Common Neck Swellings

Surgery Team
MED 433

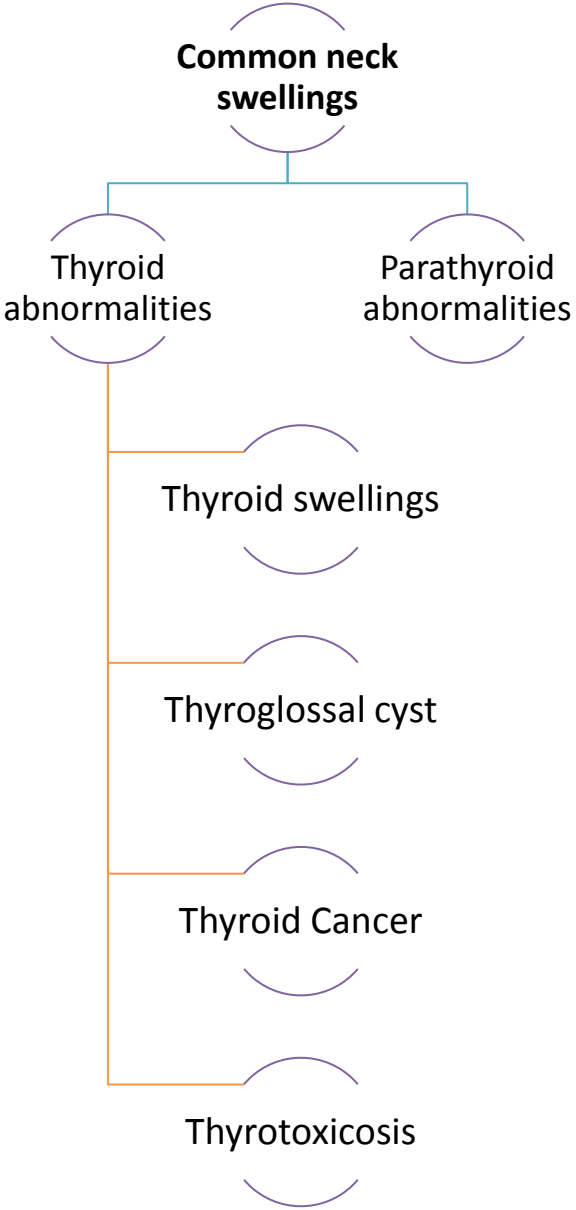
MED 433
طب ٤٣٣

