

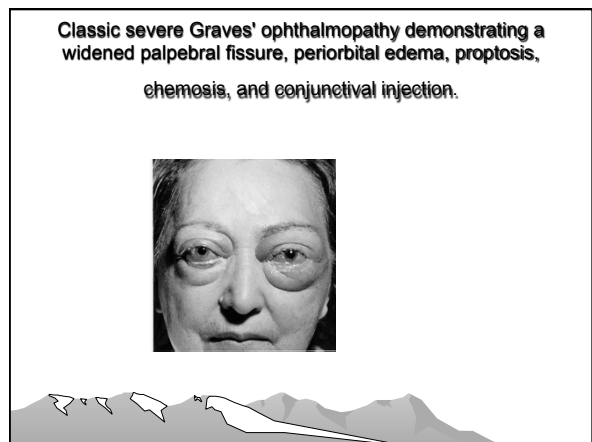
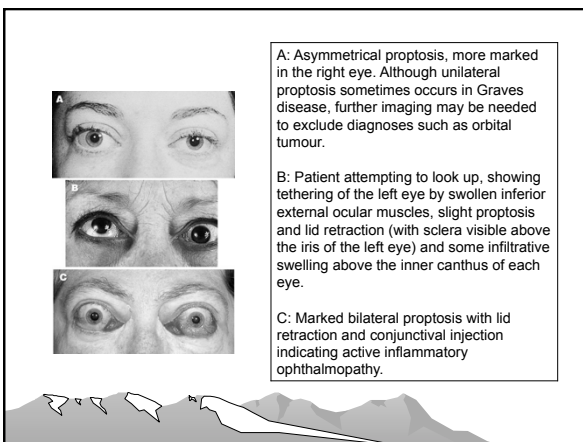
Hyperthyroidism

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- ## concepts
- Thyroid overactivity
 - F:M = 5:1
 - 2.5% of all females at sometimes; get affected
 - 20-40 years: peak
 - 90% of cases are intrinsic thyroid disease, pituitary causes extremely rare

- ## Etiology
- Graves' Disease (Basedow' s disease)**
- Most commonest cause for ~, esp young pt
 - Autoimmune disorder affecting thyroid gland---increase in synthesis & release of thyroid hormones
 - F:M = 8:1
 - Familial tendency: HLA-B8; DR3, DR2

- ## Graves' Disease
- Accompanied by **proptosis** and **pretibial myxedema**: when present indicates graves disease (90%) but not the other cause of ~
- Graves exophthalmos**: leads to corneal ulcer/ blindness
1. Proptosis: >22mm
 2. Lid retraction: staring expression
 3. Lid lag: downward gaze, upperlids
 4. Diplopia: upward/ lateral gaze
 5. Periorbital edema



Graves' Disease

- May also associated with other autoimmune ds: pernicious anemia, DM, myasthenia gravis
- TSH-R AB +ve: 80% cases
- ANA may be +ve
- TG/TPO may be positive but weak, ~10%
- Enlarged thyroid firm, diffusely enlarged with bruits, non-tender



Toxic adenomas

Without infiltrative ophthalmopathy; dermatopathy; TSH-R Ab, TG, TPO –ve

- Single (Plummer's disease): single nodule, firm/hard, non-tender; 5% of case~; Antithyroid Rx—no remission
- Multiple (Toxic multi nodular goiter): usually euthyroid, common in older pt, may cause tracheal/esophageal compression/ laryngeal N palsy; multiple-large firm nodules and nontender



A: Pemberton's sign in a man with a goitre extending through the thoracic inlet and obstructing venous drainage. (A1) At rest, he has moderate puffiness of the face. (A2) After raising the arms briefly to further obstruct venous drainage, swelling increases and there is marked suffusion of the face. B: Woman with an obstructive, predominantly retrosternal, multinodular goitre, showing dilated anterior chest veins caused by increased collateral venous flow.



AC thyroiditis (de Querrains thyroiditis)

- Viral infection: after 1 wk-10 days
- c/o: fever, malaise, tachycardia, pain in the neck (thyroid tender)
- Moderately large, diffuse, firm, tendered thyroid
- initially FT3, FT4 TSH with ESR-- after few wks gradually hypothyroidism but transient
- Thyroid uptake scan is suppressed
- Rx: B-blockers and add Aspirin/ ?predisolone
- Silent thyroiditis: if non-tendered thyroid esp post-partum thyroiditis, self limiting



Hashimoto's thyroiditis

- More common if female; late middle age
- May cause transient ~ during initial destruction phase—hypothyroidism
- Firm/soft/rubbery/hard; diffusely enlarged
- TG +ve; TPO +ve higher titre >1000 u/l



