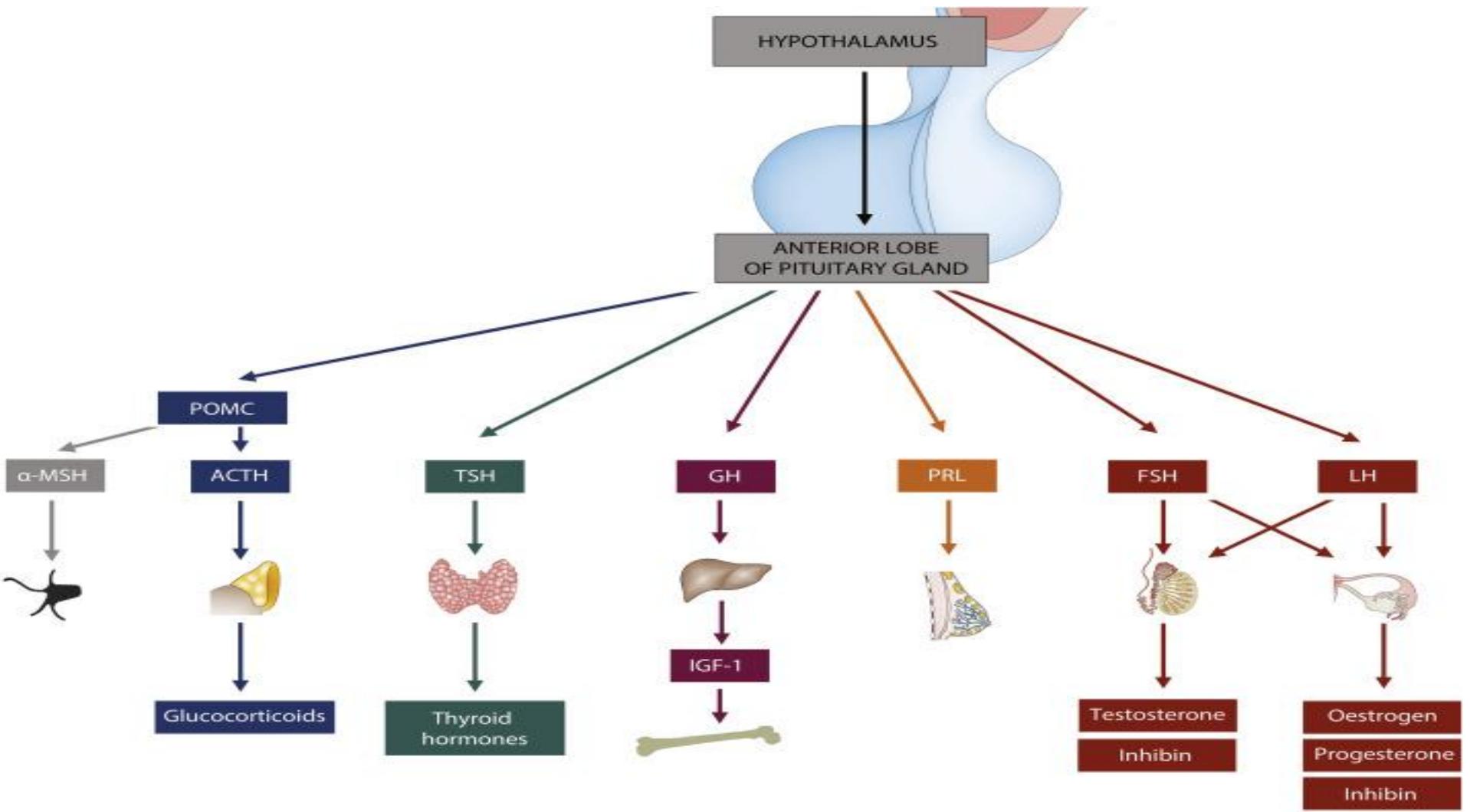
A 3D rendering of two human figures, a male and a female, shown from the waist up. The figures are semi-transparent with a glowing blue outline. Inside them, various endocrine glands are highlighted with a warm orange glow. The male figure's glands include the pineal, pituitary, thyroid, heart, adrenal, and testes. The female figure's glands include the pineal, pituitary, thyroid, heart, adrenal, ovaries, and pancreas. The background is a dark blue with faint, glowing, wavy lines.

Endocrine System

DONE BY : Abdullah Alwikhyan

Outlines

- Thyroid disorders
- Adrenal
- Acromegaly
- Parathyroid
- DM



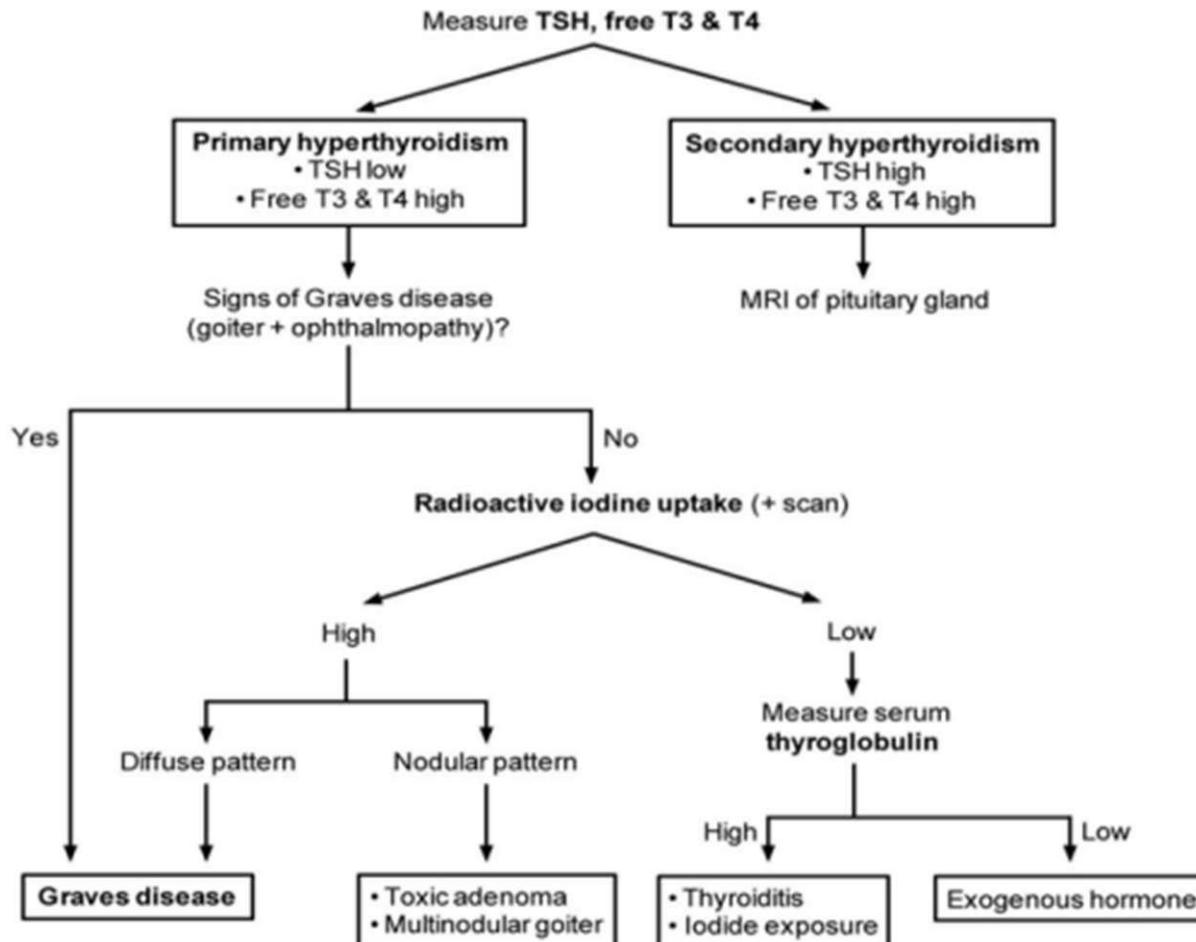
Thyroid Dx.

