Primary hyperparathyroidism and other common neck swellings

429 surgery team

Parathyroid gland

General characteristics

- We have four parathyroid glands in the posterior aspect of the thy thyroid gland
- Both of them receive blood supply from the inferior thyroid artery
- Embryologically
  - the upper parathyroid glands originate from the 4th pharyngeal pouch
  - The lower parathyroid glands originate from the 3rd pharyngeal pouch
- Physiologically they deal with
  - Ca+ homeostasis : release of parathormone increases Ca+ levels in the blood
  - Vitamin D regulation
  - Calcitonin which is released from the c-cells of the *thyroid* gland decrease Ca+ levels

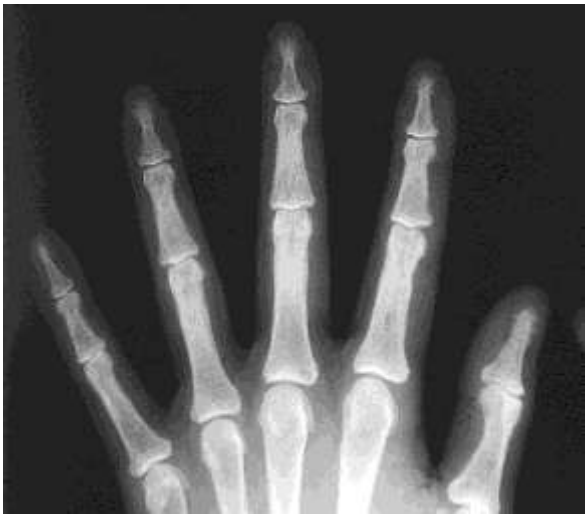
Hyperparathyroidism

- Primary and secondary
  - Primary is more common and is due to increase secretion from the gland due to hyperplasia, adenoma or carcinoma
  - Secondary is due to chronic kidney disease or vit D metabolism disorders
- Serum levels of PTH are increased along with Ca+ (because PTH increases Ca+ levels)
- It is the most common cause of hypercalcaemia in the society IMP!
  - The most common cause of hypercalcaemia in the hospital is malignancy IMP!
- Epidemiology:
  - Statistics from Western countries indicate a 0.1-0.5% prevalence rate for PHP.
  - No evidence for geographical variation
  - 1200- 6000 cases are expected in Aseer area , but when the prof did the research they only got 30 cases !
  - Uncommon in children
  - 2-3 times in females
- The most common cause of 1ry hyperparathyroidism is:
  - Adenoma
    - 84% of cases
    - usually NON palpable
    - Affects one gland IMP!
  - Hyperplasia
    - 15% of cases
    - usually NON palpable
    - Usually affects all four glands IMP!

- Carcinoma
  - 1% of cases
  - Presents with palpable swelling (unlike adenoma and hyperplasia) IMP!
- So if we have increase in calcium and PTH in the blood + neck lump it is one of two things:
  - Carcinoma of the parathyroid gland
  - Thyroid lump and the PTH and Ca+ is not related to it

Signs and symptoms:

- Signs and symptoms are related to Increased serum Ca+
- Bone: bone loss sometimes leads to fractures , bone& joint pain:
  - Due to high levels of PTH which activates bone resorption and bone matrix depletion (PTH removes calcium from bones)
  - Causes lesions like “brown tumor” which is only a radiological description and not an actual tumour
  - Hand lesions:
    - Resorption: specially on the radial side of the bone, periosteal erosion.
    - Cysts
    - Distally the bone begins to disappear



