiated thyroid glands, and in **Hurthle cell adenoma** (no vascular or capsular invasion; no metastasis)
    - They are also found in the parathyroid glands, salivary glands, and kidneys

Hurthle cell carcinoma	Subtype of follicular carcinoma; composed of Hurthle cells: large eosinophilic epithelial cells	5%	Similar to follicular carcinoma but with slightly worse prognosis (overall survival ~75%); most do not take up RAI

Hürthle Cell Tumor
- A variant of follicular cancer but more aggressive.
- Spread by lymphatics; does not take up iodine.
- Treatment: total thyroidectomy.

Answers: E (not sure)

Answers: A

53) All of the following about parathyroid adenoma are true EXCEPT:

a) Sestamibi scan is the most accurate imaging technique used for localization of a parathyroid adenoma
b) It is the second most common cause of primary hyperparathyroidism
c) It usually affects one gland
d) It is more common in women
e) Hypercalcemia is seen on laboratory evaluation

54) A 50-year-old male with a posterior neck lymph node enlargement of a few weeks duration. The history was inconclusive for malignancy or URT infection. Physical examination revealed a red, tender, enlarged lymph node. What is the most appropriate next step?

a) FNA biopsy
b) Start on antibiotics & observe
c) Excisional biopsy
d) Incisional biopsy
e) CT scan

Answer: B

**Primary hyperparathyroidism and cancer account for 90% of cases of hypercalcemia

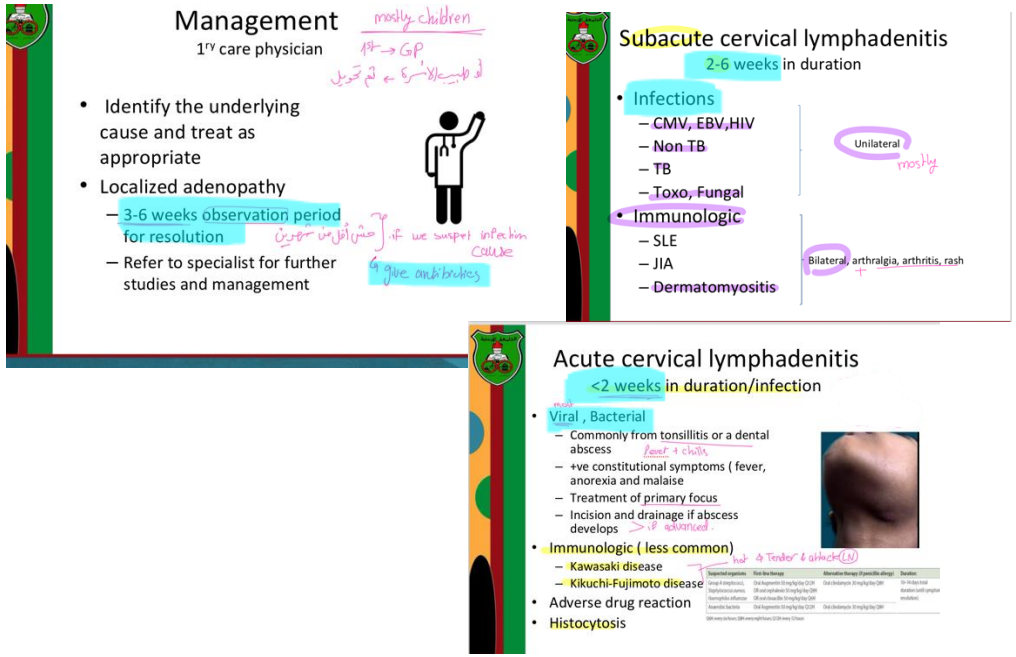
- Sestamibi → most sensitive most specific
  - 85-95% accurate in localizing adenoma in primary HPT
- Sestamibi-SPECT(single photone emission CT)
  - Sensitivity 60% for enlarged gland and 98% for solitary adenomas

- Primary hyperparathyroidism occurs in 0.1 to 0.3% of the general population and is more common in women (1:500) than in men (1:2000).

Answer: B

Red + tender + LN enlarge → Suggest inflammation

Characteristics	Likely benign or inflammatory cause	Likely malignant or mycobacterial cause
Pain	Tender	Non-tender
Consistency	Soft	Hard
Fixation	Mobile	Fixed
Location	Cervical (anterior to the sternocleidomastoid muscle), inguinal	Cervical (dorsal to the sternocleidomastoid muscle), supraclavicular
Progression	Acute enlargement without long-term progression	Slow development combined with progressive enlargement



55) In neuroendocrine response to stress, which phase can be prolonged & cause metabolic imbalance?

a) Ebb phase

b) Flow phase

c) Balance phase

d) Healing phase

EXPLANATION: Neuroendocrine response to stress consists of **3 phases**:

1. Ebb phase: the body is trying to protect the homeostasis by reducing metabolic rate & preserving the body's energy. The longer this phase can be maintained, the more likely one will survive (prolongation is kinda beneficial).
2. Flow phase: a period of catabolism that provides a compensating response to the initial stress. It is prolongation of THIS phase that leads to body damage & metabolic imbalances (it's a catabolic response).
3. Anabolic phase (balance & healing): this phase starts after the flow phase has ended & aims to restore metabolic balance & protein & fat stores.

