THYROID GLAND

LEARNING OBJECTIVES

- **To understand:**
- The development and anatomy of the thyroid glands.
- The physiology and investigation of thyroid function.
- The treatment of thyrotoxicosis and thyroid failure.

The indications for and technique of thyroid surgery

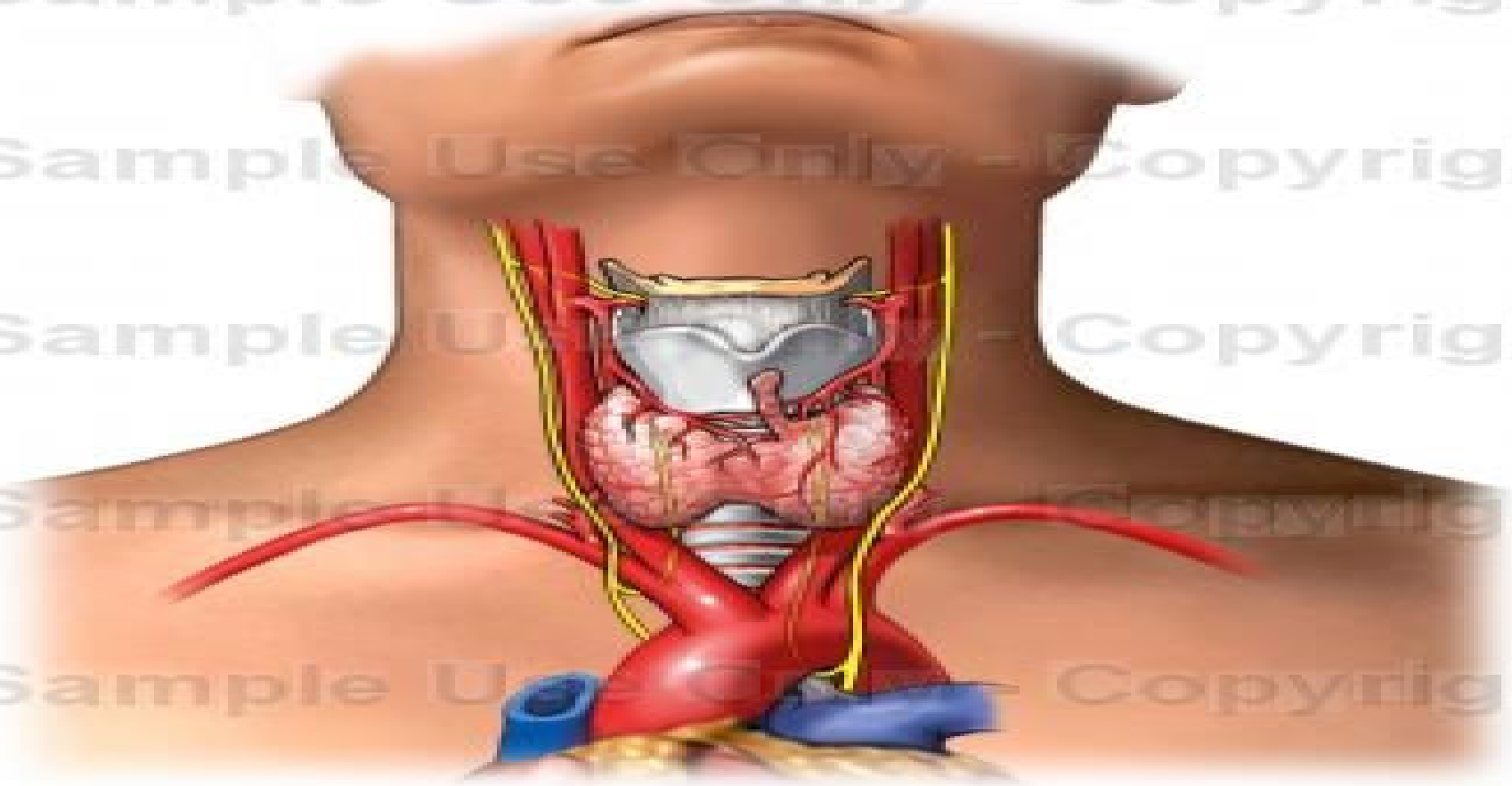
- The management of thyroid cancer

- Mention the causes of Thyrotoxicosis. Discuss the clinical features and management of primary thyrotoxicosis.
- Classify thyroid neoplasms. Discuss the management of solitary thyroid nodule.
- Describe how will you proceed with the diagnosis and treatment of a 40 y old female with multinodular goitre.
- Discuss the etiology, clinical features, diagnosis and treatment of MNG.
- Discuss the etio pathology,clinical features, diagnosis and treatment of Grave's disease.
- Discuss the classification and clinical features of thyroiditis.
- Discuss the etio pathology,clinical features, diagnosis and treatment of thyroid malignancies.

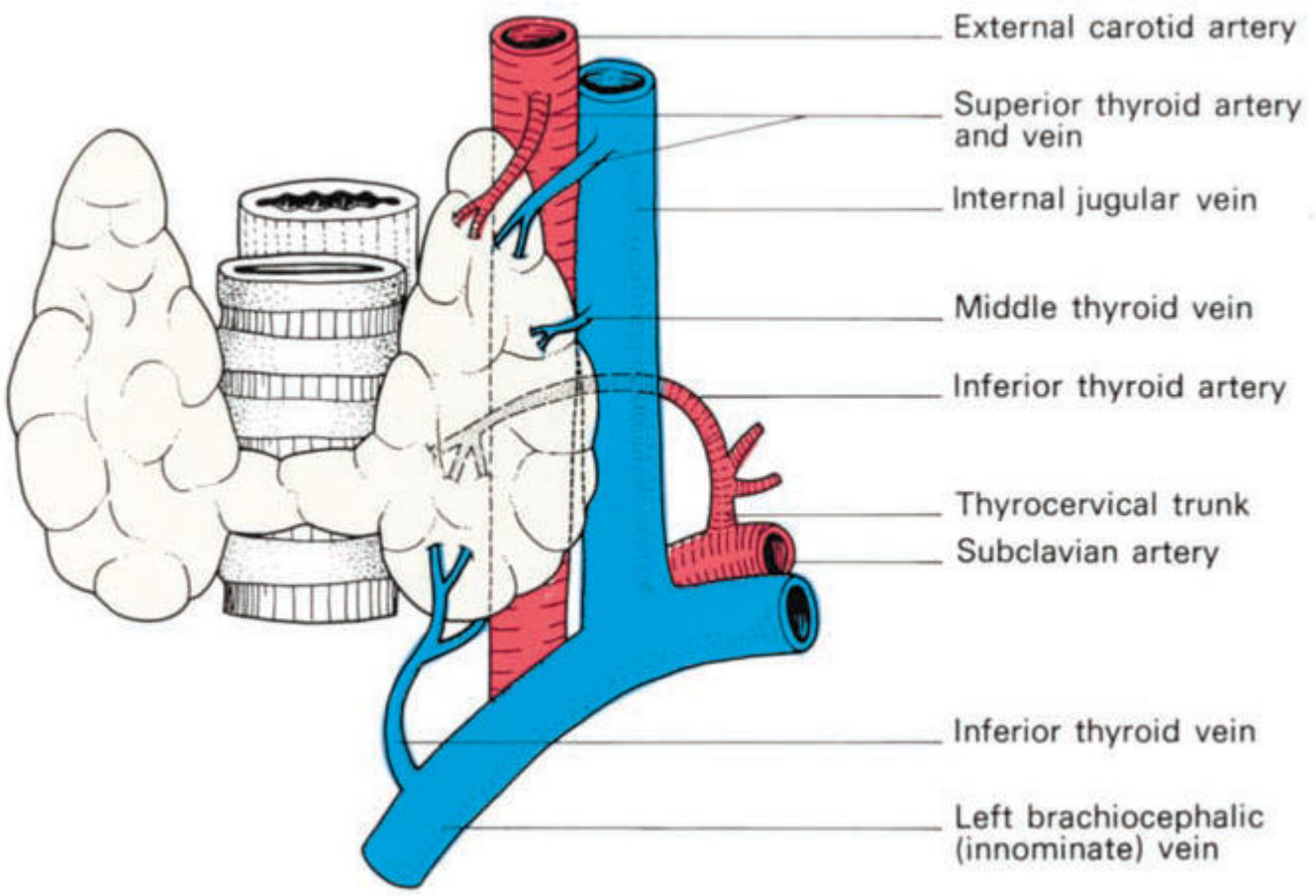
SHORT NOTES

- Complications of thyroid surgery.
- Development of thyroid and anomalies.
- Ectopic thyroid
- Eye signs in Grave's disease
- Jod Basedow thyrotoxicosis
- MEN syndrome
- Thyroglossal cyst/fistula
- Thyroid storm

