# Common Neck Swellings

**With all courtesy to our colleagues, Raslan and his team, a lot of our work is based on their Manual to Surgery Booklet.**

- **Important**
- Mentioned by doctors but not in slides
- Additional notes from Surgical Recall 6th edition or Raslan's booklet
- Not mentioned by the doctor

## 431 SURGERY TEAM


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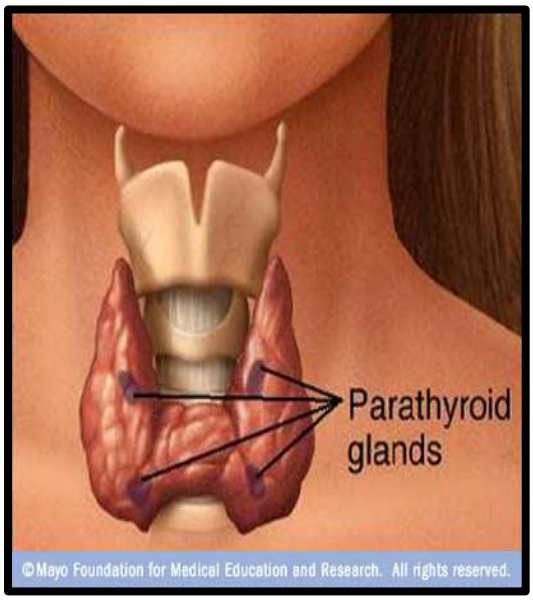
# Primary hyperparathyroidism (Surgical Approach):

There is a problem in diagnosis and management of primary hyperthyroidism in KSA, and in 3rd world countries in general.

## What are parathyroids?



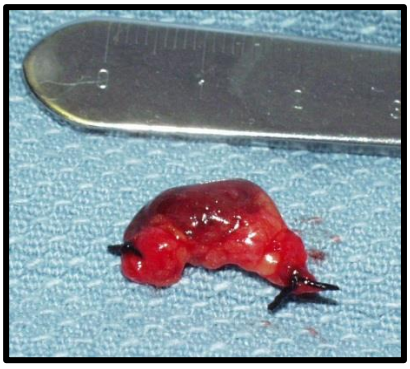

- General characteristics:
  - We have four parathyroid glands in the posterior aspect of the thyroid gland. They are very small corn-size, yellow with brownish and pinkish color glands.
  - Both the superior and the inferior parathyroid glands receive blood supply from the inferior thyroid artery.
- 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 of the Parathyroid:
  - Ca2+ homeostasis: release of Parathormone/Parathyroid hormone (PTH) to raise Ca2+ levels in the blood (PTH is not responsible of the levels of calcium in bones only in the serum). Whenever the serum calcium goes down, immediately PTH will be secreted from the parathyroids to ↑ calcium in the serum.
  - 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.
- Parathermone hormone (PTH) affects three systems:
  1) Direct affect on bones to get the calcium into the serum.
  2) Kidneys (direct + indirect) increase the absorption of the calcium to the serum, indirect effect by vitamin D.
  3) GI to get more absorption of calcium usually by vitamin D.
- Once the level of the calcium in the serum is normal, negative feedback mechanism to the parathyroids.

## Primary Hyperparathyroidism (PHP):

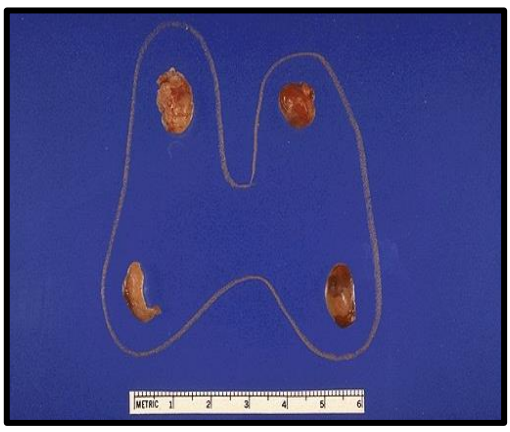
- Hyperparathyroidism: Is an increase secretion of PTH from the parathyroid glands that leads to increase serum calcium, decreased serum phosphate. Hyperparathyroidism can be either primary or secondary.
- If there is a problem with the negative feedback mechanism, i.e. the serum calcium level is normal and the parathyroid is still secreting the PTH ➔ Primary Hyperparathyroidism.

## Causes of primary hyperparathyroidism:

1. Adenoma: most common cause of 1ry hyperparathyroidism is: (84% of cases)
   a. Usually NONE is palpable.
   b. **Affects one gland.**
   - Only one of the 4 parathyroids starts to enlarge and its color start to turn to dark brownish pinkish color, the enlarged parathyroid can go from a corn size to a pigeon egg size, also it is so soft that's why we can't feel it during neck examination. So when we see a patient with a primary hyperparathyroidism and during the examination we felt something in the neck, it is probably a thyroid nodule NOT a parathyroid.



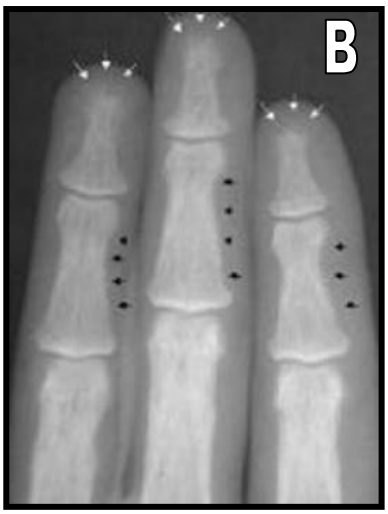
2. Hyperplasia: 15% of cases
   a. Usually NONE palpable
   b. **Usually affects all four glands.**
   - In hyperplasia all of the 4 parathyroids are enlarged but still smaller than the adenoma, so in ultrasound we can usually see the adenoma but the hyperplasia is probably not clear.