- 018 Past paper -

Answers : B

56) The most precise diagnostic screening procedure for differentiating benign thyroid nodules from malignant ones is:

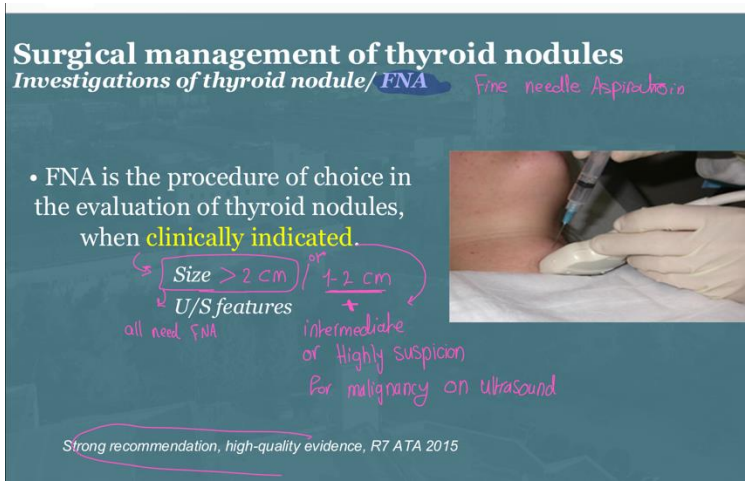
a) Fine-needle-aspiration biopsy (FNAB)

b) Thyroid Radioactive iodine scan

c) A very thorough history

d) Thyroid ultrasonography

e) Computerized tomographic scan (CT scan)



Answers : A

57) Which of the following is true regarding the parathyroid glands?

a) They contain two main types of cells; follicular & C cells

b) Their blood supply is mainly by the superior thyroid artery

c) They secrete parathyroid hormone to control calcium levels

d) The superior & inferior parathyroid develop from the third & fourth branchial pouch,

respectively

e) They drain ipsilaterally by inferior thyroid vein only

58) What is the most common site of extra-adrenal Pheochromocytoma?

a) Abdomen

b) Neck

c) Mediastinum

d) Pelvis

e) Lung

Answers: C

- Usually derive most of blood supply from branches of **inferior thyroid artery**, although branches from superior thyroid supply at least 20% of upper glands.
- Glands drain ipsillaterally by superior, middle, and inferior thyroid veins.

epithelial cells. They develop between the fifth and twelfth week of gestation. The fourth branchial pouch gives rise to the superior parathyroid glands. The third branchial pouch gives rise to the inferior parathyroid glands. Since these glands have a longer descent, variations in position are more likely. The inferior glands are

- Composed mostly of chief cells and oxyphil cells within an adipose stroma. → in aging

Answers: A

- ~ 90% adrenal medulla (physiologically activated by acetylcholine)
- ~ 10% extra-adrenal in the sympathetic ganglia
- ~ 10% at multiple locations

Epidemiology and etiology

a. Pheochromocytomas are neoplasms derived from **chromaffin cells** of the sympathoadrenal system that engage in unregulated, episodic oversecretion of catecholamines.

b. Approximately 85% to 90% of pheochromocytomas in adults arise in the adrenal medulla, whereas 10% to 15% are paragangliomas that arise in the **extra-adrenal chromaffin tissue** , including near the renal hilum, paravertebral ganglia, posterior mediastinum, **organ of Zuckerkandl** , and urinary bladder.

59) Which of the following is treated with radioactive iodine ablation?

a) Carcinoma with no iodine uptake

b) Severe, uncontrolled thyrotoxicosis

c) Hashimoto's thyroiditis in a pregnant lady

d) Destruction-induced thyrotoxicosis

e) Multinodular goitre

60) Hemi-thyroidectomy is effective for which of the following?

a) Anaplastic carcinoma

b) Graves' disease

c) Medullary carcinoma

d) Follicular carcinoma

e) Papillary carcinoma

Answers : E

Patients with toxic multinodular goiter (Plummer disease) or toxic adenoma, get symptomatic relief from beta blockers. To treat the excessive thyroid hormone production, surgery or radioiodine can be used. Surgery is preferred in patients who have large goiters, obstructive signs, or coexisting thyroid cancer.

26

Answers : D better than E

- medullary & Hurthel cell CA → Total is the only option

6. **Operative option for anaplastic thyroid carcinoma** is focused on palliative procedure(s) to relieve compressive symptoms and decrease tumor burden

- papillary & follicular → lobectomy is optional

b. Thyroid lobectomy for
   i. Low-risk patients with <1 cm, intrathyroidal unifocal tumors
   ii. Low-risk patients with tumor size 1 to 4 cm, either lobectomy or total thyroidectomy can be considered

(multifocal is a risk)

4. **Operative options for FTC**
   a. Lobectomy for unilateral tumors < 1 cm with limited invasion of the tumor capsule

(if it aggresive → Total)
(mostly as Solitary nodule)

Procedure	Description	Indication
Total thyroidectomy	• The entire thyroid gland is removed.	• **Thyroid cancer** • Some cases of Graves disease and toxic multinodular goiter • Large goiter causing obstructive symptoms or physical disfigurement
Near-total thyroidectomy	• A small cuff of thyroid tissue is left behind	• Benign thyroid conditions that affect the entire gland (e.g., large goiter, toxic MNG, Graves disease)
Subtotal thyroidectomy	• A larger cuff of thyroid tissue is left behind	
Thyroid lobectomy	• Removal of the affected thyroid lobe	• Low-risk differentiated thyroid cancer • **Follicular adenoma** • Toxic adenoma • **Thyroid cysts**
Hemithyroidectomy	• The affected lobe with the isthmus is removed.	