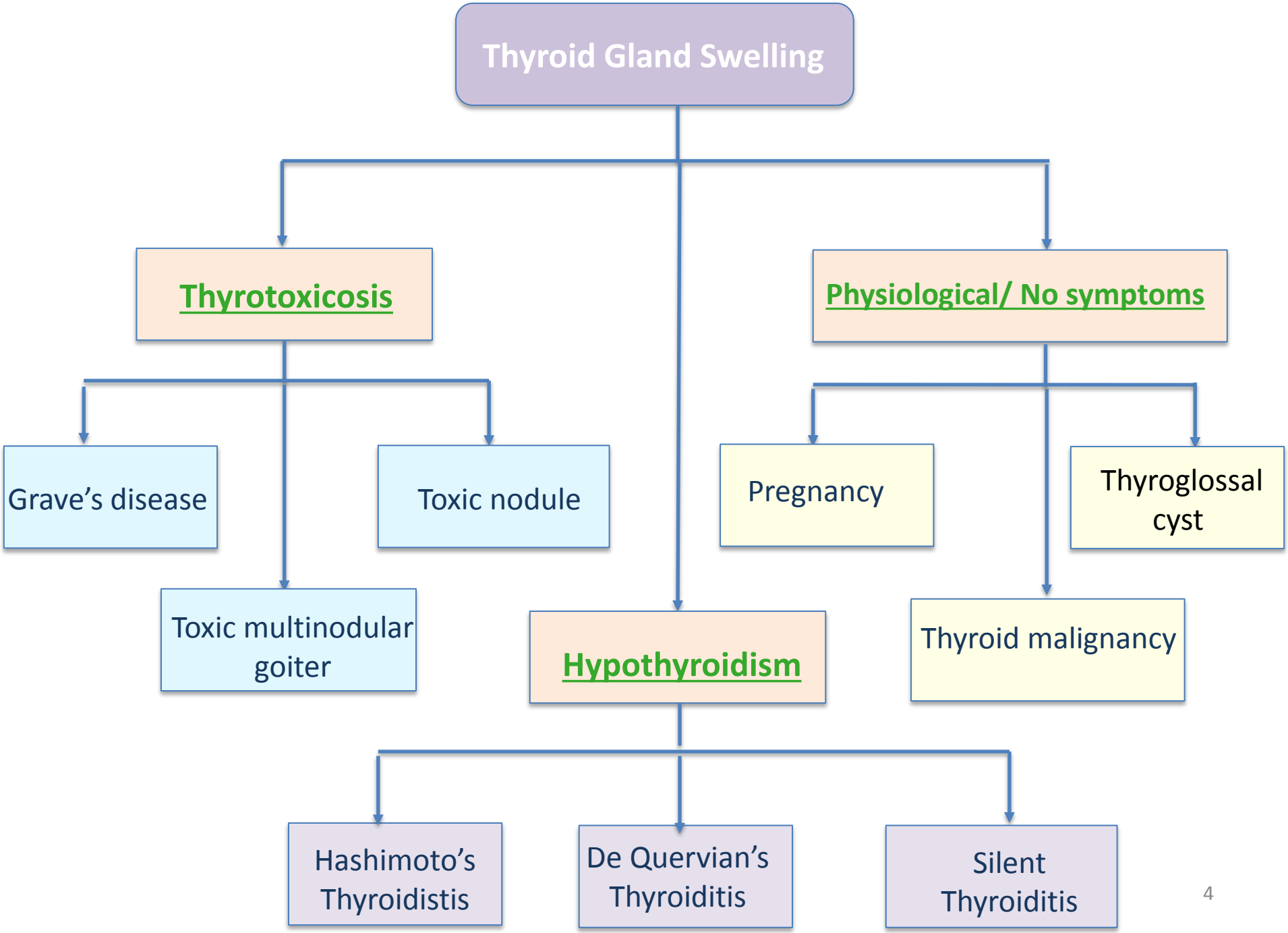
Objectives :

Color Index: Slides & Raslan's () | Doctor's Notes | Extra Explanation | Additional