CLINICAL ANATOMY



VASCULAR SUPPLY

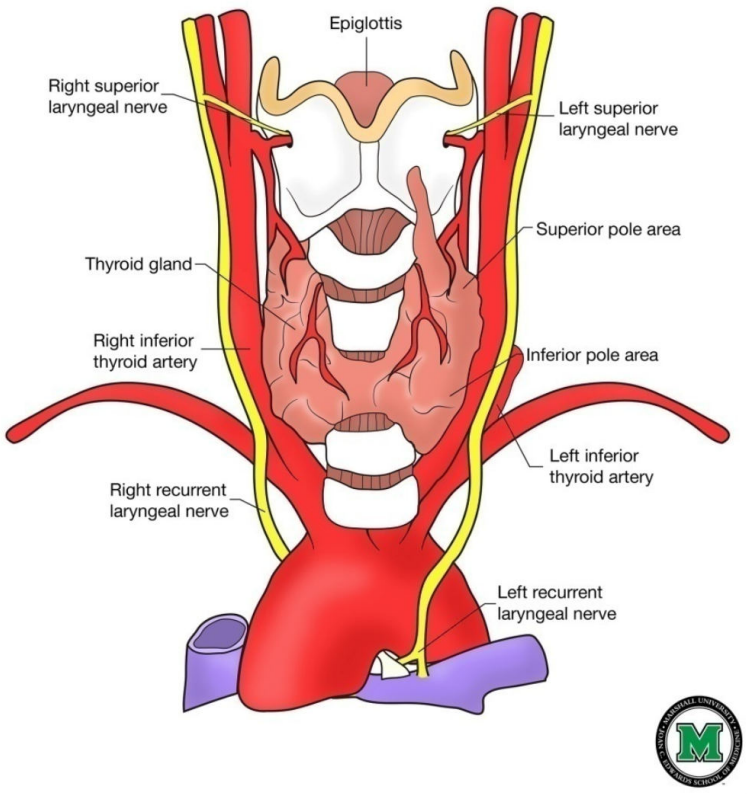


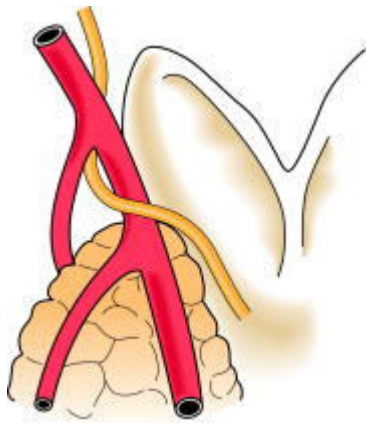
LYMPHATIC DRAINAGE

- Most important when considering surgical treatment of thyroid carcinoma.
- Paratracheal nodes; tracheoesophageal groove lymph nodes; mediastinal nodes in the anterior and superior position; jugular lymph nodes in the upper, middle, and lower distribution; and retropharyngeal and esophageal lymph nodes.
- Laterally, cervical lymph nodes within the posterior triangle.
- Papillary carcinoma of the thyroid is commonly associated with adjacent nodal metastasis.
- Medullary carcinoma has a strong predilection for metastatic lymphatic involvement, usually within the central compartment (the space between the internal jugular veins).

RELATIONS

- The gland is enclosed in the pretracheal fascia, covered by the strap muscles and overlapped by the sternocleidomastoids.
- The anterior jugular veins course over the isthmus.
- On the deep aspect of the thyroid lie the larynx and trachea, with the pharynx and oesophagus behind and the carotid sheath on either side.
- Two nerves lie in close relationship to the gland; in the groove between the trachea and oesophagus lies the *recurrent laryngeal nerve* and deep to the upper pole lies the *external branch of* the superior laryngeal nerve passing to the cricothyroid muscle.