- **Hyperthyroidism (thyrotoxicosis):-** increase in free T3,T4 with or w/out decrease TSH
- **Clinical features:**
 - a. Restlessness, irritability, fatigability
 - b. Tremor
 - c. Heat intolerance; sweating; warm, moist skin (especially of palms)
 - d. Tachycardia, often with arrhythmia(AF) and palpitation, sometimes with high-output cardiac failure
 - e. Muscle wasting and weight loss despite increased appetite
 - f. Fine hair
 - g. Diarrhea
 - h. Menstrual abnormalities, commonly amenorrhea or oligomenorrhea

Diagnosis:-by thyroid function test

Treatment:surgical mainly

Evaluation of hyperthyroidism



Clinical manifestations of Graves disease

| | |
|-------------------------|---|
| General | Heat intolerance, weight loss, sweating |
| Eyes | Lid lag, proptosis , diplopia |
| Skin | Hair loss, infiltrative dermopathy (pretibial myxedema) |
| Cardiovascular | Tachycardia, hypertension, atrial fibrillation |
| Nails | Onycholysis, clubbing (acropachy) |
| Endocrine | Hyperglycemia, hypercalcemia, bone loss, menstrual irregularities |
| Gastrointestinal | Diarrhea |
| Neurology | Tremors, hyperreflexia, proximal muscle weakness |

- Treatment:
- o Graves disease can be treated with antithyroid drugs, radioactive iodine, or thyroidectomy.

Complications of Graves disease treatment

| Treatment | Adverse effects |
|--|--|
| Antithyroid drugs (thionamides) | <ul style="list-style-type: none">• Agranulocytosis• Methimazole: 1st-trimester teratogen, cholestasis• Propylthiouracil: Hepatic failure, ANCA-associated vasculitis |
| Radioiodine ablation | <ul style="list-style-type: none">• Permanent hypothyroidism• Worsening of ophthalmopathy• Possible radiation side effects |
| Surgery | <ul style="list-style-type: none">• Permanent hypothyroidism• Risk of recurrent laryngeal nerve damage• Risk of hypoparathyroidism |

ANCA = antineutrophilic cytoplasmic antibodies.

| | Hypothyroidism | Hyperthyroidism |
|----------------|---|---|
| SIGNS/SYMPOTMS | <p>Cold intolerance (\downarrow heat production)</p> <p>Weight gain, \downarrow appetite</p> <p>Hypoactivity, lethargy, fatigue, weakness, depressed mood</p> <p>Constipation</p> <p>\downarrow reflexes (delayed/slow relaxing)</p> <p>Hypothyroid myopathy (proximal muscle weakness, \uparrow CK)</p> <p>Myxedema (facial/periorbital)</p> <p>Dry, cool skin; coarse, brittle hair</p> <p>Bradycardia, dyspnea on exertion</p> | <p>Heat intolerance (\uparrow heat production)</p> <p>Weight loss, \uparrow appetite</p> <p>Hyperactivity, anxiety, insomnia, hand tremor</p> <p>Diarrhea/hyperdefecation</p> <p>\uparrow reflexes (brisk)</p> <p>Thyrotoxic myopathy (proximal muscle weakness, normal CK)</p> <p>Pretibial myxedema (Graves disease), periorbital edema</p> <p>Warm, moist skin; fine hair</p> <p>Chest pain, palpitations, and arrhythmias (eg, atrial fibrillation) due to \uparrow number and sensitivity of β-adrenergic receptors</p> |
| LAB FINDINGS | <p>\uparrow TSH (if 1°)</p> <p>\downarrow free T_3 and T_4</p> <p>Hypercholesterolemia (due to \downarrow LDL receptor expression)</p> | <p>\downarrow TSH (if 1°)</p> <p>\uparrow free or total T_3 and T_4</p> <p>Hypocholesterolemia (due to \uparrow LDL receptor expression)</p> |

Q15. A case with thyroid function test, what is the diagnosis

- A. Primary hypothyroidism
- B. Secondary hypothyroidism
- C. Subclinical hypothyroidism
- D. .
- E. .

| TSH | Increased |
|-----|-----------|
| T3 | Decreased |
| T4 | Decreased |



Q3: A 35-year-old female patient presented to the outpatient clinic with chief complaint of weight loss and palpitation. This is how her eyes look like:

- All of the following symptoms can be explained by this condition, except:

A- diarrhea. B- hypertension. C- heat intolerance. D- menorrhagia.

Ans: D

- What will be her thyroid function test results?

High T3, high T4 & low TSH..

- You ordered thyroid isotope scan for this patient; the expected report will be:

C- Diffuse increase in iodine uptake.

15. Mention the 3 lines of treating this patient



- Anti thyroid Drugs (Propythiouracil, methimazol)
- Radio active iodine ablation
- Surgery (thyroidectomy)

A 41-year-old female patient underwent surgery to remove this neck mass which moves with swallowing. The most appropriate post-operative follow up test for her is:

- a. Thyroid releasing hormone level
- b. Serum growth hormone level
- c. Anti-microsomal antibody level
- d. Serum cortisol level
- e. Thyroid stimulation hormone level

Ans:E



Q2: This patient had thyrotoxicosis, what's this finding on her limbs?



Pretibial Myxedema

A [biopsy](#) of the affected skin reveals **mucin**
in the mid- to lower- dermis.

8.The patient has hyperthyroidism, what is this sign?