Pituitary tumors

- Rare case
- TSH hyper-secretion and features of hyperthyroidism
- Serum TSH may be normal coz of –ve feedback or
- -ve antibodies
- CT/MRI of pituitary
- Rx: surgery/radiation therapy; B-lockers for symptomatic relief



others

- Iodine induced/drugs induced ~
- 1. Occurs in pt with multinodular goiter after intake of large amount of Iodine diet/contrast materials of radiographic/ drugs like amiodarone
- 2. Amiodarone- may lead both hypo/hyper~

Clinical features: symptoms

- irritability/restlessness/increased temper /anxiety
- weight loss
- Increased appetite
- Malaise/weakness
- Heat intolerance/
- Muscle cramps
- Altered bowel habits: diarrhoea common
- Menstrual irregularities
- Hypokalemic periodic paralysis: 15% of Asian/ native americans; often after IV dextrose/vigorous exercise, last 7-72 h
- Eye complaints: only for Graves dis
- Children present with excessive height or growth rate & hyperactivity

Clinical features: sign

- | | |
|--|---|
| <ul style="list-style-type: none"> • Fine resting tremor • Irritability/psychosis • Hyper-reflexia • Tachycardia/AF • Moist worm peripheries • Fine hair • HTN/ cardiac failure | <ul style="list-style-type: none"> • Exophthalmous B/L U/L • Lid lag/stare look • Ophthalmoplegia • Bruits in thyroid area • Pretibial myxedema-glycosaminoglycan & lymphoid infiltration • Thyroid acropachy-clubbing and swelling of finger & periosteal new bone formation <p>Only in Graves ds</p> |
|--|---|

Ocular signs in Graves' disease

- Ophthalmic phenomena reflecting thyrotoxicosis per se and apparently resulting from sympathetic overactivity:
 - Lid reaction
 - Wide palpebral aperture (Dalrymple's sign)
 - Lid lag (von Graefe's sign)
 - Staring or frightened expression
 - Infrequent blinking (Stellwag's sign)
 - Absence of forehead wrinkling on upward gaze (Joffroy's sign)
- Ophthalmic phenomena unique for Graves' disease and caused by specific pathologic changes in the orbit and its contents:
 - Inability to keep the eyeballs converged (Möbius' sign)
 - Limitation of movement of the eyeballs, especially upward
 - Diplopia
 - Blurred vision due to inadequate convergence and accommodation
 - Swelling of orbital contents and puffiness of the lids
 - Chemosis: corneal injection, or ulceration
 - Irritation of the eye or pain in the globe
 - Exophthalmos (also produces mechanically a wide palpebral fissure)
 - Visible and palpable enlargement of the lacrimal glands
 - Visible swelling of lateral rectus muscles as they insert into the globe, and injection of the overlying vessels
 - Decreased visual acuity due to papilledema, retinal edema, retinal hemorrhages, or optic nerve damage

Investigation

- TFT: overt/subclinical ~
- ↑FT3/FT4; ↓↓ TSH
- Antibodies
- TPO/TG; TSH-R Ab
- Thyroid radioactive iodine uptake and scan: not useful in dx of ~
- 1. Usually performed on pt with established ~
- 2. ↑: Graves dis, toxic nodular goiter, dietary iodine deficiency, early hashimotos throiditis
- 3. ↓: subacute thyroiditis, administration of iodine in any forms eg drugs, radiological contrast

- Imaging::
- Not helpful in Dx of ~
- FNAC
- Helpful in the dx of thyroid disorder esp nodular lesions/masses.

Treatment

- 3 modes: RAI, anti-thyroid Rx and subtotal thyroidectomy
- During Treatment, pt are followed up by clinical evaluation and measurement of FT4
- TSH remain suppressed until after the pt is euthyroid so not used for monitoring the response esp initial
- Graves disease pt require for life long f/u regardless of mode of management

Symptomatic therapy with β -blocker

- Propranolol 40-80 mg q6-8h, atenolol 25-100mg/d
- Use for symptomatic relief of palpitation and tremors and anxiety
- Until hyperthyroidism is controlled by definitive method
- Also used for management of Hashimoto thyroiditis and subacute thyroiditis
- Verapamil 40-80mg TID if β -blocker contraindicated