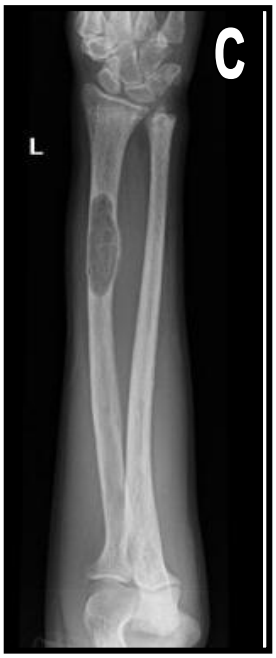


3. Carcinoma: 1% of cases
   a. **Presents with palpable swelling (unlike adenoma and hyperplasia)**
   - (extremely rare) probably you will only see one case of this kind in the next 10 years. In carcinoma cases the symptomatology is more severe and you may feel something while examining the neck because carcinomas are usually hard.

## Clinical Manifestations:

- Mnemonic for symptoms: "Renal stones, painful bones, abdominal groans, psychic moans and fatigue overtones"
- The first logical thing to happen in PHP that the serum calcium will start to increase (during the rise of the serum calcium the patient may not experience any symptoms; it could take several years while the symptoms are gradually appearing).
- Signs and symptoms are related to increased serum Ca2+ which affects multiple organs and systems:
  1. Bone: High levels of PTH activate bone resorption and cause bone matrix depletion. Bone involvement on x-rays can be seen as:
     a. Osteopenia is most common sign of hyperparathyroidism, can be generalized or local. This bone loss that may lead to fractures, bone & joint pain.
     b. Subperiosteal erosion (picture): is an early and virtually pathognomonic sign of hyperparathyroidism.Most commonly in the middle phalanges of the index and middle fingers, primarily on the radial aspect.
     c. Brown tumor (picture): which is only a radiological description and not an actual tumor. A brown tumor is a rare manifestation of hyperparathyroidism. Reparative granulation tissue and active, vascular, proliferating fibrous tissue may replace the normal marrow contents, resulting in a brown tumor. Hemosiderin imparts the brown color (hence the name of the lesions)
     d. Cyst formation.




- Since the extra serum calcium is coming from the bones, with time calcium levels will decrease in bones till the patient

develops osteoporosis. The symptoms will start with mild ostealgia (bone pain) and arthralgia (joint pain) and then could progress to pathologic fractures.

2. Kidney: stones and glomerular calcification. Large amounts of calcium in the blood will be secreted in the kidney, which will lead to stone formation, also in result of the deposition of calcium in the glomeruli ➔ calcinosis in the kidneys.
3. Abdomen: abdominal pains where some patients may develop peptic ulcer disease, pancreatitis. The high levels of calcium can also affect the abdomen and cause abdominal pain by two methods: 1) it can cause repeated attacks of pancreatitis, the exact mechanism is not clear. 2) It also can cause peptic ulcer disease ( ↑ calcium ➔ ↑ acids ➔ peptic ulcer disease)
4. Neuropsychiatric symptoms: depression, mood changes. The gradual increase of the calcium in the blood will affect the brain, that's why patients with primary hyperparathyroidism in the first years they usually complain of loss of energy, slight depression and mild mood disturbances. These brain symptoms may last and progress to the extreme. When PHP was first discovered about 100 years ago in the states, doctors went to some of the psychiatric hospitals and they found after investigations that some patients who were labeled as psychotic they only had primary hyperparathyroidism which caused the brain manifestations, they treated them and they were fine.
5. General symptoms: Fatigue
6. The symptoms range from: No symptoms → mild, general symptoms like fatigue and depression→renal symptoms →bone symptoms. At the start of PHP the only problem is hypercalcemia (no symptoms), then the mild symptoms will start for several years, and then other significant manifestations.

## Epidemiology:

- Statistics from Western countries indicate a 0.1-0.5% prevalence rate for PHP.
- No evidence for geographical variation.
- 1200- 6000 cases were expected in Aseer area alone, but when Prof.Shehri investigated the prevalence of cases, they only found 30!
- Uncommon in children.
- 2-3 times in females.

## Clinical presentation:

- In the west:
  - 60 - 70% detected by routine screening.
  - Many are asymptomatic
- In KSA:
  - Age 30 – 77 (**median 40**).
  - Majority are Females.
  - All have advanced bone disease.
  - 54% have also renal manifestations.
- In western countries 70% of the cases are diagnosed while they are asymptomatic (just hypercalcemia) and 90% of the cases are diagnosed while they are still asymptomatic or with mild symptoms (slight mood changes, loss of energy), while in KSA and 3rd world countries there are almost no cases diagnosed before the appearing of the symptoms or with only mild symptoms. Unfortunately most of the diagnosed cases in the 3rd world countries are because the formation of renal stones and bone symptomatology.