- Bilateral peritibial myxedema

11. Mention 2 causes of this condition.



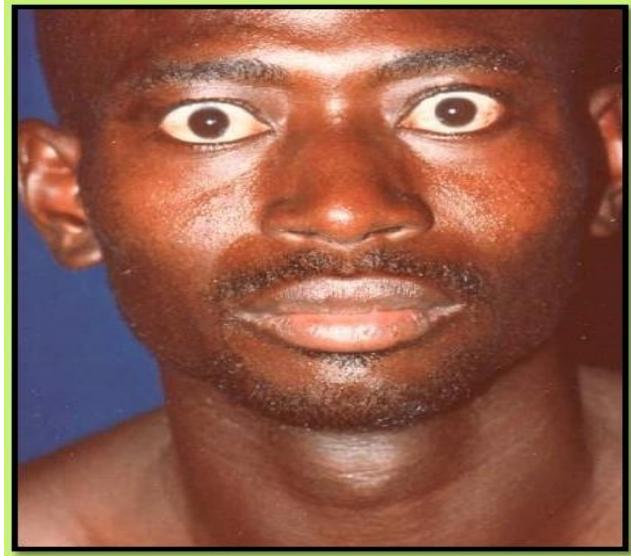
- Pregnancy
- Thyrotoxicosis
- Liver cirrhosis

Q3: this female pt is presented wt loss, tremor and excessive sweating, what is your diagnosis ? And what is the blood test you ask?

Answer :Graves Disease (Thyrotoxicosis) , Thyroid function test or TSH



Q4: a pt presented with palpitation & tachycardia, sweating & heat intolerance. what is the diagnostic test? & what is the main feature in this figure?



- 1- Thyroid function test.
- 2- Exophthalmus.

Case 5

Female pt presented with tremors, loss of wt & irregular irregular pulse.

- Dx?
- Most common rhythm you see in this case?
- Invistigations ?

- thyrotoxicosis .
- atrial fibrillation .
- thyroid function test .

A 23 YO woman, presented to ER presenting with diarrhea, excessive sweating, & tremor. on examination RR: 32, BP 130\90, HR: 120.

1. What is the diagnosis? “2 points”
2. What is the test should be done?
3. Give 2 modalities of treatment in such a case?

Q1. Thyrotoxicosis.

Q2. Thyroid function test.

Q3. Radioactive iodine, Thyroidectomy

10. This 30-year-old woman presents with weight loss sleep disorders and this orange skin rash on her lower limbs.

A. What is the likely cause?

B. Name one specific immunologic test to confirm diagnosis



- a. Thyrotoxicosis
- b. Thyroid stimulating immunoglobulins (bind to thyroid stimulating hormone receptor causing production of thyroid hormone)

37 YO female presented with thyroid enlargement, the thyroid was firm, non-nodular & double-sized.

She is suffering from increase in weight, cold intolerance, thin dry skin & hair loss as well as menstrual irregularities.

- 1- What is your Dx?
- 2- Give 2 causes of such condition.
- 3- What drug would you prescribe to this pt?

1. Hypothyroidism
2. Iodine deficiency,
Hashimoto's thyroiditis .
3. Thyroxin.

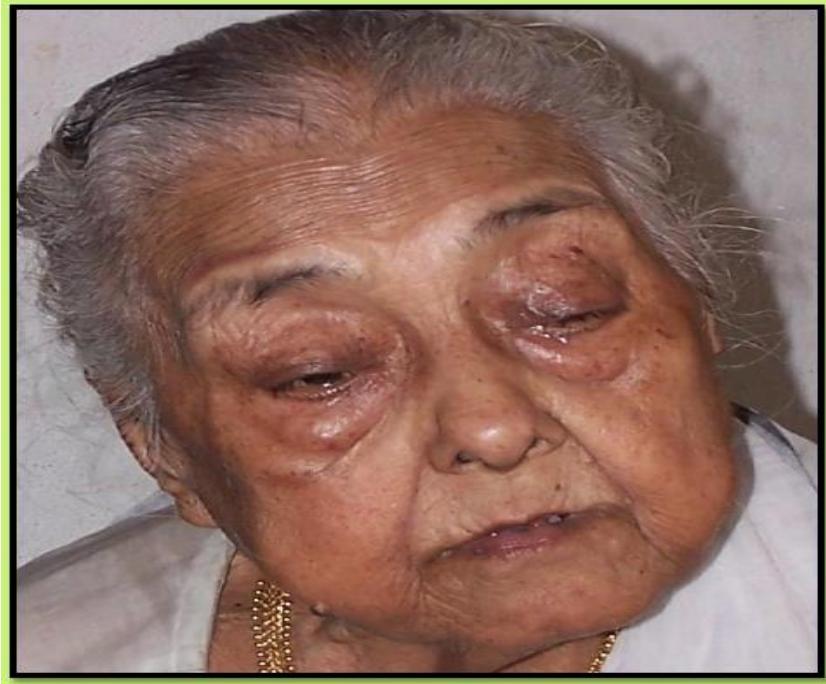
34 YO female pt come to you with fatigue, hair loss, her blood pressure 130/110 , HR 60.

- 1- What is the Spot Dx ?
- 2- What is most diagnostic lab investigation ?
- 3- What is The Treatment ?



- 1- Hypothyroidism.
- 2- Thyroid function test .
- 3- Give thyroxine & triiodothyronine.

Q7: Patient has hair loss and weight gain. What is the test you want to do?



Thyroid Function test.

Q6: This patient came with constipation & wt gain, mention 2 cardiac complications for it.



1. Hypertension.
2. Cardiomegaly.
3. Bradycardia.

Q6 : PATIENT WITH 10,000 CK LEVEL , WHAT IS THE MOST LIKELY DIAGNOSIS ?

- A- HYPOTHYROIDISM**
- B- CUSHING DISEASE**
- C- ADDISON DISEASE**
- D- MYASTHENIA GRAVIS**



Case

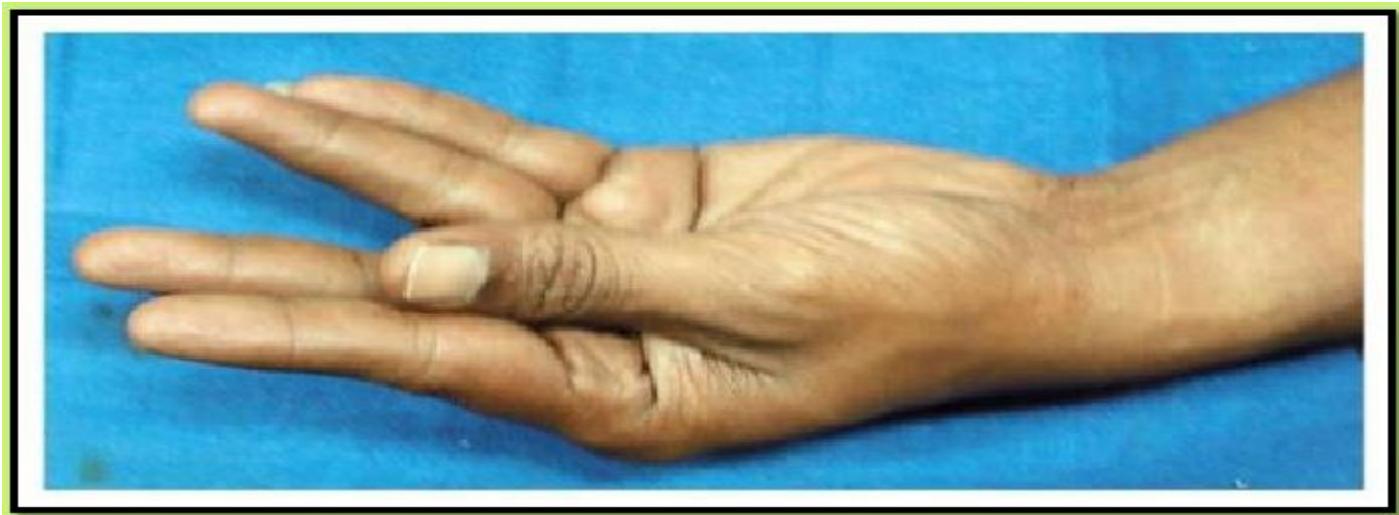
Patient with sweating, palpitation, heat intolerance, **Neck pain and tenderness**, no goitre, increased T3, T4 and low TSH.

