Neck Swelling

Objectives

- Describe and explain the pathogenesis and clinical features of the following:
  - Thyroid swelling (physiology, diffuse, multinodular and solitary)
  - Lymphadenopathy (infectious and neoplastic)
  - Salivary glands swellings
  - Others (branchial cyst and fistula, thyroglossal cyst, pharyngeal pouch, carotid body tumor, sternomastoid tumor, cystic hygroma, cervical rib, other tumors)
  - Parathyroid disease (hormone and calcium metabolism, types of hyperparathyroidism, causes of hypoparathyroidism- transient and permanent)
- List the differential diagnosis by neck triangles

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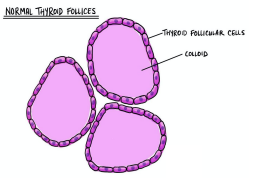
Summary File

Editing File

Physiology

Thyroid Gland

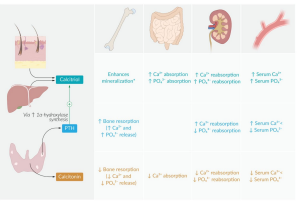
- **Thyroid hormone synthesis steps:** click here



- The hypothalamus release Thyrotropin-releasing hormone (TRH) which causes the anterior pituitary to release Thyroid-stimulating hormone (TSH) which causes the thyroid to release T3 and T4 from the **follicular cells**.
- **Triiodothyronine (T3):** Active form. Acts within hours.
- **Tetraiodothyronine (T4):** T4 is converted into T3 in the periphery. T4 acts more slowly (4-14 days)
- These hormones are bound to thyroglobulin within the follicular colloid.
- When T3 and T4 are required the thyroglobulin complex in broken down and the hormones are released into the bloodstream where they bind to serum proteins (albumin, thyroxine binding prealbumin and thyroxine binding globulin.
- A small fraction of T3 and T4 are free in the bloodstream and functionally active.
- The circulating T3 and T4 levels can exert negative feedback effect on the hypothalamus and anterior pituitary.
- The **parafollicular C cells** of the thyroid gland produces **calcitonin** which is responsible for lowering the serum calcium levels.
- Calcitonin isn't an essential hormone and doesn't need replacement after total thyroidectomy.
- Calcitonin can be used as a serum tumor marker to detect recurrence of medullary thyroid cancer.
- **Thyroid stimulating antibodies:** IgG immunoglobulins that binds to the receptor of TSH on the membrane of follicular cells and activates its. (Responsible for almost all cases of Grave's disease)

Parathyroid Gland

- **Chief cells produces parathyroid hormone (PTH) in response to:**
  - Hypocalcemia (Hypercalcemia inhibits PTH secretion)
  - Mild hypomagnesemia (Marked hypomagnesemia inhibits PTH secretion)
  - Hyperphosphatemia
  - Low calcitriol level



- **Parathyroid hormone actions:**
  - Activates the osteoclasts to resorb the bone thereby releasing calcium and phosphate.
  - Increase resorption of the calcium from the urine in the distal tubule and decreases phosphate reabsorption in the proximal tubule.
  - Increase renal excretion of phosphate.
  - Increase the activation of vitamin D in the kidneys by increasing the expression of 1α-hydroxylase, an enzyme required to synthesize calcitriol which subsequently increase the absorption of calcium and phosphate from the intestine.
- **Calcium metabolism:**
  The serum calcium levels are maintained in the normal range (2.25 - 2.6 mmol/L) by:
  - **Parathyroid hormone (Parathormone)**: Calcium mobilization from the bone, increases renal reabsorption of the calcium and Increase renal phosphate excretion
  - **Vitamin D:** Increase calcium absorption from the intestine and augments the effect of PTH on the osteoclasts.
  - **Calcitonin:** Minimal modulation.

Extra

Terminology

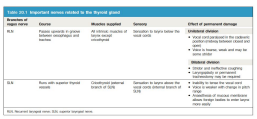
Neck dissection: The therapeutic or prophylactic removal of the cervical lymph nodes with or without adjacent neurovascular and muscular tissue for the management of head and neck malignancies, e.g., thyroid cancer and oropharyngeal cancer. The extent of dissection depends on the type, location, and stage of the cancer.

Thyroidectomy

The following terminologies are used in relation to surgery of the thyroid gland based on the extent of the gland removed for different indications:

- **Lobectomy:** Removal of one lobe of the thyroid gland leaving behind the other lobe and isthmus; usually for solitary nodule
- **Hemithyroidectomy:** Removal of one lobe along with the isthmus; most common operation for a solitary thyroid nodule and toxic nodule
  - **Indications:** Thyroid cancer <1 cm , follicular adenoma and thyroid cyst.
- **Subtotal thyroidectomy:**Removal of majority of both lobes leaving behind 6–8 g (equivalent to the size of a normal thyroid gland) of thyroid tissue on one or both sides; most common operation for multinodular goitre
- **Near-total thyroidectomy:** Removal of entire thyroid gland leaving behind 1–2 g of tissue usually on the non affected or least affected side of a malignant gland to preserve damage to the parathyroid glands and avoid injury to recurrent laryngeal nerve
- ★ **Total thyroidectomy:** Removal of the total thyroid gland sparing the recurrent laryngeal nerves by identification and preservation of parathyroid glands by individual ligation of the branches of the inferior thyroid artery, keeping their blood supply intact as far as possible, or by reimplanting the parathyroids in the sternomastoid muscle to prevent postoperative hypoparathyroidism.
  - **Indications:** Thyroid cancer > 4 cm , Toxic multinodular goiter and large goiter causing obstruction.

Complications of Thyroidectomy

Haemorrhage	• If delayed bleeding is not recognised early, it can compress the internal jugular veins, leading to laryngeal oedema and asphyxia.
Nerve damage 	• The **external branch of the superior laryngeal nerve** may be damaged while securing the superior thyroid pedicle, causing **inability to tense the vocal cord** and a **weaker voice** with noticeable pitch range changes. It can be prevented by consciously ligating the superior polar vessels as close to the thyroid gland as possible, as the nerve travels away from the superior thyroid vessels as it approaches the thyroid gland. • Damage to the **recurrent laryngeal nerve is more serious**. Traction or bruising of this nerve causes **temporary paralysis of a vocal cord** in 1% of patients undergoing thyroidectomy, but recovery within 3 months is the rule. Division of the nerve paralyses the cord in the 'cadaveric' position (i.e., midway between the closed and open positions). ○ **Bilateral** nerve injury results in **stridor** and **ineffective coughing** when the endotracheal tube is withdrawn at the end of the operation. The tube is re inserted immediately and, if there is no early improvement, tracheostomy may be required
Scar complications:	• The scar can become hypertrophic or keloid, particularly when the incision has been placed low in the neck. Recurrent keloid formation is common after excision of the scar
Others	• **Hypothyroidism** • **Hypoparathyroidism** ○ Bruising or accidental removal of the parathyroid glands leads to hypoparathyroidism, manifest by **hypocalcaemia** and symptoms of increased neuromuscular excitability

Thyroid swellings

Introduction:

- Most common causes of such enlargement are infection and secondary tumor deposits.
- Most neck masses are painless, but infection and malignant disease may cause pain.
- Goitre is a visible or palpable enlargement of the thyroid
- ★ The swelling **characteristically moves upwards on swallowing** because of the gland's attachment to the larynx and trachea.
- Majority of thyroid swellings grow slowly and painlessly.
- A rapid change in the size of part of the gland, or of an existing lump, may be caused by haemorrhage into a necrotic nodule, a fast-growing carcinoma or subacute thyroiditis.
  - Also, rapid enlargement makes malignant disease more likely.
- Infection and inflammation of the thyroid can be a complication of otitis media
- **Physiological enlargement:** Transient enlargement may occur during
  - **Puberty:** due to high metabolic demands
  - **Pregnancy** (stress situation)

Thyroid swellings are:

Diffuse, Eg:
- Graves
- Hashimotos
- Lymphoma
- Anaplastic tumours
- Diffuse hyperplastic (physiological: puberty & pregnancy)

Single, Eg:
- Cyst
- Adenoma
- Cancer:
  Medullary tumour
  Follicular tumour

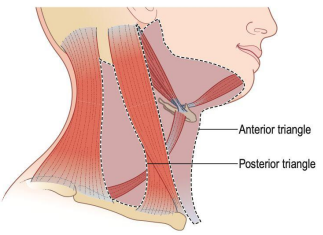
Multinodular, Eg:
- Iodine deficiency (Most common cause).
- Toxic multinodular goiter (Plummer's disease)

History

- Systemic illness, general malaise, fever, rigors, contact with people with infectious diseases and pulmonary, alimentary or skeletal symptoms.
- Loss of appetite, loss of weight and other symptoms.
- Head and neck symptoms.
- Pain in the mouth, sore throats or ulceration, discharge.
- ★ **Compression symptoms:** Dysphagia, odynophagia, Dyspnea, changes in voice.
- Hyper/Hypo-thyroidism symptoms?
- Family history of thyroid cancer?
- Radiation exposure (especially in childhood)?

Examination

- Site (Lump In the neck): Anterior and posterior triangles
- Relation to muscles.
- Relation to the trachea.
- Relation to the hyoid bone.

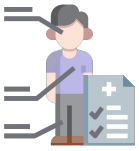


Thyrotoxicosis

Primary thyrotoxicosis (Graves' disease)

- An autoimmune disease in which TSH receptors in the thyroid are stimulated by circulating thyroid receptor antibodies (TRAbs).
- The gland is uniformly hyperactive, very vascular (TSH ↑ vascularity) and usually symmetrically enlarged.
- TRAbs can cross the placental barrier, so that neonatal thyrotoxicosis can occur.

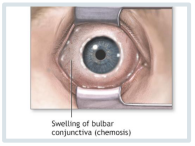
Clinical features

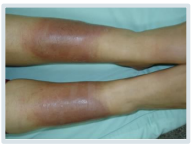


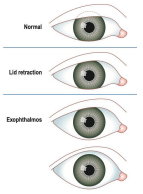
➔ Young female (female/male ratio 8:1) and the condition can be familial.

➔ **Triad of Graves disease**

- **Diffuse goiter**
  - Moderately and diffusely enlarged and soft, because of its vascularity a bruit may be audible.
- **Ophthalmopathy -**due to inflammation of the extraocular muscles and the eye muscles contain TSH receptors ⟶ autoimmunity against these receptors leads to hypertrophy of the muscles**:**
  - Exophthalmos (specific for graves)
  - Ocular motility disturbances (Ophthalmoplegia)
  - Lid retraction (Sclera visible above the cornea when looking straight ahead)
  - Lid lag "staring look" (Sclera visible above the cornea when looking down) caused by adrenergic overactivity, which results in spasming of the smooth muscle of the levator palpebrae superioris
  - Conjunctival conditions (Chemosis)
- **Dermopathy (pretibial myxedema):** presents commonly as raised pigmented lesions typically on the shins due to hyaluronic acid deposition in the dermis and subcutaneous tissue (specific for graves).







Diagnostics

- **Thyroid markers:** Raised T3 and T4 levels, coupled with low TSH levels, are confirmatory.
- **Thyroid antibodies:** ↑ TRAbs (specific)
- **Thyroid scintigraphy:** Diffuse uptake of radioactive iodine (123I) with increased activity .

Management

- **Beta blockers (First line: propranolol):** Treatment of hyperadrenergic symptoms: provide immediate control of symptoms
- **Antithyroid drugs:** Methimazole (most patients) , Propylthiouracil (Thyroid storm and first trimester pregnancy)
  - Block the incorporation of iodine into tyrosine and so prevent the synthesis of T3 and T4
- **Radioactive iodine ablation:** destruction of thyroid tissue via beta rays radioactive iodine (iodine-131) Many consider this to be the treatment of choice. **As long as it is not used in pregnancy** and used in case of failure to achieve euthyroidism with antithyroid drugs.
- **Surgery:** Thyroidectomy is a highly successful form of treatment for many patients, especially younger ones. Patients are cured by surgery, total thyroidectomy being the operation of choice. Before surgery, patients must be rendered euthyroid with antithyroid drugs. Iodine has historically been given orally for 10 days before surgery to reduce vascularity, but the evidence base to support this is weak.
  Indications:
  - Large goiters (≥ 80 g) or obstructive symptoms
  - Graves disease with:
    - Concomitant primary hyperparathyroidism or periodic paralysis
    - Moderate to severe active Graves ophthalmopathy
- Patients require **thyroxine replacement** after radioiodine or total thyroidectomy.

Thyrotoxicosis

Toxic multinodular goitre (Plummer's syndrome or Secondary thyrotoxicosis) and toxic adenoma

- A toxic multinodular goitre is responsible for thyrotoxicosis in about 25% of patients. There is usually a long-standing nontoxic goitre in which one or more nodules become hyperactive and begin to hyperfunction independently of TSH levels. A single hyperfunctioning adenoma is a rare cause of thyrotoxicosis.