61) All of the following regarding pleomorphic adenoma are true EXCEPT:

a) It is the most common salivary gland tumour

b) It increases the risk of malignancy with advancing age

c) It is ideally treated with total parotidectomy

d) Recurrence is treated with radiotherapy

e) It most commonly arises in the superficial lobe

62) A 31-year-old female came to the clinic complaining of recurrent submandibular swelling upon eating for 5 months. On examination, it was tender. What is the most likely diagnosis?

a) Sialolithiasis

b) Acute sialadenitis

c) Adenoid cystic carcinoma

d) Pleomorphic adenoma of the submandibular gland

e) Hematoma

Answer: C

Pleomorphic adenoma (benign mixed tumor)

- **Epidemiology**
  - Sex: ♀ > ♂
  - Peak incidence: 40–60 years
  - Most common salivary gland tumor (accounts for 85% of benign salivary gland tumors)
- **Etiology**: ionizing radiation, environmental/occupational exposure (e.g., rubber manufacturing, cosmetologists, nickel compound exposure) [9]
- **Location**: usually the **parotid gland** (~ 80% of cases)
- **Clinical features**
  - Gradual and painless unilateral swelling of the gland
  - Robust, movable tumor
- **Diagnostics**
  - Ultrasound: diagnostic method of choice in salivary gland tumors
  - MRI (T2-weighted image): sharply limited, lobulated hyperintense mass [10]
  - Histology
    - Mixed cellular constitution with myoepithelial cells and chondroid tissue
    - Cytokeratin is expressed immunohistochemically
- **Complications**: **Malignant transformation** may occur (~ 5% of cases).
- **Treatment**: Best treatment is superficial parotidectomy to prevent recurrence. [11]

Uptodate عن radiotherapy. →

Salivary gland tumors: Treatment of locoregional disease

Rarely, pleomorphic adenoma has been reported to metastasize to the lung, bone, and elsewhere. Furthermore, carcinoma ex pleomorphic adenoma, an aggressive malignancy, may arise in a small percentage of pleomorphic adenomas. Evidence suggests that the occurrence of both is related to incomplete or inadequate primary surgery [81]. (See "Pathology of head and neck neoplasms", section on 'Salivary gland tumors'.)

Recurrent pleomorphic adenomas are treated with resection, but the likelihood of control diminishes with each subsequent surgery while the morbidity increases [82-85]. These include facial nerve dysfunction, Frey syndrome, salivary fistula, and necrosis [78,85].

The role of postoperative radiation following resection of recurrences is debated, but improved local control with postoperative radiation therapy (RT), particularly for positive margins and/or multinodular recurrence, has been reported [78,80,82]. Although reresection should be performed, if possible, for positive margins, many experts would consider postoperative RT for patients with recurrent pleomorphic adenoma and positive margins, depending upon factors such as rapidity of recurrence, patient age, and completeness of resection. Unresectable recurrences are also treated with RT. RT doses used for pleomorphic adenomas are generally lower than for carcinomas, 50 to 54 Gy in 1.8 to 2.0 Gy fractions.

Answer: A

Sialolithiasis

parotid → serous → flow of saliva by gravity

- Most common in the duct of submandibular salivary glands.

content → protein more & depth → back flow of saliva

- Intermittent obstruction→ chronic sialadenitis → dilatation of the ducts and atrophy of acinar cells→superimposed infection and microabscesses .

63) All of the following are manifestations of hypercalcemia EXCEPT:

a) Kidney stones

b) Arrhythmias

c) Oliguria

d) Depression

e) Hyperreflexia

64) All of the following cause hypercalcemia EXCEPT:

a) Sarcoidosis

b) Medullary thyroid carcinoma

c) Vitamin D toxicity

d) Metastatic cancer

e) Thiazide diuretics

Answers: C (not sure about e)

usually incidental finding, but if you dig deep in history you'll find that 70% have manifestations

Hyperparathyroidism Clinical

classical manifestations

- **Kidney stones, painful bones, abdominal groans, psychic moans, and fatigue overtones**
- Kidney stones (calcium phosphate and oxalate)
- Osteopenia, osteoporosis, and osteitis fibrosa cystica. Increased bone turnover can usually be determined by documenting an elevated blood alkaline phosphatase level.
- Peptic ulcer disease, pancreatitis, constipation
- Psychiatric manifestations such as florid psychosis, obtubdation, coma, depression, anxiety, fatigue
- Polyurea, polydepsia — hypercalcima

PHYSICAL FINDINGS

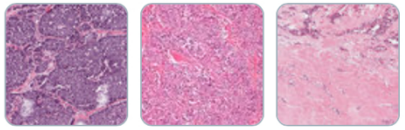
There are usually no specific physical findings of hypercalcemia other than those that might be related to an underlying disease, such as malignancy, and nonspecific findings related to dehydration. Band keratopathy, a reflection of subepithelial calcium phosphate deposits in the cornea, is a very rare finding [27]. It extends as a horizontal band across the cornea in the area that is exposed between the eyelids; calcium salts probably precipitate in that site because of the higher local pH induced by the evaporation of CO_2. It is usually detected by slit-lamp examination.

https://www.uptodate.com/contents/clinical-manifestations-of-hypercalcemia?search=hypercalcemia%20and%20reflex&topicRef=836&source=see_link#

Answers: B

Medullary carcinoma

- Ovoid cells of C cell origin and therefore without follicle development
- Amyloid in the stroma (stains with Congo red)



Medullary carcinoma is composed of **C**-cells producing **C**alcitonin and is characterized by amyloid a**CC**umulation staining with **C**ongo red.

65) What is the incidence of bilateral Pheochromocytoma in paediatrics?

a) 10%

b) 25%

c) 50%

d) 75%

e) All cases are bilateral

66) A 49-year-old lady came to the clinic complaining of a swelling in the right parotid area. The history & examination were consistent with facial nerve palsy of 6-month duration. What is the best next step?

a) CT scan

b) MRI to localize the facial nerve

c) FNA biopsy

d) Incisional biopsy

e) Sonography

Answers: B

Pheochromocytoma Rule's of 10

- Bilateral
- Familial (non-sporadic)
- Pediatric
- Malignant
- Normotensive
- Extra-adrenal
- Multiple
- *Childhood presentation breaks the rules- 25% bilateral, multiple, extra-adrenal