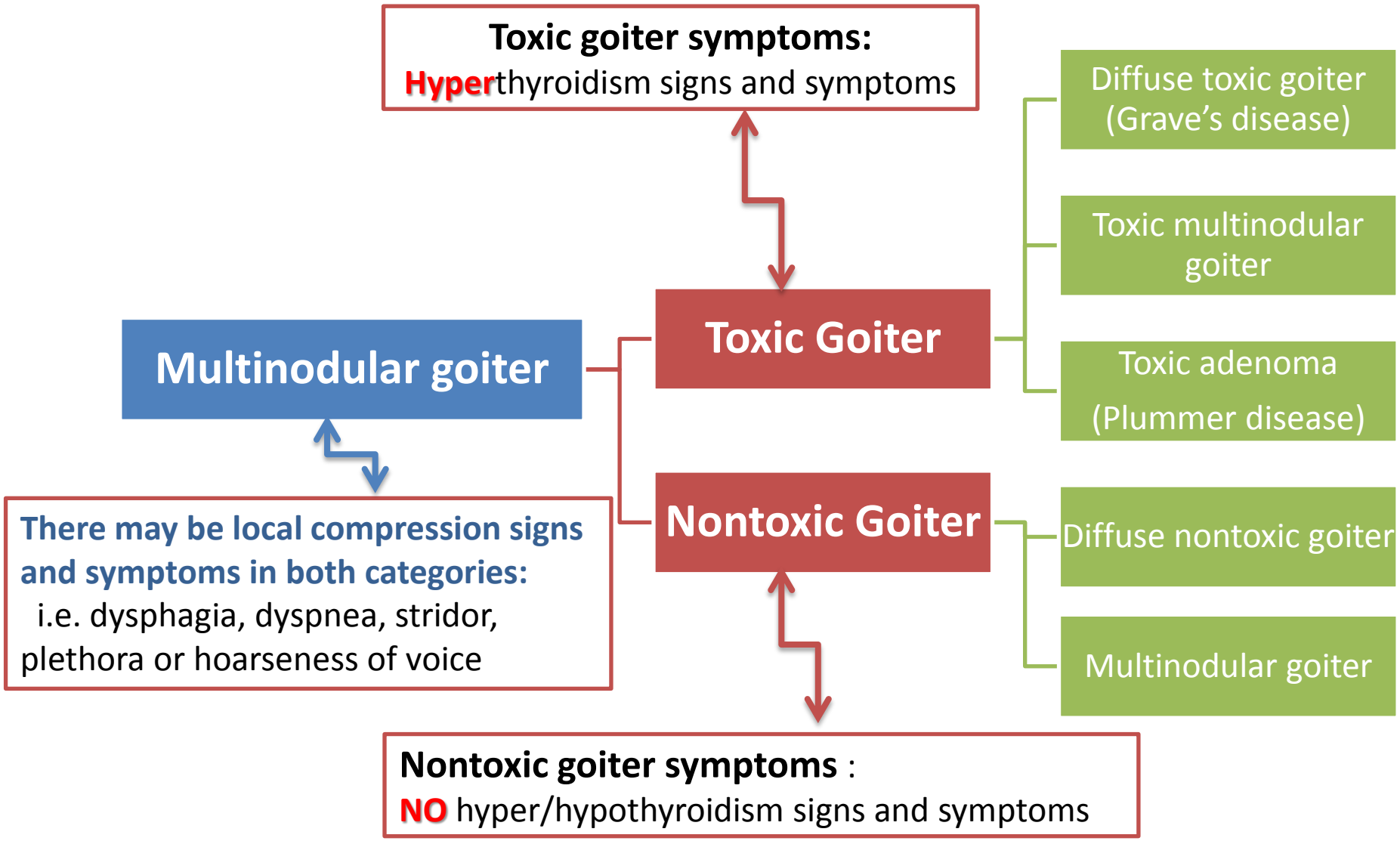
This work is based on doctor's Slides +Notes and Raslan's only (Does not include the book)

Mind Map


Common neck swellings
Thyroid abnormalities
Parathyroid abnormalities
Thyroid swellings
Thyroglossal cyst
Thyroid Cancer
Thyrotoxicosis


Thyroid Gland Swelling
Thyrotoxicosis
Physiological/ No symptoms
Grave's disease
Toxic nodule
Toxic multinodular goiter
Hypothyroidism
Pregnancy
Thyroglossal cyst
Thyroid malignancy
Hashimoto's Thyroidistis
De Quervian's Thyroiditis
Silent Thyroiditis

Multinodular goiter types & Symptoms :



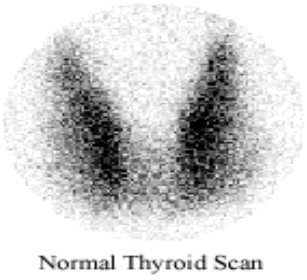
Diagnosis:

1-U/S

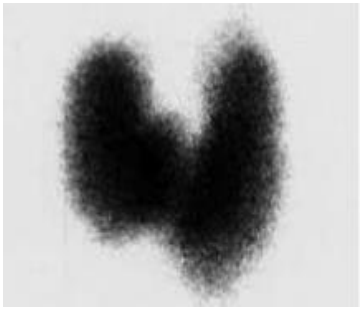
2-FNA (fine needle aspiration)