Clinical features

Toxic multinodular goitre is more common in older women, and cardiac complications such as arrhythmias are particularly frequent due to the presence of an already compromised cardiovascular system.

- **Multinodular goitre:**
  - Painless goiter with multiple palpable nodules.
  - Symptoms of thyrotoxicosis.
- **Toxic adenoma:**
  - Palpable, usually painless nodule in otherwise normal gland
  - Symptoms of thyrotoxicosis

Diagnostics

Thyroid scintigraphy:

- **In a toxic multinodular goitre**, the isotope scan usually demonstrates multiple 'patchy' areas of increased uptake (several hyperfunctioning "hot" nodules).
- **In toxic adenoma**, the nodule is 'hot' and the remainder of the gland is 'cold'.

Management

- **Initial management** -treatment of hyperthyroidism-**:**
  - **Beta blockers** for symptom control
  - **Antithyroid drugs** to achieve euthyroidism
- **Definitive treatment options:**
  - **Multinodular goitre**:
    - Total thyroidectomy or near-total thyroidectomy.
    - Radioactive iodine ablation.
  - **Toxic adenoma**:
    - Hemithyroidectomy.
    - Radioactive iodine ablation.

Grave's disease	Plummer's Disease
Common in **young** women (M:F 8:1)	More common in **elderly** women
The onset is **abrupt**	The onset is **insidious**
Hyperthyroidism is **more severe**	Hyperthyroidism is **not severe**
The goiter is **diffuse** and vascular. It can be large or small, firm or soft.	The goiter is **nodular**
Cardiac failure is **rare**	May present with cardiac failure or atrial fibrillation
Autoimmune due to TSH-Rab which can cross the placenta and cause neonatal thyrotoxicosis	Eye signs other than lid lag and lid retraction **are very rare**
Thrill and bruit may be present	

Thyrotoxicosis

Thyroid storm (Thyrotoxic Crisis)

- An acute exacerbation of hyperthyroidism that results in a life-threatening hypermetabolic state.
- **Etiology:**
  - Iatrogenic
  - Stress-related catecholamine surge

Clinical features

- Hyperpyrexia (fever ≥ 41.5 C) with profuse sweating.
- Tachycardia (> 140/minute) and (possibly severe) arrhythmia (e.g., atrial fibrillation), hypertension with wide pulse pressure, congestive cardiac failure (The cardiovascular system is often most severely affected)
- Symptoms of thyrotoxicosis
- Severe nausea, vomiting, diarrhea, possibly jaundice
- Severe agitation and anxiety, delirium and psychosis, seizures, coma (Neuropsychiatric symptoms are seen in most cases of thyroid storm.)

Diagnostics

- Low/undetectable TSH, elevated free T3/T4.
- Assess for complications, e.g.:
  - ECG to assess for atrial fibrillation
  - Liver chemistries to assess for evidence of jaundice

Management

- Consult critical care for ICU admission and monitoring.
- Treat the symptoms
- Inhibition of thyroid hormone synthesis (Antithyroid medications)
  - **First line:** propylthiouracil
  - **Alternative:** methimazole
- Inhibition of thyroid hormone release (through the Wolff-Chaikoff effect)
  - **First line:** iodine solutions given at least 1 hour after antithyroid drugs
  - Potassium iodide solution
  - Lugol solution
- Inhibition of peripheral conversion of T_4 to T_3
  - Propranolol
  - Glucocorticoids: can also treat concurrent adrenal insufficiency
    - **First line:** hydrocortisone
    - **Alternative:** dexamethasone
- **Mnemonic:** Treat thyroid storm with **PRO**pranolol, **PRO**pylthiouracil, **PO**tassium iodide, and **GLU**cocorticoids.

Thyroiditis

Autoimmune thyroiditis (Hashimoto's disease):

- This condition is due to destruction of the thyroid follicles by lymphocytes.
- The patient is usually euthyroid, but thyrotoxicosis can occur early. In the long term, the patient becomes hypothyroid as the gland is progressively destroyed.
- The thyroid is diffusely enlarged and firm. A nodular form may be confused with multinodular goitre.
- Lymphoma and papillary carcinoma may occur in a thyroid that has been affected by long-standing Hashimoto's disease.
- Antibodies are detected in the serum against thyroglobulin, antithyroid antibodies, particularly to microsomal components of the follicle cells.
- Biopsy for cytology helps to confirm the diagnosis.

Clinical features

➔ **Early-stage**
- Primarily asymptomatic
- Goiter: nontender or painless, rubbery thyroid with moderate and symmetrical enlargement
- Hashitoxicosis may occur: transient hyperthyroidism due to follicular rupture of hormone-containing thyroid tissue that manifests with, e.g., irritability, heat intolerance, diarrhea.

➔ **Late-stage**
- Thyroid may be normal-sized or small if extensive fibrosis has occurred.
- Hypothyroidism (e.g., cold intolerance, constipation, fatigue)

Diagnostics

➔ **Thyroid markers:**
- **Early-stage**: transient hyperthyroidism (↓TSH, ↑FT3, and ↑ FT4)
- **Progression**: subclinical hypothyroidism (↑ TSH; FT3 and FT4 normal)
- **Late-stage:** overt hypothyroidism (↑ TSH; ↓ FT4 and ↓ FT3)

➔ **Antibody:**
- **Anti-TPO** (Anti-thyroid peroxidase) **(anti-microsomal)**
- **Anti-Tg** (Anti-thyroglobulin) **antibodies**

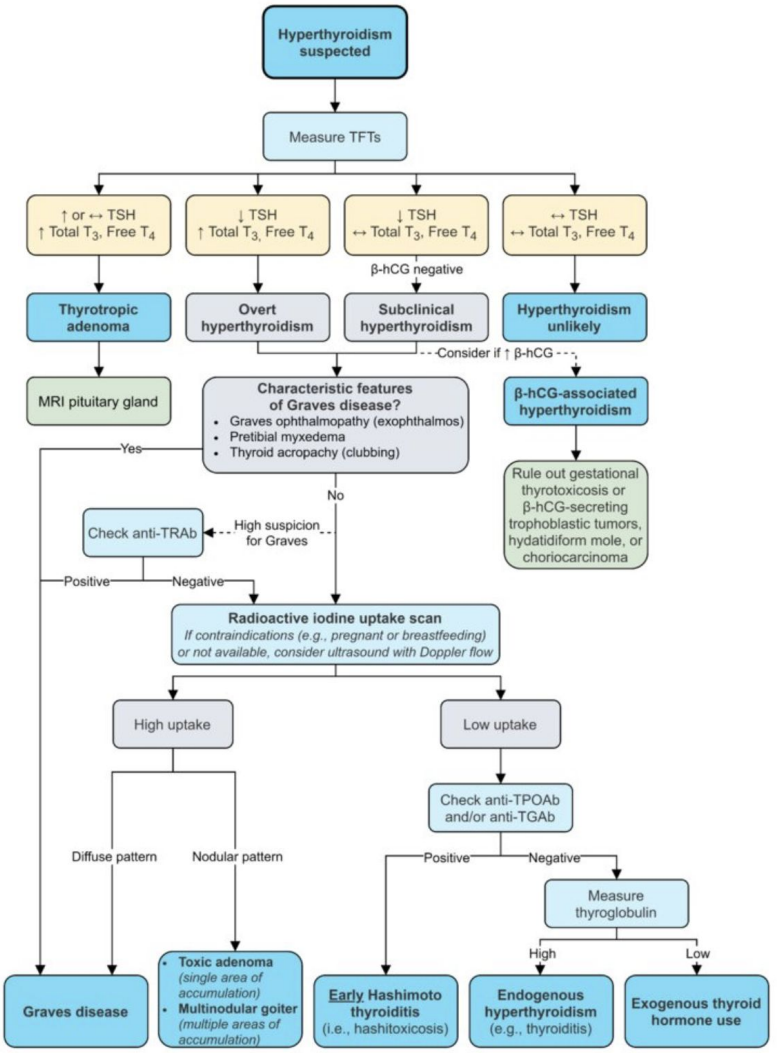
➔ **US** -Results depend on the form of Hashimoto thyroiditis-**:**
- **Atrophic phenotype**: reduction in thyroid size (mainly observed)
- **Goitrous phenotype**: heterogeneous enlargement

➔ **FNAC:** Most helpful but abundant lymphocytes in the cytology may create difficulty in the cytological distinction between lymphoma and autoimmune thyroiditis.

Management

- **Levothyroxine (T4) replacement therapy:** lifelong

T3 thyrotoxicosis:
Thyroid markers: Raised T3 and normal T4 levels, coupled with low TSH levels.

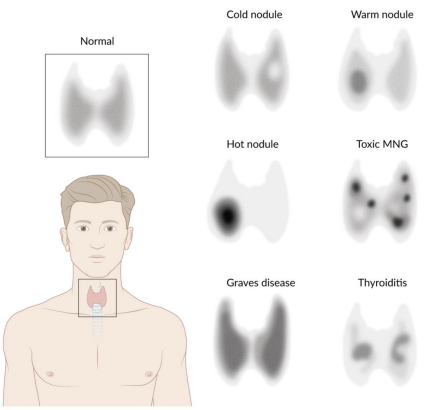


Isotope scan:

- **Hot nodule:** < 5% Malignant (malignancy is rare)
  A circumscribed area of increased radioiodine uptake on a radionuclide scan, which indicates a hyperfunctioning (autonomous) thyroid nodule.

- **Cold nodule:** 15-20% Malignant
  A circumscribed area of reduced radioiodine uptake on a radionuclide scan, which indicates a thyroid nodule with reduced or no physiologic secretory function.

- **Warm nodule:** Suspicious malignancy



Tumours of the thyroid

Benign Tumor: Follicular Adenoma

Clinical features

- **Clinically:** Solitary thyroid nodule.
- **Histological** examination is required to distinguish follicular adenoma from carcinoma.
- Invasion of the capsule or pericapsular blood vessels is **not** seen in the adenomas.

Management

- Treatment is by thyroid **lobectomy.**

Overview of malignant tumours of the thyroid

Thyroid carcinoma may be asymptomatic (e.g., thyroid incidentaloma) or manifest with any or all of the following clinical features:

- **Thyroid nodule**
  - Firm to hard consistency
  - Typically painless
- **Features of local infiltration or compression**
  - Recent onset of any of the following:
    - Hoarseness, Dyspnea, Dysphagia, Horner syndrome (rare).
- **Painless cervical lymphadenopathy**
  - More common in papillary and anaplastic thyroid cancer
  - Less common in follicular thyroid cancer
- **Signs of distant metastasis**
  - More common in follicular and anaplastic thyroid cancer
  - Less common in papillary thyroid cancer
  - Examples include:
    - Pulmonary metastases: coughing, hemoptysis, dyspnea
    - Bone metastases: bone pain, pathologic fractures
    - Brain metastases: focal neurologic deficit, seizures
- **Paraneoplastic syndrome:** diarrhea and facial flushing (typically seen in advanced medullary carcinoma).

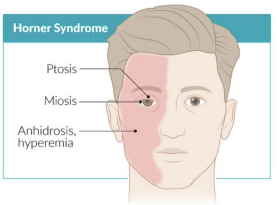


Table 20.3 Thyroid cancers

Type	Features	Prognosis
Papillary (70%)	• Mostly affects <40 years of age • Lymph node spread common; may present first with lymphadenopathy (so-called lateral aberrant thyroid) • Commonly multifocal • Distant metastases rare • Focus of papillary carcinoma an incidental finding in 20% thyroids resected for other causes	Excellent 10-year survival: 90%
Follicular (20%)	• Affects patients typically 30–50 years • Haematogenous spread more common than lymph node spread. Common sites: lungs, bone, liver	More aggressive than papillary carcinoma. 10-year survival: 75%
Anaplastic	• Typically affects older patients • Aggressive tumour presents late • Local invasion may cause: - *Stridor:* from either tracheal compression and/or recurrent laryngeal nerve involvement - *Dysphagia:* involvement of the oesophagus - *Horner's syndrome:* from invasion of cervical sympathetic nerves • Pulmonary metastases common	Very poor prognosis;: most patients die within 1 year of diagnosis
Medullary	• Arises from parafollicular C cells • May occur sporadically or as part of MEN II (Sipple's syndrome). Exclude presence of concomitant phaeochromocytoma • Calcitonin levels elevated	10-year survival: 75%
Lymphoma (uncommon)	• Rare complication of autoimmune thyroiditis	10-year survival: 40%

Malignant tumours of the thyroid

Primary causes (Differentiated carcinomas):

1 Papillary carcinoma

- Most common type of thyroid cancer
- ★ Most prevalent **before the age of 40 years** and presents as a **slow-growing**, solitary thyroid swelling.
- The disease has an excellent prognosis, with 10-year survival rates approaching 90%.
- Long time Asymptomatic tumor

Diagnostics

- **Histologically**, complex papillary folds lined by several layers of cuboidal cells project into what appear to be cystic spaces. Psammoma bodies and nuclear inclusions with a resemblance to a comic-strip character (Orphan Annie) may be found.
- **Mnemonic:** "**Papi** and **Moma** adopted **Orphan Annie**:" **papi**llary thyroid cancer is histologically characterized by psam**moma** bodies and **Orphan Annie**-eye nuclei.
- **Lymph node** spread is common in papillary carcinoma in comparison to follicular carcinoma.
- Staging of the tumor by TNM is required.