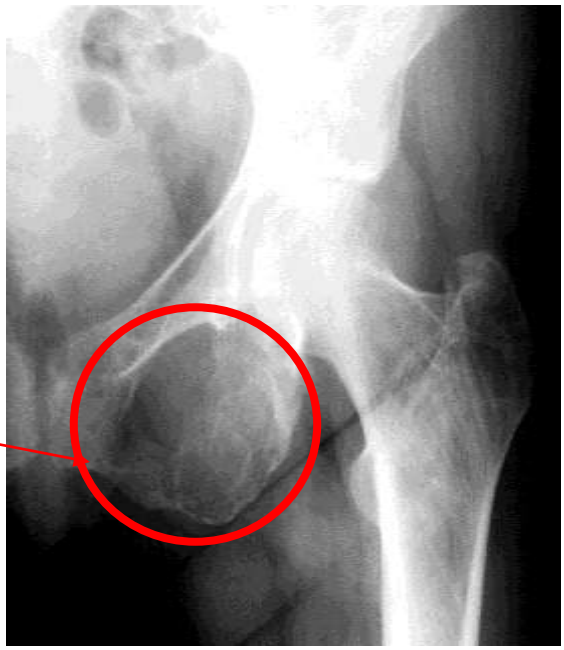
- Kidney: kidney stones and glomerular calcification
- Abdomen: peptic ulcer disease & pancreatitis (remember the pancreatitis lecture)
- Brain: psychiatric symptoms like depression, mood changes
- General symptoms: Fatigue
- “Almost all patients in KSA present with bone symptoms”
- The symptoms range from: No symptoms > Mild symptoms > Renal symptoms > Bone symptoms

Presentation:

- In the west
  - 60 - 70% detected by routine screening.
  - Many are asymptomatic
- In KSA:
  - Age 30 – 77 (median 40)
  - Females 70 %
  - All have advanced bone disease.
  - 54% have also renal manifestations.
- Cases from the doctor:
  - 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 Ca+ 11.2 mg/dl and Po4 2.2mg/dl
    - Bone symptoms, kidney symptoms (failure and colic), high calcium and low phosphorus
  - 30 year old lady that presented with long history of generalized bone ache, heart burn, easy fatigability and right humeral fracture, past medical history is significant of left ureteric stone. Serum Ca+ 14.3 mg/dl and po4 2.4 mg/dl
    - Bone, GI and renal symptoms, High calcium and low phosphorus

- 45 y old lady ESRF, Advanced bone disease (usually pt with renal failure has secondary hyperparathyroidism b/c of low calcium and phosphate and can transform to tertiary hyperparathyroidism) , But in this pt with Hx it turns that she has primary hyperthyroidism b/c of adenoma and for many years she had recurrent renal stones until she reached ESRF!

- Investigations
  - Serum calcium ↑
  - PTH ↑, if u have high Ca & PTH u Dx the 1ry Hyperpatahyroidms :)
  - Phosphorus ↓, almost 1ry Hyperpatahyroidms is only Dz that has high Ca low phosphorus.
  - Chloride ↑, PTH effects on kidney leads to secrete hco3 and retain Cl.
  - Imaging X-Ray
    - Brown tumour
    - Hand X-Ray V.IMP!!



  - U/S can show u Adenoma , CT can sometimes show adenoma but not always , Last thing is nuclear scan " Sestamibi Scan"

Management:

- All symptomatic patients should be treated
  - Adenoma: remove it
  - Hyperplasia: remove 3 and a half
- Asymptomatic patients
  - Some say they should be treated and some say they should only be followed up
- Postoperative management: Be careful of bone hunger syndrome which might cause tetany

Conclusion

- PHP is a very under diagnosed disease in Saudi Arabia.
- Patients are not diagnosed early
- Complications could be serious and these are avoidable.