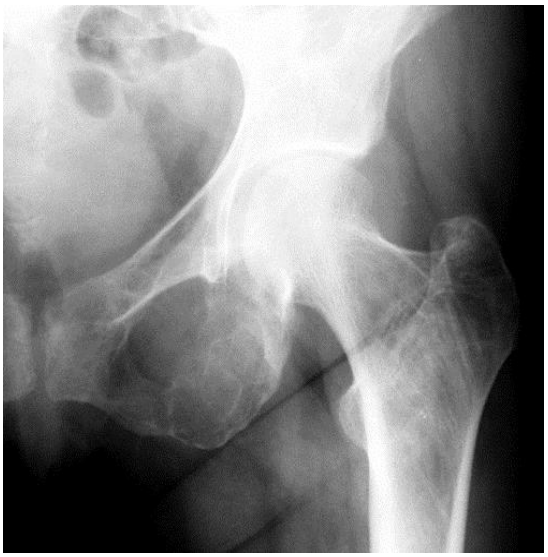
## Cases from the doctor:

- Case 1: 40 year old lady that presented with left humerus fracture, past medical history is significant of left ureteric stone removed 6 years ago, right ureteric stone removed 3 years ago and a non-functional left kidney. Serum Ca2+ was 11.2 mg/dl (normal 10.4mg/dl) and PO4 2.2mg/dl (normal 3.0 - 4.5 mg/dL). Bone symptoms, kidney symptoms (failure and colic), high calcium and low phosphorus. Almost the only disease that can cause HYPERcalcemia and HYPOphosphatemia together is PHP. Other diseases which cause HYPERcalcemia usually cause HYPERphosphatemia also.
- Case 2: 30 year old lady that presented with right radius fracture (caused by falling), long history of generalized bone ache, heart burn, easy fatigability. Past medical history is significant of left ureteric stone removed 5 years ago. Serum Ca2+ was 14.3 mg/dl and po4 2.4 mg/dl. Bone, GI and renal symptoms present, and high calcium and low phosphorus.
- Case 3: 45 y old lady with ESRF and advanced bone disease (usually patients with renal failure has secondary

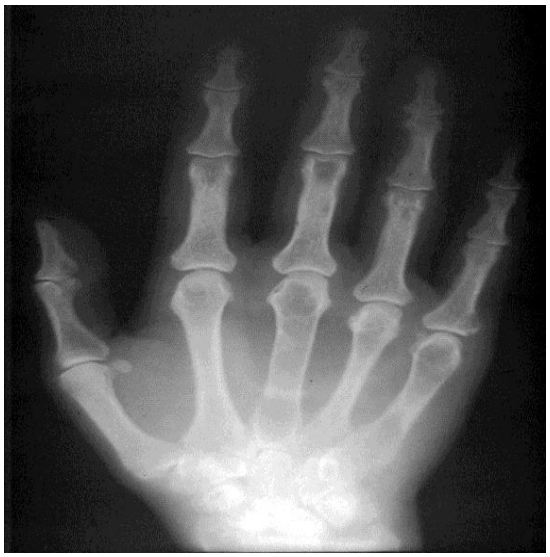
hyperparathyroidism because of low calcium and phosphate and can transform to tertiary hyperparathyroidism) , But in this patient with history it turns that she has primary hyperthyroidism because of adenoma and for many years she had recurrent renal stones until she reached ESRF!.

## Investigations:

- ↑ Serum Ca2+
- ↑ PTH
- MOST important: ↑Serum calcium + ↑PTH (both serum calcium and PTH should be done at the same time) = PHP
- ↓ Serum phosphate
- ↑ Chloride
- Important: slightly decrease in the serum phosphate and slightly increase in chloride
- PTH effects on kidney leads to Ca retention.
- Imaging X-Ray: Hand X-Ray you may see brown tumors.
- Other imaging: U/S can show you Adenoma , CT can sometimes show adenoma but not always , Last thing is nuclear scan "Sestamibi Scan".



Brown tumor in the inferior obturator ramus.



There is a well defined lytic lesion of the middle metacarpal with some expansion. There is a more subtle, less expanded lesion of the fifth metacarpal. The phalanges are asymmetrical with some bone loss on the radial side. There is acro-osteolysis. The poor visibility of the terminal phalangeal tufts is not all due to present image quality. The view does not show the sub-cortical bone resorption and other views will be added later.

## Management

- All symptomatic patients should be treated, even if it was just neurological (mood changes) or mild arthralgia. The treatment is surgical. A) Adenoma"only one parathyroid is enlarged": surgical removal. B) Hyperplasia "all the 4 parathyroids are enlarged": remove 3 and half parathyroid glands (subtotal parathyroidectomy)
- Asymptomatic patients:

  The treatment of patients with asymptomatic primary hyperparathyroidism remains controversial. The most reasonable approach: patients with no symptoms at all ➔ just observe except in two conditions: 1) if serum calcium is really high (surgery is recommended). 2) if we do a spectrography for the bones and the density is really affected (surgery is recommended)
- Postoperative management: Be careful of bone hunger syndrome which might cause tetany.

## 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)
- Commonest cause of hypercalciema in the hospital ➔ malignancy
- Commonest cause of hypercalciema in the society ➔ PHP

## Conclusions & Recommendations:

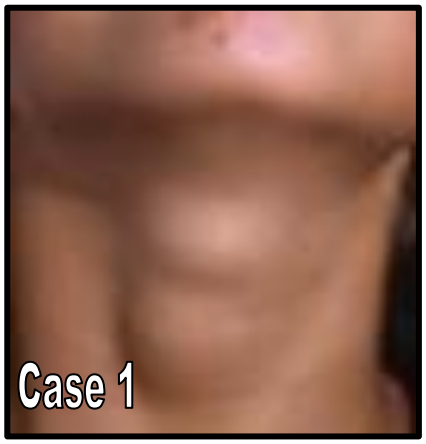
- PHP is a very under diagnosed disease in Saudi Arabia.
- Patients are not diagnosed early
- Complications could be serious and these are avoidable.
- The medical community needs to be more aware of the disease.
- Specifically the diagnosis should be considered in patients with: bilateral or recurrent renal stones, patients with suggestive

radiological bone changes and naturally in patients with high serum calcium level.

