



Common neck swelling

Objectives:

- NOT GIVEN

Resources:

- Davidson
- Current diagnosis & treatment
- Raslan
- Doctor's note

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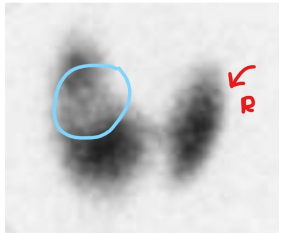
Once you stop learning
you start dying.

CAUSES OF GOITER: Types of swellings:

1. Thyroid cyst :

| | |
|------------------|--|
| Features | - Benign, painless . |
| Diagnosis | Ultrasound and FNA. - Thyroid gland is located behind a fascia "pretracheal fascia", so it is difficult to differentiate <u>solid mass or cyst</u> by examination" Ultrasound and FNA are the best options to differentiate between them. |
| Treatment | Aspiration. If it reoccurs up to two times → aspirate cyst again, but the 3rd time surgery is indicated. (lobectomy) |
| pics |  |

2. Multinodular goiter (Simple goiter):

| | | |
|--------------------------|---|---|
| What is it? | - <u>Functional</u> problem, it's Hyperplasia of the cells . It is solid and locally causing dysphagia, dyspnea, stridor or hoarseness. - It is the most common thyroid disease. | |
| Causes | The hyperplasia of cells is because of: 1.iodine deficiency¹ 2.side effect of "lithium" 3.problem in the synthesis (idiopathic). | |
| Clinical features | - Starts as a simple goiter then becomes nodular (but the function stays normal). After years, some of the nodules will produce excessive amount of thyroxine; we call it toxic multinodular goiter . So simple multinodular goiter may eventually turn into toxic. - simple multinodular goiter is the most common cause of single nodule (هو الوحيد المحسوس بينهم). - indication for surgical intervention → if the multinodular goiter restrict the respiration. | |
| Diagnosis | - Ultrasound and FNA then nuclear (warm) scan. - Warm scan is <u>normal</u> : like the lobe on the right side of the picture - or - abnormal either: Hot ² (overtaking iodine hyperactive). Or Cold (circled area): it means that area is not uptaking iodine hence it is no longer thyroid tissue, indicative of <u>malignancies</u> in 15% of patients. |  |

¹ Common in iodine deficiency area.

² In nuclear scan: hot nodule: the nodule uptake the iodine and produce thyroxine more than surrounding tissue, and cold nodule: it doesn't uptake iodine (hence it appears lighter in the image) and not functioning.

| | |
|---------------------|--|
| Presentation | <p>The goiter presents incidentally : either:</p> <p>1-toxic goiter: associated with hyperthyroidism. E.g. Graves disease, toxic multinodular goiter (Plummer's disease), and toxic adenoma.</p> <p>2-Nontoxic goiter: asymptomatic goiter but can cause compression symptoms, thyroid function is normal. It may be diffuse or multinodular.</p> |
|---------------------|--|

3. Inflammatory (thyroiditis):

| | |
|------------------|---|
| Note | It is difficult to differentiate between inflammatory and simple goiter by signs and symptoms, you need to do aspiration and biopsy. (Even by US they look alike) |
| Types | <p>1- Acute : is extremely rare especially biogenic (bacterial³) inflammation.</p> <p>2- Sub-acute:⁴ rare noninfectious either de Quervain's disease (hyperthyroidism) that is associated with an influenza-like illness (virus) and painful diffuse swelling of the gland, or Riedel's thyroiditis (hypothyroidism) which is a very rare cause of painless thyroid.</p> <p>3- Chronic (Hashimoto's thyroiditis "autoimmune"): most common inflammation. usually mixed with simple goiter (painless diffuse swelling), no signs of inflammation like redness. Starts slightly⁵ hyperthyroidism → then eufunction → lastly hypothyroidism.</p> |
| Diagnosis | by serological markers and biopsy which shows lymphocytes, monocytes, etc. |

| | |
|---|---|
| <p>4. Benign tumor : 90% of tumors. Usually Follicular adenoma.</p> | <p>5. Malignant tumor : 10% of tumors. Types: 1-Papillary Carcinoma 2- Follicular Carcinoma 3- Medullary 4- Undifferentiated 5- Lymphoma</p> |
|---|---|

6. Physiological goiter (simple diffuse swelling): happens as a result of increase the demand (like in puberty - due to growth - and in pregnancy...etc), the body needs thyroxine and the gland will try to compensate. It's usually not extremely enlarged.