- 1- what's your diagnosis?
- 2- next investigation?
- 3- what's the finding in thyroid scan?
- 4- what's the treatment?
- 5-Mention one ECG abnormality you can find it in this patient

Case answers

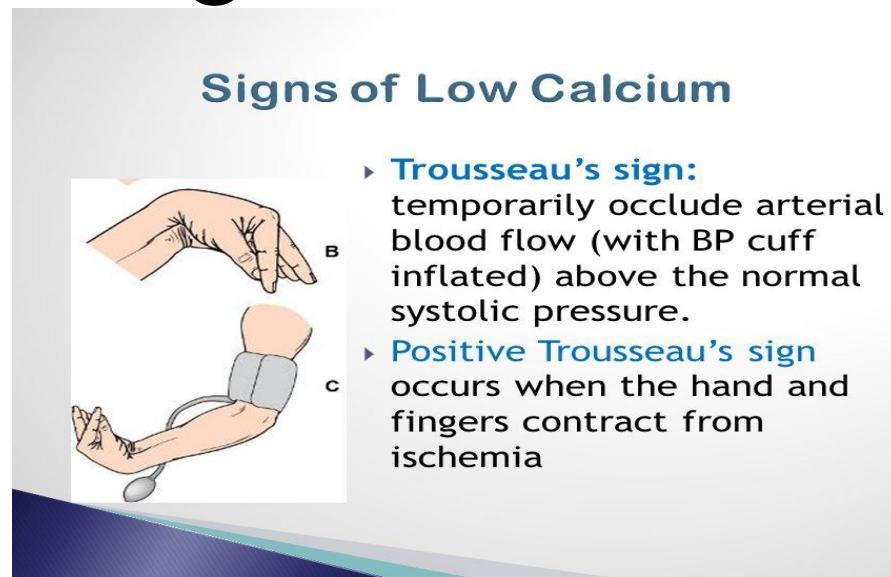
- 1- thyrotoxicosis/ subacute thyroiditis
- 2- RAIU/ thyroid scan
- 3- decrease uptake
- 4- symptomatic and supportive tt; NAID, analgesics, antipyretics, beta blockers... no antithyroid drugs since hyperthyroid state is due to release of previously formed thyroid hormones.
- 5- Atrial fibrillation

Q28: Pt after total thyroidectomy presented with this condition, what is the cause ?



Hypocalcemia (carpopedal spasm).

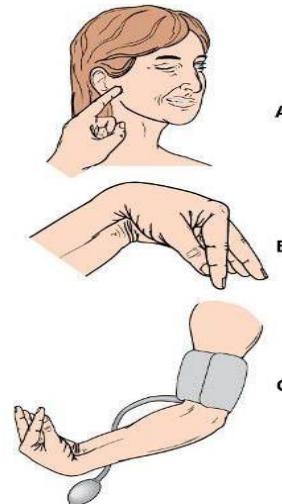
* If cuff of sphygmomanometer
where present in pic...
it's called troussie sign



Hypocalcemia

- **Manifestations**

- **Weakness/Tetany**
- **Positive Trousseau's or Chvostek's sign**
- **Laryngeal stridor**
- **Dysphagia**
- **Tingling around the mouth or in the extremities**



Q29: 33 YO male pt, underwent subtotal thyroidectomy 5 days ago, presented with this pic. What is this sign? & What is the investigation of choice?



1. Troussie sign .
2. Ca+2 level

. A 35-year-old man on furosemide presents with a 2-day history of cramps and paresthesia in the arms. This physical finding is reproducible by inflating a blood- pressure cuff placed on the patient's arm.

A: What is the cause of this presentation?

B: What is the name of this sign?

a. Hypocalcemia b. Trousseau sign





5. This patient underwent a surgery for asymptomatic hypercalcemia

- Name the cause of this hypercalcemia

Parathyroid adenoma



60 YO female pt, presented to the clinic complaining mainly of **lower limb pain, bilateral** but more severe on the right side, muscle weakness, she has difficulty standing up from chair without help, in addition to **back**

& **thigh pain**, on examination there was tenderness mainly on right calf muscle. On investigations:

Ca=2.1(normal range 2.2-2.4), low), alkaline phosphatase=600.

- 1- What is the diagnosis?
- 2- mention the most important 2 tests.
- 3- give 2 modalities of treatment.

- 1- Osteomalacia.**
- 2- Ca+2 & V.D levels.**
- 3- Ca+2 supplement and V.D**

patient with vertebral fracture

lab results .. (something very similar to that)

| Test | Value | Normal range | Unit |
|------------------|---------|-----------------|---------|
| WBC | 6000 | 3500-11000 | μ l |
| Hb | 11.9 | 13.5-16.5 | Gr/dl |
| PLT | 253,000 | 150,000-450,000 | μ l |
| Calcium | 12.72 | 8.5-10.4 | mg/dl |
| Phosphor | 1.84 | 2.5-5 | mg/dl |
| Intact PTH | 147.5 | 15-65 | pg/ml |
| Cr | 1.43 | 0.6-1.4 | mg/dl |
| Urea | 34 | 10-50 | ng/dl |
| 25(OH) Vitamin D | 30.67 | 30-100 | ng/ml |
| PTH | 429 | 8-69 | pg/ml |
| Albumin | 4.39 | 3.5-5.3 | g/dl |
| Alk ph | 190 | 40-129 | IU/l |
| 24 h urine Ca | 36.10 | 50-300 | mg |
| 24 h urine Cr | 1526.6 | 980-2200 | mg |

WBC: White blood cells, Hb: Hemoglobin, PLT: Platelet, PTH: Parathyroid hormone, Cr: Creatinine

Case1:

- 1) Diagnosis? Primary hyperparathyroidism –very high PTH, High Ca, high ALP
- 2) Expected GI and renal symptoms?

GI: constipation /PUD

Renal : polyurea/ kidney stone

- 3) 2 lines of management?