Management

- The disease is commonly multifocal, and thus **total thyroidectomy** is the optimal surgical procedure. It has the advantage of facilitating early detection of metastases by using radioactive iodine scan, as no functional thyroid tissue is left in the body after surgery
- Microscopic disease (<1 cm and unifocal) and tumours with favourable histology and <2 cm in size may be treated by **lobectomy** alone

2 Follicular carcinoma

- This disease typically presents as a solitary thyroid nodule in patients aged 30–50 years
- The disease is more aggressive than papillary carcinoma and the 10-year survival rate is 75%.

Diagnostics

- Staging of the tumor by TNM is required.
- Blood spread (Doesn't spread to lymph)
- **Histologically**:
  - Uniform follicles
  - Vascular and/or capsular invasion

Management

- Treatment consists of **total thyroidectomy** with preservation of the parathyroids where the index of suspicion is high
- When a hemithyroidectomy has been done for a thyroid nodule that turns out to be a follicular carcinoma on biopsy, a completion thyroidectomy is preferred over radioactive ablation of the remaining gland.
- If a postoperative radioisotope scan (challenge scan) reveals increased uptake in the skeleton or neck, therapeutic doses of **radioiodine** are given.
- Plasma thyroglobulin levels should be undetectable after a successful surgery and radioiodine therapy subsequent detection of thyroglobulin indicates recurrent disease.

Malignant tumours of the thyroid

Primary causes

3 Anaplastic carcinoma (Undifferentiated carcinomas):

- Typically **affects older patients**.
- **Poor prognosis**: Most patients die within 1 year of diagnosis.
- The tumours feel hard and are usually locally fixed at the time of presentation.
- ★ Local invasion may involve the **recurrent laryngeal nerve(s) and cause hoarseness**, trachea causing dyspnoea and stridor, and the oesophagus causing dysphagia.
- Invasion of the cervical sympathetic nerves may cause Horner's syndrome (contraction of the pupil, enophthalmos, narrowing of the palpebral fissure and loss of sweating on the face and neck). Pulmonary metastases are common.

Diagnostics

- **Histologically**:
  - Undifferentiated giant cell (i.e., osteoclast-like cell)
  - Areas of necrosis and hemorrhage

Management

- Resection is rarely curative in the early stages of the disease, but the main goal of surgery is to relieve tracheal compression.
- Resectable cancer: total thyroidectomy + neck dissection + radiochemotherapy
- Unresectable or metastatic cancer: palliative care

4 Medullary carcinoma

- This tumour arises from the parafollicular C cells. There is hard enlargement of one or both thyroid lobes, and in more than 50% of patients the cervical lymph nodes are involved.
- 10-year survival: 75%.
- The tumour may occur sporadically or as part of an inherited **multiple endocrine neoplasia (MEN) syndrome type II (Sipple's syndrome).**
- **Calcitonin levels are elevated**, and can be used to monitor progress and screen relatives.

Diagnostics

- **Histologically**:
  - Ovoid cells of **C cell** origin and therefore without follicle development
  - ★ **Amyloid deposits** in the stroma (stains with Congo red)
  - **Mnemonic:** Medullary carcinoma is composed of **C**-cells producing **C**alcitonin and is characterized by amyloid a**CC**umulation staining with **C**ongo red.
  - High levels of serum calcitonin and carcinoembryonic antigen (CEA)

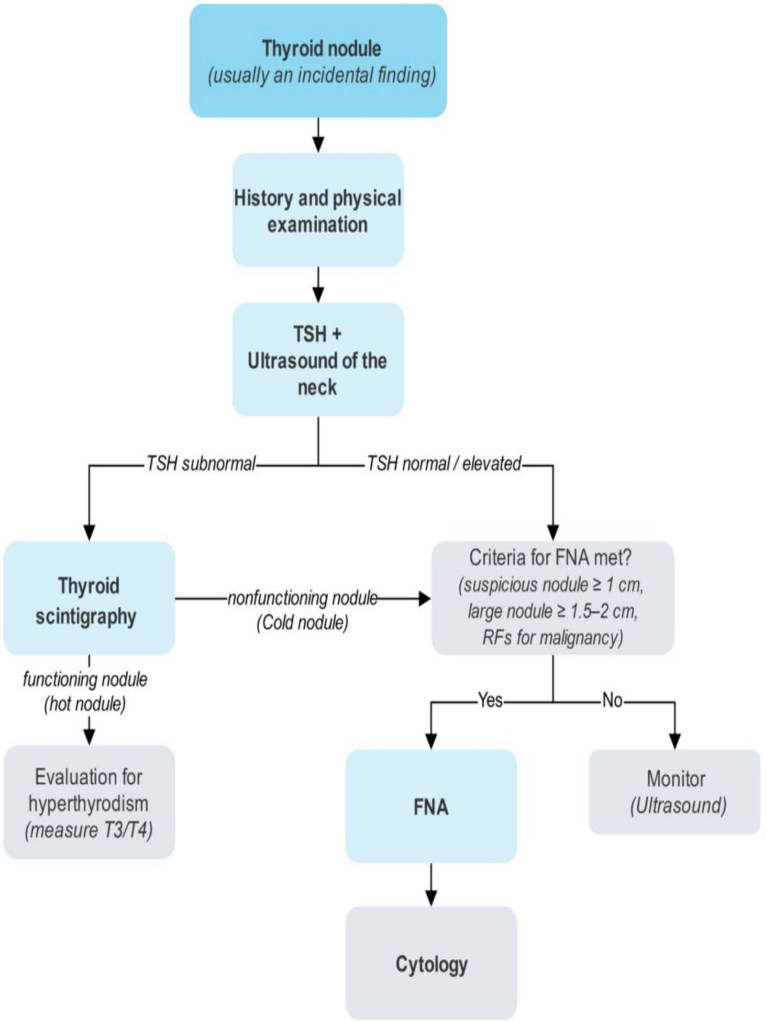
Management

- Treatment consists of total thyroidectomy and, if the calcitonin level is raised, dissection of the lymph nodes in the central compartment of the neck (levels 6 and 7) ± radiation therapy and/or systemic chemotherapy as needed.

Secondary causes

- Metastatic lesions in the thyroid are rare, and originating most commonly from the breast, colon and kidney.

- For **initial evaluation** of tumors, follow the diagnostic approach to thyroid nodules.
  - TSH, ultrasound, potentially scintigraphy
  - **Confirmation:** fine-needle aspiration cytology (FNAC) or intraoperative frozen-section



Tumors of the Thyroid

Benign

Follicular Adenoma

Malignant

Causes

Secondary

Primary

Differentiated

- Papillary Carcinoma
- Follicular Carcinoma

Undifferentiated

- Anaplastic Carcinoma

- Medullary Carcinoma

Thyroid swellings

Solitary thyroid nodules:

- **Slow-growing** and **painless** clinically 'solitary' nodules are common, although 50% really represent a clinically dominant nodule within part of a multinodular goitre.
- Amongst patients presenting with a thyroid nodule, the incidence of malignancy is approximately 10%. The others are benign adenomas or cysts
- **All patients with new thyroid nodules should be referred for investigation.**
- Patients with concerning features should be referred urgently, features include:
    - Increasing size
    - Family history of thyroid cancer
    - Previous radiation exposure
    - Patient over 65 years
    - Unexplained hoarseness
    - Cervical lymphadenopathy
    - Stridor
- **Ultrasound is the most sensitive first-line investigation** in the management of thyroid nodules and allows identification of nodules suitable for FNAC.

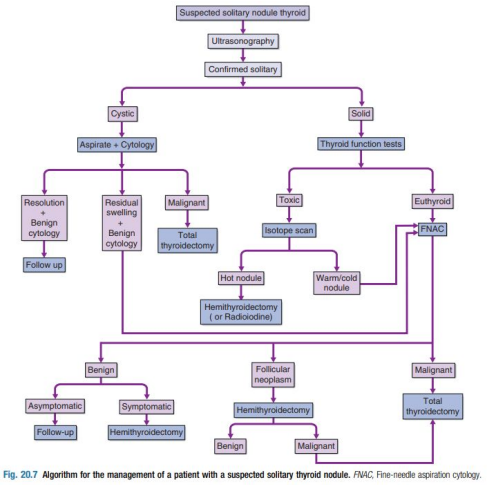


Fig. 20.7 **Algorithm for the management of a patient with a suspected solitary thyroid nodule.** *FNAC*, Fine-needle aspiration cytology.

20.1 Summary

Goitres

- Physiological thyroid enlargement may occur during puberty or pregnancy
- Nontoxic nodular goitre can be associated with iodine deficiency and drug reactions; it is usually asymptomatic but can cause compression symptoms
- Thyrotoxic goitre results from stimulation of the gland by TSH or TSH-like proteins, resulting in excessive production of T_3 and T_4. About 25% of cases of thyrotoxicosis are due to a toxic multinodular goitre (a long-standing nontoxic goitre develops hyperactive nodule(s) that function independently of TSH levels)
- Thyroiditis can produce diffuse painful swelling that may be subacute (de Quervain's disease) or autoimmune (Hashimoto's disease). Riedel's thyroiditis is a very rare cause of painless thyroid swelling and tracheal compression
- A solitary thyroid nodule is often a conspicuous palpable nodule in a multinodular goitre. True solitary nodules may be adenomas, cysts or cancers, conditions that are distinguished by fine-needle aspiration cytology, ultrasonography, isotope scans and function tests
- Thyroid cancers can produce a goitre, particularly in the case of medullary carcinoma of the thyroid and lymphoma.

Parathyroid disease

Introduction

- Parathyroid conditions are rarely accompanied by clear physical signs.
- Extremely uncommon to be able to palpate an abnormal parathyroid gland in the neck.
- The parathyroid glands receive a rich blood supply from the inferior thyroid artery
- Histologically, the glands contain chief cells that secrete parathormone (PTH).

Hypoparathyroidism

Temporary	• Usually seen **post-operatively**, labs findings:
	  ○ **Low PTH**
	  ○ **Low Ca**
	• **Symptoms & Signs:**
	  ○ **Numbness**, **Paresthesia** around the tips of finger and the mouth.
	  ○ Tetany in extreme cases.
	  ○ **Chvostek** : contractions (twitching) of the facial muscles elicited by tapping the facial nerve below and in front of the ear
	  ○ **Trousseau sign:** ipsilateral carpopedal spasm occurring several minutes after inflation of a blood pressure cuff to pressures above the systolic blood pressure
	  ○ **Erb's sign:** Hyperexcitability of the muscles on electrical stimulation.
	  ○ **ECG:** QT Prolongation & QRS complex changes.
	• **Managed by** high Ca doses and active Vit. D

Permanent	• When the gland is removed by accident (Eg. during thyroidectomy)

Parathyroid disease

Primary hyperparathyroidism

- In **90% Primary hyperparathyroidism is due to an adenoma**, in 10% it results from **hyperplasia** (usually affecting all **four** glands, incase of MEN syndrome), and in less than 1% it results from parathyroid carcinoma
- Effect of PTH on bone → ↑ bone resorption → ↑ release of calcium phosphate → ↑ calcium levels
- Effect of PTH on the kidneys → ↑ phosphate excretion (phosphaturia)
- **Clinical features:** 'broken bones, renal stones, abdominal groans and psychic moans'

Bones	★ Renal stones	Gastrointestinal	Cardiovascular	Psychiatric
• Demineralisation and subperiosteal bone resorption • Cysts in long bones and jaw • Moth-eaten appearance to skull • Pathological fractures	• **Nephrocalcinosis** and **calculi** • **Hypercalcemia** • **Polyuria:** An early symptom	• **Peptic ulcer** • **Pancreatitis** • **Nausea and vomiting** increase dehydration and increase serum calcium further leading to a vicious spiral of deterioration)	• Left ventricular hypertrophy • Arterial hypertension • Shortened QT interval	**Psychosis** and **acute confusion** (uncommon but indicate marked hypercalcaemia >3.5 mmol/L) **Others:** Lethargy and general weakness