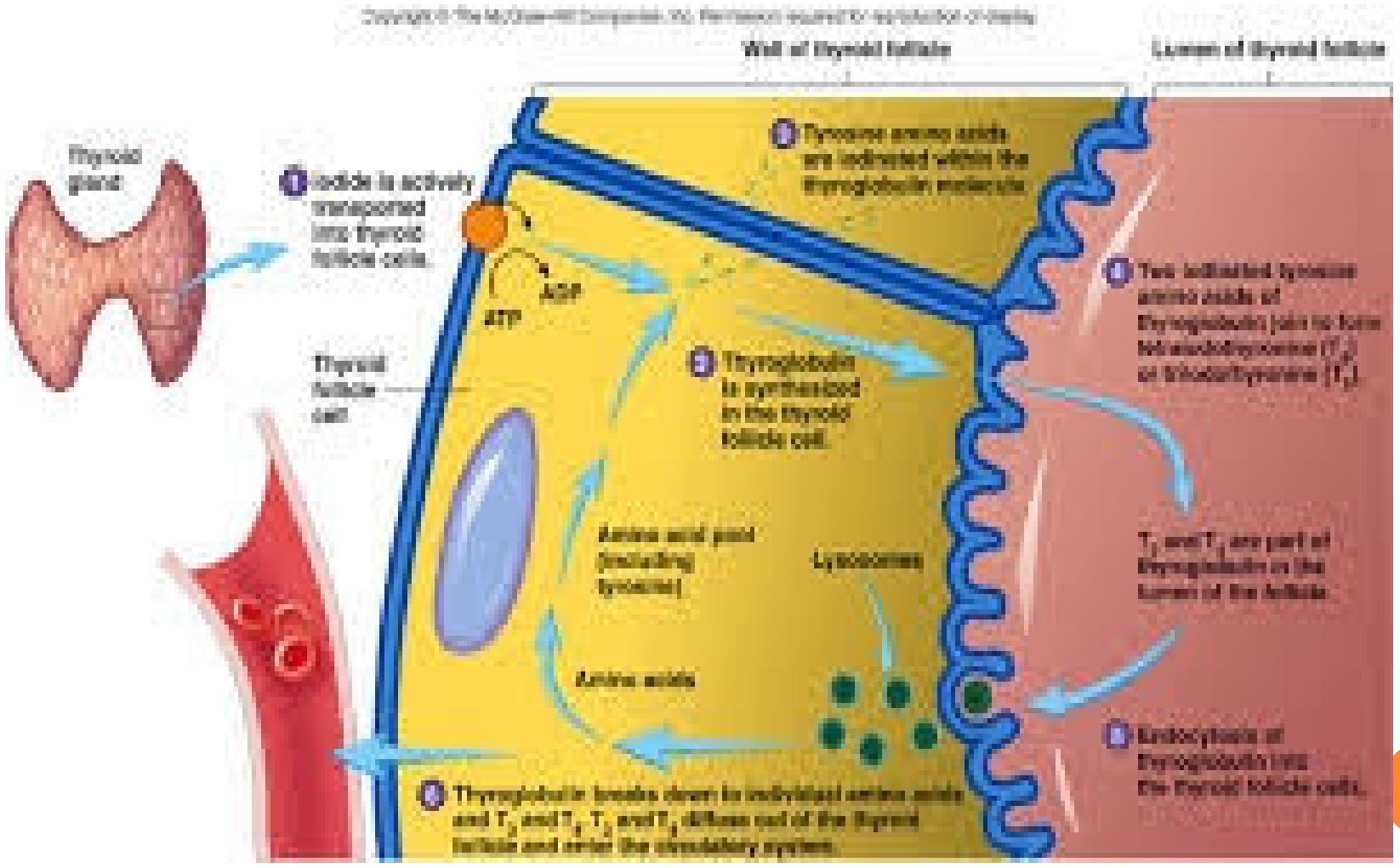


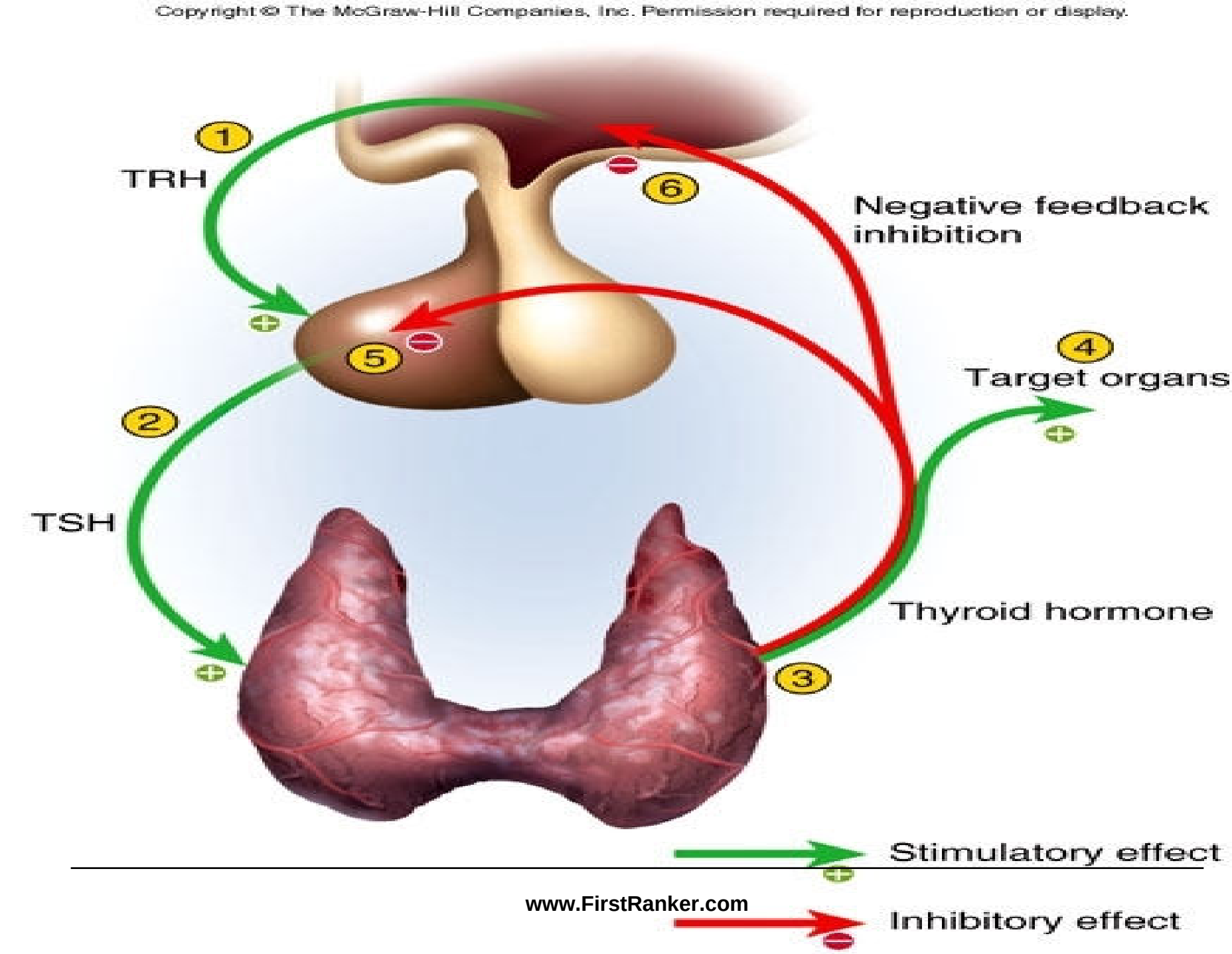


PHYSIOLOGY

- IODIDE TRAPPING.
- OXIDATION to iodine by thyroid peroxidase.
- IODINATION of tyrosine residues to mono and di iodotyrosine.
- COUPLING.

HORMONE SYNTHESIS





PHYSIOLOGY

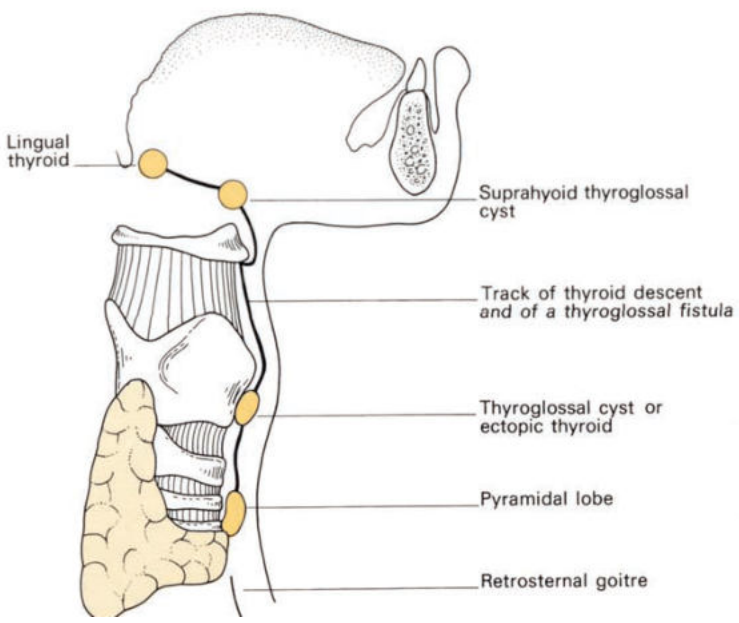
- TRH secreted by hypothalamus.
- Stimulates TSH secreted by ant pituitary.
- Stimulates the thyroid gland to synthesise T3 and T4.
- T3 and T4 have negative feedback inhibition on TSH and TRH.

PHYSIOLOGY

- The thyroid hormones secreted by the gland are in bound form and free form.
- Free form is biologically active.
- The hormones once liberated are bound to serum proteins- name?
- T3 has a rapid onset of action and a much shorter half life than T4.
- Thyroid hormone synthesis is inhibited by?

CONGENITAL DISEASES

DEVELOPMENT



- The thyroid develops from a bud which pushes out from the floor of the pharynx and then descends to its definitive position in the neck.

THYROGLOSSAL CYST

LINGUAL THYROID

- Occurs as a failure of normal descent of the thyroid
- Presents as a lump in the foramen caecum or in the front of the neck near the body of the hyoid bone.
- In all cases of unexplained nodules in the line of thyroid descent, a radio-iodine scan should be performed to ensure that there is normal thyroid tissue in the correct place before the lump is removed.
- Enlargement of a lingual thyroid can cause airway obstruction, dysphagia, or bleeding.
- Most lingual thyroid glands can be suppressed with thyroid hormone administration.
- In resistant lingual thyroids, radioactive iodine treatment may be given.

Ectopic thyroid tissue

- Can be found in the central compartment of the neck, under the lower poles of normal thyroid or in the anterior mediastinum.
- *Lateral aberrant thyroid*

Pendred's syndrome

- A rare autosomal recessive condition characterised by incomplete oxidation of trapped iodide prior to organification.
- Associated with sensorineural deafness, mild primary hypothyroidism with a non-toxic diffuse goitre.
- It may be confirmed by a positive perchlorate discharge test.