- 1) hydration.. IV fluid
- 2) Bisphosphonate
- 3) Calcitonin

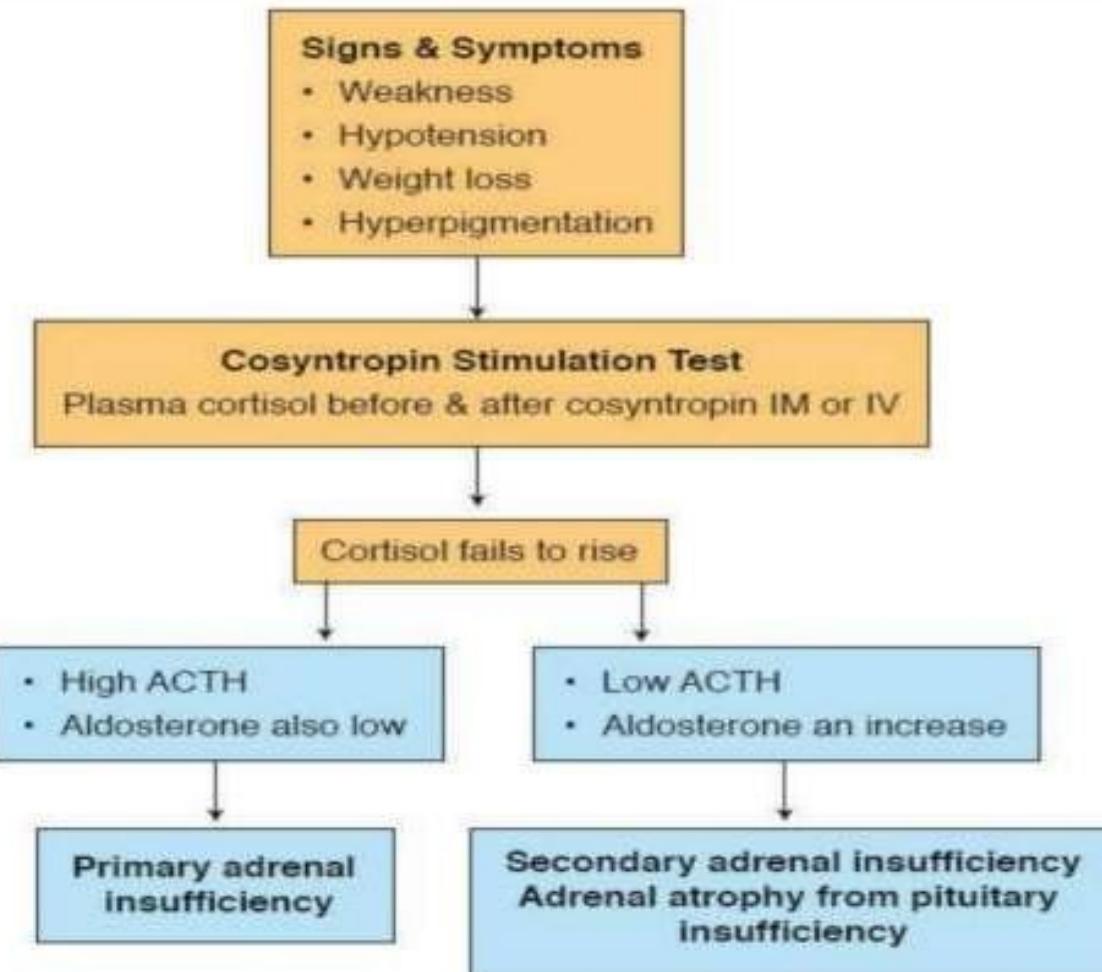
Adrenal Dx

Addison's Disease

- ◆ Protein anabolism
 - lethargy
- ◆ Aldosterone deficient
 - Postural hypotension, fainting, dizziness
- ◆ Androgen deficient
 - Impotence
- ◆ Others
 - Hyperpigmentation – palmar creases, buccal mucosa, scars (increased ACTH), vitiligo (autoimmune), Abdo (diarrhoea, constipation, vomiting), depression, anorexia, weight loss, myalgia, arthralgia, hair loss

Onset of symptoms is gradual
- Diagnosis is often made late





Q9: This patient has general weakness & hyperkalemia. What's your diagnosis?



Addison's disease

Q10: A 17 YO male has fatigue, lightheadedness upon standing or while upright, muscle weakness, fever, wt loss, difficulty in standing up, anxiety for long period with hyper-pigmentation, this is his hand (inf.) compared to his brother (Sup.). What is your spot Dx.?





Normal sister



Patient

Adrenal insufficiency.

30 years old lady with autoimmune hepatitis on prednisolone therapy presents with weakness ,fatigue and abdominal pain. Important readings: BP (95/60) Blood glucose (65) Hb (12).

1. What is the diagnosis?
2. What test you will order to confirm your diagnosis?
 - a. Adrenal/Addison's crisis
 - b. Serum Cortisol level

A female patient known case of SLE and on **steroids**, presented complaining of high fever, nausea and vomiting, chills, dysuria, and **hypotension 80/60**, her lab data are as follows:

- O₂ sat 92%
- labs: **Na 135 | K 5.9** | Cl 90 | Hco₃ 10 | Glucose 65
- Wbc 17,000 | Urine positive for nitrites and leukoesterase.
- Other CBC parameters were normal.

1. What is your diagnosis?
2. What is the confirmatory investigation?
3. Calculate the anion gap?
4. How do you explain the bicarbonate level?
5. What is the management?

1. Adrenal crisis

2. 24 hour urine for **cortisol** (if adrenal crisis)
3. AG = 35
4. Low bicarbonate because of the increase in hydrogen ions that resulted from the acidosis → due to metabolic acidosis
5. IV fluids, IV mineralocorticoids & **steroid**, IV antibiotics.

Cushing syndrome (hypercortisolism):-increased circulating glucocorticoids, primarily cortisol.

Causes:-

- a. Exogenous corticosteroid medication (most common)
- b. Hyperproduction of ACTH by pituitary adenoma
- c. Adrenal cortical adenoma or adrenal carcinoma (less common than adenoma)

Symptoms:-

1-Redistribution of body fat with round moon face, dorsal “**buffalo hump**”