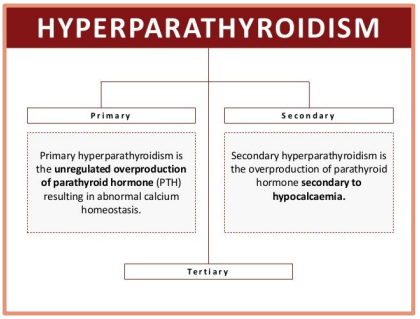
Secondary hyperparathyroidism

- **Secondary hyperparathyroidism**, there is over-secretion of PTH in response to low plasma levels of ionised calcium, usually because of **renal disease, Vit. D deficiency** or **malabsorption**
- ↓ calcium and/or ↑ phosphate blood levels → reactive hyperplasia of the parathyroid glands → ↑ PTH secretion
- Chronic kidney disease → impaired renal phosphate excretion → ↑ phosphate blood levels→ ↑ PTH secretion
- In addition, CKD → ↓ biosynthesis of active vitamin D → ↓ intestinal calcium resorption and ↓ renal calcium reabsorption → hypocalcemia → ↑ PTH secretion
    - Managed initially by treating the underlying condition, **dietary phosphate restriction** and by giving **1-α-hydroxyvitamin D3 (alfacalcidol)** (They should be given the active form of Vit.D) to increase calcium absorption and provide negative feedback on the parathyroids. If dietary restriction alone is unsuccessful, add **phosphate binders (sevelamer)** binds phosphate in the gut (sevelamer is nonabsorbable) → ↓ phosphate absorption → ↓ serum phosphate → ↓ PTH

Tertiary hyperparathyroidism

- Excessive PTH secretion in secondary hyperparathyroidism may become autonomous; it is then termed **tertiary hyperparathyroidism**. This may occur after renal transplantation.
    - **Total parathyroidectomy** may be needed, with calcium and vitamin D replacement therapy
    - **Subtotal parathyroidectomy** leaving half-equivalent of a normal gland in situ or autotransplantation of parathyroid tissue (equivalent in size to one normal gland) into an arm muscle (where it can be readily located if problems persist)

Hyperparathyroidism	Calcium	PTH	Vitamin D	Phosphate
Primary	↑	↑→	↑	↓
Secondary	↓→	↑	↓	↑ or ↓
Tertiary	↑	↑↑	↓	↑



Hypercalcemic crisis may occur in primary and tertiary HPT.

Parathyroid disease

Diagnostic

- Serum **calcium** and **PTH levels must be measured on more than one occasion.** PTH levels may be normal, but the detection of **unsuppressed PTH** values in a patient with **hypercalcaemia** supports the diagnosis of primary hyperparathyroidism
- Other supportive findings include a **low serum phosphate**, **hyperchloraemia** (and an abnormal Cl/PO4 ratio), and a **raised** 24-hour **urinary calcium excretion**
- A **low urinary calcium excretion** should alert the clinician to the possibility of **familial hypercalcemic hypocalciuria**, a disease of the renal tubules in which the parathyroids are normal**.**
- **X-ray**: decreased bone mineral density
- **Ultrasound/nuclear imaging** (**Tc99m-sestamibi scan**): only performed prior to surgery to determine the exact location of the abnormal glands

Management of primary and tertiary hyperparathyroidism:

- **Remove all overactive parathyroid tissue**
- Preoperative imaging with ultrasound and sestamibi (MIBI) scans will allow selection of patients for a focused approach.
- With discordant imaging or associated multinodular goitre and previous neck surgery, traditional cervicotomy and four-gland exploration will be required.
- ★ If **two or more** glands are enlarged, **they should be removed.**
- If **all four glands** are thought to be **hyperplastic**, then **all but** a **portion** of the smallest gland should be removed, then transplanted in other regions
- If exploration fails to identify an adenoma or hyperplasia, the incision is closed.
- Reoperation is considered after (re)confirming the diagnosis and attempting to localise the gland using CT, MRI or selective venous catheterisation
- **Procedures:**
  - **Parathyroidectomy:** In case of solitaire adenoma only the respective gland is removed
  - **Total parathyroidectomy:** In case of hyperplasia all four glands are removed.
  - **Tumor resection:** In case of carcinoma, removal of ipsilateral thyroid lobe and enlarged lymph nodes.
- **Pharmacotherapy:**
  - **Calcimimetics:** Primary hyperparathyroidism after failed parathyroidectomy (modulation of calcium-sensitive receptor (CaSR) in parathyroid glands → ↑ sensitivity of the receptor to circulating Ca^{2+} → inhibition of PTH release)
  - **Bisphosphonates**: In patients with osteoporosis

Surgery indicated for symptomatic patients and asymptomatic patients with:

01

Serum calcium levels >1 mg/dL (>0.25 mM/L) above the upper limit of normal

02

Patients <50 years

03

Evidence of end-organ disease. Eg:

- Impaired bone mineral density
- 24 hour urinary calcium >400 mg/day and increased stone risk
- Reduced creatinine clearance
- Impaired renal function (eGFR < 60 mL/min)

Lymphadenopathy

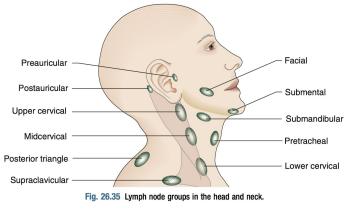
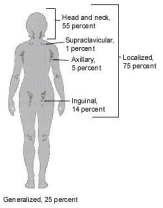


Fig. 26.35 Lymph node groups in the head and neck.

Introduction

- **The most common sources of neck swelling is lymph node enlargement.**
- Lymph nodes may become enlarged in response to infection or cancer in their area of drainage
- **Generalized lymphadenopathy** is defined as the enlargement of more than two non contiguous lymph node groups.
- **Instructions:**
  - Primary neoplasms of lymph nodes (lymphomas), tuberculous lymphadenitis and secondary deposits (usually from squamous carcinoma of the head and neck) are commonly seen lymph node swellings in the neck.
  - Secondaries from thyroid carcinoma.
  - Lymph node enlargement in the lower half of the neck warrants exclusion of a primary in the breast, chest and abdomen (including testis/ovary).
  - Systemic lymph node enlargement (including hepatosplenomegaly) should be looked for.

Causes of cervical lymph gland enlargement



- The four main causes of cervical lymph gland enlargement are:

01

Infection

- Non-specific tonsillitis
- Glandular fever
- Toxoplasmosis
- Cat-scratch fever

02

Metastatic tumour

From the head, neck, chest and abdomen

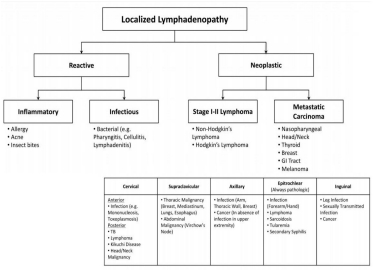
03

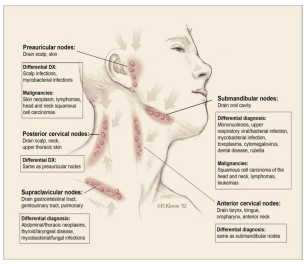
Primary reticulose

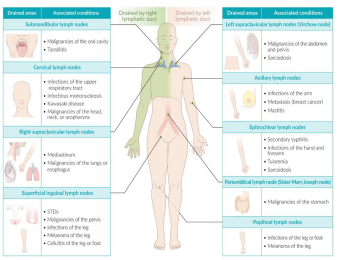
- Lymphoma
- Lymphosarcoma
- Reticulosarcoma

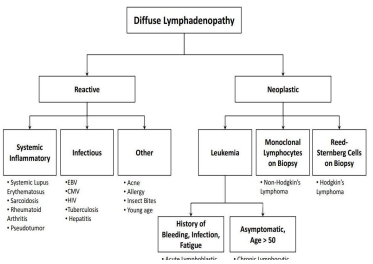
04

Sarcoidosis









To remember the different causes of lymphadenopathy, think "**MIAMI**": **M**alignancy (e.g., lymphomas), **I**nfection (e.g., TB), **A**utoimmune disease (e.g., SLE), **M**iscellaneous (e.g., sarcoidosis), and **I**atrogenic (medications).

DDx of <u>generalized</u> lymphadenopathy:

1. Infections (**<u>TB</u>**)
2. Autoimmune disease
3. Lymphomas

DDx of <u>localized</u> lymphadenopathy

1. Infections
2. Metastatic cancer
   - You should think of intra abdominal malignancy when the left **supraclavicular** lymph nodes (Virchow's node) is enlarged

➔ **Hints for infectious cause:** Tenderness, fever, acute presentation

★ You should think of **lymphoma** when the patient presents with **lateral** neck swelling and **constitutional symptoms**

➔ General rule in lymph node swelling

- **Adults** = painless cancer
- **Pediatric** = painful infection

Lymphadenopathy

General characteristics of lymphadenopathy

Non-specific cervical inflammatory lymphadenopathy

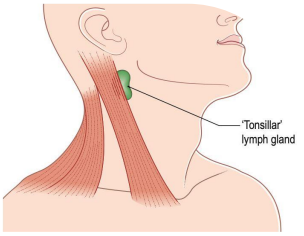
- Follow any inflammatory process, mostly recurrent tonsillitis.
- The upper deep cervical glands are most often affected.

History

- **Case:** Mother bring her child saying that she felt something below the mandible, Sore throat , fever, small swelling in one side, Has history of recurrent chest infection not well treated.
- Below the age of 10 years.
- Painful lump just below the angle of the jaw.
- The patient often feels ill, has a sore throat and pyrexia.

Examination

- Tonsillar gland : upper deep cervical lymph glands , deep to the angle of the mandible.
- Tender, Red and edematous with pus above it
- 1–2 cm in diameter.
- With enlarged tonsils.



Tuberculous cervical lymphadenitis and abscess

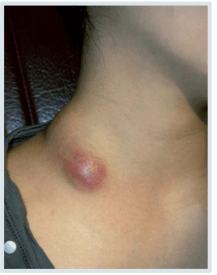
History

- Common in all ages.
- The patient complains of a lump in the neck with or **without pain.** **DDx. Cancer**
- There is no generalized infection.
- Check for a family history of tuberculosis , and Vaccination (BCG) , **ESR** (raised)
- **Case:** Patient without a history of Vaccination has been in close contact with someone who has TB

Examination

➔ **Tuberculous lymphadenitis**

- Upper and middle deep cervical glands.
- NOT hot.
- 1 and 2 cm in diameter.
- Indistinct, firm mass of glands (matted).

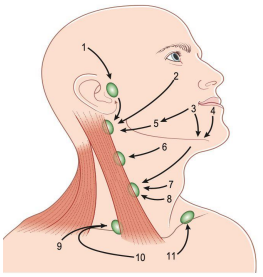


➔ **Tuberculous abscess**

- The overlying skin turns reddish-purple.
- Skin temperature is normal (cold abscess).
- Tender.
- 3–5 cm across.
- The other lymph glands in the neck near the abscess may be enlarged.
- Tachycardia, pyrexia, anorexia and general malaise.

Lymphadenopathy

Carcinomatous lymph glands



- Malignant metastatic deposits in the cervical lymph glands are the most common cause of cervical lymphadenopathy in adults.
- Most common site for metastasis is mid - jugular lymph nodes (level III lymph nodes)

History

- Over the age of 50 years.
- Common in males.
- Painless lump in the neck.
- Patient may have symptoms from the primary lesion.

Examination

- Site depend on the primary lesion location.
- An enlarged supraclavicular lymph gland commonly indicates intra-abdominal or thoracic disease.
- **This gland is called Virchow's gland; its presence is Troisier's sign.**
- General Examination "pt complains of swelling in other sites or mouth and skull ulcers (occipital) "
  - Examine all sites that might contain the primary lesion.

Primary neoplasm of the lymph glands (Reticuloses, lymphoma)

- The most common primary tumor of lymphoid tissue is malignant lymphoma.
- The enlargement of the neck lymph nodes is felt before other parts of body (axilla, groin)
- ★ They are often loosely divided into **Hodgkin's** and **non-Hodgkin's lymphoma**

History

- **Common in children and young adults** (The only neoplasm of lymph occurs in young)
- Males are affected more.
- Painless lump that grows slowly.
- Malaise & pallor.
- Itching of the skin (pruritus) is a distinctive complaint.
- Fever with rigors and weight loss **(Constitutional symptoms)**

Examination

- Any Lymph gland group , often **bilateral**.
- Not tender.
- Solid and **rubbery** , possible to define.
- Liver and spleen may be palpable.
- Anemia and jaundice.