Fast growth → increased need of thyroxine → thyroid hypertrophy.

Remember: Normal thyroid function in: Thyroid cyst - Simple multinodular - Malignant tumor - physiological goiter - Inflammatory.

Case: Ahmed (28 year-old) came to the Outpatient clinic **complaining of** nervousness, palpitations, sweating, and weight loss. Clinical examination revealed **the presence of a goiter**. Hyperthyroidism Thyrotoxicosis can be a manifestation of a number of thyroid conditions, but the most common are:

1. Grave's disease: autoimmune disease (inflammatory) causes thyrotoxicosis and it has a direct affect on the eyes. Eye signs in grave's disease are very obvious(lid retraction and exophthalmos). Usually affects the young.
2. Toxic multinodular goiter: It starts as a simple goiter, but sometimes with time these nodules may turn into toxic nodules (which secrete thyroxine).

In nuclear scan, you will see hot nodules. And sometimes only one nodule becomes toxic on nuclear scan.

³ sudden onset of severe neck pain, fever, and chills. It usually follows an acute URTI; most often by strep/staph/pneumo cocci or coliforms. Maybe associated with pyriform sinus fistula. Barium swallow is therefore recommended in recurrences.

⁴ thyroid swelling, head and chest pain, fever, palpitations, and weight loss. Some have no pain (silent thyroiditis), in which case the condition must be distinguished from Graves disease.

⁵ **Slightly**, not high like graves disease.

Causes of a solitary thyroid nodule:

- 1- Thyroid cyst.
- 2- Dominant nodule in a multinodular goiter (**most common cause**).
- 3- Degeneration or hemorrhage into a colloid cyst or nodule.
- 4- Benign tumor.
- 5- malignancy.

Malignant tumors of the thyroid:

ESSENTIALS OF DIAGNOSIS :

- 1- **Painless** enlarging nodule (: لما يقول البيشنت عندي ألم أفرح)
- 2- Lymphadenopathy ⇒ specially ipsilateral cervical, high chance of malignancy (specific for, but not sensitive)⁶. **More than 95% of the malignancy conditions don't have lymphadenopathy.** افحصوا اللمف نودز بالاوسكي.
- 3- Hoarseness of voice → **recurrent laryngeal nerve involvement**: malignancy or iatrogenic. (also specific 99%, but not Sensitive) (: لما تشوفون هورسنس هي وحدة من ثنتين يا تيومر يا جراح زار المنطقة)
- 4- Dysphagia (because of the size).
- 5- **Function in malignancy is usually normal!! MCQ** لحد يقول لي بالاختبار تايروتوكسيكوسس
- 6- Investigation: Whenever you see **cold nodule (nuclear)** or nodule **stippled with microcalcifications (U/S)** ⇒ **Suspect malignancy**
- 7- Family history of thyroid cancer.

TYPES OF THYROID CANCER:

Remember: Papillary + Follicular are the differentiated malignant tumors (the cells are well formed), while anaplastic tumors are called undifferentiated malignant tumors.