Answers: C

Nerve involvement: Red Flag

2. **Benign**
   a. Etiology
      i. Most common: **Pleomorphic adenoma** (50%-75%)
      ii. Second most common: **Warthin tumor** (5%-15%)
   b. Present as painless, slow growing masses, usually within the parotid gland.
   c. Diagnosis/testing
      i. Fine needle aspiration (FNA) biopsy
      ii. CT for surgical planning
   d. Treatment: Parotidectomy with facial nerve preservation.
3. **Malignant**
   a. Etiology and presentation **Table 40.2**
   b. Diagnosis/testing
      i. FNA
      ii. CT for surgical planning
   c. Treatment: Parotidectomy, with possible facial nerve sacrifice, possible neck dissectior possible adjuvant radiation

67) What is the most common thyroid cancer?

a) Papillary carcinoma

b) Medullary carcinoma

c) Follicular carcinoma

d) Anaplastic carcinoma

e) Fibrolymphovascular tumours

68) What is the mechanism of orthostatic hypotension in Pheochromocytoma?

a) Increased heart rate

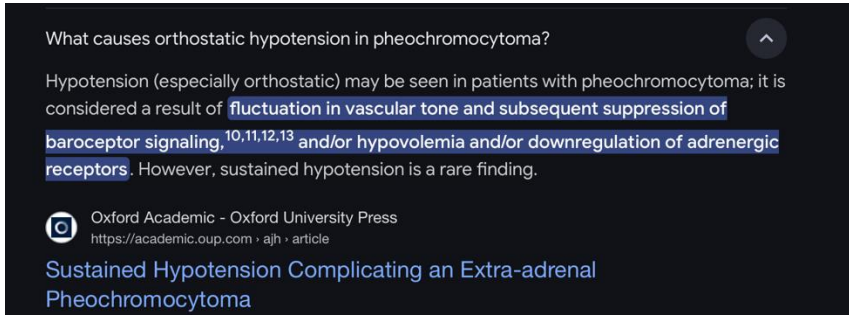
b) Decreased contractility

c) Arrhythmia

d) Decreased venous return

e) Increased arterial vascular tone

tion. The woman's most prominent symptoms are cardiovascular: pounding heart, increased heart rate, increased blood pressure, and cold hands and feet. These symptoms can be understood by considering the functions of adrenoreceptors in the heart and blood vessels. The increased amounts of circulating catecholamines activated β_1 receptors in the heart, increasing the heart rate and increasing contractility (pounding of the heart). Activation of α_1 receptors in vascular smooth muscle of the skin produced vasoconstriction, which presented as cold hands and feet. The patient felt hot, however, because this vasoconstriction in the skin impaired the ability to dissipate heat. Her extremely elevated blood pressure was caused by the combination of increased heart rate, increased contractility, and increased constriction (resistance) of the blood vessels. The patient's headache was secondary to her elevated blood pressure.



Answer: A - D

69) The most common malignant tumour of the submandibular gland is:

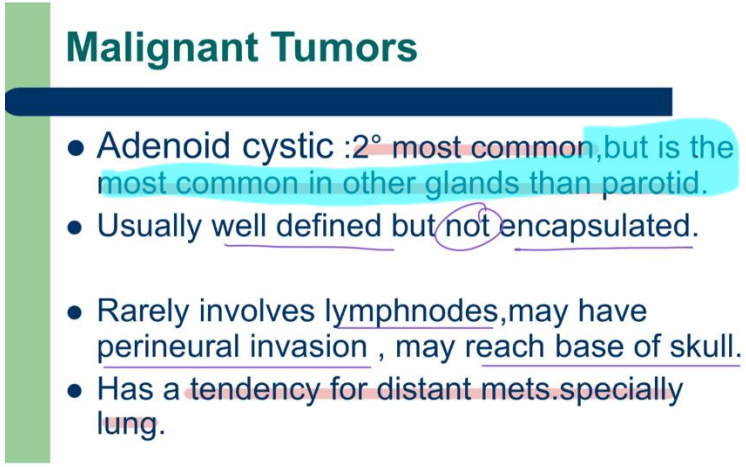
a) Mucoepidermoid carcinoma

b) Lymphoma

c) Adenocarcinoma

d) Adenoid cystic carcinoma

e) Acinar cell carcinoma



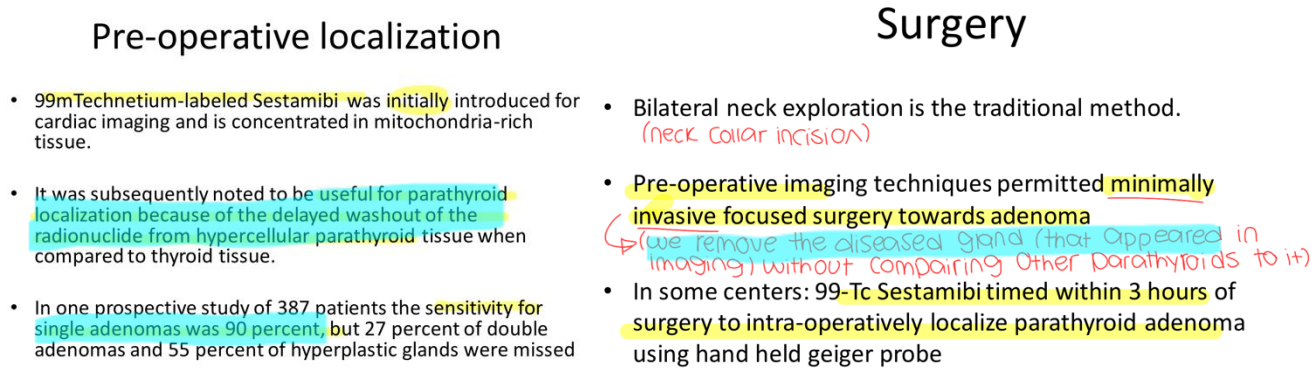
70) A 50-year-old lady who has pancreatitis was found to have high parathyroid hormone. She doesn't have hypercalciuria. She had a sestamibi scan showing hyperactivity below the right thyroid lobe. What is the best next step?