Lymphadenopathy

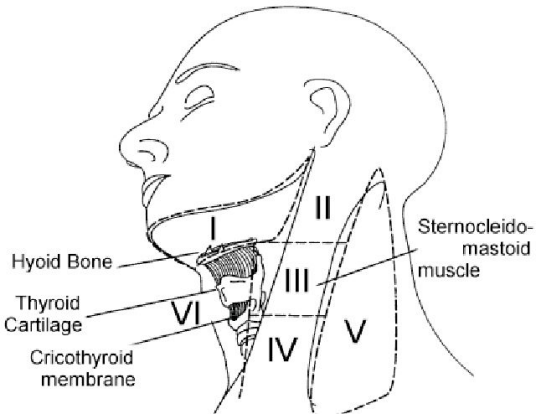
Hodgkin's and non Hodgkin's lymphoma

- Higher risk in hashimoto's
- The lymph glands in Hodgkin's disease are ovoid, smooth and discrete.
- The nodular sclerosing histologic type of Hodgkin's disease is the most common and is often localized to the cervical and upper mediastinal lymph nodes,
- Hodgkin's lymphoma: Matted lymph in the posterior triangle.
- Pathologic confirmation (biopsy) is mandatory, and this is usually the only role played by surgery in treating this condition.
- Treatment generally consists of chemotherapy, irradiation, or both.
- The most common symptom of non-Hodgkin lymphoma is a painless swelling in a lymph node, usually in the neck, armpit or groin.
- For more info

Book's Summary of lymphadenopathies

- Nodes become palpable when their diameter exceeds 1 cm, but impalpable nodes may contain tumour.
- Painless neck nodes in patients >45 years are often due to metastases from carcinoma. In most cases, the primary is within the head and neck. A thorough search for a primary lesion must precede biopsy.
- Fine-needle aspiration cytology can be diagnostic for secondary carcinoma in lymph nodes from head and neck tumours or for tuberculosis; histology is needed for lymphoma.
- **In lymphoma:**
  - The nodes are often bilaterally enlarged, rubbery, firm and discrete.
  - Extranodal disease suggests non-Hodgkin's lymphoma.
  - Bone marrow examination and CT are used in staging.

Lymph node levels of the neck



Level I: Submandibular and submental nodes.

Level II: Upper internal jugular (deep cervical) chain

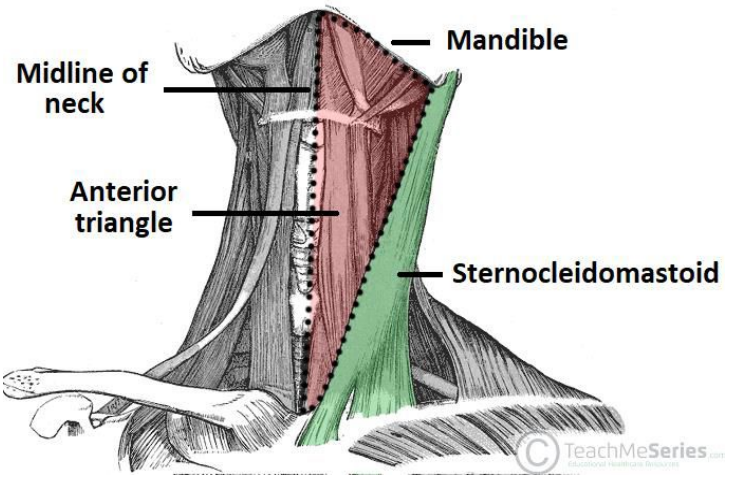
Level III: Middle internal jugular (deep cervical) chain

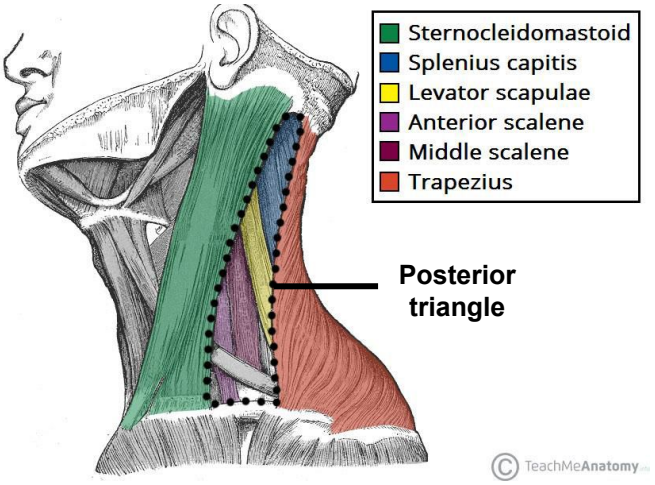
Level IV: Lower internal jugular (deep cervical) chain

Level V: Posterior triangle

Level VI: Central (anterior) compartment

Triangles of the neck





Anterior and posterior triangles are separated by sternocleidomastoid muscle

Anterior triangle borders:

- **Medially:** Midline of the neck
- **Above:** Inferior border of the mandible
- **Laterally:** Anterior border of the sternocleidomastoid muscle

Posterior triangle borders:

- **Anterior:** Posterior edge of the sternocleidomastoid muscle
- **Posterior:** Anterior edge of the trapezius muscle
- **Apical:** Occipital bone
- **Inferior:** Clavicle

Differential diagnosis

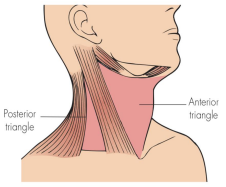
- Enlarged lymph nodes
- Thyroglossal cyst
- Thyroid pathology
- Lipoma
- Sternocleidomastoid tumor
- Submandibular salivary gland swelling

Differential diagnosis

- Enlarged lymph nodes
- Cystic hygroma
- Zenker's diverticulum

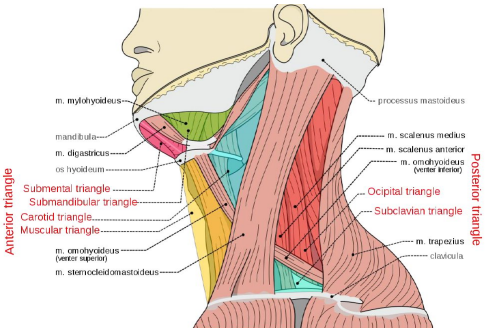
➔ **Anterior triangle is further divided into:**

- **Submental triangle:** Below the mental notch
- **Submandibular triangle:** below the angle of the mandible
- **Carotid triangle:** between the Omohyoid, SCM & digastric muscle
- **Muscular triangle:** in front of the thyroid gland. It contains strap muscles



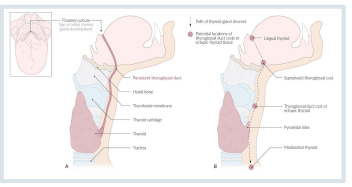
➔ **Posterior triangle is further divided into:**

- **Occipital triangle:** Above omohyoid
- **Subclavian triangle:** Below omohyoid
  - Contains supraclavicular lymph nodes



Thyroglossal cyst

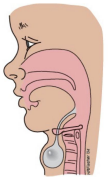
Thyroglossal cyst

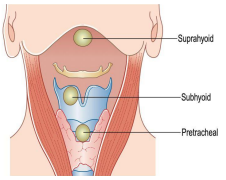


- Portion of the thyroglossal duct remains patent, originates from foramen cecum at the base of the tongue and descends caudally.
- Between the isthmus of the thyroid gland and the hyoid bone, and just above the hyoid bone.
- A midline swelling usually situated just above the upper border of the thyroid cartilage.
- The cyst may contain mucoid-to-purulent fluid, rich in cholesterol.
- Since the duct or its remnant is attached to the foramen caecum, **it moves on protrusion of the tongue** (a thyroid swelling does not move up on protrusion of the tongue). Also, as a thyroglossal cyst is intimately related to the hyoid bone, it also moves on swallowing
- If an infected thyroglossal cyst bursts or is incised for drainage a thyroglossal fistula results.

History

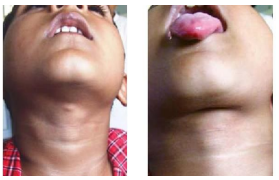
- Between 15 and 30 years old.
- Common in females
- Painless prominent lump
- No systemic symptoms





Examination

- Painless firm and close to the midline.
- Usually located near the hyoid bone.
- May cause dysphagia or neck/throat pain if the cyst enlarges
- Skin is normal unless infected.
- 0.5 to 5 cm in diameter.
- ★ **Moves with protruding of the tongue.** If the cyst moves with it that confirm the diagnosis of Thyroglossal cyst but if it didn't move that does not exclude it as the cyst may be low.



Diagnostics

- **Ultrasound of the neck** to evaluate the cyst and confirm the location of the thyroid.
- Thyroglossal cysts may be differentiated from aberrant thyroid tissue by an ultrasound scan.
- Contrast-enhanced CT of the neck: preferred imaging modality.
- If an infection is suspected, **fine needle aspiration** should be performed for Gram stain and culture (including AFB and mycobacterial culture).

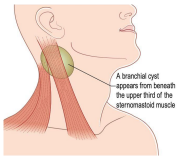
Management

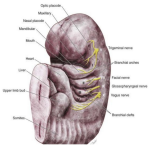
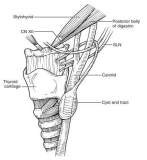
- Need **surgery** cause it's an important risk of cancer.
- **Elective surgical excision (Sistrunk procedure) to prevent infection** includes removal of:
  - The cyst
  - A portion of the hyoid bone
  - Excision of tissue comprising the path (duct) of descent from the foramen cecum (The whole trunk)
- Treatment of any active infection with **antibiotics** before surgery

Branchial cyst & fistula

Branchial cyst

★ It can be from any cleft, but most commonly from the remnant of the **second and third branchial cleft.**



History

- Mostly between the ages of 15 and 25 years because the cyst takes time to fill.
- Males and females are equally affected.
- Painless firm swelling in the upper lateral part of the neck. (upper neck anterior to upper third of sternomastoid)
- No systemic effects and not associated with any other congenital abnormality.
- It's not tumor nor infection thus it's painless and no palpable lymph nodes.
- Usually diagnosed in late childhood or in adulthood after a previously undiagnosed cyst becomes infected

Examination

- Behind the anterior edge of the upper third of the sternomastoid muscle.
- Between 5 and 10 cm long.
- Sometimes the fluid is golden yellow and shimmers with fat globules and cholesterol crystals.
- Skin is normal and no enlarged lymph nodes (not palpable)
- Smooth cyst with distinct margins with minimal mobility.
- Painless with no signs of infection.

Diagnostics

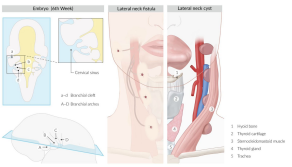
- Neck examination
- Ultrasound
- CT or MRI to further assess anatomical structures for surgical planning

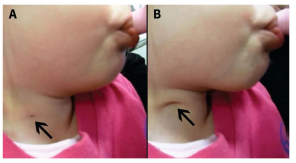
Management

- Complete surgical excision of both the cyst and any associated tracts

Branchial fistula (or sinus)

- Rare congenital abnormality.
- Branchial cleft which has not closed off.
- Small dimple in the skin at the junction of the middle and the lower third of the anterior edge of the sternomastoid muscle that discharges clear mucus.
- Swallowing accentuates the openings on the skin.
- **Fistula:** An abnormal connection between two epithelium-lined surfaces.
- **Sinus tract:** an abnormal channel that originates or ends in one opening





Characteristic finding:
Tethering of the skin upon swallowing

Carotid body tumour (Chemodectoma)

Introduction

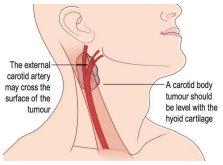
- Rare tumour of the **chemoreceptor** tissue in the carotid body (chemodectoma)
- The incidence is higher at high altitudes
- It is estimated that malignant paragangliomas have less than a 50% 10-year survival rate; surgery is the treatment of choice as chemotherapy and radiation do not appear to be of significant benefit.

History

- Between the ages of 40 and 60 years.
- May be bilateral in 10%
- **Benign, Painless** & slowly growing lump.
- Symptoms of **transient cerebral ischaemia.** which are **(syncope, hemiparesis, paresthesia that completely recover within 24 h)** due to on and off obstruction of the internal carotid artery
- Variable history of fainting
- Carotid body tumors may be functional and secrete catecholamines.

Examination

- Always be gentle especially when palpating a lump **close to the bifurcation of the carotid artery.**
- They are found in the upper part of the anterior triangle of the neck, level with the hyoid bone and beneath the anterior edge of the sternomastoid muscle. **(Lateral neck swelling)**
- Not tender, not hot & skin is normal.
- Vary from 2–3 cm to 10 cm in diameter.
- Lesion is mobile only transversely
- Solid and hard, dull to percussion and do not fluctuate.
- **Sometimes they pulsate.**
- The common carotid artery can be felt below the mass.