Tests of thyroid function

Evaluation of Pituitary- Thyroid feedback loop

1)Serum TSH assay

2)TRH stimulation test

SERUM T3 AND T4 LEVELS

- Only a small fraction of the total (0.03% of T4 and 0.3% of T3) is free.
- Assays of total hormones are now obsolete.
- Estimation of free T3 and free T4.
  - **T3 resin uptake test**

THYROID AUTOANTIBODIES

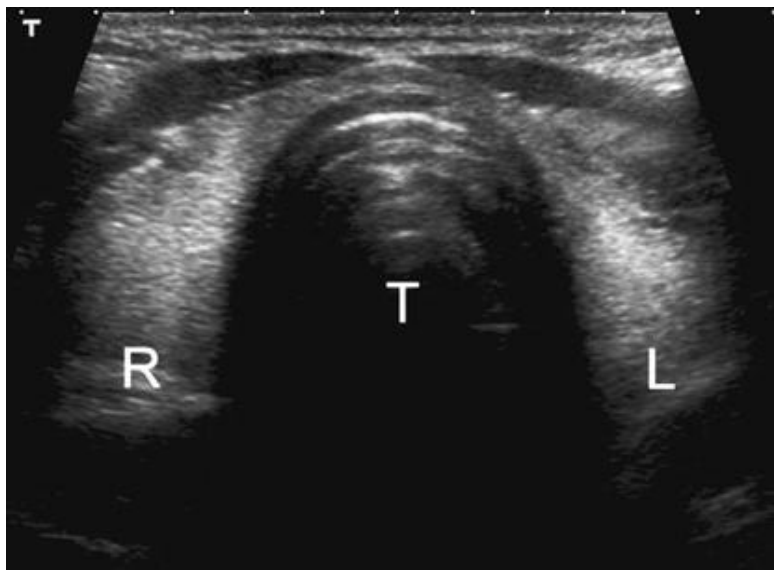
- TPO antibodies
- Anti thyroglobulin antibodies
- Antimicrosomal antibodies

Thyroid imaging

1) Chest X-Ray.

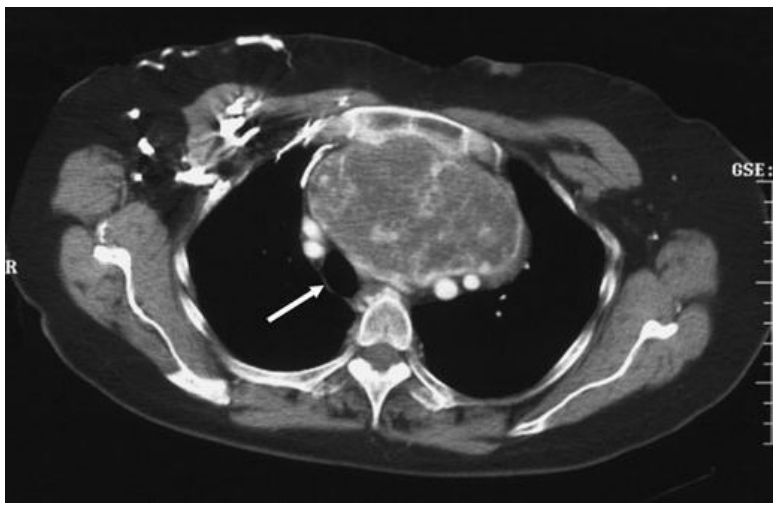
Thyroid imaging

- USG
- Helps in determining the nature of swelling.
- USG guided FNAC.
- Helps in detecting MetastaticLNs.
- Followup.



THYROID IMAGING

- CT scan
- To know the extent of malignancy and reterosternal extension.



THYROID SCINTIGRAPHY

- Provide information about thyroid activity , the size and extent of the gland.
- Helpful in showing retrosternal extension.
- Material used is Tc 99m, I123,I131.
- Cold nodule: 80% benign,20% malignant.
- Hot nodule: 5-9% malignant.
- Warm nodule: take up the same radioactivity as rest of the gland.
- The principal benefits of isotope scanning are in confirming the presence of a ‘hot/toxic' nodule in the thyroid gland in a thyrotoxic patient, and in identifying metastases or residual local disease after total thyroidectomy for carcinoma.

THYROID SCINTIGRAPHY

- A hot nodule is one that takes up isotope while the surrounding thyroid tissue does not.
- Here, the surrounding thyroid tissue is inactive because the nodule is producing such high levels of thyroid hormones that TSH secretion is suppressed.
- A warm nodule takes up isotope, as does the normal thyroid tissue around it.
- A cold nodule does not take up isotope

FNAC

- IOC for discrete thyroid swellings.
- Thy1- Non-diagnostic
- Thy2- Non-neoplastic
- Thy3 -Follicular
- Thy4 -Suspicious of malignancy
- Thy5- Malignant

MISCELLANEOUS

Serum calcitonin

Serum thyroglobulin-concentrations > 50µg/l indicate probable residual or recurrent tumour.

- Concentrations >100 µg/l strongly suggest the presence of pulmonary or skeletal metastases.

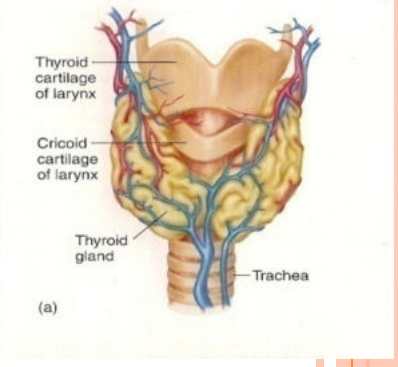
Flow cytometry for identifying diploid tumours, which have a good prognosis, and aneuploid tumours, which have a poor prognosis.

CLINICAL FEATURES

- There are two broad categories of symptoms : those occurring as a result of the enlargement of the gland itself and those related to its disordered endocrine activity.
- The history will establish whether one or both classes of symptoms are present, and examination then aims to elicit the relevant physical signs.

Neck symptoms

- ***A lump in the neck***
- ***Discomfort on swallowing***
- ***Dyspnoea***
- ***Hoarseness***



HYPOTHYROIDISM ADULT (MYXEDEMA)

- Hypothyroidism in adults → ↓ THs.
- Could be:

  1ry hypothyroidism … (diseases is in the gland)

  - autoimmune disease such as "Hashimoto's thyroiditis".
  - lack of iodine.
  - absence of deiodination enzyme.

  ↓ **T_3** & **T_4** → reflex ↑ **TSH**.

  2ry hypothyroidism … (disease is higher up)

  ↓ **TRH** → ↓ **TSH** → ↓ **T_3** & **T_4**.
- Follicular cells become less active.

HYPOTHYROIDISM

- ***Autoimmune thyroiditis (chronic lymphocytic thyroiditis)***
- Non-goitrous: Primary myxoedema
- Goitrous: Hashimoto's disease
- ***Iatrogenic***
- After thyroidectomy
- After radioiodine therapy
- Drug induced (anti-thyroid drugs, para-aminosalicylic acid,Amiodarone,Cytokines and iodides in excess)
- ***Dyshormonogenesis***
- ***Goitrogens***
- ***Secondary to pituitary or hypothalamic disease***
- ***Thyroid agenesis***
- ***Endemic cretinism----*** due to iodine deficiency

CRETENISM

- Inadequate thyroid hormone production during fetal and neonatal development.
- 2 types- Endemic and Sporadic
- A hoarse cry, macroglossia and umbilical hernia in a neonate with features of thyroid failure suggests the diagnosis.
- Tt is by thyroxine.

ADULT HYPOTHYROIDISM

- The symptoms are:

• tiredness;
• mental lethargy;
• cold intolerance;
• weight gain;
• constipation;
• menstrual disturbance;
• carpal tunnel syndrome

- The signs are:

• bradycardia;
• cold extremities;
• dry skin and hair;
• periorbital puffiness;
• hoarse voice;
• bradykinesis, slow movements;
• delayed relaxation phase of ankle jerks

MYXEDEMA

- The signs and symptoms of hypothyroidism are accentuated.
- The facial appearance is typical-supraclavicular puffiness, a malar flush and a yellow tinge to the skin.
- Myxoedema coma, characterised by altered mental state, hypothermia and a precipitating medical condition, for example cardiac failure or infection.

Diagnosis and treatment

- Low T4 and T3 levels with a high TSH.
- What will happen in Pituitary failure?
- High serum levels of TPO antibodies are characteristic of autoimmune disease.
- Treatment-
- Oral thyroxine (0.10–0.20 mg) as a single daily dose.