1. Papillary carcinoma⁷:

| | |
|-------------------|---|
| Occurrence | <ul style="list-style-type: none">- Female:Male ratio ⇒ 3:1 (more common in females).- occurs in young age ⇒ any <20 y/o patient with a single thyroid nodule should be considered as a case of papillary carcinoma until proven otherwise. imp- Most common endocrine cancer is thyroid cancer (and Papillary accounts about 85% of thyroid cancers).- Appears in early adult life (Painless).- Incidence is increases with exposure to radiation & in familial types.- زمان كانوا يعالجون الـacne بالـlow radiation وفيما بعد لاحظوا ان هالاشخاص جاها papillary thyroid carcinoma. |
|-------------------|---|

⁶ Which means that if lymphadenopathy is present → very suggestive for malignancy, but you can't exclude malignancy if it's not present.

⁷ A BRAF mutation is the most common mutation in papillary thyroid cancer and is associated with lymph node metastases and a higher recurrence rate.

| | |
|------------------------------|---|
| Spread and metastases | - Lymphatic spread. Imp Any malignancy in the body with lymph nodes involvement → worse prognosis, EXCEPT papillary, the prognosis doesn't change. - Metastasizes to lung & bone. |
| Management | total thyroidectomy (because it is multifocal) is the optimal surgical procedure. |
| Prognosis | Usually good prognosis. |

2. Follicular carcinoma:

| | |
|------------------------------|--|
| Occurrence | - In 30–50 year age group (later than papillary). - Accounts for about 10% of thyroid cancers. |
| Spread and metastases | - Blood spread. Doesn't spread to lymph. - Metastasizes to lung & bone (functional metastasis, bone and lung starts uptaking iodine and producing thyroxine by themselves). - Hürthle cell carcinoma is a clinical variant of follicular carcinoma. It is more likely to be multifocal and involve lymph nodes. Like follicular carcinoma, it makes thyroglobulin, however it does not usually take up radioiodine. |
| Management | Treatment consists of total thyroidectomy with preservation of the parathyroids. But metastasis should be treated by radionuclear radiation containing iodine isotopes so once the bone metastases uptake it, it'll burn the cells. |
| Prognosis | Not as good as papillary carcinoma. |

3. Medullary carcinoma⁸:

| | |
|-------------------|---|
| Origin | It's solid, containing amyloid, nodular tumor that does not take up radioiodine and secretes calcitonin since Arises from C-Cells in pancreas and adrenals, hence, radioiodine is not good as investigation or treatment in this condition. - Accounts for about 7% of thyroid cancers. - 25% is familial type of medullary carcinoma (Associated with MEN 2a/2b syndrome). most aggressive in MEN2B patients. |
| Management | - It's better to do thyroidectomy and remove surrounding lymphs before it progresses. - Preoperative CT CAP is advised as well as exclusion of pheochromocytoma(MEN2). |
| Prognosis | Prognosis is not good, especially if it's part of MEN ⇒ that's why we screen families. |

4. Undifferentiated (Anaplastic):

⁸ MEN IIa: medullary carcinoma, pheochromocytoma, hyperparathyroidism,
MEN IIb: Medullary carcinoma, pheochromocytoma, mucosal neuromas and marfanoid shape

| | |
|--------------------------------|---|
| Occurrence | - Usually in Elderly. - Accounts for about 1% of thyroid cancers. |
| Features | - Rapidly growing. - Usually evolves from papillary or follicular neoplasm. - Locally invasive → causing compression (dyspnea), and may cause Horner's syndrome (miosis-ptosis-anhidrosis) ⁹ |
| Spread & metastases | Cervical lymphadenopathy and pulmonary metastases are common |
| Management | Both resection and chemotherapy <u>don't show any value</u> , external beam radiation may be value. The idea is to relieve compression. |
| Prognosis | the worst; Rarely cured and recurrence is high. |

5. Lymphoma

| | |
|-------------------|---|
| Occurrence | - More common in our part of the world. - Higher risk in Hashimoto's. - Accounts for about < 5% of thyroid cancers. |
| Diagnosis | Usually diagnosed post-op, but if diagnosed before → send to oncology for treatment. |
| Management | Chemo & radiotherapy. |

Investigations:

1 **Ultrasound** → **1st diagnostic method**.

2- **Fine Needle Aspiration (FNA)** → **most important method**.