Diagnostics

- **Angiography** is useful to define (and possibly embolize) the feeder vessels.
- Biopsy is hazardous because of the risk of bleeding and formation of a pseudoaneurysm.
- A diagnosis of malignancy is **based on lymph node or distant metastases** as pathology.
- Histopathological criteria are unreliable to make a diagnosis of malignant carotid body tumour.
- **CT**: splaying of internal and external carotid arteries (lyre sign)
- **MRI**:
  - ‘Salt’ (High signal foci of hemorrhage /Slow flow)
  - ‘Pepper’ (The low signal flow voids)

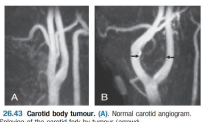


Fig. 26.43 **Carotid body tumour.** (A). Normal carotid angiogram. (B) Splaying of the carotid fork by tumour (arrows).

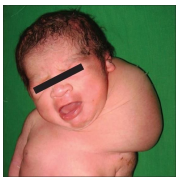
Management

- **Treatment is surgical excision.**
- Operative bleeding and duration of surgery are reduced by preoperative embolisation.
- The **superior laryngeal nerve, vagus nerve and hypoglossal nerve are at risk** during the procedure.
- **In bilateral lesions, operate on the smaller first** and counsel the patient that there may be fluctuation in blood pressure following the second side excision due to complete loss of carotid sinus function.

Cystic hygroma

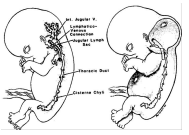
Cystic hygroma (Lymph cyst, lymphocele, lymphangioma)

- Congenital **collection of lymphatic sacs in underdeveloped lymphatic channels** that contain clear, colourless lymph.
- Commonly occur near the root of the arm and the leg.
- **Pediatric** (Cystic hygroma)
- **Adults** (Lymph cyst and lymphocele)



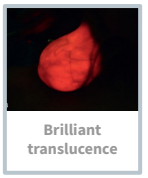
History

- The majority **present at birth** in pediatrics , while in adults after trauma or surgery.
- The only symptom is the complaint about the lump.
- This condition is not familial.

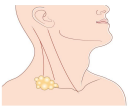


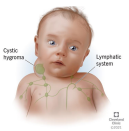
Examination

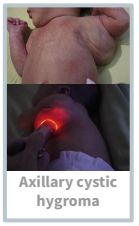
- Found around the base of the neck, usually in the posterior triangle.
- **Diffuse** swelling, not tender, not hot & normal skin.
- Variable in size.
- Their distinctive physical sign is a **brilliant translucence** as hygroma is filled with lymphatic fluid
- Superficial to the neck muscles and close to the skin
- It can go to the axilla, therefore it should be examined.
- **Fluctuation** may present at first, but lost later on



Brilliant translucence







Axillary cystic hygroma

Diagnostics

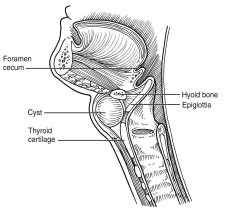
- **Prenatal ultrasound :** fluid-filled neck mass with or without septations
- **Ultrasound** to identify mass in infancy
- **CT or MRI** may be used to further assess anatomical structures for surgical planning.

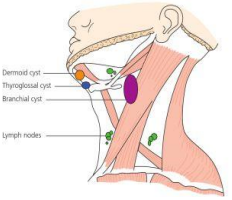
Management

- Small masses may regress spontaneously, but surgical excision is usually indicated to prevent infection or airway compromise, as well as for cosmesis.
- Recurrence is common following surgical excision of extensive hygromas.

Dermoid cyst

- Soft, painless, persistent midline neck masses occurring during the first or second decade of life. However, they do not elevate with swallowing because they are not attached to the hyoid bone and they are often found superficial to the strap musculature.
- Pathophysiologically, they are developmental anomalies involving pluripotential embryonal cells that become isolated and subsequently undergo disorganized growth.
- They are composed of ectoderm and mesoderm and often contain hair follicles, sweat glands, and sebaceous glands.
- Enlarged lymph nodes (lymphadenopathy) may also appear in the midline of the neck.
- The treatment of choice is complete surgical excision.





Sternomastoid 'tumour'

Sternomastoid 'tumour' (Ischaemic contracture of a segment of the sternomastoid muscle)

- **Swelling** of the middle third of the sternomastoid muscle due to ischemic attack, it is **not a tumor**

History

- Lump is noticed **at birth** or in the first few weeks of life, instrumental delivery (difficult delivery)
- Mother may notice the lump or **that the child keeps their head turned to one side – torticollis**.

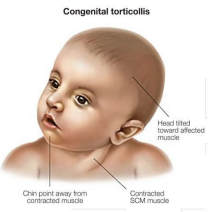
Examination

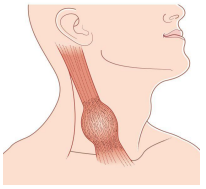
➔ **The lump:**
- Tender Lump in the middle third of the neck on the **anterolateral surface.**
- Usually 1–2 cm across, fusiform.

➔ **The neck:**
- Examine the movements of the neck.
- Child will turn head to the other side but tilt head to same side.

➔ **The eyes:**
- Squint

➔ **The head:**
- An uncorrected torticollis may cause facial asymmetry.

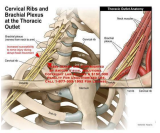


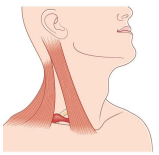


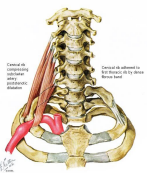
Management

- Conservative treatment in the form of physiotherapy of head may prevent it. Surgery in the form of neck muscle release is indicated only if torticollis persists after the age of one year

Cervical Rib







- Basically it is additional rib from lower cervical vertebra adherent to the first rib by fibrous bands.
- It causes narrowing of the thoracic outlet, compressing a lot of structures like:
  - Subclavian artery
  - Brachial plexus
- Sudden turning of the head causes severe compression especially to the nerves
- Asymptomatic and most of them don't need to be treated.
- Although a cervical rib can cause serious neurological and vascular symptoms in the upper arm, clinical examination of the neck does not usually reveal any abnormalities (Discovered by x-ray)
- **Symptoms & Signs may include (Exacerbated by elevation of the hands) :**

Numbness, weakness

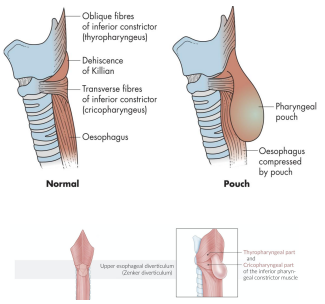
Trophic changes: Muscle Atrophy (due to brachial plexus damage)

Fatigue, Pain

Raynaud phenomenon

Zenker's diverticulum

Pharyngeal pouch (Zenker's diverticulum)

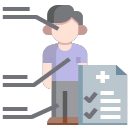


- 'Pulsion' diverticulum of the pharynx between the cricopharyngeus muscle below and the lowermost fibres of the inferior constrictor muscle above.
- At the Killian triangle (a triangular weak point in the dorsal muscular wall of the hypopharynx, between the thyropharyngeal and cricopharyngeal parts of the inferior pharyngeal constrictor muscle)

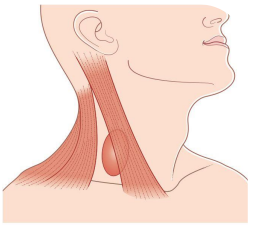
History

- Middle and old age males.
- ★ Long history of **halitosis** (due to food retained in the diverticulum) and **recurrent sore throats.**
- ★ Common presenting symptom is **regurgitation** of froth and undigested food.
- Dysphagia, cough
- If it is longstanding it might lead to malnutrition and weight loss
- **Mnemonic: Elder MIKE** has bad breath: **Elder**ly, **M**ale individuals, **I**nferior pharyngeal constrictor, **K**illian triangle, **E**sophageal dysmotility, halitosis.

Examination



- In most patients, there is no palpable swelling , but if present it appears behind the sternomastoid muscle, below the level of the thyroid cartilage.
- 5–10 cm diameter.
- It can be compressed and sometimes emptied with **gurgling sounds.**
- Pay special attention to the chest.



Diagnostics

- **Barium swallow (best confirmatory test):** contrast-filled pouch protruding dorsally from the hypopharynx at the level of C5/C6.
- **Endoscopy:** to rule out malignancy
- **Transcutaneous US:** differential diagnosis of sEnter diverticula from malignancy

Management

- **PPI:** For gastroesophageal reflux symptoms
- **Endoscopy**: with diverticulostomy and myotomy
- **Open surgery:** cricopharyngeal myotomy
- **Injection of botulinum toxin:** symptomatic patients with esophageal motility disorder and contraindications for surgery

Quick summary from the doctor

Branchial cyst + fistula Patient with small **lateral** neck swelling with **discharge**, when the patient **swallows**, the swelling moves (with skin **tethering**)	**Sternomastoid tumor** **2 days old** infant with lateral neck swelling	**Cystic hygroma** **5 Months old** baby with **diffuse**, **lobulated lateral** neck swelling with **fluctuation**	**Central neck** swelling that moves upon: 1. **protruding the tongue** • **Thyroglossal cyst** 2. upon **swallowing**? • **Thyroid mass**

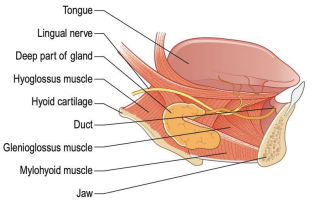
The salivary glands

Introduction

- Saliva is produced by the paired parotid, submandibular and sublingual glands and many other small, unnamed glands.
- Salivary stagnation, increased alkalinity or calcium content of the saliva, infection or inflammation of the salivary duct or gland, and physical trauma to the salivary duct or gland may predispose to calculus formation.
- Submandibular gland swelling results from obstruction of the duct by a stone or inflammation.
- The most common surgical conditions:
  - Infection and calculus formation in the submandibular gland.
  - Tumours of the parotid gland.

1. Submandibular gland

Submandibular calculi



- Submandibular calculi are common.
- Gland lies below the opening of its duct.
- Secretion of the submandibular gland contains a considerable quantity of mucus which encourage stasis in the duct.
- The submandibular salivary gland is the source of 80% of salivary gland calculi, most of which are radio-opaque.

History

- Most submandibular calculi occurs in young to middle-aged adults.
- Main symptoms are pain and swelling beneath the jaw.
- The pain is dull ache which radiates to the ear or into the tongue.
- Swelling appears before, and persists after, the pain.
- Symptoms appear, or worsen, before and **during eating.**
- Patients may be able to relive their symptoms by pressing on the gland, and they may notice that this action produces a foul tasting fluid in the mouth (purlunt saliva)

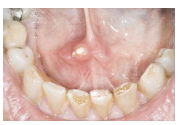
Examination

➔ **The lump**

- The submandibular gland lies beneath the horizontal ramus of the mandible on the mylohyoid muscle.
- Tender when tense or infected.
- 3–5 cm across.
- It is important to ascertain the relations of the lump to the floor of the mouth and the tongue by bimanual palpation.

➔ **The floor of the mouth**

- Inspect: you can display the orifice of the submandibular gland if the stone was impacted at the end of the tongue grey-yellow color may be visible in the open orifice.
- Palpate for lumps and tenderness.



➔ **General examination**

Examine all the salivary glands

Diagnostics

- **Sonography**
- Noncontrast CT
- Sialography (rarely): The imaging of the salivary glands.
- Possibly x-ray of the skull (particularly the base of the mouth)

Management

- **Mainly conservative**
  - NSAIDs for pain relief
  - Stimulation of salivary flow by sucking sour candies, massaging the gland , and applying warm compresses
- **Invasive** (only in severe cases): dilatation of the salivary duct or ultrasonic lithotripsy (shock waves)

1. Submandibular gland

Submandibular sialadenitis

- Infection of the submandibular gland is secondary to the presence of stone in its duct or damage done by the stone which has passed through the duct.
- The infecting organism is usually staphylococcus.

History

- The symptoms are identical to those caused by a stone except when the gland is infected the pain is severe, throbbing, continuous and exacerbated by eating.

Examination

- The physical signs of the lump in the neck are similar to those of the obstructed gland, with the addition of **heat and tenderness.**
- An infected gland may become quite big (5 x 10 cm).
- If the duct system becomes dilated (sialectasis), the pus may pool in the gland and the whole structure turn into a multilocular abscess, which may then point externally onto the skin.

Diagnostics

- Mostly a clinical diagnosis
- Gram stain and culture of discharge
- Ultrasound or CT if abscess is suspected

Management

- Hydration
- Stimulation of salivation (chewing gum, lemon drops)
- **Intravenous antibiotics**: nafcillin + metronidazole OR clindamycin
- Poor response to 48 hours of antibiotics or an abscess: surgical drainage and decompression

Adenoid cystic carcinoma (cylindroma)

- This tumour can affect any of the salivary glands and is the **most common malignant tumour of the *submandibular salivary gland.***
- It is locally aggressive and **tends to invade the nerves.**
- It has a high propensity to recur, even after several years.
- Pathological grades are
  - Grade 1 (tubular)
  - Grade 2 (cribriform)
  - Grade 3 (solid).
- Submandibular gland tumors are less common but more frequently malignant than parotid tumors. Generally, the smaller the gland, the higher the risk a tumor is malignant!