THYROTOXICOSIS

Describe the causes
- Discuss the pros and cons of the three major treatment options
- Know how to prepare a patient for operation
- Describe appropriate surgical procedures
- Know about early and late postoperative management

THYROTOXICOSIS

- THYROTOXICOSIS v/s HYPERTHYROIDISM??
- **Hyperthyroidism** is a condition in which the thyroid gland producesand secretes excessive amounts of the free thyroid hormones.
- **Thyrotoxicosis**
  hypermetabolic clinical syndrome which occurs when there are elevated serum levels of T3 and/or T4.
- Thyrotoxicosis can also occur without hyperthyroidism.

THYROTOXICOSIS

- Clinical types are:
- • diffuse toxic goitre (Graves' disease);
- • toxic nodular goitre;
- • toxic nodule;
- • hyperthyroidism due to rarer causes.

THYROTOXICOSIS

- ***Diffuse toxic goitre***
- Graves' disease, occurs in younger women .
- Associated with eye signs.
- 50% of patients have a family history of autoimmune endocrine diseases.
- The whole of the functioning thyroid tissue is involved.
- Hypertrophy and hyperplasia are due to abnormal thyroid-stimulating antibodies (TSH-RAbs)

THYROTOXICOSIS

- ***Toxic nodular goitre***
- A simple nodular goitre is present for a long time before the Hyperthyroidism.
- Middle-aged or elderly.
- Very infrequently associated with eye signs.
- The syndrome is that of secondary thyrotoxicosis.
- In many cases of toxic nodular goitre the nodules are inactive and it is the internodular thyroid tissue that is overactive.

THYROTOXICOSIS

- ***Toxic nodule***
- A toxic nodule is a solitary overactive nodule, which may be part of a generalised nodularity or a true toxic adenoma.
- It is autonomous and its hypertrophy and hyperplasia are not due to TSH-RAb.
- TSH secretion is suppressed by the high level of circulating thyroid hormones and the normal thyroid tissue surrounding the nodule is itself suppressed and inactive.

THYROTOXICOSIS-CLINICAL FEATURES

- The symptoms are:
- • tiredness;
- • emotional lability;
- • **heat intolerance;**
- • **weight loss;**
- • **excessive appetite;**
- • **palpitations.**

- The signs are:
- • **tachycardia;**
- • hot, moist palms;
- • exophthalmos;
- • lid lag/retraction;
- • **agitation;**
- • **thyroid goitre and bruit.**

GRAVE'S OPHTHALMOPATHY

- 2 clinical phases:
- The **inflammatory** stage and the **fibrotic** stage
- The inflammatory stage is marked by edema and deposition of glycosaminoglycan in the extraocular muscles. There is orbital swelling, stare, diplopia, periorbital edema, and at times, pain.
- The fibrotic stage is a convalescent phase and may result in further diplopia and lid retraction. It improves spontaneously in 64% of patients

PRETIBIAL MYXEDEMA

- Elevated, firm, nonpitting, localized thickening over the lateral aspect of the lower leg, with bilateral involvement.
- Milder cases do not require therapy other than treatment of the thyrotoxicosis.
- Therapy with topical steroids applied under an occlusive plastic dressing film for 3-10 weeks has been helpful.
- In severe cases, pulse glucocorticoid therapy may be tried.

ACROPACHY

- Clubbing of fingers with osteoarthropathy, including periosteal new bone formation, may occur.
- This almost always occurs in association with ophthalmopathy and dermopathy.
- No therapy has been proven to be effective.

WORKUP

- TSH levels usually are suppressed to immeasurable levels (<0.05 μIU/mL) in thyrotoxicosis.
  - Subclinical hyperthyroidism is defined as a suppressed TSH level (<0.5 μU/mL in many laboratories) in combination with serum concentrations of T_3 and T_4 that are within the reference range.

- Thyroid autoantibodies: The most specific autoantibody for autoimmune thyroiditis is an enzyme-linked immunosorbent assay (ELISA) for anti-TPO antibody (thyroperoxidase).

SCANNING

- Graves disease is associated with diffuse enlargement of both thyroid lobes, with an elevated uptake .
- A toxic multinodular goiter demonstrates an enlarged thyroid with multiple nodules and areas of both increased and decreased isotope uptake .
- Subacute thyroiditis usually demonstrates very low I-123 isotope uptake.
- A toxic adenoma demonstrates a solitary hot nodule with suppression of function in the surrounding normal thyroid tissue .

MANAGEMENT

- ANTITHYROID DRUGS
- SURGERY
- RADIOIODINE

ANTI THYROID DRUGS

- Carbimazole, methimazole and propylthiouracil are most commonly used.
- Reduce the synthesis of thyroid hormones by inhibiting the iodination of tyrosine residues.
- Carbimazole also has an immunosuppresive action.
- Clinical improvement occurs within 10-14 days.
- Pt is clinically and biochemically euthyroid by 3-4 wks.
- Tt is continued for 12-18 months.

ANTI THYROID DRUGS

- ADVANTAGE

No surgery and no use of radioiodine.

- DISADVANTAGE

Tt is prolonged and the failure rate is atleast 50%

Some goitres enlarge and become more vascular during tt.

Side effects are agranulocytosis or aplastic anemia

SURGERY

- Usually done when there is a large goitre,poor drug compliance,recurrence.
- Subtotal thyroidectomy is done.
- Contraindication is previous thyroid surgery.
- Complications are hypothyroidism,transient hypocalcemia,permanent hypoparathyroidism,recurrent laryngeal nerve palsy.

SURGERY

- ADVANTAGE

Goitre is removed.

Cure is rapid and cure rate is high.

- DISADVANTAGE

Recurrenc occurs in 5%

Every operation carries mortality and morbidity.

Post op thyroid insufficiency

RADIOIODINE

- 131I is given orally as a single dose and is trapped and organified in thyroid.
- There is alag period of 4-12 wks before it is effective.
- During this period the symptoms are controlled by beta blockers.
- Contraindications are pregnancy,active graves ophthalmopathy.
- Complications are hypothyroidism,malignancies of thyroid and gi tract.

RADIOIODINE

- No surgery and prolonged drugs.

DISADVANTAGE

Isotope facilities must be available.

High incidence of hypothyroidism which may reach 75 -80% after 10 yrs.

Indefinite follow up.

Increased risk of malignancy.

CHOICE

1.DIFFUSE TOXIC GOITRE-

Over 45-Radioiodine

Under 45-Surgery for large goitre and drugs for small goitre.

2.TOXIC NODULAR GOITRE-

SURGERY.

3.TOXIC NODULE-

Surgery or Radioiodine

4.RECURRENT THYROTOXICOSIS AFTER SURGERY-

Over 45-Radioiodine,Under 45-Drugs.

- Correction of hyperthyroidism is important for the ophthalmopathy.
- Antithyroid drugs and thyroidectomy do not influence the course of the ophthalmopathy, whereas radioiodine treatment may exacerbate preexisting ophthalmopathy but can be prevented by glucocorticoids.
- In the long term, thyroid ablation may be beneficial for ophthalmopathy because of the decrease in antigens shared by the thyroid and the orbit in the autoimmune reactions.

GRAVE'S OPHTAHLMOPATHY

- For mild-to-moderate ophthalmopathy, local therapeutic measures (eg, artificial tears and ointments, sunglasses, eye patches, nocturnal taping of the eyes, prisms, elevating the head at night) can control symptoms and signs.
- If the disease is active (1) high-dose glucocorticoids, (2) orbital radiotherapy, (3) both, or (4) orbital decompression

PRE OP PREPARATION

- Carbimazole in the dose of 30-40mg daily for 8-12wks is given. when euthyroid the dose is reduced to 5mg t.d.s.
- Iodides in the form of lugol's iodine is used 2-3 wks prior to surgery.dose is 30 drops t.d.s.it reduces the size and vascularity of the gland.
- Propranol acts on the target organs and not on the gland itself. Dose is 40mgt.d.s.it inhibits the peripheral conversion of T4 to T3.