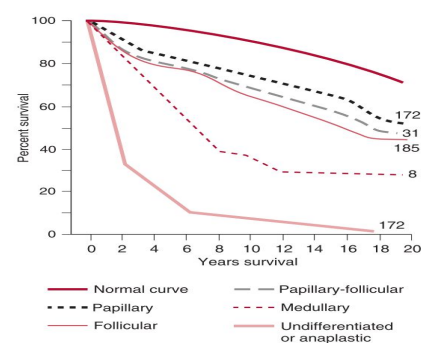
3- **Percutaneous needle biopsy** → **the most cost-effective diagnostic test**.

along with ultrasound, Needle biopsy is not as helpful in patients with a history of irradiation to the neck. Because radiation-induced tumors are often multifocal and a negative biopsy may therefore be unreliable.

4- **Thyroid uptake scan** (basically nuclear medicine).

5- **FNA/Bethesda System** → **the main diagnostic method**. الدكتور قال مش مهم الجدول.

| Diagnostic Category | Risk (%) |
|---|----------|
| Non-diagnostic | 1-4 |
| Benign | 0-3 |
| Atypia of undetermined significance or Follicular lesion of undetermined Significance | 5-15 |
| Follicular Neoplasms or Suspicious for a Follicular Neoplasm | 15-30 |
| Suspicious for Malignancy | 60-75 |
| Malignant | 97 -99 |



▲ Figure 16-2. Survival rates after thyroidectomy for papillary, mixed papillary-follicular, follicular, medullary, and undifferentiated thyroid cancer.

Indications for Thyroidectomy¹⁰

⁹ سندروم تجي بسبب ضرر على السمبائتك ترنك، احفظوها انها ثلاث تضيقات (البؤبؤ، العين و فتحات التعرق)

¹⁰ Surgery is often the preferred treatment, because it's more rapid and has more certain control of the disease than radioiodine.

U CAN SKIP this part, but we always get asked about the indications in OSCE :).

- 1- in the presence of a very large goiter or a multinodular goiter **with** relatively low radioactive iodine uptake.
- 2- if there is a suspicious or malignant thyroid nodule.
- 3- for patients with ophthalmopathy.
- 4- for the treatment of pregnant patients or children.
- 5- for the treatment of women who wish to become pregnant within 1 year after treatment.
- 6- for patients with amiodarone-induced hyperthyroidism.
- 7- compressive symptoms e.g. Dysphagia, dyspnea and/or hoarseness.

Branchial cyst and fistula:

- Swellings lying laterally in the upper neck may be **branchial cysts**. They are thought to be remnants of the second and third branchial arches yet often present in young adults. The cysts contain opaque fluid with cholesterol crystals. Lymphoid tissue is found in their walls. They may become infected and usually require excision.
- Branchial fistula may occur between the skin surface, low in the neck, and the tonsil or lower pharynx internally. Infection often occurs and excision is usually required.

Other cystic swellings:

Cystic hygroma is a rare, benign lymphangioma of the neck, which usually presents in early life. Complete excision is difficult, leading to frequent recurrence.

Dermoid cysts may also occur in the upper neck, usually in the midline or submandibular area, in younger children. They contain skin appendages unlike sebaceous cysts.

Laryngoceles occur as a result of herniation of laryngeal mucosa laterally into the neck. They distend with air during the Valsalva manoeuvre and may become infected. Excision is usually required.