DEFINITIVE THERAPY Antithyroid drugs

- Antithyroid drugs are the management of choice during pregnancy
- Carbimazole (methimazole, active metabolite) and propylthiouracil (PTU)
- Half life of T4 is 7 days, clinical benefit is not apparent for about 3 weeks, so use β -blockers for symptomatic relief
- Carbimazole: initially 20-40mg/day (OD/TID \rightarrow max. 60mg/day), it has mild immunosuppressive activity
- PTU: initially 100-200mg 8 hourly \rightarrow max. 300mg QID (blocks the conversion T4 to T3)
- Adverse effects: rash, nausea/vomiting, agranulocytosis, jaundice – in these later two cases stop the drug immediately

Antithyroid drugs Dose titration

- Review after 4-6 weeks, adjust the dose depending on clinical status and FT4/FT3 levels
- When clinically and biochemically euthyroid, stop β -blockers
- Review after 2-3 months, if controlled, reduce the dose of antithyroid drugs
- Gradually reduce to 5mg OD of carbimazole or 50mg TID of PTU over 6-24 months if hyperthyroidism is controlled
- If patient is euthyroid in above dose, discontinue
- Majority of patients with Graves disease, hyperthyroidism recurs within 6 months after therapy is stopped

RAI therapy

- May be given to patients of all ages, except pregnancy and breastfeeding – before Rx pregnancy should be ruled out for fertile woman
- Single dose permanently control hyperthyroidism in ~90%
- RAI uptake is usually measured and calculate the dose of RAI (usually 200-500 MBq)
- Antithyroid drugs should be stopped 3 days before the RAI therapy

RAI therapy cont.

- If iodine therapy is given, should be stopped 2 weeks before RAI
- Usually takes several months (3-6 months) to restore euthyroid status
- Hypothyroidism and worsen of severe cardiac disease are the two main side effects
- After 4-6 weeks of RAI therapy, patient is evaluated
 1. thyroid function normal: monitor TSH
 2. hypothyroidism with symptoms: T4 therapy
 3. symptomatic hyperthyroidism persist after 6 months: repeat RAI

Subtotal thyroidectomy

Indications:

- Patient's choice: eg. Goiter
- Persistent side effect of drugs
- Poor compliance with drugs therapy
- Compression of trachea/oesophagus
- Retrosternal thyroid
- Recurrent hyperthyroidism after drugs
- Toxic goiter and suspicious of carcinoma

Preparation for surgery

- Antithyroid drugs are given until patient is euthyroid and 10 days before surgery is stopped
- Potassium iodide 40-80mg BD/TID is given at least for 1-2 weeks before surgery (reduces vascularity)
- Atenolol 50-100mg OD is given 1-2 weeks before surgery (HR<90 bpm) and continue 1-2 weeks after surgery
- fT4 and TSH to be accessed after 4-6 months of surgery
- Complication: hypothyroidism, hypoparathyroidism and laryngeal nerve injury

Special considerations

Subclinical hyperthyroidism

→Indications to treat:

1. Clinically symptomatic
2. Atrial fibrillation in the elderly
3. Osteoporosis in the postmenopausal women

Thyroid storm/crisis

- Rare condition, ~10% of mortality
- Rapid deterioration of hyperthyroidism with hyperpyrexia, severe tachycardia, extreme restlessness, delirium and precipitates heart failure/CAD
- Precipitated by stress, infection, surgery in unprepared patient or RAI therapy
- Treatment is urgent and intensively, and confirmatory (fT4, TSH) test should be obtained before the therapy is started

Thyroid storm - therapy

- PTU 300mg Q6h stat
- Potassium iodide 40-80mg BD after 2 hours od PTU (to inhibit thyroid hormone secretion rapidly)
- Propranolol 40mg Q6h oral or iv., esp. if patient have angina/tachycardia/MI
- fT4 is measured every 3-7 days and when serum T4 is in normal range, then PTU and iodide should be gradually decreased
- RAI therapy can be given 2 weeks after iodide is stopped

Hyperthyroidism in pregnancy

- TSH and fT3/fT4 monitored
- RAI therapy is contraindicated
- Rx with PTU only
- Adjust the dose of PTU in every months
- Target is fT4 is maintained near the upper limit of normal range
- Later stages of pregnancy dose requirement is often less
- Atenolol 25-50mg OD can be used to reduce the symptoms

Thyroid eye disease

- Thyrotoxic status should be treated but avoid hypothyroidism
- Stop smoking
- Methylcellulose eye drop – lubrication and comfort
- Eyelid should be tapped, upright sleeping
- Systemic steroids (prednisolone 30-120mg OD)
- Irradiation of the orbits
- Lid surgery to protect the corneal damage
- Surgical decompression of the orbits
- Correcting eye muscles – improves diplopia