Diagnostics

- **Ultrasound** of the head and neck (to determine location and size of mass); with or without **biopsy** (definitive diagnosis)
- Contrast enhanced CT/MRI of head and neck: useful as preoperative workup to determine location, size, and extension of the lesion

Management

- **Curative**
  - **Parotidectomy** (superficial or total), if possible, with preservation of the facial nerve
  - +/- Neck dissection and/or adjuvant radiotherapy for extensive or higher grade tumors
- **Palliative:** chemotherapy

2. Parotid gland

Introduction

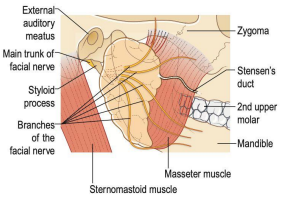
- Most swellings of the parotid gland are **(benign) tumours.**
- Since total removal of the parotid gland would be required to treat inflammation, this should be avoided if possible due to the risk of damage to the **facial nerve**
- The parotid gland is the most common site of origin of salivary neoplasms, almost 80% of which are benign
- **Tumors and infections in parotid gland are quite similar both are targeting eldery patients with painful and rapid/sudden onset lump. To differentiate 1- Facial nerve involvement. 2- HISTORY**

1 Acute bacterial parotitis

- The most common infection of the parotid gland is mumps **(prevented by vaccination)**
- Epidemic viral parotitis.
- Bacterial parotitis? Staphylococcus
- When it occurs in an epidemic with bilateral involvement painful, swollen glands and excessive oedema, which spreads down into the neck, giving the child a double chin, it is easy to diagnose.
- When it causes unilateral gland enlargement, little pain, no oedema, and there are no obvious contacts with the infection, it can be much more difficult to diagnose.

History

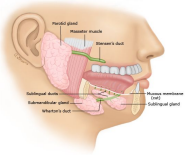
- More common in the elderly and the debilitated.
- Sudden onset of pain and swelling in the side of the face.
- Symptoms of another illness.
- The pain is continuous and throbbing, and radiates to the ear and over the side of the head.
- Speaking and eating cause pain because any movement of the temporomandibular joint is painful.
- Increased WBCs
- Immunocompromised / ICU patient with ongoing disease.



Examination

➔ **The lump**

- The parotid gland lies in front of and below the lower half of the ear.
- The skin is discolored a reddish-brown, shiny, feels hot, smooth and tender.
- Since its infection the function of the facial nerve is not impaired.



➔ **The mouth**

- Inspection: The Stensen's duct.
- Palpation: Feel the mouth of the duct for any thickening or lumps.
- The parotid gland cannot be palpated bimanually because it lies behind the anterior edge of the masseter muscle and the vertical ramus of the mandible.

Management

- Antibiotics
- Operative drainage as necessary

2. Parotid gland

2 Pleomorphic adenoma (Mixed parotid tumour, sialoma)

- It is a true adenoma of the parotid gland

History

- Most common salivary gland tumour (Most in parotid gland) and more common in adult males
- They are **benign**, slow growing, non-tender with potential for malignant transformation.
- Gradual, **painless unilateral swelling** of the gland & movable tumor
- **Lobulated:** pseudocapsule with pseudopods
- Epithelial and mesenchymal elements with fibromyxoid, fibroid stroma
- **Facial nerve is never involved.**
- Prognosis is good.

Diagnostics

- **Ultrasound:** diagnostic method of choice in salivary gland tumors

Management

- Best treatment is **superficial parotidectomy** to prevent recurrence

3 Adenolymphoma (Warthin's tumour)

- The second most common tumour of the salivary glands.
- Almost exclusively parotid (Most in the lower pole of the gland)
- 60% male. 30% bilateral
- Benign salivary gland tumors fall under the umbrella term "monomorphic adenoma" because they usually originate in only one type of cell – as opposed to the pleomorphic adenomas, which consist of both epithelial and myoepithelial cells.

History

- Middle and old age, more common in males.
- It does not occur in Negroes.
- The patient complains of a slow-growing, painless swelling over the angle of the jaw.
- The swelling may be bilateral.

Examination

- Develops in the lower part of the parotid gland, level with the lower border of the mandible. This is slightly lower than the common site of origin of the pleomorphic adenoma.
- They are usually 1–3 cm in diameter.
- soft consistence, are dull to percussion and not translucent, but they often fluctuate.

Diagnostics

- **Ultrasound:** diagnostic method of choice in salivary gland tumors

Management

- Complete extirpation of the tumor with preservation of facial nerve
- Option of watchful waiting may be discussed with patient.

2. Parotid gland

Features suggestive of malignant transformation of a benign salivary gland tumor:

- Sudden and rapid increase in size
- Prominence of the veins over the swelling
- Overlying skin infiltrated
- Area of anesthesia over the skin
- Enlargement of cervical lymph nodes

4 Carcinoma of the parotid gland

- It is uncommon but not rare

History

- Over the age of 50 years.
- Rapidly enlarging swelling on the side of the face.
- Painful, especially during movements of the jaw.
- The pain may radiate to the ear and over the side of the face.
- Patients may complain of symptoms of facial nerve involvement the patient will be unable to use the muscles of facial expression. The signs may vary from mild weakness of the lower lip when baring the teeth, to a complete seventh nerve palsy.
- Numbness of the anterior two-thirds of the tongue indicates infiltration of the lingual nerve, and is diagnostic of carcinoma.
- The patient may also complain of asymmetry of the mouth and difficulty in closing the eyes.

Examination

- Skin may be infiltrated, reddish-blue , hyperaemic and hot.
- Soft or cystic, not very tender.
- The cervical lymph glands are likely to be enlarged and hard.
- Look for distant metastasis.
- The thickening of the tissues around the temporomandibular joint may restrict jaw movements.

Diagnostics

- **Ultrasound:** diagnostic method of choice in salivary gland tumors

Management

- **Curative**
  - **Parotidectomy** (superficial or total), if possible, with preservation of the facial nerve
  - +/- Neck dissection and/or adjuvant radiotherapy for extensive or higher grade tumors
- **Palliative**: chemotherapy

Mucoepidermoid carcinoma

- This is the most common salivary gland malignancy
- It has a mix of mucin-producing columnar cells and squamous cells.

Differential Diagnosis

Differential diagnosis according to site

★ Midline	Lateral (mainly lymph nodes)	Posterior
• Solitary nodular goiter (either toxic or not) • Multinodular nodular goiter • Hemorrhagic cyst "**Sudden painful swelling** ",pain is due expansion of the cyst then rupture • Thyroid cancer • Thyroglossal cyst • Dermoid cyst " no need to know anything about it"	• **Reactive** - results from near infection • **Infectious** • **Metastatic** - most commonly in midjagular lymph node • **Lymphoma**	• Lymph nodes • Cystic hygroma • Sebaceous cyst

› We can differentiate between midline mass in physical examination by first asking the patient while you inspect to swallow then to protrude the tongue :

- The mass moves with swallowing only = thyroid mass
- The mass moves also with tongue protrusion = thyroglossal cyst

Extra

	Anterior Triangle	Midline	Posterior Triangle
Inflammatory	Adenitis from various causes Reactive adenopathy Parotitis Atypical mycobacteria	Adenitis Thyroiditis Ludwig's angina	Adenitis Sialadenitis
Congenital	Branchial cleft cyst Laryngocoele Congenital torticollis	Thyroglossal duct cyst Dermoid cyst	Cystic hygroma
Neoplastic	Hemangioma Neurogenic tumors Salivary gland tumors	Thymomas Lymphoma Lipoma Goiter	Lymphoma Metastatic lesions Neuroblastoma Rhabdomyosarcoma
Traumatic	Hematoma Acquired torticollis	Laryngeal fracture	Hematoma Acquired torticollis

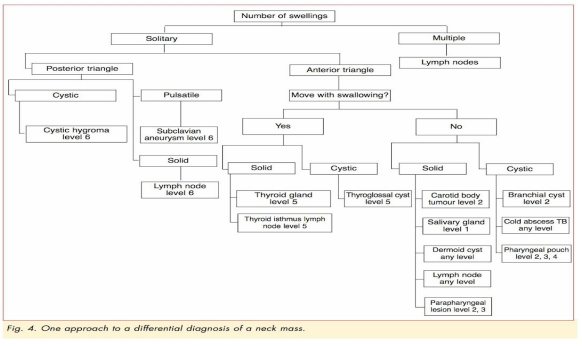
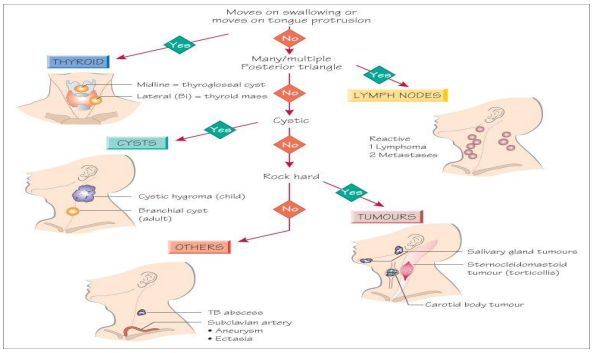


Fig. 4. One approach to a differential diagnosis of a neck mass.

TABLE 23-9 Neck Masses in Children

Location	Type
Midline	Thyroglossal duct cyst
	Ectopic thyroid
	Thyroid masses
	Dermoid and epidermoid cysts
	Lymphadenopathy
Lateral	Lymphadenopathy
	Cystic hygroma
	Branchial cleft cysts
	Torticollis



Doctor's Notes

Differential diagnosis:

1. Infection
2. Inflammation (ex: sarcoidosis, thyroiditis)
3. Congenital (ex :cystic hygroma = located in the posterior triangle comes at 1-4 years old + dermoid cyst)
4. Trauma (ex: causing hematoma)
5. Malignancy (ex: lymphoma)
6. Autoimmune (ex: Graves disease)
7. Vascular (ex: carotid body tumor also known as carotid body paraganglioma which presents as a painless pulsatile lump)

History:

- The most common swellings in the neck are due to **infection or cancer** therefore you should ask qs that are related to them.
- Infection: painful , Faver , contact with someone , fatigability
- Cancer : painless, lymph nodes enlargement due to metastasis
- When you have a patient complaining of neck swelling the most imp thing is to take a history which will help in 99% of the cases, the most imp part of history is **compression symptoms** which may present as **dysphagia**, **odynophagia** & **dyspnea** **THREE MARKS IN THE EXAM ON THIS POINT**
- Some question may help to reach a definitive diagnosis or help in exclusion of a disease " symptoms of hypo & hyperthyroidism"
- Note that head & neck cancer on its own do not cause constitutional symptoms
- If the patient has thyroid cancer it will be hyper or hypo symptoms which are not constitutional. So if a patient comes to you with neck swelling and constitutional symptoms you have to look for cancer in other areas e.g abdomen, lung
- The only exception we have is lymphoma and we do not consider it head and neck cancer, its primary lymphatic cancer.
- Constitutional symptoms is important such as weight loss (it may be called B symptoms which are significant to the diagnosis of lymphoma)
- Family history of any thyroid disease, laryngeal cancer, skin cancer or lymphoma is imp
- In case of patient who had recent trauma we need to consider hematoma.

Examination: The doctor revised the Thyroid examination with the student and emphasized on understanding of it

- In general examination you must look for the sign of hypo & hyperthyroidism
- If there's a mass you ask the patient to swallow, if it moves = thyroid origin, then you ask the patient to protrude the tongue to rule out thyroglossal cyst

Investigation:

- **Blood test:** CBC to check for chronic anemia, platelet count & coagulation profile, liver function test (if needed), kidney function test (if needed for example in CT scan with contrast), thyroid function test (90% of cancer patient will have euthyroid)
- **Imaging:** first start with ultrasound (will tell us if the lesion is cystic or solid lesion and to know the vascularity of the lesion, and to look for other lesions), if no findings do CT, if still no findings do MRI. Nuclear medicine is done only if we have high T4 If their is hot uptake that means their is less than 1% chance of malignancy so no need to take a biopsy If their was cold uptake that means their is 20% chance of malignancy and we need to take a biopsy
- **Biopsy** (two types):
  - Fine needle aspiration (FNA): which shows only the cytology (tells us whether its malignant or not only). Papillary thyroid can be confirmed by FNA alone and also medullary thyroid but need also markers with it
  - True cut: shows us the histology; which is our go to biopsy
  - Incisional biopsy is a medical test to remove a piece of tissue from a lesion or mass
  - Excisional biopsy is a medical test in which the whole lesion or mass is removed and tested with negative margin (region around lesion)

Doctor's Notes

Management:

- For Cancerous lesion we first stage
- Thyroglossal cyst: need surgery cause it's an important risk of cancer
- Dermoid cyst: excision
- Multinodular goiter (benign): we remove only if there's symptoms

Summary

Recall

Q1: What is the differential diagnosis of a thyroid nodule?
Multinodular goiter -Adenoma- Hyperfunctioning adenoma- Cyst - Thyroiditis - Carcinoma/lymphoma - Parathyroid carcinoma

Q2: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

Q3: 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

Q4: What is the most common cause of thyroid enlargement?
Multinodular goiter

Q5: What are indications for surgery with multinodular goiter?
Cosmetic deformity, **compressive symptoms**, cannot rule out cancer

Q6: What is Plummer's disease? Toxic multinodular goiter

Q7:What are the "P's" of papillary thyroid cancer (7)?
1. **P**opular (most common)
2. **P**sammoma bodies
3. **P**alpable LNs. (spreads most commonly by lymphatics, seen in ≈33% of patients)
4. **P**ositive 131I uptake
5. **P**ositive prognosis (10 years survival 95%)
6. **P**ostoperative 131I scan to diagnose/treat metastases
7. **P**ulmonary metastases

Q8: in follicular adenocarcinoma;
- **nodule consistency:** Rubbery, encapsulated
- **Spread "metastasis:** Hematogenous commonly to bone, more aggressive than papillary adenocarcinoma.