GENERAL CONSIDERATIONS

Thyrotoxicosis: is the clinical condition of presence of high levels of thyroid hormones in Blood by any cause.
Hyperthyroidism: is **over activity** of the thyroid gland, thus it causes thyrotoxicosis.

| Hyperthyroidism | Hypothyroidism |
|---|--|
| <ol style="list-style-type: none">1-GRAVE'S2-Toxic multinodular goiter3-early Hashimoto's4- single toxic nodule (commonly Follicular Adenoma). | <ol style="list-style-type: none">1-Surgical removal of thyroid gland2-Late Hashimoto's |

PARATHYROID SWELLING

Primary Hyperparathyroidism (PHPT):

| | |
|--------------------------------|---|
| Occurrence | <ul style="list-style-type: none"> - 2-3 times more in females than males. - Uncommon in children. - No evidence for geographical variation. |
| Due to & results in | <ul style="list-style-type: none"> - In 90% of patients, primary hyperparathyroidism is due to an adenoma¹¹, in 10% it results from hyperplasia¹², and in less than 1% it results from parathyroid carcinoma. - The most common cause of hypercalcemia. Most common cause of hypercalcemia in hospitals → malignancy. Most common cause in community → primary hyperparathyroidism. MCQ! - (all causes of high Calcium leads to high Phosphate except this condition → causes high Chloride). |
| Clinical presentation | <ul style="list-style-type: none"> - In the west 60-70% detected by routine screening. - Many are asymptomatic. |
| Clinical manifestations | <ol style="list-style-type: none"> 1- Renal stones. Due to hypercalcemia لما يجيك بيشنت ريكنت او بايلاترال ستونز افحص الباراثايرويد 2- Bone loss and joint pain. العظم ينكسر من ابسط ضربة 3- Abdominal groans. 4- Psychic moans.¹³ 5- Fatigue overtones. 6- Moth Eaten appearance of the skull¹⁴. 7- Peptic ulcer <div data-bbox="1136 819 1526 1144" style="text-align: right;"> <p>CLINICAL FEATURES</p> <p>• The signs and symptoms of primary hyperparathyroidism are those of hypercalcemia.</p> </div> |
| Investigations | <ol style="list-style-type: none"> 1- Serum Calcium. 2- PTH. 3- Serum Phosphate. 4- raised Chloride. والله يا شباب هذا سؤال ام سي كيوز حلوه الكلورايد عالي والفوسفيت ناقص مع الهابريبارا 5- Decreased bone density. <p>High Serum Calcium + PTH ⇒ enough to confirm the Dx of 1ry hyperparathyroidism</p> |
| Management | <ul style="list-style-type: none"> - All symptomatic patients should be treated. - The aim is to remove all hyperactive parathyroid tissue. In adenoma → remove the enlarged gland. In hyperplasia → remove 3.5 glands, leave only half a gland for the patient to maintain the function. |

¹¹ In adenoma, usually only 1 parathyroid gland is enlarged.

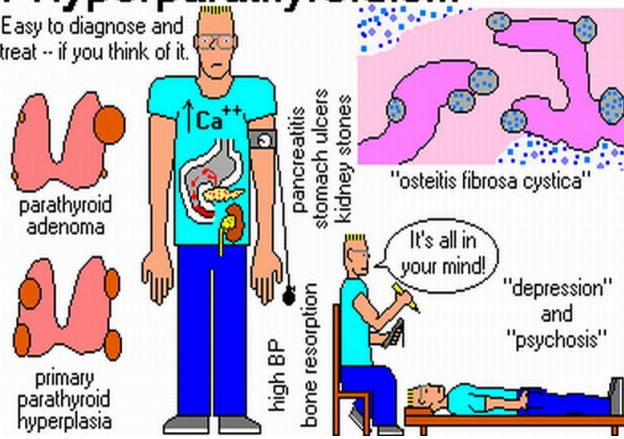
¹² In hyperplasia, all 4 glands are usually affected.

¹³ كانوا يروحون للسايكاتري ويلقون مرضى منومين وسبب تنويمهم كان **increased parathyroid hormone** /:

¹⁴ multiple small endosteal lucent lesions or holes, often with poorly defined margins, with sparing of the cortex.

1° Hyperparathyroidism

Easy to diagnose and treat -- if you think of it.