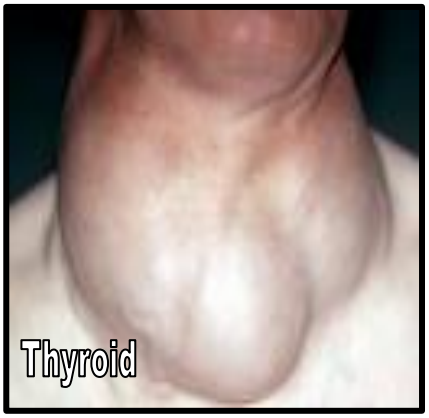
# Thyroid diseases:

## General Considerations:

- Thyroid diseases are more common. Usually students mix between the swelling and the function (i.e. when there is a tumor, students mix between goiter and thyrotoxicosis) but they are different.
- Q: Thyrotoxicosis vs. Hyperthyroidism?
  A: Thyrotoxicosis is the clinical condition of presence of high levels of thyroid hormones in the Blood.
  B: Hyperthyroidism is over activity of the thyroid gland, thus it causes thyrotoxicosis
- Thyroid disease can present as:
  - Lump "goiter"
  - Change in function (hypo or hyper)




**Case 1:** 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.

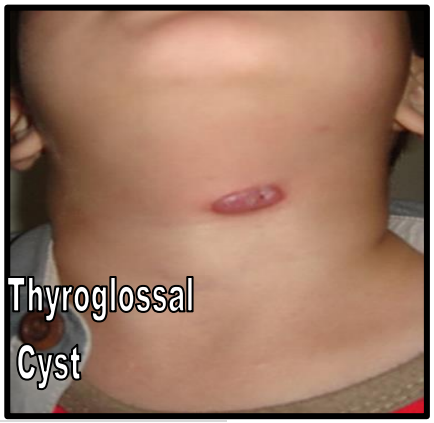



Q: **What could this be? Is it a thyroid swelling**

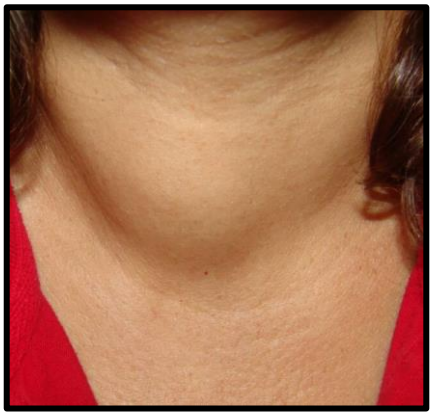
A: **First:** Ask the patient to swallow.

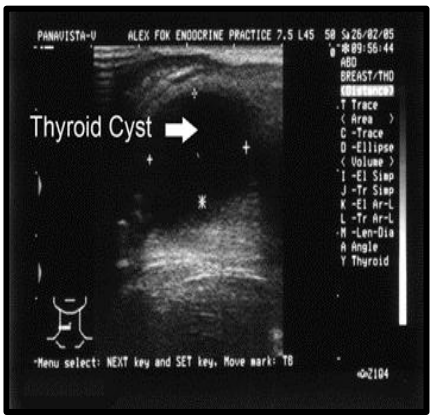
1. If it doesn't move with swallowing then it is not thyroid disease (could be dermoid cyst, lipoma, lymph node).
2. If it moves with swallowing then it is one of two:
   - Thyroid lump "goiter"
   - Thryroglossal cysts

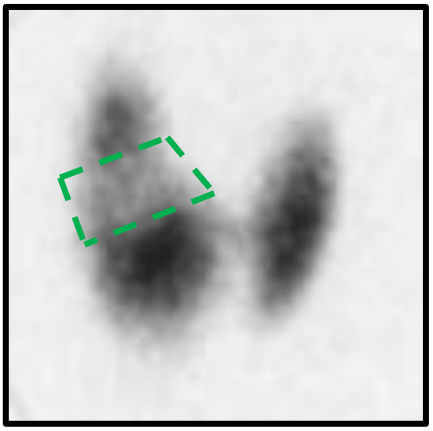
**Second:** Ask the patient to protrude her tongue out and if the lump moves ➔ it is a thyroglossal cyst.
(Thyroglossal cysts are attached to the tongue ➔ will move upwards with protrusion of the tongue)



Q: **If it was a thyroid swelling, what could be the cause of this swelling?**





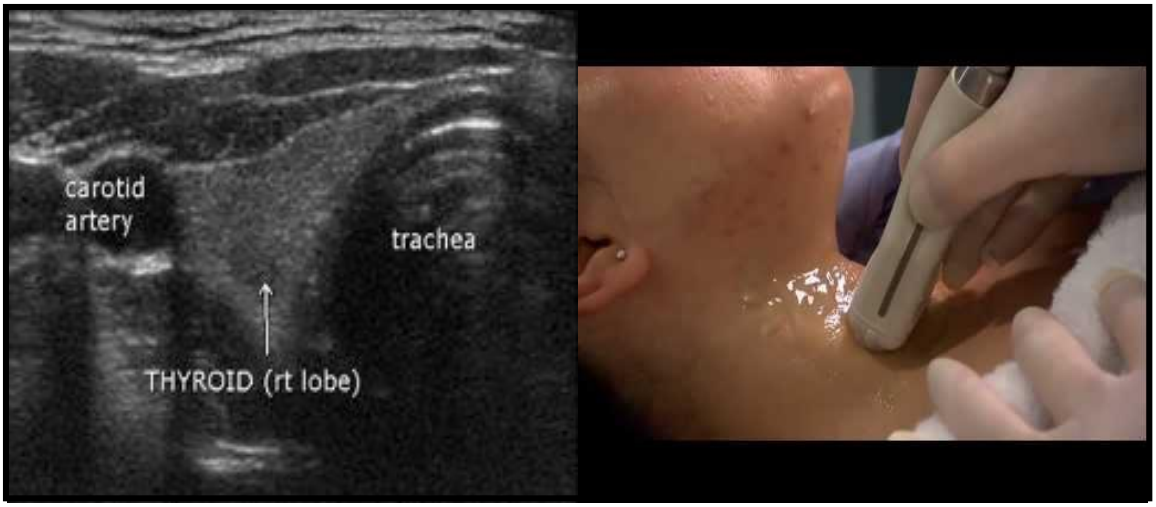



The cause could be one of the following:

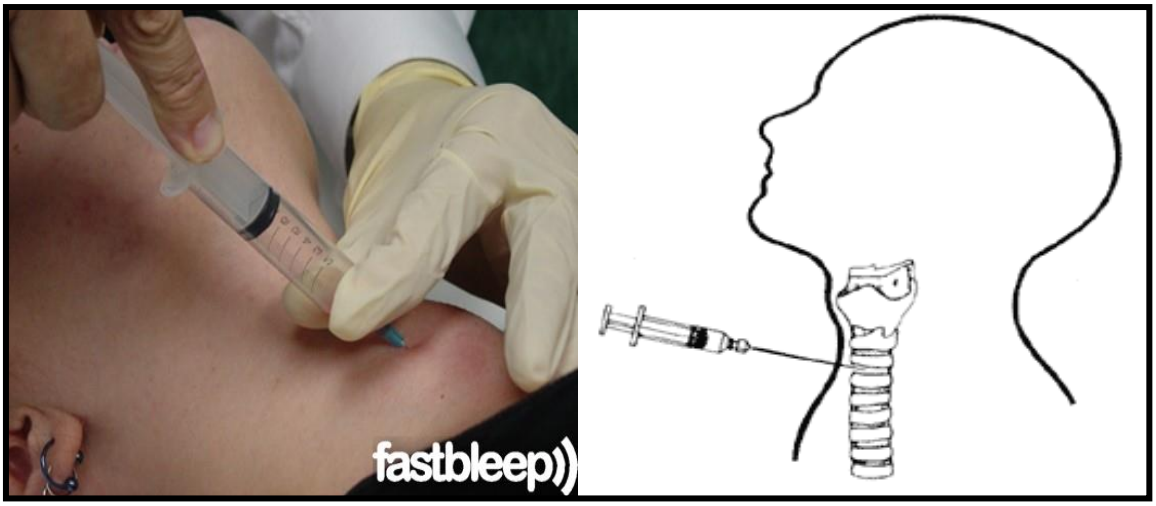
1. Thyroid cysts:
   a. Benign. b. Diagnosed by U/S and FNA.
   c. Treated by aspirating the cyst.
   d. If it reoccurs up to two times aspirate it again but in the 3rd time surgery should be done.
2. Multinodular goiter (Simple goiter):
   a) Can present as:
      - Incidentally
      - With or without symptoms of hyper or hypothyroidism
      - Local compression causing dysphagia, dyspnea, stridor, plethora or hoarseness
      - Solid
   b) Diagnosed by US, FNA and then nuclear scan
      - Warm scan is normal like the lobe on the right side of the picture
      - Hot: abnormal
      - Cold (circled area): abnormal. And it means that area is not up taking iodine hence it is no longer thyroid tissue, indicative of malignancies in 15% of patients.
3. Inflammatory (thyroiditis):
   a) Acute:is extremely rare especially biogenic (bacterial) inflammation.
   b) Sub-acute: is rare.
   c) Chronic (Hashimoto's thyroiditis): most common. The presentation of Hashimoto's thyroiditis is usually mixed with simple goiter (swelling, painless, no signs of inflammation like redness). Usually presents with hypothyroidism. Diagnosis by serological markers, on biopsy lymphocytes, monocytes, etc.
4. Benign tumor: Follicular adenoma.
5. Malignant tumor.
6. Physiological goiter (simple swelling, diffuse in the thyroid as a result of puberty or pregnancy)

Q: **What points in history, in clinical examination, and investigation will help you to differentiate between all these causes of thyroid swelling?**

A. Ultrasound: Will help to differentiate if it is a cyst or a nodule, if the whole thyroid is enlarged or just a lobe. If there is a specific enlarged nodule was seen in ultrasound, then we can treat by taking a FNA.