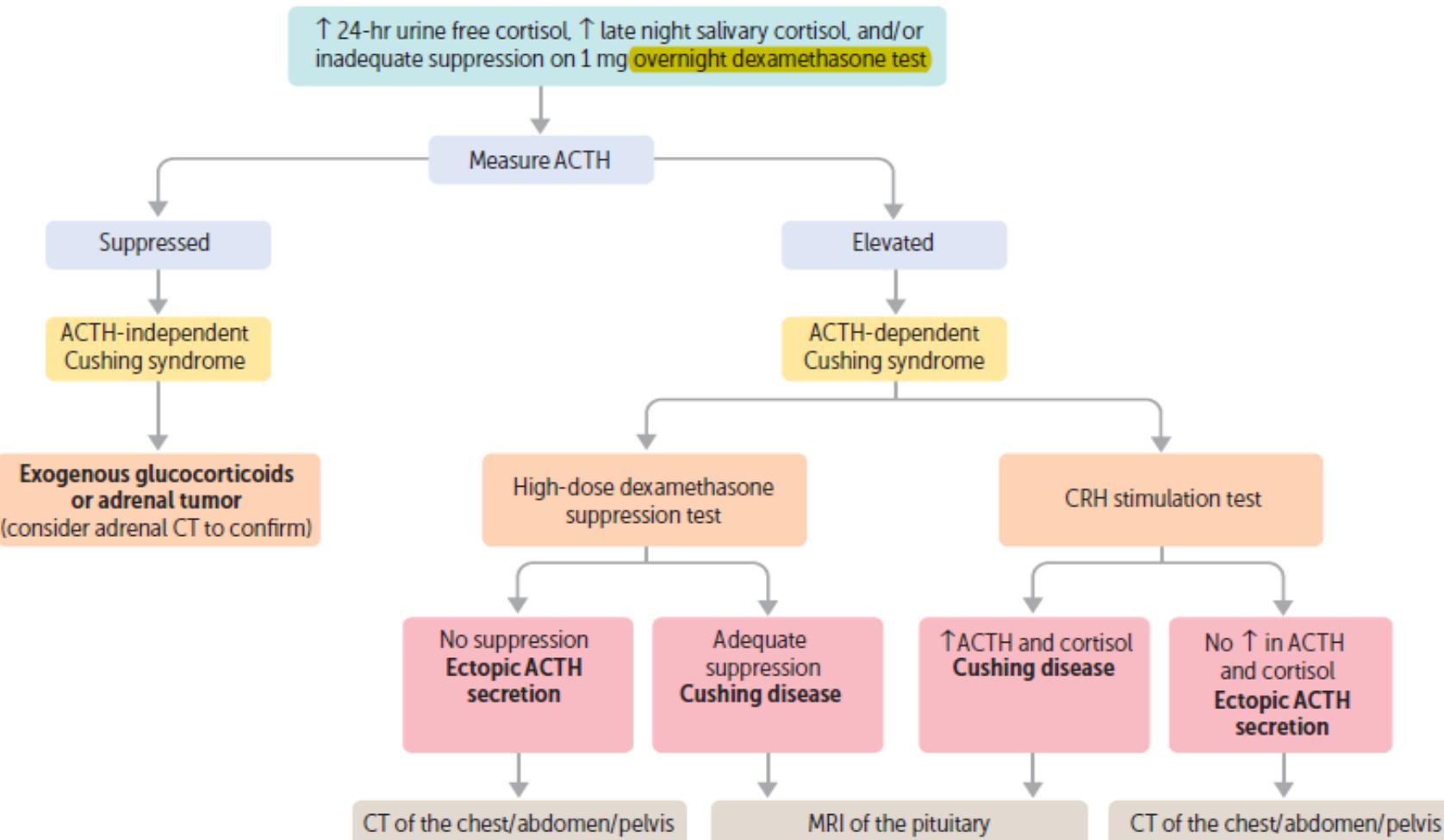
2-thin extremities caused by muscle wasting “ **Central obesity**”

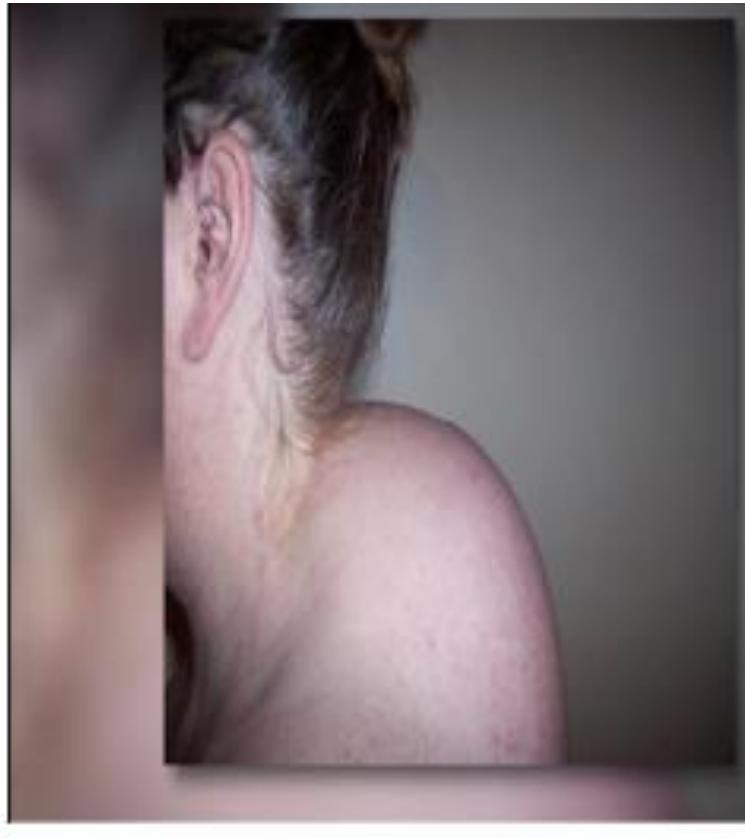
3 **skin atrophy with easy bruising and purplish striae**, especially over the abdomen; and **hirsutism**

4Muscle weakness, osteoporosis, amenorrhea, new onset of HTN and DM , and psychiatric dysfunction

Best screening test:-is 24-h urine cortisol

Diagnostic test:- Overnight Dexamethasone suppression test.





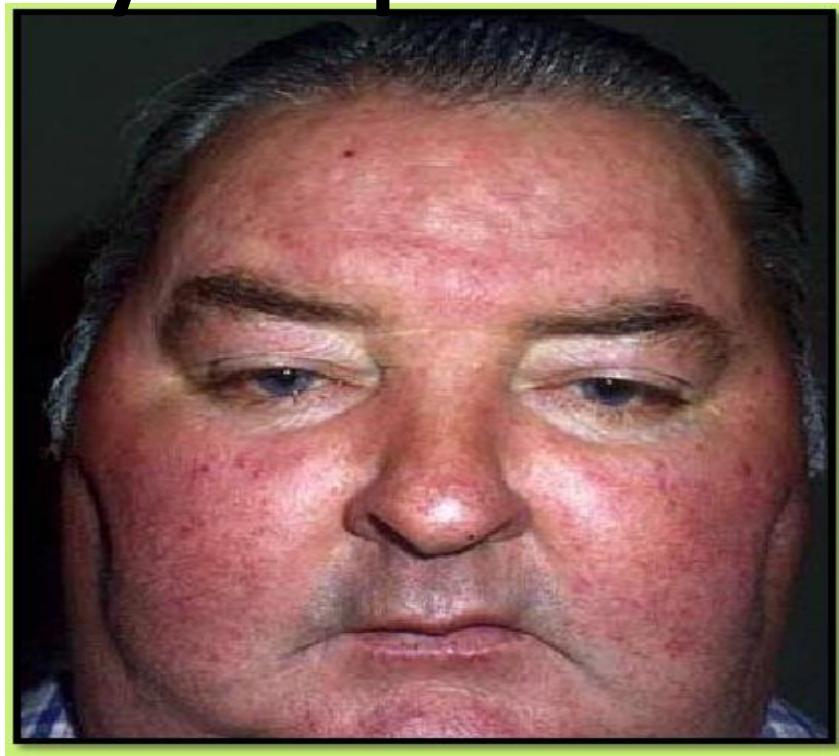
Q12: This pt presented with new onset HTN & DM, (other features of Cushing's). What's your Dx? Give two abnormal tests you would use to reach the Dx.?