a) Exploration of all 4 parathyroid glands

b) Excision of the single adenoma

c) Hemi-thyroidectomy with exploration

d) Total thyroidectomy with right parathyroidectomy



Answer: D – B

71) Which salivary gland neoplasm only involves the parotid gland?

a) Warthin's tumour

b) Pleomorphic adenoma

c) Mucoepidermoid carcinoma

d) Adenoid cystic carcinoma

e) Acinar cell tumour

72) Bilateral adrenal hyperplasia (bilateral Conn's of the adrenals) is treated with:

a) Ketoconazole

b) PTU

c) Mitotane

d) Fludrocortisone

e) Spironolactone

Answers: A - E

Papillary Cystadenoma Lymphomatosum(Warthin)

- Occurs only in Parotid. not in Submandibular Sublingual
- 10% bilat.
- More in males(90%)
- More in smokers.
- Cystic mass(may be fluctuant)
- Doesnot change into malignancy. always benign

Treatment of Conn's syndrome

A. **Adrenal Adenoma**
   Surgical excision (unilateral adrenalectomy)

B. **Adrenal Hyperplasia**
   Spironolactone (Aldactone)

73) A male patient presented with recurrent swelling upon eating. After imaging he was found to have a submandibular Stone 0.5 cm in its largest diameter, 1 cm away from the opening of Wharton's duct. What is the best management plan for this patient?

a) Intra-oral removal

b) Shock wave Lithotripsy

c) Antibiotics for 2 weeks

d) Advise good oral hygiene

Treatment [6][4]

- **Symptomatic management of salivary gland disorders**
  - NSAIDs for pain relief
  - Stimulation of salivary flow
    - Sialogogues
    - Glandular massage
    - Warm compresses
- For signs of infection, see "Treatment" in "Acute suppurative sialadenitis."
- Interventions: sialoendoscopy, laser lithotripsy, transoral stone removal, or sialadenectomy

Answer: A

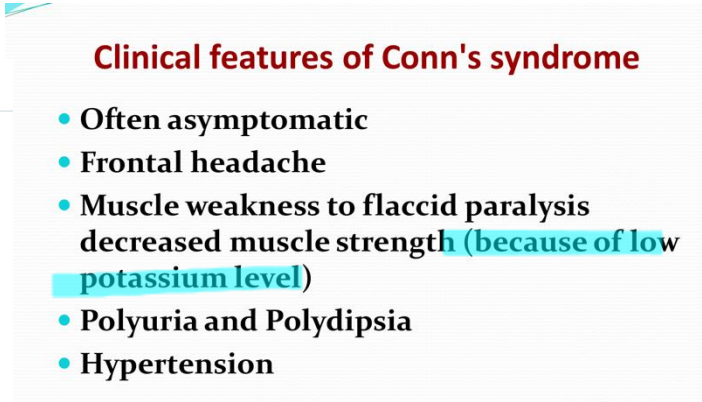
74) Which of the adrenal masses supports hypokalemia?

a) Conn's

b) Cushing

c) Pheochromocytoma

d) Adrenal carcinoma



Answer: A

75) What is the malignancy that most commonly presents with unilateral cervical lymphadepathy in adults:

a) Lymphoma

b) leukemia

c) squamous cell carcinoma of the head and neck

d) Melanoma

e) adenocarcinoma

76) What is the most common cause of cervical lymphadenopathy in children

a) bacterial infection

b) viral infection

c) noninfectious inflammation

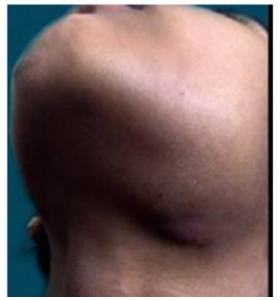
d) lymphoma

2. **Malignant**
   a. **Squamous cell carcinoma (SCC)** is the most common **head and neck cancer (HNC)** in adults and often metastasizes to the neck.
      i. Epidemiology/etiology
         a. Unknown primary in 1% to 3% of new SCC cases
         b. Risk factors: Tobacco/alcohol use, HPV genotypes 16/18
   c. **Lymphoma**
      i. Epidemiology
         a. The most common HNC in children
         b. US annual incidence (per million children)
            1. Non-Hodgkin's: 30
            2. Hodgkin's: 50

Acute cervical lymphadenitis

<2 weeks in duration/infection

- most Viral , Bacterial
  - Commonly from tonsillitis or a dental abscess fever + chills
  - +ve constitutional symptoms (fever, anorexia and malaise
  - Treatment of primary focus
  - Incision and drainage if abscess develops > if advanced.