POSTOPERATIVE COMPLICATIONS

- Haemorrhage
- Respiratory obstruction
- Recurrent laryngeal nerve paralysis and voice change
- Thyroid insufficiency
- Parathyroid insufficiency
- Thyrotoxic crisis
- Wound infection
- Hypertrophic or keloid scar
- Stitch granuloma

GOITRE

Know how to describe thyroid swellings
Use appropriate investigations
Know the indications for surgery
Select the appropriate procedure
Describe and manage postoperative complications

Classification of goitre

- **Simple goitre (euthyroid)**
  - Diffuse hyperplastic
    - Physiological
    - Pubertal
    - Pregnancy
  - Multinodular goitre
- **Toxic**
- Diffuse
  - Graves' disease
- Multinodular
- Toxic adenoma
- **Neoplastic**
- Benign
- Malignant

Classification of goitre

- **Inflammatory**
  - Autoimmune
  - Chronic lymphocytic thyroiditis
  - Hashimoto's disease
  - Granulomatous
  - De Quervain's thyroiditis
  - Fibrosing
  - Riedel's thyroiditis
- Infective
  - Acute (bacterial thyroiditis, viral thyroiditis, 'subacute thyroiditis')
  - Chronic (tuberculous, syphilitic)

Inflammatory	Hyperplasia	Tumours		Others
		Benign	Malignant	
Graves Disease	Multinodular goitre	Follicular adenoma	Papillary	Colloid cyst
Hashimoto's thyroiditis	Non-toxic goitre		Follicular	Thyroid lymphoma
De Quervain's			Anaplastic	Acute suppurative thyroiditis
			Medullary	

SIMPLE GOITRE

- Stimulation of the thyroid gland by TSH.
- The most common cause iodine deficiency.
- Increased demand.
- Excess iodine or lithium ingestion, which decrease release of thyroid hormone
- Goitrogens(cassava, lima beans, maize, bamboo




-Inborn errors of metabolism causing defects in biosynthesis of thyroid hormones

- Exposure to radiation

-Thyroid hormone resistance

Side-effects of pharmacological therapy such as:

Amiodarone :

inhibits peripheral conversion of thyroxine to triiodothyronine; also interferes with thyroid hormone action.

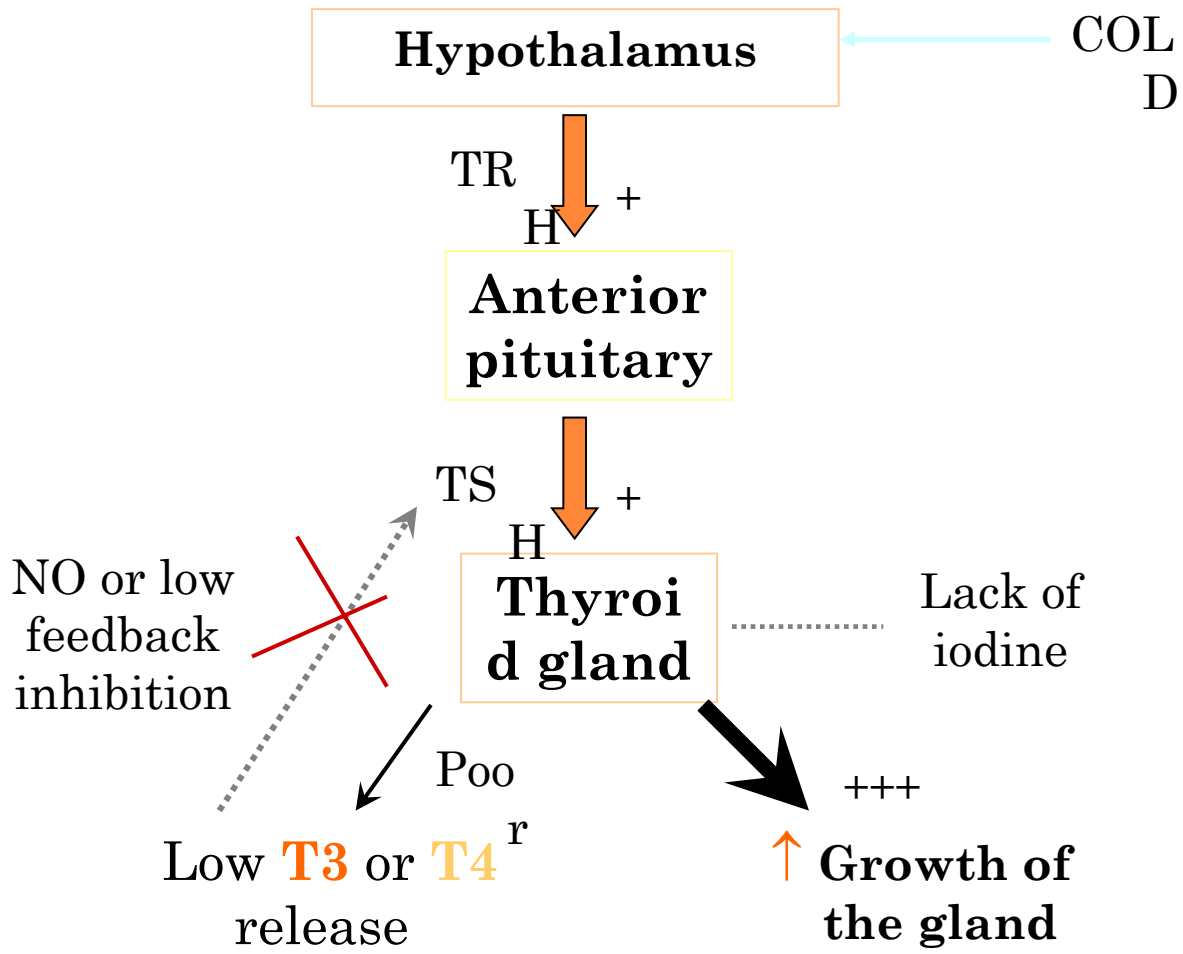
Phenobarbitone, phenytoin, carbamazepine, Rifampcin:

induce metabolic degradation of T3 and T4.

- If **No Iodine** → ↓ **T_3 & T_4** → ↑ **TRH** → ↑ **TSH**→ ↑ growth (size) of the gland → **simple goiter**.

How goiter is formed?

With lack of iodine …



NATURAL HISTORY

Persistant growth stimulation cause diffuse hyperplasia ,all lobules are composed of active follicles and iodine uptake is uniform .This is a diffuse hyperplastic goiter .

Mixed pattern develops with areas of active lobules and areas of inactive lobule as a result of fluctuating stimulation.

Active lobules become more vascular & hyperplastic untill haemorrhage occur causing central necrosis & leaving only a surrounding rind of active follices.

Necrotic lobules __ form nodules filled with either iodine-free colloid or a mass of new but inactive follicles.

Continual repetition of this process result in a nodular goiter.

CLINICAL FEATURES

- Euthyroid.
- Neck swelling which moves on swallowing.
- Rule out compressive symptoms.
- Hardness and irregularity, due to calcification, may simulate carcinoma.
- A painful nodule or the sudden appearance or rapid enlargement of a nodule may be because of haemorrhage or carcinoma.

INVESTIGATIONS

- Serum TSH.
- USG neck.
- Thyroid autoantibodies.
- Plain X-Ray neck.
- FNAC.

COMPLICATIONS

- Respiratory obstruction.
- Secondary Thyrotoxicosis.
- Carcinoma (Follicular).

Prevention and treatment of simple goitre

- Iodised salt.
- INDICATIONS OF SURGERY:
  - Cosmesis
  - Retrosternal extension.
  - Compressive symptoms.
  - Suspected malignancy.

WHAT SURGERY???

Total thyroidectomy

Subtotal thyroidectomy leaving up to 4 g of relatively normal tissue in each remnant.

- *Total lobectomy on the more* affected side with either subtotal resection (Dunhill procedure) or no intervention on the less affected side.

Discrete thyroid swelling

- WHAT IS SOLITARY SWELLING OF THYROID?
- WHAT IS DOMINANT SWELLING?
- About 70% of discrete thyroid swellings are isolated and about 30% are dominant.
- The importance lies in the increased risk of neoplasia compared with other thyroid swellings.
- 15% of isolated swellings are malignant, 30–40% are follicular adenomas.