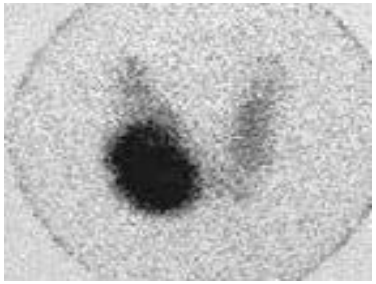
3- Nuclear scan :

Warm scan	Hot	Cold
Normal	abnormal	Malignancy



Normal Thyroid Scan





Thyrotoxicosis:

Signs And Symptoms

1. Nervousness
2. **Weight loss with Increased appetite**
3. Warm moist skin
4. Heat intolerance
5. Sweating
6. Muscular weakness
7. Menstrual irregularities
8. Tachycardia +/- Arrhythmias (especially in elderly where they may present with atrial fibrillation)
9. Goiter
10. Bruit & thrill over the thyroid gland
11. Eye signs

LAB TESTS

- Increases T4, T3
- Decreased TSH (in primary hyperthyroidism)

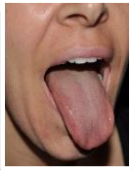
Management

1. Medical
2. Radio-nuclear iodine
3. Surgery

Thyroglossal cyst (BENIGN)

Symptoms

- Painless (only tender if infected)
- No symptoms of hyper/hypo - thyroidism

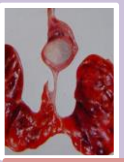


Characteristics

- Moves with:
  -swallowing
  -***Tongue protrusion***

Diagnosis

- U/S
- Fine needle aspiration



Treatment

- Aspiration by FNA
- If > 2 times → Surgery (Sistrunk procedure)

- **FNA (fine needle aspiration)** is **both therapeutic and diagnostic** as well in the thyroglossal cyst.
- Thyroglossal cyst moves with **swallowing and tongue protrusion** while the other thyroid masses move with swallowing only and don't move with tongue protrusion.

❖ Thyroid swellings: (CASE)

Fatima is a 30-year old Saudi lady that presented to the Outpatient clinic, complaining of a swelling in the midline of her neck that she had for 2 months.
(Midline swelling of a neck = four questions come in mind

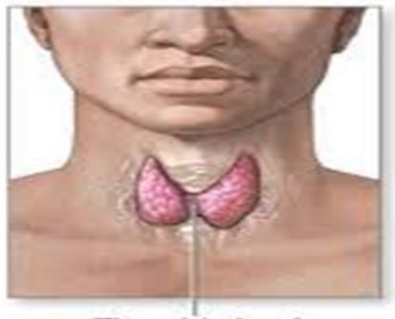
- **1st Q- What could this be?**
  - ✓ It could be either a thyroid swelling or a something else (could be dermoid cyst, lipoma, lymph Node)
- **2nd Q- How to differentiate between them?**
  - ✓ By movement **with swallowing** { if moved, it is a thyroid swellings or thyroglossal cyst. / If NOT moved, it is a something else)
- **3rd Q- How to differintiate between thyroid and thyroglossal cyst?**
  - ✓Movement with **Tongue protrusion** { if moved , it is a thyroglossal cyst / If NOT moved, it is a thyroid swellings
- **4th Q- If it is a thyroid swelling, what could be the cause of this swelling?**
  - ✓**Thyroid cyst** ☞ More details in the next slide
  - ✓**Multinodular goiter**
  - ✓**Benign tumor**
  - ✓**Malignancy**
  - ✓**Inflammatory:**
    - Acute and subacute are rare
    - Chronic is more common (such as Hashimotos)

❖Thyroid swellings: (Thyroid cyst)

❖ **Thyroid cyst :**

- Benign
- Diagnosed by U/S and fine needle aspiration (FNA)
- Treated by aspirating the cyst via FNA
- If it reoccurs up to two times aspirate it again but
- in the 3rd time surgery should be done

In the thyroid gland, usually what feels like cyst turns out to be solid tumor and what feels solid turns out to be a benign cyst.