Answers : C - B

77) What is the best diagnostic tool of cervical lymphadenopathy in children

a) CT

b) MRI

c) US

d) PET scan

e) Thyroid US

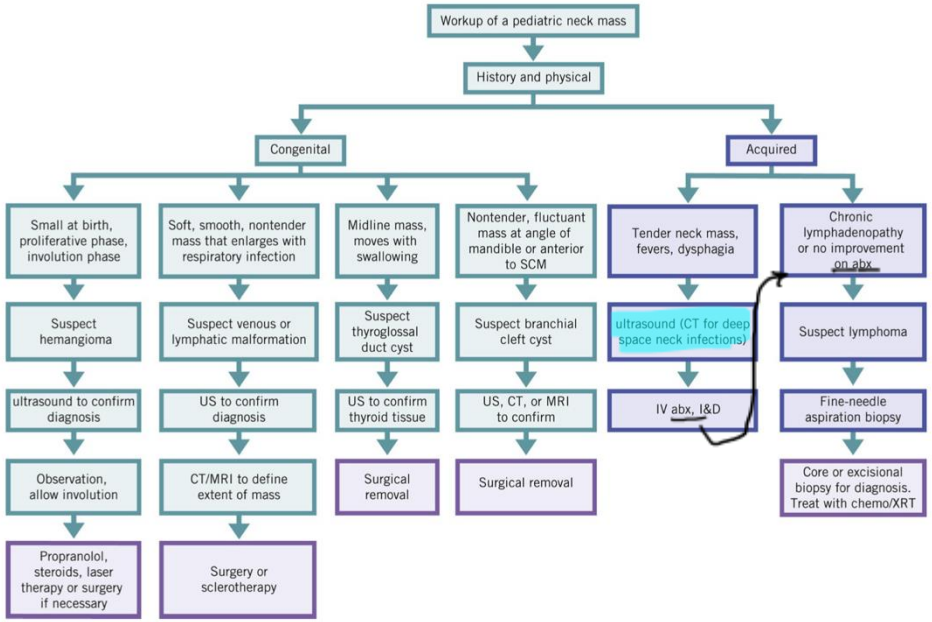


FIGURE 40.6 Workup of pediatric neck mass.SCM, sternocleidomastoid; XRT, radiation therapy.

78) Which of the following diseases shows diffuse high iodine uptake in the thyroid gland?

a) Graves' disease

b) Hashimoto

c) Thyroiditis

Remember that radioactive iodine is contraindicated in pregnancy.
If TRAb are positive, the diagnosis is Graves' disease. Radioactive iodine uptake can help us differentiate Graves' disease from other causes of hyperthyroidism. A toxic adenoma will be seen as a focal increase in uptake, toxic multinodular goiter appears as multiple areas of focal increased with areas of suppressed uptake, and Graves' disease appears as a diffuse increase in uptake.

Answers: C - A

79) Which of the following scans is the best localization study of Hyperparathyroidism?

a) Sestamibi scan

b) FNA

c) Ultrasound

d) PET

Answers: A

80) Which of the following Least likely cause of acute hypocalcemia?

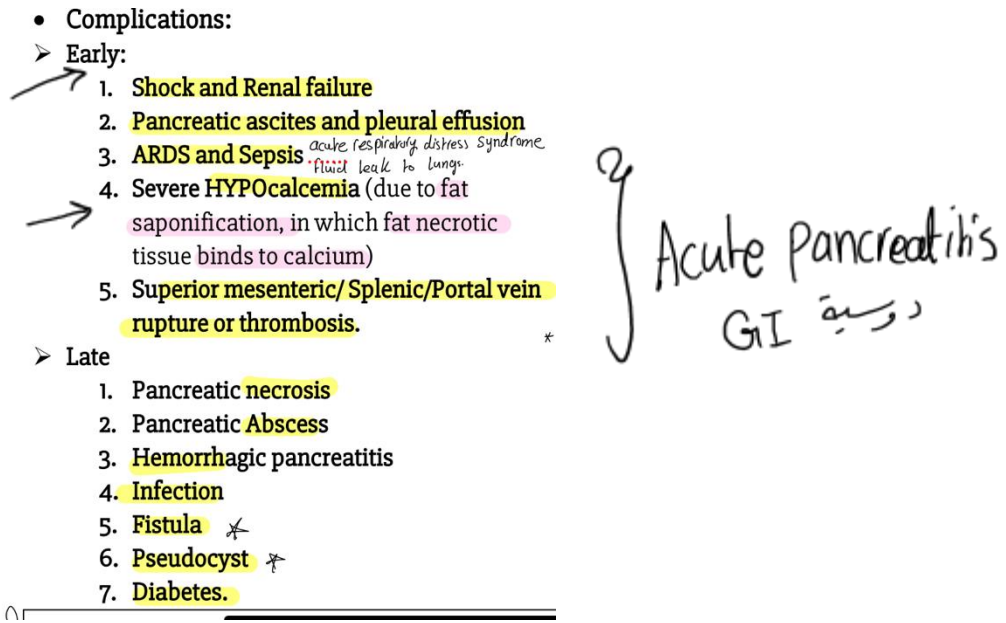
a) Fluid resuscitation of shock

b) massive blood transfusion

c) Vitamin D deficient diets

d) Acute pancreatitis

- Vitamin D deficiency leads to impaired calcium absorption from the gut. However, it typically causes *chronic* hypocalcemia rather than *acute* drops in calcium. The body has compensatory mechanisms to maintain calcium levels in the short term, even with low vitamin D.



Answers: C

81) Medullary thyroid carcinoma most likely associated with?

a) MEN1

b) MEN2A

c) FAP

	MEN 1 Wermer's syndrome	MEN2	
		MEN 2A Sipple's syndrome	MEN 2B
Genetics	Altered menin protein expression	Altered expression of the RET proto-oncogene → elevated tyrosine kinase activity	
Main disease	Primary hyperparathyroidism (~ %90 of cases)	Medullary Thyroid Cancer (almost %100 of cases)	
Other manifestations	• Endocrine pancreatic tumors (~ 50–80% of cases) such as gastrinoma (most common) and insulinoma • Pituitary adenoma (~ 30–50% of cases): most commonly prolactinoma • Carcinoid tumors (~ 10–15% of cases)	Pheochromocytoma (around %40 of cases)	
		Primary hyperparathyroidism (%20-%30)	*Multiple neurinomas *Marfanoid habitus (more than %95)

82) Most aggressive genetic mutation associated with papillary thyroid carcinoma?

a) BRAF V600E

b) H-RAS

c) K-RAS

d) RET/PTC

e) PAX8/PPAR-Y

amboss

- Genetic factors
  - Medullary carcinoma: associated with MEN2 (RET gene mutations) or familial medullary carcinoma
  - Papillary carcinoma: associated with RET/PTC rearrangements and BRAF mutations
  - Follicular carcinoma: associated with **PAX8-PPAR-γ rearrangement** and RAS mutation
  - Undifferentiated/anaplastic carcinoma: associated with TP53 mutation
- Ionizing radiation (particularly during childhood): mostly associated with papillary carcinoma

BRAF mutations — The BRAF isoform of RAF has been implicated in the pathogenesis of papillary thyroid cancer, but not of benign or follicular neoplasms [29]. The RAF proteins are serine-threonine kinases that activate the RAF/MEK/MAPK signaling pathway. The T1799A mutation of the *BRAF* gene, which was originally found in over 50 percent of malignant melanomas and a smaller percentage of colon cancers, occurs in 29 to 69 percent of papillary thyroid cancers [29,47-49]. The predicted protein product BRAF V600E has increased basal kinase activity and transforms NIH3T3 cells with a higher efficiency than does the wild-type BRAF. Transgenic mice expressing this mutation develop papillary thyroid cancer [50].