Recommendations

- The medical community needs to be more aware of the disease.
- Specifically the diagnosis should be considered in patients with IMP!
  - bilateral or recurrent renal stones
  - patients with suggestive radiological bone changes
  - and naturally in patients with high serum calcium level

Thyroid diseases

General considerations

- Thyrotioxicosis vs. Hyperthyroidism?
  - Thyrotixicosis is the clinical condition of presence of high levels of thyroid hormones in the blood
  - Hyperthyroidism is over activity of the thyroid gland, thus it causes thyrotoxicosis

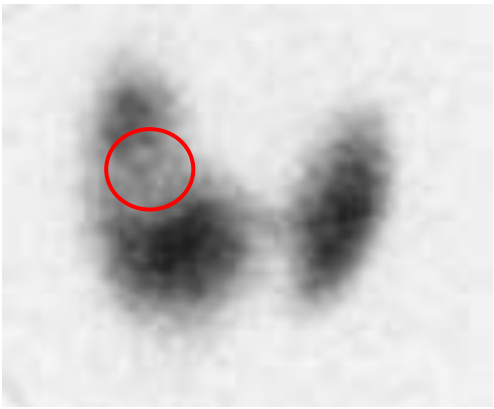
- Thyroid disease can present as:
  - Lump “goitre”
  - Change in function (hypo or hyper)
- If we see a lump, how can we tell if it is a thyroid lump?
  - Ask the patient to swallow:
    - If it doesn’t move then it is not thyroid disease (could be dermoid, lipoma, lymph node)
    - If it moves then it is one of two
      - Thyroid lump “goitre”
      - Thryroglossal cysts
    - Then you ask the patient to stick his tongue out and if the lump moves then it is a thyroglossal cyst. Because thyroglossal cyst extends to the tounge.

Examination

- We cannot do the fluctuation test due to the presence of pretracheal fascia which fixes the thyroid in position
- In the thyroid gland usually what feels like cyst turns out to be solid and what feels solid turns out to be a cyst
  - That’s why we need Ultrasound and FNA (Fine Needle Aspritation) to differentiate
- Other IMP examination points for the thyroid gland:
  - CNS
    - Reflexes are brisk and exaggerated in hyperthyroidism
    - Reflexes are delayed in hypothyroidism
  - Eye, 3 IMP signs!!
    - Exopthalmous
    - 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)
    - Lid retraction
    - Hand: Moist, sweaty, pulse is tachycardia in hyperthyroidism

Causes of thyroid swelling

- Thyroid cyst
  - Benign
  - Diagnosed by U/S and FNA
  - Treated by aspirating the cyst
    - If it reoccurs up to two times aspirate it again but in the 3rd time surgery should be done
- Multinodular goiter
  - Can present as:
    - Incidentally
    - With or without symptoms of hyper or hypothyroidism
      - 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.
    - Local compression causing dysphagia, dyspnea, stridor, plethora or hoarseness



- Solid
- 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 uptaking iodine hence it is no longer thyroid tissue, indicative of malignancies in 15% of patiens

- Inflammatory (thyroiditis)
    - Acute, v.rare
    - Sub-acute, v.rare
    - Hashimoto "chronic": most common and usually presents with hypothyroidism> dx by serological markers , on biopsy lymphocyte. Monocyte..etc
- Benign tumor: Follicular adenoma
- Malignant tumour

Thyrotoxicosis

- Presents usually as
    - Grave's disease (usually affects the young)
    - Toxic multinodular goiter
    - Toxic nodule
- Signs and symptoms include:
    - Nervousness
    - Wt loss + Increased appetite
    - Heat intolerance
    - Sweating
    - Muscular weakness
    - Menstrual irregularities
    - Goiter
    - Tachycardia +/-Arrhythmias
    - Warm moist skin
    - Bruit & thrill (when applying the stethoscope on the gland, due to increased vascularity)IMP!
    - Eye signs (mentioned earlier)
- Lab tests
    - Increases T4, T3
    - Decreased TSH (due to inhibition by high levels of T4 and T3)
- Management
    - Medical
    - Radio-nuclear iodine
    - Surgery
- Case: 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.
    - How to Dx? Decreases T4, T3 , Increased TSH

Thyroid cancer

General considerations:

- Thyroid cancers are usually non-functional, meaning they do not produce symptoms
- Cancers can be solitary or diffusely enlarged
- 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 IMP!
- Lymphatic spread of the cancer does not affect the prognosis

Types of thyroid cancer

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