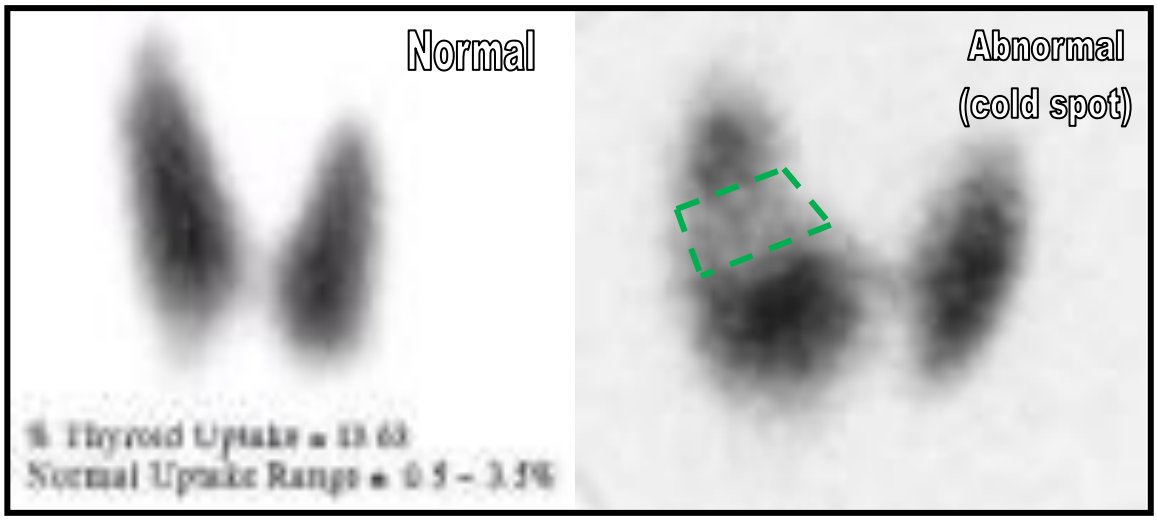

B. Fine needle aspiration (FNA): We can make sure if the swelling is caused by a thyroid cyst or not, if it was a thyroid cyst we will be able to aspirate the swelling completely and patient will be cured. If the cyst is recurring more than three times, it should be removed surgically because thyroid cysts are 97% benign and 3% malignant.




C. Nuclear scan:

- When we give radioactive iodine it will go to the thyroid because of the iodine and we will be able to see it in the nuclear scan.

- A healthy thyroid we will take the iodine equally.
- Nodules exhibiting increased iodine uptake (appears dark) ➔ "hot spots".
- Nodules that take up little or no iodine (appears light or white) ➔ "cold spots".
- Cold spots are more dangerous than hot spots, because 15% - 20% of the cold spots are malignant, while a patient with thyrotoxicosis (benign) is more associated with hot spots.




**Case 2:** Ahmed ( age 28 years) 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 thyroxin).
    - In nuclear scan, you will see hot nodules. And sometimes only one nodule become toxic ➔ on nuclear scan the

nodule will appear black "hot spot" while the rest of thyroid will appear WHITE, because the rest of the thyroid is normal and when the toxic nodule is secreting a lot(appears black)➔ normal part will compensate by not secreting (appears white).

3. Toxic nodule.

**Hyperthyroidism Signs & Symptoms** (Read more about the manifestations of hyperthyroidism):

1. Nervousness.
2. Weight loss with increased appetite.
3. Heat intolerance.
4. Sweating.
5. Muscular weakness.
6. Menstrual irregularities.
7. Goiter.
8. Tachycardia +/-Arrhythmias. (especially in elderly where they may present with atrial fibrillation)
9. Warm moist skin.
10. Bruit & thrill.
11. Eye signs.
12. Systolic Bruit & thrill (a bruit maybe heard when applying the stethoscope on the swelling. If in auscultation you heard a bruit in the thyroid ➔ grave's disease

**Laboratory:**

- **Increases T4, T3**
- **Decreased TSH** (due to inhibition by high levels of T4 and T3)
- Changes in T4 levels are slow while changes in TSH levels are fast (sensitive). That's why the first hormone to change in thyrotoxicosis is TSH.

**Management:**

1. Medical
2. Radio-nuclear iodine: The iodine used in the treatment is different than the iodine used in the nuclear scan.
   Disadvantages: 1) It takes weeks to treat.
   2) The injected iodine will stay forever ➔ 100% of the patients will eventually have HYPOthyroidism.

3) Minor radiation (pregnancy).

For these reasons surgery is recommended in young patients

3. Surgery

**Case 3:** Aisha is a 55-year old lady that presented to your clinic. Her main complaint is related to some recent difficulty in hearing. The family noticed that she started to have difficulty in understanding, that she gained weight, and her voice started to be coarse. ➔ Hypothyroidism

**Laboratory (How to diagnose?):**

- Decreases T4, T3
- Increased TSH

**Causes of Hypothyroidism:**

- 1st most common → hashimoto's thyroditis.
- 2nd most common → post-surgery.

**Examination:**

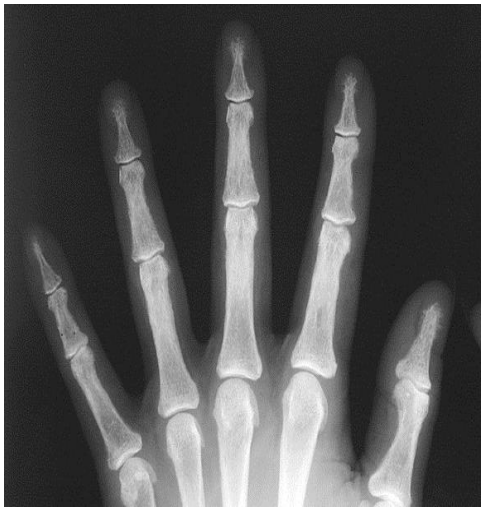
- A suspected thyroid nodule should be treated as a lump anywhere in the body, but the fluctuation test cannot be done due to the presence of pretracheal fascia which fixes the thyroid in position.
- Ultrasound and FNA (Fine Needle Aspiration) are used to differentiate between different conditions. In the thyroid gland, usually what feels like cyst turns out to be solid and what feels solid turns out to be a cyst.
- Other Important examination points for the thyroid gland:
  A. Neurological Examination: Reflexes are brisk and exaggerated in hyperthyroidism, Reflexes are delayed in hypothyroidism.
  B. Eye Examination: There are three
     1) Exophthalmos: the eye ball is pushed forwards by the increase in retro-orbital fat, edema, and cellular infiltration.
     2) Lid lag (ask the patient to look down and follow your finger or a pen and you will see his eye lid moving slower than his cornea).
     3) Lid retraction
  C. Hand: Moist, sweaty, pulse is high in hyperthyroidism

Toxic Goiter:
A goiter that is associated with hyperthyroidism is described as a toxic goiter. Examples of toxic goiters include diffuse toxic goiter (Graves's disease), toxic multinodular goiter, and toxic adenoma (Plummer disease). Nontoxic goiter: A goiter without hyperthyroidism or hypothyroidism is described as a nontoxic goiter. It may be diffuse or multinodular.