Dx=Cushing's Syndrome.

- A) 24-hour urine cortisol (elevated).
- B) Overnight dexamethasone suppression test (no response/no suppression).

**Q13: This pt has DM, & HTN, What is
your spot Dx?**



Cushing syndrome (cushinoid face).

Q14: A pt presented with puffiness in the face & increase in weight. What is your most likely Dx? After starting the patient on medications. What test should you do to confirm your Dx?



1. Cushing's Syndrome.
2. Urine Cortisol Test [There were doubts about Dexamethasone Suppression Test since it is diagnostic not confirmatory].

Confirmatory tests include 24-hour UFC levels and/or low-dose dexamethasone suppression tests.

Q:A 40 yr old Female patient known case of SLE and Rheumatoid arthritis newly ... and hirsutism . What is the cause?



- Cushing's Syndrome , exogenous steroid as treatment for RA

Q16: What is the **best** test to diagnose this disease?



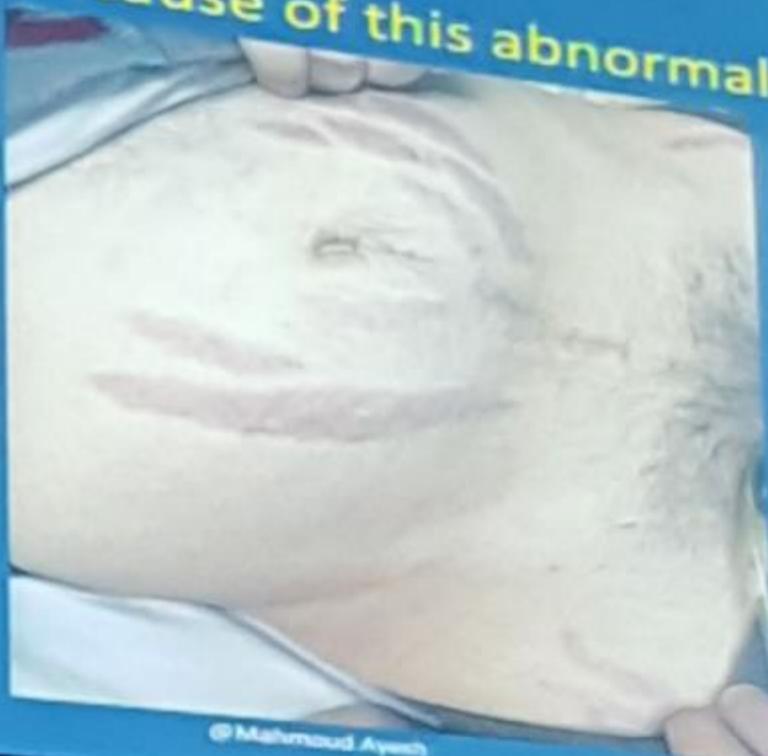
Overnight dexamethasone suppression test.

Q17: This patient presented with new onset hypertension and diabetes. What's **the best screening test** for this case?



24 hour urine cortisol level

What is the cause of this abnormal sign?



Abdominal Striae
-Cushing

3) What medication causes this side effect?

- A- NSAIDS.
- B- steroids.
- C- penicillin.
- D- rifampin.
- E- metronidazole.

Ans: b



5. Mention 3 abnormalities associated with this condition?



- Buffalo hump, hirsutism, acne, stria, proximal myopathy, ...

What is the diagnosis in this patient with hypertension, weight gain, and proximal myopathy over 9 months?

Name one initial screening test for this diagnosis.



Cushing Syndrome
Cortisol Level



- Q18: A patient recently diagnosed with hypertension has the following finding on physical exam. Name **one confirmatory test for the htn's etiology**

Answer

**purplish blue striae suggestive of
Cushing's syndrome**

Answer: **Overnight low dose dexamethasone suppression test** (Or just overnight dexamethasone suppression test) or 24 hour urine free cortisol collection

The most likely electrolyte imbalance in this patient is:

- a. Hyponatremia
- b. Hypophosphatemia
- c. Hypercalcemia
- d. Hyperkalemia
- e. Metabolic alkalosis



Ans:E

Growth hormone

Acromegaly:-is happened due to overproduction of Somatotropin (growth hormone) after epiphyseal closure.

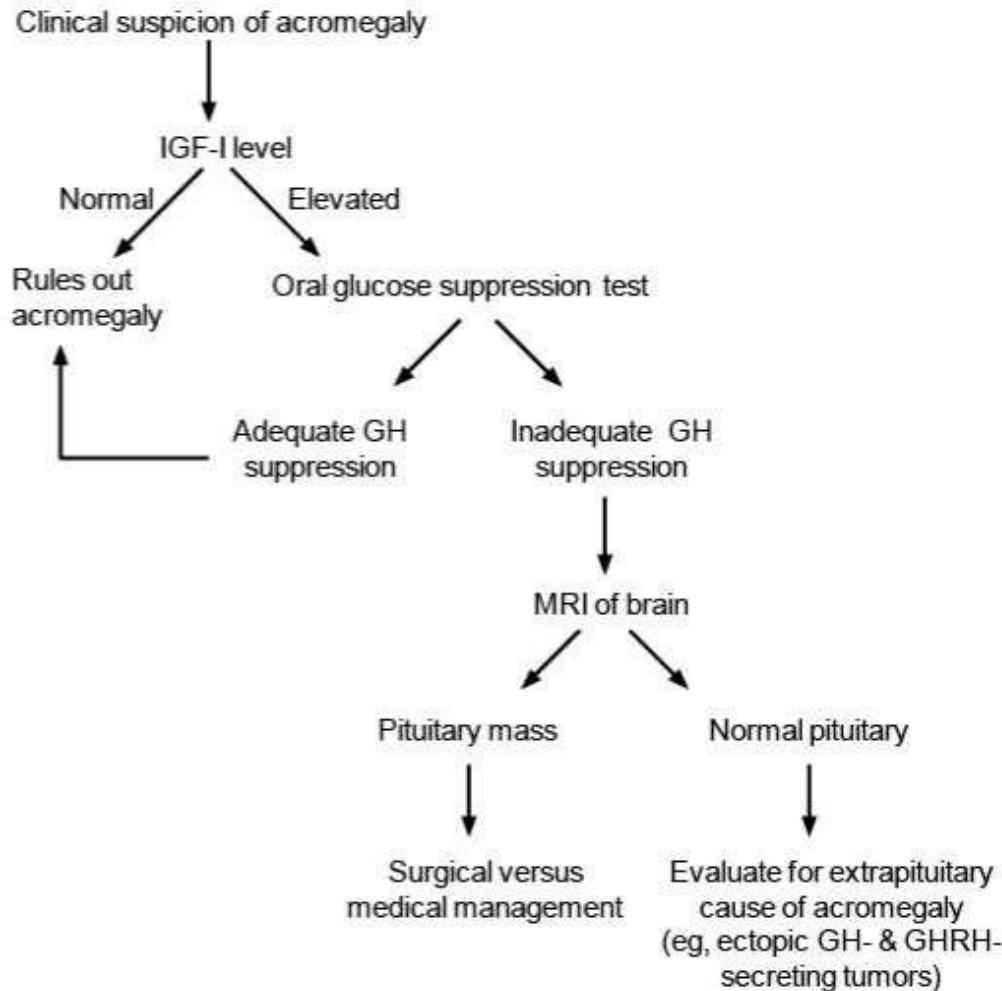
Causes:-Somatotropic adenoma

Symptoms:-

- 1 Overgrowth of the jaws, face, hands, and feet, and generalized enlargement of viscera
- 2 hyperglycemia(due to anti-insulin effect of somatotropin),
- 3-osteoporosis
- 4-hypertension
- 5-vision problem