Thyroglossal cyst

Thyroid

Thyroid malignancy:

Characteristics:

- ✓ Cancers can appear as solitary nodules or diffusely enlarged glands
- ✓ Thyroid cancers are usually ***non-functional*** (they neither produce excess nor decreased thyroid hormone sxs→ because cancer cells are abnormal cells so they don't have the thyroid cells proprieties of synthesizing the T3 & T4 hormones)
- ✓ **Thyroid function is usually normal (NORMAL T3 & T4 serum levels)**
- ✓ Lymphatic spread *doesn't affect the prognosis*

Symptoms :

- The patient usually comes with a lump only, WITHOUT any symptoms
- Painless enlarging nodule
- Lymphadenopathy
- **Hoarseness of voice** (due to recurrent laryngeal nerve injury)
- **Dysphagia**

What differs the thyroid cancer from the other organs malignancy?

1- **It doesn't show any general sign of malignancy (i.e, weight loss, loss of appetite & fatigue)**

2- The malignant neck nodule **may be there for 10 or more years yet malignant**
(i.e if you had a breast lump that has been there for many years then it's a benign nodule not a malignant one but if you had a lump in your thyroid gland for many years then there are chances that it may be a malignant one although there for years)

3- Thyroid malignancy usually doesn't cause any functional disturbance related to the thyroid hormone .

4-Yet the thyroid cancer patient may present with →

- hoarseness of voice
- dysphagia
- lymphadenopathy

MEN IIa/IIb syndrome : is a group of disorders consists of multiple endocrine tumors.
And has two types:

1-MEN IIa:

- ✓ medullary carcinoma
- ✓ hyperparathyroidisim
- ✓ pheochormocytoma

2-MEN IIb:

- ✓ Medullary carcinoma
- ✓ mucosal neuromas
- ✓ pheochromocytoma
- ✓ marfanoid shape

Cancer	characteristics	Management
Papillary	• Commonest (85%) • Painless nodule • At any age • Spreads to lymphatics • Metastasis to lung & bone • Good prognosis (even if there's a lymphadenopathy) • Thyroid lump in a child is a papillary carcinoma until proven otherwise	• Near total thyroidectomy • There will be a little bit of thyroid, this little bit is treated with Radionuclear Iodine • We don't use Total thyroidectomy because of recurrent laryngeal nerve injury risk
Follicular	• Older patients than papillary (60-70 years old) • Metastasis by blood to lung & bone (doesn't go to lymph nodes)	• Radionuclear Iodine
Lymphoma	• More common in our part of the world. • Usually diagnosed post operation. (not dx by FNA)	• Treated by Chemo/radiotherapy
Medullary	• This cancer arises from C cells not thyroid cells • C cells exist also in adrenals causing pheochromocytoma • Might be associated with MEN IIa/IIb syndrome slide 6 (multiple endocrine neoplasia). • 25% of medullary is familial, so must to screen other family members • Prognosis is not good, especially if it's part of MEN that's why we screen family and we remove thyroid before age of 6 years. • Produces amyloid	• Iodine is not effective in this case, so you have to do total thyrodectomy (even if you have a risk of recurrnet laryngeal nerve injury) • If a pheochromocytoma is exist, treat it first before thyroidectomy (otherwise the patient is going to die in the OR)
Undifferentiated	• Elderly patients • Locally invasive • Rapidly growing • Worst prognosis	• Rarely curable

Doctor's notes:

- A patient with neck nodule + -
  - hoarseness of voice
  - dysphagia
  - lymphadenopathy

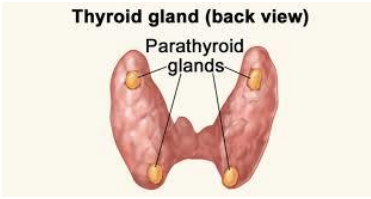
  → MALIGNANCY

- Because the benign thyroid diseases don't usually present with hoarsness or dysphagia .
- Papilary carcinoma have a good prognosis even when it metastasizes to the bone or lungs.
- Any thyroid lump in child is papillary carcinoma until proven otherwise
- Lymphoma isn't diagnosed by fine-needle aspiration , we do thyroidectomy and send it to the pathologist .
- Radiation 131I radioactive ablation is contraindicated in pregnant ladies and kids.