Thyroglossal cyst:

| | |
|------------------------|--|
| Pathophysiology | The thyroid gland begins its embryological development in the tongue base and as it descends a duct forms and then gets obliterated. A cyst may develop with improper obliteration. |
| Note | If we see a lump, how can we tell if it is a thyroid lump? Ask the patient to swallow. If it doesn't move with swallowing then it is not thyroid disease (could be dermoid cyst, lipoma, lymph Node). If it moves then it is one of two: Thyroid lump "goiter" Thyroglossal cysts. Then you ask the patient to stick his tongue out and if the lump moves then it is a thyroglossal cyst. Because Thyroglossal cysts extend to the tongue. |
| Treatment | surgical excision |
| Pics | |

Recall : THYROID

1. Identify the following structures: 1. Pyramidal lobe 2. Right lobe 3. Isthmus 4. Left lobe

2. Define the arterial blood supply to the thyroid:

- Superior thyroid artery (first branch of the external carotid artery)
- Inferior thyroid artery (branch of the thyrocervical trunk) (IMA artery rare)

3. What is the venous drainage of the thyroid?

- Superior thyroid vein
- Middle thyroid vein
- Inferior thyroid vein

4. Name the lymph node group around the pyramidal thyroid lobe? Delphian lymph node group

5. What is the thyroid isthmus? Midline tissue border between the left and right thyroid lobes

6. Which ligament connects the thyroid to the trachea? Ligament of Berry (remember mazen berry)

7. Which paired nerves must be carefully identified during a thyroidectomy?

Recurrent laryngeal nerves, behind the cricothyroid muscle; damage one causes hoarseness, if bilateral = airway obstruction.

8. What is TRH? Thyrotropin-Releasing Hormone released from the hypothalamus; causes release of TSH **What is it?** Thyroid-Stimulating Hormone released by the anterior pituitary; causes release of thyroid hormones from the thyroid.. **What are they?** T3 (active) and T4 (levothyroxine).

9. What is the differential diagnosis of a thyroid nodule?

Multinodular goiter /Hyperfunctioning adenoma/ Cyst/ thyroiditis/ Carcinoma/lymphoma

10. What are the indications for a scintiscan? 1. Nodule with multiple "nondiagnostic" FNAs with low TSH 2. Nodule with thyrotoxicosis and low TSH

11. In evaluating a thyroid nodule, which of the following suggest thyroid carcinoma: History?

- Neck radiation
- Family history (thyroid cancer, MEN-II)
- Young age
- Male > female

Signs?

- Single nodule
- Cold nodule
- Increased calcitonin levels
- Lymphadenopathy
- Hard, immobile nodule

Symptoms?

- Voice change (vocal cord paralysis)
- Dysphagia
- Discomfort (in neck)
- Rapid enlargement

12. What is the most common cause of thyroid enlargement? Multinodular goiter

13. What are indications for surgery with multinodular goiter? Cosmetic deformity, compressive symptoms, cannot rule out cancer

14. Anaplastic Carcinoma What is it also known as?

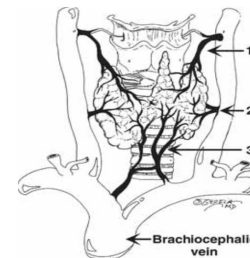
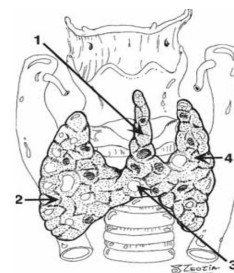
Undifferentiated cancer arising in 75% of previously differentiated thyroid cancers (most commonly, follicular carcinoma)

15. How can the differences between etiologies of ACUTE and SUBACUTE thyroiditis be remembered?

Alphabetically: A before S, B before V (i.e., Acute before Subacute and Bacterial before Viral, and thus: Acute Bacterial and Subacute Viral)

16. What are the common causative bacteria in acute suppurative thyroiditis? Staph and streptococcus

17. What are the two types of chronic thyroiditis? 1. Hashimoto's thyroiditis 2. Riedel's thyroiditis (subacute sometimes)