**Thyroid cancer:**

- Thyroid cancers are usually non-functional, meaning they do not produce symptoms.
- Cancers can appear as solitary nodules or diffusely enlarged glands.
- A young patient " younger than 20" with a single thyroid nodule should be considered as a case of thyroid cancer (papillary carcinoma is the most common) until proven otherwise.
- Lymphatic spread of the cancer does not affect the prognosis.

| Thyroid cancer | | | | |
|---|---|---|---|---|
| Papillary carcinoma | Follicular carcinoma | Medullary carcinoma | Undifferntiated | Lymphoma |
| - Accounts for 85%.<br>- Appears in early adult life.<br>- Lymphatic spread.<br>- Good prognosis, 5 year survival is <95%.<br>- Overall most common endocrine cancer. | - Accounts for about 10%.<br>- Differentiation between benign and malignant is not easy.<br>- Blood spread.<br>- Prognosis not as good.<br>- Doesn't spread to lymph but spreads to bone and blood. | - Accounts for about 7%.<br>- Arises from C-Cells.<br>- C-cells secrete calcitonin.<br>- Familial medullary carcinoma accounts for 25% of medullary carcinomas the other 75% are sporadic.<br>- Associated with MEN IIa/IIb syndrome (multiple endocrine neoplasia)<br>- 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.<br>- Produces amyloid. | - Accounts for about 1%.<br>- Rapidly growing.<br>- Locally invasive.<br>- Rarely curative.<br>- Usually in old patients. | - More common in our part of the world.<br>- Usually diagnosed post op.<br>- Treated by Chemo/radiotherapy. |



Subperiosteal resorption as well as acroosteolysis.

**Recommendations:**

- Hyperparathyroidism should be included in undergraduate curriculum and certainly in residency programs.
- Developing expertise in parathyroid surgery is required.

**Websites recommended by Prof. Al-Shehri**

- ✓ http://www.powershow.com/view/f7c3a-NzFhY/NECK_SWELLINGS_powerpoint_ppt_presentation
- ✓ http://www.youtube.com/user/ParathyroidTV?v=sD9st1ZPFrQ

# MCQs

1. **A 30-year old female presents with pain in the right forearm. She has a long history of bone aches, heart burn & 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

C

2. **The most common pathology of the parathyroid glands is:**
    a. Hyperplasia
    b. Adenoma
    c. Carcinoma
    d. None of the above

B

3. **Which of these manifestations indicate advanced hyperparathyroidism?**
    a. Renal stones
    b. Bone pain
    c. Fatigue
    d. Abdominal pain

B

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

D

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

D

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

D

7. **The most common type of thyroid tumors is:**
    a. Papillary carcinoma
    b. Follicular carcinoma
    c. Lymphoma
    d. Medullary carcinoma

A

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

D

9. **Which thyroid cancer is more common in the middle east?**
    a. Papillary carcinoma
    b. Follicular carcinoma
    c. Lymphoma
    d. Medullary carcinoma

C

10. **Thyroid lymphomas are:**
    a. Usually diagnosed post-operatively
    b. Treated by chemo-radiotherapy
    c. Rarely curable
    d. A & b

D

11. **Papillary carcinomas:**

a. Appear in early adult life
b. Spread hematogenously
c. Have a bad prognosis
d. Are rapidly growing, very aggressive tumors

A

**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

D

**13. What is the least likely cause of hypercalcemia:**

a. Metastatic cancer.
b. Sarcoidosis.
c. Acute pancreatitis.
d. Vit.D deficiency

C

**14. All the following are superficial neck swellings EXCEPT:**

a. Branchial cyst
b. Sebaceous cyst
c. Lipoma
d. Neurofibromatosis

D

**15. The most common midline single neck swelling is:**

a. Pharyngeal pouch
b. Dermoid cyst
c. Laryngocele
d. Thyroglossal cyst

D

**16. All the followings are true EXCEPT:**

a. The most common cause of primary hyperparathyroidism is adenoma
b. Thyroid malignant lymphoma should be treated surgically
c. Stensen's duct opens opposite to the second upper molar tooth
d. Recurrent laryngeal nerve injury during thyroidectomy can be permanent

B

**17. The approach to patient with thyroid nodule includes :**

a. Thyroid scan.
b. Fine needle aspiration.
c. Ultrasonography.
d. TSH T4 T3.

B

# Surgical Recall 6th edition

**Name three types of nonthyroidal neck masses ?**

1. Inflammatory lesions (e.g., abscess, lymphadenitis)
2. Congenital lesions (i.e., thyroglossal duct [midline], branchial cleft cyst [lateral])
3. Malignant lesions: lymphoma, metastases, squamous cell carcinoma

**What studies can be used to evaluate a thyroid nodule?**

U/S—solid or cystic nodule
Fine Needle Aspirate (FNA) S cytology
123I scintiscan—hot or cold nodule