A cytopathologist can't distinguish follicular adenoma from follicular carcinoma after fine-needle aspiration, tissue biopsy should be taken to see the capsular or vascular invasion (coming with the follicular carcinoma)

❖Parathyroid Gland: (from Raslan's)

Anatomy



There are four parathyroid glands which located posterior to the thyroid and these four glands are supplied by **inferior thyroid artery.**

Embryology of The parathyroid glands:

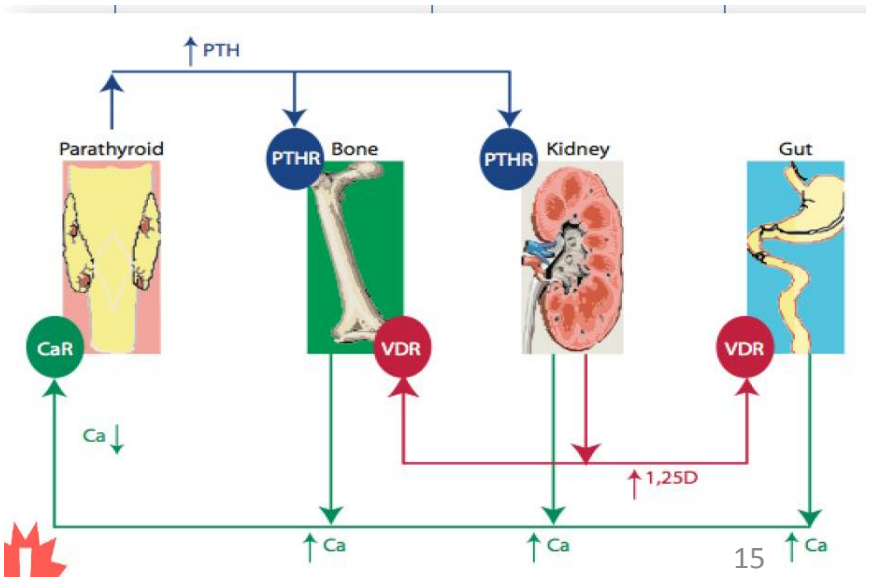
The upper parathyroid glands originate from the→ 4th pharyngeal pouch
The lower parathyroid glands originate from the → 3rd pharyngeal pouch

Physiology

Ca2+ homeostasis:
release of Parathormone/Parathyroid hormone (PTH) to ↑Ca2+ levels in the blood

Vitamin D regulation:
PTH induces Vit.D hydroxylation in the kidney, and this process is necessary for Vit.D activation.

Calcitonin: is released from the c-cells of the thyroid gland decrease Ca2+ levels. These are not of physiological significance.



❖Parathyroid Gland: (from Raslan's)

Primary And Secondary Hyperparathyroidism:

- Primary is more common and is due to increase secretion from the any of the glands due to hyperplasia, adenoma or carcinoma.
- Secondary hyperparathyroidism is due disordered metabolism (chronic kidney disease or Vit.D metabolism disorders) that causes hypocalcaemia for prolonged times and secondary enlargement of the parathyroid glands.
- Serum levels of PTH are increased along with Ca2+ (because PTH increases Ca2+ levels)
- Hyperparathyroidism is the most common cause of hypercalcaemia in society.
- The most common cause of hypercalcaemia in the hospital is malignancy.
- Uncommon in children
- 2-3 times in females

It is rare to see a patient with neck swelling from parathyroid origin and if you do it is almost always cancer.