MCQS

1. A 30-year old female presents with pain in the right forearm. She has a long history of bone aches, heartburn & easy fatigue. She also had a stone removed from her left ureter 5 years ago. Lab tests revealed a serum calcium level of 14.3 mg/dl and a phosphate level of 2.4 mg/dl. Diagnosis:

- A. Hyperthyroidism
- B. Adrenal insufficiency
- C. Hyperparathyroidism
- D. Familial hypocalciuric hypercalcemia

2. The most common pathology of the parathyroid glands is:

- A. Hyperplasia
- B. Adenoma
- C. Carcinoma
- D. None of the above

3. Which of these manifestations indicate advanced hyperparathyroidism?

- A. Renal stones
- B. Bone pain
- C. Fatigue
- D. Abdominal pain

4. Which of the following is NOT true about hyperparathyroidism?

- A. Common in children
- B. Affects females more than males
- C. Many are asymptomatic
- D. All have advanced bone disease

5. Which of the following is true about hyperparathyroidism?

- A. PHP is under diagnosed in Saudi Arabia
- B. Patients are not diagnosed early
- C. It should be suspected in patients with bilateral or recurrent renal stones
- D. All of the above

6. The following are useful in the diagnosis of hyperparathyroidism, except:

- A. High PTH
- B. Low serum phosphate
- C. High serum chloride
- D. High serum phosphate

7. The most common type of thyroid tumors is:

- A. Papillary carcinoma
- B. Follicular carcinoma
- C. Lymphoma
- D. Medullary carcinoma

8. A thyroid tumor arising from C-cells that is related to MEN syndrome is:

- A. Papillary carcinoma
- B. Follicular carcinoma
- C. Lymphoma
- D. Medullary carcinoma

9. Which thyroid cancer is more common in the middle east?

- A. Papillary carcinoma
- B. Follicular carcinoma
- C. Lymphoma
- D. Medullary carcinoma

10. Thyroid lymphomas are:

- A. Usually diagnosed post-operatively
- B. Treated by chemo-radiotherapy
- C. Rarely curable
- D. A & B

11. Papillary carcinomas:

- A. Appear in early adult life
- B. Spread hematogenously
- C. Have a bad prognosis
- D. Are rapidly growing, very aggressive tumors

12. Follicular carcinomas:

- A. Are associated with MEN syndrome
- B. Spread through lymphatics
- C. Have a good
- D. Differentiation between benign & malignant forms is difficult

13. All the following are superficial neck swellings EXCEPT:

- A. Branchial cyst
- B. Sebaceous cyst
- C. Lipoma
- D. Neurofibromatosis

14. The most common midline single neck swelling is:

- A. Pharyngeal pouch
- B. Dermoid cyst
- C. Laryngocele
- D. Thyroglossal cyst

15. The third postoperative day following thyroidectomy a patient c/o tingling of her finger tips and is found to have serum calcium of 1 mmol/l. The next step in treatment should be:

- A. Careful observation until the Calcium level increases
- B. Administration of dihydrotachysterol
- C. Administration of 1,25(OH) 2D (Calcitriol)

D. Administration of calcium gluconate by slow intravenous drip

16. Medullary Thyroid Carcinoma:

- A. Is a tumor of Parafollicular C cells
- B. Produces thyroxine as the principal hormone
- C. Are TSH dependent
- D. T3 act as a tumor marker

17. What is the least likely cause of Hypercalcemia?

- A. Metastatic tumor
- B. Acute pancreatitis
- C. Hyperparathyroidism
- D. Vit. D deficiency

18. The approach to patient with thyroid nodule includes the following except:

- A. Thyroid scan.
- B. Fine needle aspiration.
- C. Ultrasonography.
- D. Calcitonin level.

Answers:

- 1- C
- 2- B
- 3- B
- 4- A
- 5- D
- 6- D
- 7- A
- 8- D
- 9- C
- 10- D
- 11- A
- 12- D
- 13- D
- 14- D
- 15- D
- 16- A
- 17- D
- 18- D