**What is the DIAGNOSTIC test of choice for thyroid nodule?**

FNA

**In evaluating a thyroid nodule, which of the following suggest thyroid carcinoma:**

**History?**

1. Neck radiation
2. Family history (thyroid cancer, MEN-II)
3. Young age (especially children)
4. Male _ female

**Signs?**

1. Single nodule
2. Cold nodule
3. Increased calcitonin levels
4. Lymphadenopathy
5. Hard, immobile nodule

**Symptoms?**

1. Voice change (vocal cord paralysis)
2. Dysphagia
3. Discomfort (in neck)
4. Rapid enlargement

**What are indications for surgery with multinodular goiter?**

Cosmetic deformity, compressive symptoms, cannot rule out cancer

**What is Plummer's disease?**

Toxic multinodular goiter

**Name the FIVE main types of thyroid carcinoma and their relative percentages ?**

1. Papillary carcinoma: 80% (Popular _ Papillary)
2. Follicular carcinoma: 10%
3. Medullary carcinoma: 5%
4. Hürthle cell carcinoma: 4%
5. Anaplastic/undifferentiated carcinoma: 1% to 2%

**What are the "P's" of PAPILLARY thyroid cancer (7)?**

**P**apillary cancer:

**P**opular (most common)

**P**sammoma bodies

**P**alpable lymph nodes (spreads mostcommonly by lymphatics, seen in_33% of patients)

**P**ositive 131I uptake

**P**ositive prognosis

**P**ostoperative 131I scan to diagnose/treat metastases

**P**ulmonary metastases

**What is a "lateral aberrant thyroid" in papillary cancer?**

Misnomer—it is metastatic papillary carcinoma to a lymph node

## FOLLICULAR ADENOCARCINOMA

**Describe the nodule consistency?**

Rubbery, encapsulated

**What histologic findings define malignancy in follicular cancer?**

Capsular or blood vessel invasion

**What is the most common site of distant metastasis?**

Bone

**What are the 4 "F's" of follicular cancer?**

**F**ollicular cancer:

**F**ar-away metastasis (spreads hematogenously)

**F**emale (3 to 1 ratio)

**F**NA . . . NOT (FNA CANNOT diagnose cancer)

**F**avorable prognosis

## MEDULLARY CARCINOMA

**With what other conditions is it associated?**

MEN type II; autosomal-dominant genetic transmission

**Histology?**

Amyloid (a**M**yloid _ **M**edullary)

**What does it secrete?**

Calcitonin (tumor marker)

**What is the appropriate stimulation test?**

Pentagastrin (causes an increase in calcitonin)

**Describe the route of spread ?**

Lymphatic and hematogenous distant metastasis

**How is the diagnosis made?**

FNA

**What are the "M's" of medullary carcinoma?**

**M**edullary cancer:

**M**EN II

a**M**yloid

**M**edian lymph node dissection

**M**odified neck dissection if lateral nodes are positive

## BENIGN THYROID DISEASE

### GRAVES :

**What specific physical finding is associated with Graves'?**

Exophthalmos

**Name treatment option modalities for Graves' disease ?**

**1. Medical blockade:** iodide, propranolol, propylthiouracil (PTU), methimazole, Lugol's solution (potassium iodide)

**2. Radioiodide ablation:** most popular therapy

**3. Surgical resection** (bilateral subtotal thyroidectomy)

**What are the possible indications for surgical resection?**

Suspicious nodule; if patient is noncompliant or refractory to medicines, pregnant, a child, or if patient refuses radioiodide therapy

**How does PTU work?**

1. Inhibits incorporation of iodine into T4/T3 (by blocking peroxidase oxidation of iodide to iodine)
2. Inhibits peripheral conversion of T4 to T3

**How does methimazole work?**

Inhibits incorporation of iodine into T4/T3 only (by blocking peroxidase oxidation of iodide to iodine)

## THYROIDITIS

**What is the treatment of ACUTE thyroiditis?**

Antibiotics, drainage of abscess, needle aspiration for culture; most patients need definitive surgery later to remove the fistula

## HASHIMOTO'S

**What are the features of Hashimoto's (chronic) thyroiditis?**

Firm and rubbery gland, 95% in women, lymphocyte invasion

**What lab tests should be performed to diagnose Hashimoto's disease?**

Antithyroglobulin and microsomal antibodies

**What is the medical treatment for Hashimoto's thyroiditis?**

Thyroid hormone replacement if hypothyroid (surgery is reserved for compressive symptoms and/or if cancer needs to be ruled out)

## PARATHYROID

**What are the etiologies of primary HPTH and percentages?**

Adenoma (_85%)

Hyperplasia (_10%)

Carcinoma (_1%)

**What is the "33 to 1" rule?**

Most patients with primary HPTH have a ratio of serum (Cl_) to phosphate _33

**What plain x-ray findings are classic for HPTH?**

Subperiosteal bone resorption (usually in hand digits; said to be "pathognomonic" for HPTH!)

**How many of the glands are USUALLY affected by the following conditions:**

**Hyperplasia?** 4

**Adenoma?** 1

**Carcinoma?** 1

**What is the initial medical treatment of hypercalcemia (1_ HPTH)?**

Medical—IV fluids, furosemide—NOT thiazide diuretics

**What is the definitive treatment of HPTH in the following cases:**

**Primary HPTH resulting from HYPERPLASIA?**

Neck exploration removing all parathyroid glands and leaving at least 30 mg of parathyroid tissue placed in the forearm muscles (nondominant arm, of course!)

**Primary HPTH resulting from parathyroid ADENOMA?**

Surgically remove adenoma (send for frozen section) and biopsy all abnormally enlarged parathyroid glands (some experts biopsy all glands)

**Primary HPTH resulting from parathyroid CARCINOMA?**

Remove carcinoma, ipsilateral thyroid lobe, and all enlarged lymph nodes (modified radical neck dissection for LN metastases)

### Secondary HPTH?

Correct calcium and phosphate; perform
renal transplantation (no role for
parathyroid surgery)

**What is the most likely diagnosis if a patient has a PALPABLE neck mass, hypercalcemia, and elevated PTH?**

Parathyroid carcinoma (vast majority of other causes of primary HPTH have nonpalpable parathyroids)