More details in the next slide

Primary hyperparathyroidism	Secondary hyperparathyroidism
CAUSES	
• **Adenoma:** ✓ most common cause of 1ry hyperparathyroidism (84% of cases) ✓ Usually not palpable and affects one gland • **Hypreplasia:** ✓ 15% of cases ✓ Usually not palpable and usually affects all four glands • **Carcinoma:** ✓ 1% of cases ✓ May present with neck swelling	• Parathyroid glands are normal. • It is caused by other disordered metabolisms that cause hypocalcaemia for prolonged times and secondary enlargement of the parathyroid glands. Such as: ✓ **chronic kidney disease** ✓ **Rickets and Osteomalacia** ✓ **Low calcium diet** ✓ **Pregnancy** ✓ **Lactation**

SIGNS AND SYMPTOMS

- **Many are asympotmatic,** The symptoms range from: No symptoms ,mild, general symptoms like fatigue and depression, renal symptoms and bone symptoms.

1. **Bone**: high levels of PTH activate bone resorption and cause bone matrix depletion, like: A)Osteopenia B)Subperiosteal erosion C) Brown tumor (It is only a radiological description and not an actual tumor.) D) Cyst
2. **Kidney:** stones and glomerular calcification.
3. **Abdomen:** abdominal pain where some patients may develop peptic ulcer disease and pancreatitis.
4. **Neuropsychiatric**: depression, mood changes
5. **General** : Fatigue

INVESTIGATIONS

- ↑ Serum Ca2+, ↑ PTH, ↓ Phosphorus, ↑ Chloride (PTH effect on the kidney leads to Ca retention.)
- Imaging X-Ray: **Hand X-Ray:** you may see brown tumors
- Other imaging: **U/S** can show Adenoma , CT can sometimes show adenoma , Last thing is nuclear scan" Sestamibi Scan"

common clinical scenario

40 year old lady that presented with left humerus fracture, past medical history is significant of bilateral ureteric stones that have been removed and a non-functional left kidney. Serum Ca2+ was 11.2 mg/dl and PO4 2.2mg/dl. Bone symptoms, kidney symptoms (failure and colic), high calcium and low phosphorus

Management:

All symptomatic patients should be treated:

A) **Adenoma**: surgical removal or

B) **Hyperplasia**: remove 3 and a half parathyroid glands (subtotal parathyroidectomy)

Asymptomatic patients:

There is debate on wither asymptomatic patients should be treated or only followed up

Postoperative management:

Be careful of bone hunger syndrome which might cause tetany.

Recommendations

The medical community needs to be more aware of the disease.

The diagnosis should be especially considered in the **following cases:**

- ✓ Patients with bilateral or recurrent renal stones
- ✓ Patients with suggestive radiological bone changes
- ✓ Patients with high serum calcium level

❖ Other neck swellings: (Not mentioned by the doctor)

Branchial Cleft Cysts:

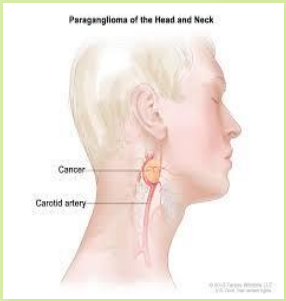
- Branchial cleft cysts are congenital epithelial cysts, which arise on the lateral part of the neck from a failure of obliteration of the second branchial cleft in embryonic development
- Non-tender until inflamed, and cholesterol granules are found in aspiration
- Comes usually in late childhood or early adulthood.
- Diagnosed by ultrasound and treated by surgical excision.

Cystic Hygroma:

- Also called cystic lymphangioma
- Lymphatic malformation during fetal development.
- Soft, non-tender, compressible and transilluminates.
- Treated by surgery and sclerotherapy

Carotid Body Tumors (Paraganglioma) :

- These are benign tumors arise from extra-adrenal chromaffin cells in the parasympathetic ganglia.
- Diagnosis: ultrasound, and confirmation by MRA/carotid angiogram.
- Treatment: surgical excision.