Clinically discrete swellings

- What are the risk factors which suggest that a discrete swelling is malignant????
- When will you suspect malignancy in a discrete swelling????

Clinically discrete swellings

- Causes???
- Investigation???

Clinically discrete swellings

- INDICATIONS OF SURGERY?
- All proven malignant nodules.
- Cytologically proven follicular adenoma.
- Suspicious nodules.
- Cystic nodules which recur following aspiration.
- Nodules producing obstructive symptoms.
- Toxic nodule.
- Cosmesis.
- Patient's wish.

Retrosternal goitre

RETROSTERNAL GOITRE

- Arise from the lower pole of a nodular goitre.
- Short neck and strong pretracheal muscles increase the negative intrathoracic pressure which tends to draw these nodules into the superior mediastinum.
- Symptomless.
- Dyspnoea, particularly at night,
- Cough and stridor
- Dysphagia.
- Engorgement of facial, neck and superficial chest wall veins.
- Obstruction of the superior vena cava
- Recurrent nerve paralysis

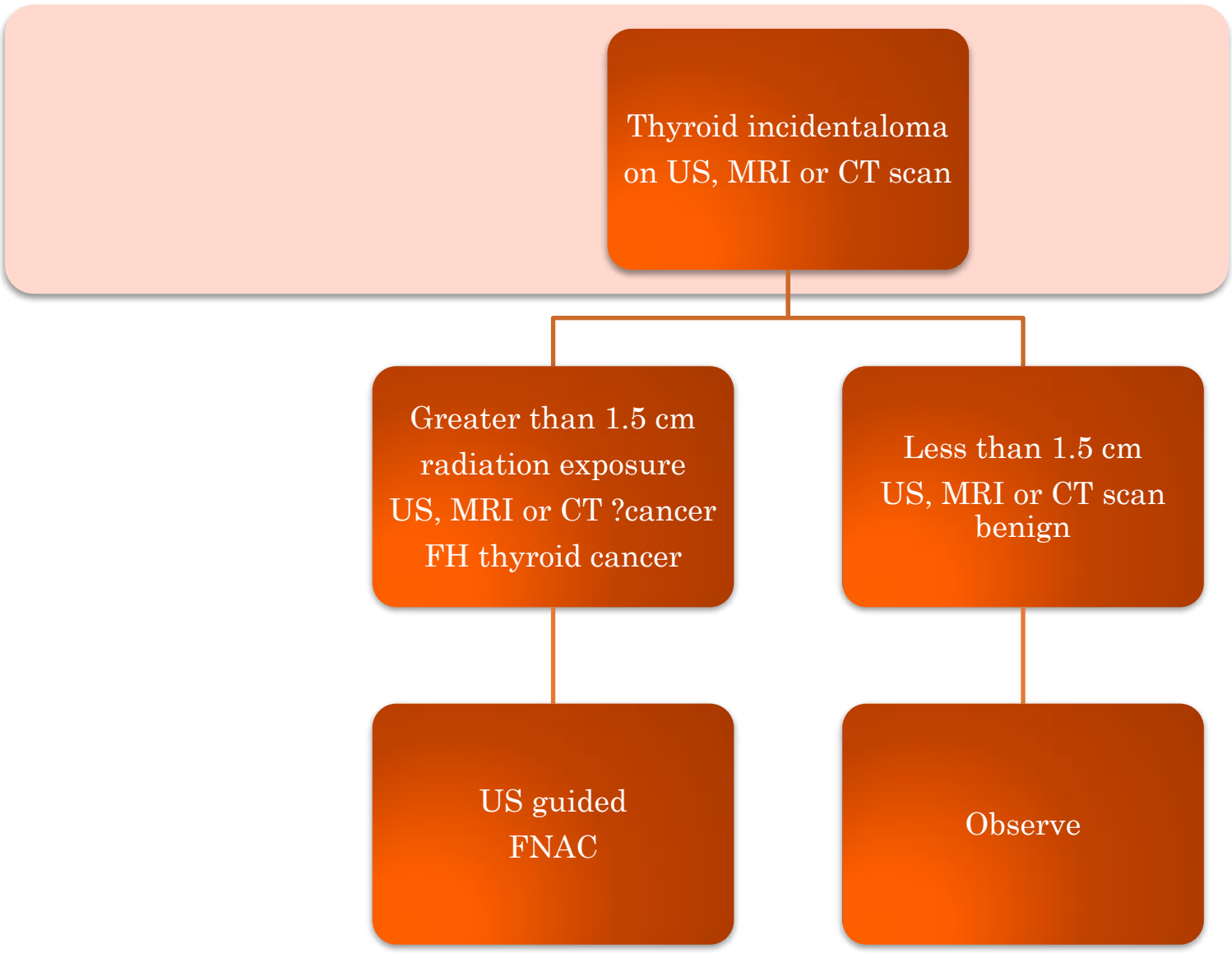
RETROSTERNAL GOITRE

- CXR
- CT Scan.
- Surgery.

THYROID INCIDENTALOMA

THYROID INCIDENTALOMA

- Due to the increased use of imaging modalities for non-thyroid head and neck pathology.
- Clinically unsuspected and impalpable thyroid swellings.
- Generates needless anxiety.
- Can be safely managed expectantly by a single annual review.



HASHIMOTO'S THYROIDITIS

- Characterized by the destruction of thyroid cells by cell- and antibody-mediated immune processes.
- The thyroid gland is typically goitrous.
- Antithyroid peroxidase (anti-TPO), antithyroglobulin (anti-Tg),TSH receptor-blocking antibodies.
- Inadequate thyroid hormone production and secretion.
- Initially, (T4) and (T3) may "leak" into the circulation from damaged cells.
- 10-15 times more common in females.
- The most commonly affected age range is 30-50 years.

WORKUP

- TFT.
- USG.
- Complete blood count.
- Total and fractionated lipid profile.

WORKUP

- Basic metabolic panel: Glomerular filtration rate, renal plasma flow, and renal free water clearance are all decreased in hypothyroidism and may result in hyponatremia.
- Creatine kinase: Creatine kinase levels, predominantly the MM isoenzyme from skeletal muscle and the aldolase enzyme, are frequently elevated in severe hypothyroidism.
- Prolactin: Prolactin may be elevated in primary hypothyroidism

TREATMENT

- The treatment of choice for Hashimoto thyroiditis is thyroid hormone replacement.
- The drug of choice is orally administered levothyroxine sodium, usually for life.
- Indications for surgery
  - A large goiter with obstructive symptoms such as dysphagia, voice hoarseness, and stridor from extrinsic obstruction to airflow.
  - Presence of a malignant nodule, as found by cytologic examination by fine-needle aspiration.
  - Presence of a lymphoma diagnosed on fine-needle aspiration.
  - Cosmetic reasons for unsightly large goiters

REIDEL'S THYROIDITIS

- A rare, chronic inflammatory disease of the thyroid gland characterized by a dense fibrosis that replaces normal thyroid parenchyma.
- The fibrotic process invades adjacent structures of the neck and extends beyond the thyroid capsule.
- This feature differentiates RT from other inflammatory or fibrotic disorders of the thyroid.
- Because of the encroachment beyond the thyroid capsule, other problems can be associated with RT, including hypoparathyroidism, hoarseness (due to recurrent laryngeal involvement), and stridor (due to tracheal compression).

PATHOPHYSIOLOGY

- The etiology of Riedel's thyroiditis (RT) is unknown.
- An autoimmune process or a primary fibrotic disorder.
- The following evidence supports an autoimmune pathogenesis for RT:
- The presence of antithyroid antibodies in a significant percentage of patients with RT (67% of 178 cases reviewed in one study)[2]
- The pathological features of cellular infiltration, including lymphocytes, plasma cells, and histiocytes
- The frequent presence of focal vasculitis on pathologic examination
- The favorable response of a subset of patients with RT to treatment with systemic corticosteroids

CLINICAL FEATURES

- **History**
- Nonpainful, rapidly growing thyroid mass.
- Hard, fixed, painless goiter- stony or woody.
- Most patients are euthyroid. Hypothyroidism is noted in approximately 30% of cases.
- Local compressive symptoms.
- Hypoparathyroidism.
- Clinical features closely resemble those of anaplastic carcinoma of the thyroid.
- One distinguishing feature of RT is the absence of associated cervical adenopathy.