Death due to **cardiomegaly**

Diagnostic test:-Glucose suppression test



This patient has
hypertension
& DM, what's
your diagnosis?

Acromegaly



**Q20: This pt has HTN, diabetes insipidus, ...
What's your Dx.? & What's the diagnostic
test?**



- 1.Acromegaly.
- 2.Glucose suppression test.
(glucose tolerance test)

Question 16

- A- What's your diagnostic test?
- B- What's the visual field abnormality?



Q16) A- glucose suppression test.
B- bitemporal hemianopia

Q22: A pt newly diagnosed with HTN, DM & bone pain, what is your Dx?



Acromegaly.

This patient presents with obstructive sleep apnea, bilateral hand numbness, sweating and blurred vision.

- **What is the most likely underlying disease?**
- **- What is the likely cause of her sleep apnea?**



- Acromegaly
- Macroglossia.

Q: what's your Diagnosis and what complications this patient might have ?



- Acromegaly
- carpal tunnel syndrome, DM, HTN, cardiomegaly

Q11 What is the most common pathology this patient will develop?

- A. Cardiomyopathy
- B. Renal failure
- C. Acne



Answer: A. Cardiomegaly

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Others

Q27: 60 YO Pt known case of DM 30 yrs ago, presented with this asymptomatic, gradual, painless lesion. Name this lesion?



necrobiosis lipoidica.

Most frequently appears on **the patient's shins**, often on both legs, although it may also occur on forearms, hands, trunk, and, rarely, nipple, penis, and surgical sites. The lesions are often **asymptomatic but may become tender and ulcerate when injured**.

Strongly associated with DM.

7) Patient with uncontrolled diabetes

- a) What do you see in the picture? **Charcot joint**
- b) What's the cause? **Diabetic neuropathy**



14. In this diabetic Patient, name the sign seen in the picture



Acanthosis nigricans

This 45 year old female patient is diabetic for 25 years, what complication of Diabetes mellitus she has?



Cataracts 😊

A 36yr old female pt has hypotensive and sweating
and polyphagia and abdominal pain, her blood
sugar was 450 , HR 120, RR 25 ,Temp 37.5
has Hx of polyuria, polydypsia 2 days ago but
now is anuria, dry lips

1. What is the diagnosis?
2. mention two important managements.
3. mention 2 investigation.

1. Diabetic Ketoacidosis
2. IV fluid , IV insulin
3. ABG, Ketone bodies in the blood

Case2:

known to have lung cancer, underwent surgery and was given chemotherapy..

Lab results.. Normal except $\text{Na} = 120 \text{ meq/l}$

- 1) What's the abnormality? Hyponatremia
- 2) Cause? SIADH
- 3) 2 other investigations?
 - plasma and urine specific gravity and osmolarity
 - ADH level
- 4) Other causes for this condition?
For SIADH ? Post surgical stress, Drugs...
for hyponatremia? Water toxicity, adrenal insufficiency

. Name the blood test to correlate with this eyelid physical finding

Lipid profile (check for cholesterol level)



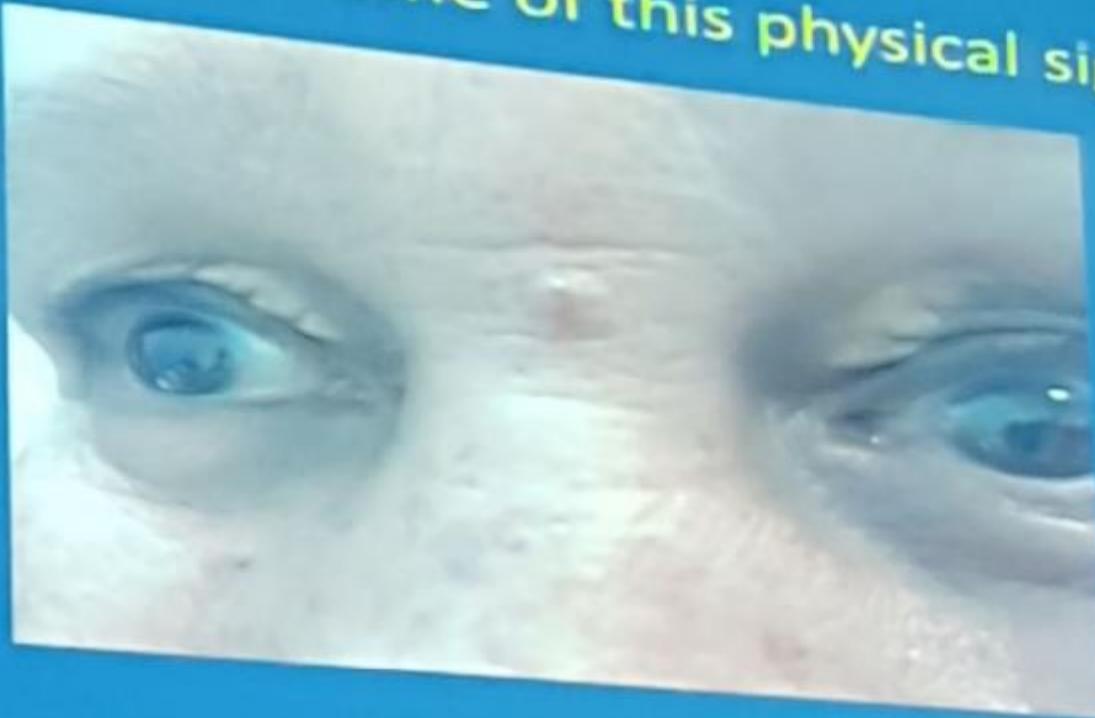
Q3: THE PATIENT IS AT A HIGH RISK OF:

- A- lung cancer.
- B- kidney failure.
- C- ischemic heart disease.
- D- inflammatory bowel disease.



Ans: C

What is the name of this physical sign?



xanthelasma

This 20 year old female patient died of myocardial infarction ,what is the cause of MI?



Familial
Hypercholesterolemia
(Homozygous)

AD

Thank you