Summary

- Neck swellings could be due to multiple causes. So when the patient comes with neck swelling try to identify the origin of this swelling by taking history, physical examination and investigations.
- The consistency of thyroid mass can not be assessed by physical examination because it may be felt solid while it is fluid filled and vise versa.
- Papillary, follicular, Undifferentiated thyroid carcinomas arise from follicular cells. medullary carcinoma arises from C-cells so Iodine has no role in the treatment of medullary carcinoma.
- Patients with medullary carcinoma should be screened for other cancers related to MEN IIa/IIb syndrome. In addition, the patient's family should be screened for all cancers related to MEN IIa/IIb syndrome.
- The best prognosis among thyroid cancers is papillary carcinoma. Undifferentiated carcinoma has the worst prognosis.
- It is rare to see a patient with neck swelling from parathyroid origin and if you do it is almost always cancer.
- There are three causes of primary hyperparathyroidism : Adenoma, Hyperplasia and carcinoma.
- **Most patients with hyperparathyroidism are asymptomatic**.

MCQs

Q1/ A 55-year-old woman presents with a slow-growing painless mass on the right side of the neck. A fine-needle aspiration of the nodule shows a well-differentiated papillary carcinoma. A complete neck ultrasound demonstrates a 1-cm nodule in the right thyroid without masses in the contralateral lobe or lymph node metastasis in the central and lateral neck compartments. With regards to this patient, which of the following is associated with a poor prognosis?

a- sex b- age c- grade of tumor d-size of tumor e- Lymph node status

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Q2/ A 55-year-old woman presents with a 6-cm right thyroid mass and palpable cervical lymphadenopathy. Fine-needle aspiration (FNA) of one of the lymph nodes demonstrates the presence of calcified clumps of sloughed cells. Which of the following best describes the management of this thyroid disorder?

a. The patient should be screened for pancreatic endocrine neoplasms and hypercalcemia.
b. The patient should undergo total thyroidectomy with modified radical neck dissection.
c. The patient should undergo total thyroidectomy with frozen section intraoperatively, with modified radical neck dissection reserved for patients with extra-capsular invasion.
d. The patient should undergo right thyroid lobectomy followed by iodine 131 (131I) therapy.
e. The patient should undergo right thyroid lobectomy.

Q3/ A 36-year-old woman, 20 weeks pregnant, presents with a 1.5-cm right thyroid mass. FNA is consistent with a papillary neoplasm. The mass is cold on scan and solid on ultrasound. Which of the following methods of treatment is contraindicated in this patient?

a. Right thyroid lobectomy
b. Subtotal thyroidectomy
c. Total thyroidectomy
d. Total thyroidectomy with lymph node dissection
e. 131I radioactive ablation of the thyroid gland

Q4/ A 51-year-old man presents with a 2-cm left thyroid nodule. Thyroid scan shows a cold lesion. FNA cytology demonstrates follicular cells. Which of the following is the most appropriate initial treatment of this patient?

a. External beam radiation to the neck.
b. Multidrug chemotherapy.
c. TSH suppression by thyroid hormone.
d. Prophylactic neck dissection is indicated along with a total thyroidectomy.

Q5/ 264. A 30-year-old woman presents with hypertension, weakness, bone pain, and a serum calcium level of 15.2 mg/dL. Hand films below show osteitis fibrosa cystica. Which of the following is the most likely cause of these findings?

a. Sarcoidosis
b. Vitamin D intoxication
c. Paget disease
d. Metastatic carcinoma
e. Primary hyperparathyroidism

Q6/ 265. A 35-year-old woman presents with a serum calcium level of 15.2 mg/dL and an elevated parathyroid hormone level. Following correction of the patient's hypercalcemia with hydration and furosemide, which of the following is the best therapeutic approach?

a. Administration of steroids
b. Radiation treatment to the neck
c. Neck exploration and resection of all 4 parathyroid glands
d. Neck exploration and resection of a parathyroid adenoma
e. Avoidance of sunlight, vitamin D, and calcium-containing dairy products

ANS: 1- b 2-b 3-e 4-e 5-e 6-d

Thank You..

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