CLINICAL FEATURES

- Approximately one third of patients with RT have an associated extracervical manifestation of multifocal fibrosclerosis (eg, retroperitoneal fibrosis, mediastinal fibrosis, orbital pseudotumor, pulmonary fibrosis, sclerosing cholangitis, lacrimal gland fibrosis, fibrosing parotitis).

MANAGEMENT

- ROUTINE TESTS.
- FNAC,BIOPSY.
- SURGERY.

DEQUAIRVEIN'S THYROIDITIS

- Most common cause of a painful thyroid gland.
- Pain in the region of the thyroid, which is usually diffusely tender with systemic symptoms.
- Hyperthyroidism occurs initially, sometimes followed by transient hypothyroidism.
- Complete recovery in weeks to months is characteristic.

PATHOPHYSIOLOGY

- A viral infection like coxsackievirus, Ebstein-Barr, mumps, measles, adenovirus, echovirus, and influenza.
- A strong association exists with human leukocyte antigen (HLA)-B35.

EPIDEMIOLOGY

- **Sex**
- Female-to-male ratio of 3-5:1.
- **Age**
- A peak incidence in the fourth and fifth decades of life

HISTORY

- **History**
- Flulike prodromal episode 1-3 weeks prior to the onset of clinical disease. The natural course of the disease can be divided into the following 4 phases that usually unfold over a period of 3-6 months:
- The acute phase, lasting 3-6 weeks, presents primarily with pain. Symptoms of hyperthyroidism also may be present.
- The transient asymptomatic and euthyroid phase lasts 1-3 weeks.
- The hypothyroid phase lasts from weeks to months, and it may become permanent in 5-15% of patients.
- The recovery phase is characterized by normalization of thyroid structure and function.

S | S

- Local symptoms
  - Pain over the thyroid that radiates to the neck, ear, jaw, throat, or occiput; and is aggravated by swallowing and head movement;
  - pain is the presenting symptom in over 90% of cases
  - Dysphagia
  - Hoarseness (uncommon)
- Constitutional symptoms (often absent)

S | S

- Symptoms of hyperthyroidism (palpitations, tremulousness, heat intolerance, sweating, nervousness) occurring in the initial phase of the disease
  - Hyperthyroidism that usually is mild and rarely is severe
  - Transient symptoms, usually lasting 3-6 weeks
- Symptoms of hypothyroidism, occurring in the late phase of the disease
  - Mostly mild or moderate
  - Hypothyroidism lasts weeks to months

WORKUP

- Usually, the diagnosis is made on clinical grounds, and the only laboratory studies needed initially are those to determine whether hyperthyroidism is present, including TSH and free T4.
- If any doubt exists as to whether de Quervain thyroiditis is the correct diagnosis, 2 other tests may be helpful.
  - Serum thyroglobulin is almost always markedly elevated.
  - Erythrocyte sedimentation rate (ESR) is usually higher than 50 mm/h in the initial phase

WORKUP

- After the initial inflammatory phase subsides, TSH should be monitored at intervals of 4-6 weeks for a few months to determine whether hypothyroidism occurs.
- Antibodies to TGB, thyroid peroxidase, and TSH receptor are usually absent in de Quervain thyroiditis.
- In rare cases with systemic multiorgan involvement, elevation of serum alkaline phosphatase, gamma-glutamyl transpeptidase, aminotransferases, and pancreatic enzymes may occur. Glucose intolerance has been reported.

TT.

- Management is directed towards 2 problems—pain and thyroid dysfunction.
- Pain
  - Some patients with mild pain require no treatment. Nonsteroidal anti-inflammatory drugs (NSAIDs), are used.
  - If pain does not respond within 3 days, the diagnosis should be reconsidered.

TT.

- Management of thyroid dysfunction
  - In the initial phase of de Quervain thyroiditis, symptomatic hyperthyroidism can be treated with beta-blockade (propranolol 10-20 mg qid or atenolol 25-50 mg/d).
- If hypothyroidism occurs during the late phase, it is usually mild and transient. If symptoms are present or TSH is elevated, the patient needs replacement therapy with levothyroxine

THYROID NEOPLASMS

THYROID NEOPLASMS

A.BENIGN
a.Follicular adenoma.
b.Hurthle cell adenoma.
c.Colloid adenoma.
d.Papillary adenoma.
B.MALIGNANT(Dunhill classification)
a.Differentiated
1.Papillary CA(60%)
2.Follicular CA(17%)
3.Papillofollicular CA
4.Hurthle cell CA
b.Undifferentiated
1.Anaplastic CA(13%)
C.Medullary CA(6%)
D.Malignant lymphoma(4%)
E.Secondaries.

ETIOLOGY

- Radiation exposure.
- MNG.
- Genetic.
- Hashimoto's thyroiditis.

PAPILLARY CA

- Most common cancer of thyroid.
- Common in females and young age group.
- Woolner classification includes
- i)occult primary
- ii)intrathyroidal.
- iii)extrathyroidal

PAPILLARY CA

- PATHOLOGY
- Grossly it can be soft,firm,solid or cystic.
- Microscopically it contains cystic spaces with papillary projections with psammoma bodies,malignant cells with orphan annie eye nuclei.

PAPILLARY CA

- SPREAD
- Slowly progressive tumor.
- Multicentric.
- Spread is via lymphatics.

PAPILLARY CA

Treatment-----

- Total thyroidectomy.
- Suppressive dose of L-thyroxine.
- Neck dissection if LNs are positive.
- PROGNOSIS is good.

PAPILLARY CA

- AMES SCORING-
- A-Age less than 40.
- M-mets
- E-extent of primary tumor
- S-size less than 4cm has agood prognosis
- AGES SCORING-
- A-age
- G-grade
- E-extent
- S-size

FOLLICULAR CA

- Can occur de novo or in a multinodular goitre.
- More aggressive tumor.
- Spreads mainly by blood.
- Bone secondaries are typically vascular,warm and pulsatile.
- FNAC is inconclusive.
- Tt. Is total thyroidectomy.

ANAPLASTIC CA

- Occurs in elderly.
- Very aggressive tumor of short duration.
- Stridor and hoarseness of voice.
- Dysphagia.
- Fixity to skin.
- FNAC is diagnostic.
- Tracheostomy and isthmectomy to relieve obstruction.
- Radiotherapy is tt.
- Very poor prognosis.

MEDULLARY CA

- Arises from parafollicular c cells which are derived from ultimobranchial body.
- Contains characterstic amyloid stroma.
- Calcitonin is a useful tumor marker.
- Tumor also secretes 5 HT,PGs,ACTH,and VIP
- Spreads mainly via lymphatics.
- Can be sporadic,associated withMENII syndrome or familial.
- Tt. Is total thyroidectomy.

A 50 year old man has presented with a 3cm diameter firm lump in the left lobe of the thyroid gland. Thyroid function is normal. Fine needle aspiration cytology of the 3cm diameter lump shows definite papillary carcinoma.

a) Describe any further investigations you would wish to undertake.
b) Discuss the principles of the surgical treatment of this condition. (Do not give operative surgery details.)
c) Enumerate the advantages of the proposed operation you have chosen.
d) Indicate your plan for follow up treatment.
e) Discuss the prognosis for this patient.

- A 30 years old female pregnant in her 14 weeks developed tremors,
- insomnia, intolerance to hot weather and loss of weight. On examination
- she had tachycardia and wide pulse pressure.
- a. What is the possible diagnosis
- b. How would you investigate it
- c. Management of the condition in view of her pregnancy

- A 35 year old housewife is suffering from TNG. She has been advised a radioiodine scan.
- Which other radionuclide scans are available? Write two merits and two demerits of radioiodine scan.