In one report, *BRAF* mutations were found in 219 of 500 patients with papillary thyroid cancer (44 percent) [51]. *BRAF* V600E, the most prevalent mutation, was associated with invasive tumor growth and the follicular variant of papillary cancer.

Uptodate

Answers: B - A

83) Most common parotid tumor in young age?

a) pleomorphic carcinoma

b) Adenoid cystic carcinoma

c) Acinic cell carcinoma

d) Mucoepidermoid carcinoma

e) Warthin Tumor

84) Which of the following is not an indication of surgery of an adrenal tumor:

a) 25% washout

b) <5 Hu on specimen

c) Secreting tumor

d) Increase in size in two images

e) Size > 6 cm

Answers: D

Malignant Tumors

- Mucoepidermoid: most
  - -most common.
  - -usually in parotid,2° site is palate.
  - -peak age 5° decade.

Malignant Tumors

- Acinic cell Ca.:2° most common parotid and paediatric ca. عادة في الأطفال
- Has a good prog.:

  5 years-------85%

  10 years------68% → some studies 90٪.

  25 years------50%

Answers: B

Benign adenomas typically have **>60% absolute washout** or **>40% relative washout** on delayed imaging.
A **<5 HU** measurement on a **non-contrast CT** strongly suggests a benign **lipid-rich adenoma**, which usually **does not require surgery** unless hormonally active.

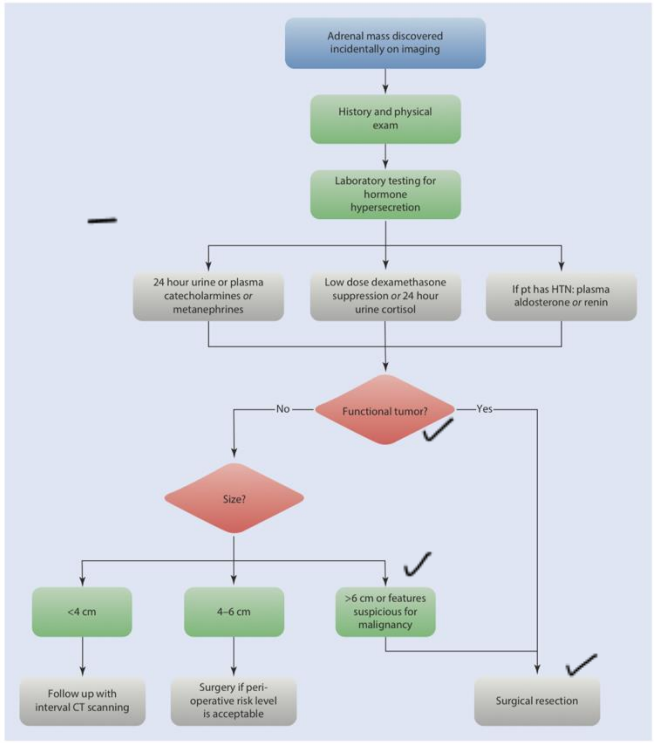


Fig. 11.4 Algorithm for workup and management of incidental adrenal mass

What Imaging Characteristics Help to Differentiate a Benign from Malignant Lesion?

The following characteristics are suggestive of a benign lesion on CT scan: size <4 cm, homogeneous appearance, well-defined borders, high levels of intracellular lipid (identified as ≤10 Hounsfield units (HU) on noncontrast CT scan), rapid washout of contrast, and low amount of vascularity. Features that are more concerning for malignancy include size >6 cm, irregular borders with necrosis, calcification and/or hemorrhage within the mass, ill-defined borders with possible invasion into adjacent structures, low levels of intracellular lipid, and high vascularity.

85) Which of the following antibodies is most likely found in Hashimoto thyroiditis?

a) Antithyroglobulin

b) Anti TPO

c) TSH receptor Ab

d) Anti sodium iodide symporter

Pathophysiology

- **Unknown etiology**: Genetic and environmental factors likely play a role.
- **Immunological mechanisms**
  - Associations with **HLA-DR3, and DR5** have been proposed. [3]
  - Cellular (especially T cells) and humoral immune responses are activated → active B lymphocytes produce **thyroid peroxidase antibodies (TPOAbs)** and **thyroglobulin antibodies (TgAbs)** → destruction of thyroid tissue

FEEDBACK

Answers: B

86) The best preoperative assessment of highly suspicious thyroid nodule is?

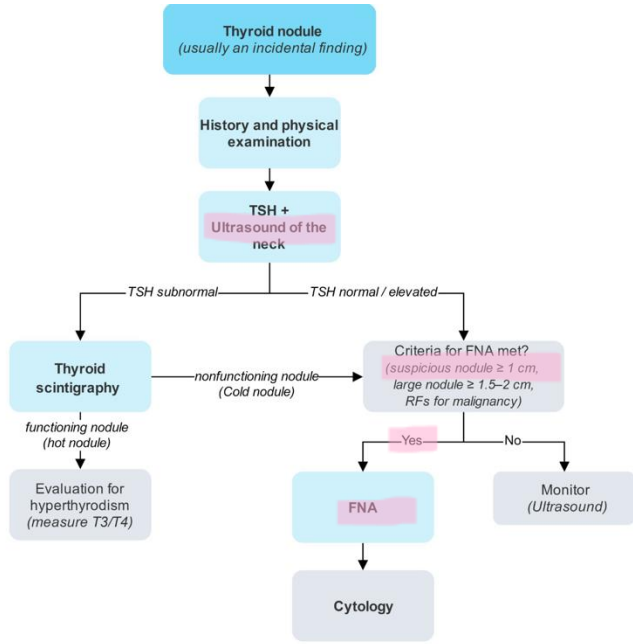
a) US

b) FNA

c) PET

d) RAI

e) CT



Answers: B

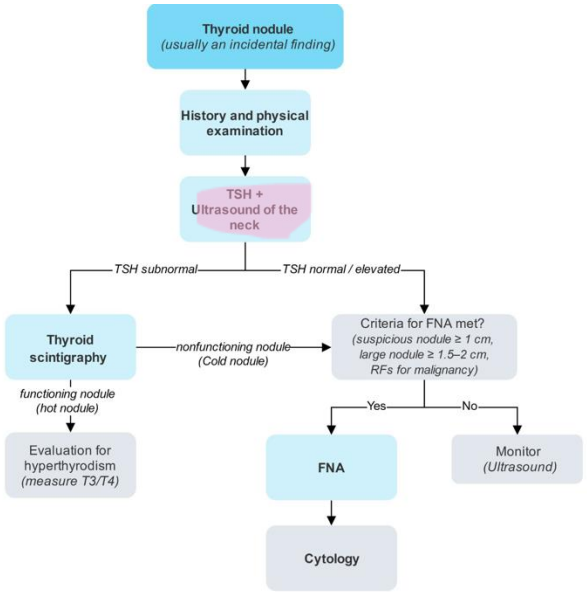
87) Newly discovered thyroid nodule, what is the best initial test?

a) US

b) FNA

c) CT

d) MRI



Answer: A

88)Most of the blood supply of the parathyroid is from which artery?

Inferior thyroid artery.

89) Management of a non-functioning Bethesda 4 thyroid nodule?

Lobectomy

The 2017 Bethesda system for reporting thyroid cytopathology
Implied risk of malignancy and recommended clinical management (simplified)

Diagnostic category	Risk of malignancy		Usual management
	NIFTP ≠ cancer	*NIFTP = cancer*	
I. **Nondiagnostic**	5–10%	5–10%	Repeat FNA with ultrasound guidance
II. **Benign**	0–3%	0–3%	Clinical and sonographic follow-up
III. **AUS/FLUS**	6–18%	≈ 10–30%	Repeat FNA, molecular testing, or lobectomy
IV. **FN/SFN**	10–40%	25–40%	Molecular testing, lobectomy
V. **Suspicious for malignancy**	45–60%	50–75%	Near–total thyroidectomy or lobectomy
VI. **Malignant**	94–96%	97–99%	Near–total thyroidectomy or lobectomy

90) What is the preferred site for reimplantation of parathyroid tissue after performing parathyroidectomy? Forearm

6. **Parathyroid autotransplantation**
   a. Total parathyroidectomy with heterotopic parathyroid autotransplantation should be considered in patients with renal failure and secondary HPT, four-gland parathyroid hyperplasia, and those undergoing neck reexploration in which the adenoma is the only remaining parathyroid gland.
   b. The sternocleidomastoid or the brachioradialis muscles of the patient's nondominant forearm are common sites for autotransplantation
   c. To autotransplant
      i. After excision, mince parathyroid tissue finely and place in sterile iced saline.
      ii. Create separate intramuscular beds in muscle fibers of the brachioradialis or sternocleidomastoid with a fine forceps.
      iii. Several pieces of parathyroid tissue are placed in each site for a total transplant volume of approximately 100 mg.
      iv. Nonabsorbable suture is used to close the beds and to mark the site.
   d. Transplanted parathyroid tissue begins to function within 14 to 21 days of surgery.
   e. **Cryopreservation** of parathyroid glands can be performed in patients who are at risk for permanent hypoparathyroidism after repeat exploration allowing for future autotransplantation in patients with failure of the initial graft.

92) Which isotope of iodine is used for the treatment of thyroid disease?
I 131

91) You performed a total thyroidectomy to a 56-year-old female patient for thyroid cancer. After the surgery, she developed hoarseness of voice. When should you examine the recurrent laryngeal nerve to check for permanent injury?

After 6 months

3. **Nerve injury**
   a. RLN
      i. Injury occurs in <1% of cases
      ii. Unilateral: Presents as hoarseness
      iii. Bilateral: Can result in airway compromise potentially requiring tracheostomy
      iv. May be transient (improving over 1-6 weeks postoperatively) or permanent, in which case cord medialization procedure can be considered

93) Which of the following conditions is associated with thyroid lymphoma?
Hashimoto's thyroiditis

Complications

- **Myxedema coma**
- **Primary thyroid lymphoma** [18]
  - Epidemiology: 40- to 80-fold increase in risk in patients with Hashimoto thyroiditis
  - Pathophysiology: usually originating from B cells

We list the most important complications. The selection is not exhaustive.

94) What is the treatment of the thyrotoxic state of Hashimoto's thyroiditis?

B-blockers

Treatment [17][13][6]

Lifelong oral levothyroxine replacement is required in most patients with Hashimoto thyroiditis.

- **Overt hypothyroidism**
  - Full-dose levothyroxine in young, healthy patients
  - OR low-dose levothyroxine depending on age and comorbidities
- **Subclinical hypothyroidism**: Consider low-dose levothyroxine.
- **Hashitoxicosis**: symptomatic therapy for thyrotoxicosis with ß-blockers [13]

95) The prognosis of which of the following parotid tumors is dependent on the histologic features of the tumor?

Mucoepidermoid carcinoma

96) Wrong about NET:

Most NETs causes carcinoid syndrome

تم بحمد الله