Q9: in Medullary adenocarcinoma;
- **Histology :** Amyloid (a**M**yloid = **M**edullary)
- **Spread "metastasis:** lymphatic and Hematogenous
- **Associated conditions:** MEN-II, pheochromocytoma, Hyperparathyroidism

Summary

Recall

Q10: What are the signs/symptoms of primary Hyperparathyroidism hypercalcemia?

"Stones, bones, groans, and psychiatric overtones":

- Stones: Kidney stones
- Bones: Bone pain, pathologic fractures, subperiosteal resorption
- Groans: Muscle pain and weakness, pancreatitis, gout constipation Psychiatric overtones: Depression, anorexia, anxiety

Q11: Neck Mass

What is the usual etiology in infants?

- Congenital (branchial cleft cysts, thyroglossal duct cysts)
- Adolescents (Inflammatory (cervical adenitis is #1), with congenital also possible)
- Adults (Malignancy (squamous is #1), especially if painless and immobile)

What are the seven cardinal symptoms of neck masses?

1. Dysphagia
2. Odynophagia
3. Hoarseness
4. Stridor(signifies upper airway obstruction)
5. Globus
6. Speech Disorder
7. Referred ear pain(via CNV,IX,orX)

What is the differential diagnosis?

- **Inflammatory:** cervical lymphadenitis, cat-scratch disease, infectious mononucleosis, infection in neck spaces
- **Congenital:** thyroglossal duct cyst (midline, elevates with tongue protrusion), branchial cleft cysts (lateral), dermoid cysts (midline submental), hemangioma, cystic hygroma
- **Neoplastic:** primary or metastatic

What is the treatment?

- Surgical excision for congenital or neoplastic; two most important procedures for cancer treatment are selective and modified neck dissection

Q12:Cystic Hygroma

What is it?

- Congenital abnormality of lymph sac resulting in lymphangioma

What is the anatomic location?

- Occurs in sites of primitive lymphatic lakes and anywhere in the body, most commonly in the floor of mouth; under the jaw; or in the neck, axilla, or thorax

What is the treatment?

- Early total surgical removal because they tend to enlarge; sclerosis may be needed if the lesion is unresectable

Q13:Thyroglossal Duct Cyst

What is it?

- Remnant of the diverticulum formed by migration of thyroid tissue

How is the diagnosis made?

- Ultrasound

How can one remember the position of the thyroglossal duct cyst?

- Think: thyroGLOSSAL = TONGUE midline sticking out

What is the treatment?

- Antibiotics if infection is present, then excision, which must include the midportion of the hyoid bone and entire tract to foramen cecum (Sistrunk procedure)

Q13:Zenker's Diverticulum

What is it?

- Pharyngoesophageal diverticulum; a false diverticulum containing mucosa and submucosa at the UES at the pharyngoesophageal junction through Killian's triangle

What are the signs/symptoms?

- Dysphagia, neck mass, halitosis, food regurgitation, heartburn

How is the diagnosis made?

- Barium swallow

438's Quiz

Q1: Q1: A 55-year-old woman presents with a 6-cm right thyroid mass and palpable cervical lymphadenopathy. Fine-needle aspiration (FNA) of one of the lymph nodes demonstrates the presence of calcified clumps of sloughed cells. Which of the following best describes the management of this thyroid disorder?

A) The patient should be screened for pancreatic endocrine neoplasms and hypercalcemia.
B) The patient should undergo total thyroidectomy with modified radical neck dissection.
C) The patient should undergo total thyroidectomy with frozen section intraoperatively, with modified radical neck dissection reserved for patients with extra-capsular invasion.
D) The patient should undergo right thyroid lobectomy followed by iodine 131 (131 I) therapy.

Q2: Which of the following patients with primary hyperparathyroidism should undergo parathyroidectomy?

A) 62-year-old asymptomatic woman
B) A 54-year-old woman with fatigue and depression
C) A 42-year-old woman with a history of kidney stones
D) A 59-year-old woman with mildly elevated 24-hour urinary calcium excretion

Q3: A 62-year-old man presents with a 3-month history of an enlarged lymph node in the left neck. He is a long-time smoker of cigarettes and denies fevers, night sweats, fatigue, or cough. On physical examination there is a 1.5-cm hard, fixed mass below the angle of the mandible in the left neck. Which of the following is the most likely cause of an enlarged lymph node in the neck?

A) Thyroglossal duct cyst
B) Dermoid tumor
C) Carotid body tumor
D) Metastatic squamous cell carcinoma

Q4: An 89-year-old man has lost 30 lb over the past 2 years. He reports that food frequently sticks when he swallows. He also complains of a chronic cough. Barium swallow is shown here. What is the best treatment option for this patient?

A) Placement of an esophageal stent
B) Diverticuloplasty
C) Excision of the diverticulum and cricopharyngeal myotomy
D) Excision of the diverticulum and administration of a promotility agent

Q5: Who is going to ACE their exam?

A) Me
B) Myself
C) I

Answers

Q1	B	Q4	C
Q2	C	Q5	A, B & C
Q3	D		

438's Quiz

Explanations

Q1 Explanation:

Treatment of high-risk papillary carcinomas consists of near-total (or total) thyroidectomy. If patients have lymph node metastases in the lateral neck, concomitant modified radical neck dissection should be performed with total thyroidectomy. Papillary carcinoma of the thyroid frequently metastasizes to cervical lymph nodes, but distant metastasis is uncommon. Overall, survival at 10 years is greater than 95%. Several scoring systems for determining prognosis have been developed; one of the more common systems takes into account age, grade, extrathyroidal invasion and metastases, and size (AGES). The surgical management of low-risk papillary thyroid cancers is controversial (lobectomy versus total thyroidectomy). Medullary, but not papillary, thyroid carcinoma is associated with multiple endocrine neoplasia syndrome.

Q2 Explanation:

Patients with symptomatic primary hyperparathyroidism as manifested by kidney stones, renal dysfunction, or osteoporosis should undergo parathyroidectomy. However, management of "asymptomatic" patients is controversial. Indications for surgical intervention for asymptomatic primary hyperparathyroidism include age less than 50 years, markedly elevated urine calcium excretion, kidney stones on radiography, decreased creatinine clearance, markedly elevated calcium or 1 episode of life-threatening hypercalcemia, and substantially decreased bone mass.

.

Q3 Explanation:

Most commonly, lymphadenopathy in an adult is indicative of metastatic squamous cell cancer (SCC). Metastatic SCC originates most frequently from the nasopharynx, oropharynx, or hypopharynx. In addition to lymphadenopathy, persistent lateral neck masses in adults may represent neuromas, neurofibromas, carotid body tumors, branchial cleft cysts, lipomas, sebaceous cysts, parathyroid cysts, or a primary soft tissue tumor. Midline neck masses may represent thyroglossal duct cysts, dermoid tumors, thyroid masses, lipomas, or sebaceous cysts.

.

Q4 Explanation:

The barium swallow shows a pharyngoesophageal (Zenker) diverticulum, which is an outpouching of mucosa between the lower pharyngeal constrictor and the cricopharyngeus muscles. Surgical treatment is excision of the diverticulum (or diverticulopexy which inverts the diverticulum) and division of the cricopharyngeus muscle (cricopharyngeal myotomy), which can be done under local anesthesia in a cooperative patient. A Zenker diverticulum is thought to result from an incoordination of cricopharyngeal relaxation with swallowing. These diverticula occur in elderly patients and more commonly on the left. The typical patient presents with complaints of dysphagia, weight loss, and choking. Other patients present symptoms such as repeated aspiration, pneumonia, or chronic cough. A mass is sometimes palpable, and a gurgle may be heard. Diagnosis is made with a barium swallow; endoscopy is indicated if there is concern for malignancy (which is rarely associated with Zenker diverticulum). Esophagoscopy should be performed cautiously because the blind pouch is easily perforated. Even though the pouch may extend down into the mediastinum, the origin of the diverticulum is at the cricopharyngeus muscle near the level of the bifurcation of the carotid artery.

.

Q5 Explanation: Duh..

439's Quiz

Q1: Which of the following statements are true regarding medical management of primary hyperparathyroidism?

A) Use of diuretics could reduce serum calcium levels by increasing their excretion via the kidneys.
B) Cinacalcet is a bisphosphonate used to reduce calcium levels.
C) Pamidronate is a bisphosphonate used to reduce calcium levels.
D) Intravenous saline is the first line of management in hypercalcaemia.
E) Serum calcium over 3.5 mmol/L is a medical emergency

Q2: What are the manifestations of thyrotoxicosis?

A) Irritability
B) Hair loss
C) Muscle weakness and wasting
D) Hyperkinesia
E) Heart failure.

Q3: Biochemically hypothyroidism can be associated with:

A. Hyponatraemia
B. Hyperlipidaemia
C. Thyroid peroxidase (TPO)autoantibodies
D. Raised TSH
E. Low fT3 and fT4.

Q4: Which of the following statements are true?

A. Primary hyperparathyroidism is usually sporadic.
B. Hypercalcaemia triggers the release of parathyroid hormone (PTH).
C. Familial hyperparathyroidism commonly presents as an adenoma.
D. Familial hyperparathyroidism is mostly sporadic.
E. Hyperparathyroidism can be associated with a pituitary adenoma.

Q5: Which of the following statements regarding thyroid neoplasms are true?

A. Papillary carcinoma is the most common.
B. Men and women are equally affected. C Thyroid cancer is commonest after the age of 70 years.
C. Medullary carcinoma originates from the C-cells.
D. Anaplastic carcinoma is the least common.

Q6: A thyroglossal duct cyst is a remnant of which structure?

A. The thyrocervical trunk
B. The cervical sinus
C. The track of the thymus through the neck in to the mediastinum
D. The fourth branchial pouch
E. The track of the thyroid from the tongue base to the neck.

Answers

Q1	C, D, E	Q4	A, E
Q2	A, B, C, D, E	Q5	A, D
Q3	A, B, C, D, E	Q6	E

Extra Questions

439's Quiz

Explanations

Q1 Explanation: C, D, E
Medical management of primary hyperparathyroidism involves a low calcium diet and withdrawal of drugs that aggravate hypercalcaemia, such as diuretics and lithium. Cinacalcet is a calcium receptor agonist and reduces calcium levels. Intravenous saline to correct dehydration and a bisphosphonate such as pamidronate is essential..

Q2 Explanation: A, B, C, D, E
Thyrotoxicosis is characterised by the clinical, physiological and biochemical changes that result when tissues are exposed to excess thyroid hormone. It can present with symptoms of hyperactivity, insomnia and heat intolerance, weight loss with increased appetite, palpitations and fatigue. The signs often are fine tremor, warm moist skin, proptosis palmar erythema, onycholysis, hair loss, high output heart failure and, rarely, periodic paralysis which is associated with hypokalemia..

Q3 Explanation: A, B, C, D, E
Biochemically hypothyroidism is characterized by low free t3 and free t4 hormones. As a compensatory attempt, the pituitary secretes TSH, which is elevated. It can present as hyponatraemia and raised total cholesterol and LDL cholesterol..

Q4 Explanation: A, E
The prevalence of primary hyperparathyroidism increases with advancing age. Most cases are sporadic. Nearly 85 per cent of these patients have an adenoma; 13 per cent have hyperplasia of the glands; and a very small proportion have multiple adenomas or cancer. Familial hyperparathyroidism is genetically determined and associated with MEN-1 (primary hyperparathyroidism, pituitary adenoma and pancreatic tumours such as insulinoma, gastrinoma and VIPoma) and MEN 2 (primary hyperparathyroidism, medullary carcinoma of thyroid and pheochromocytoma). The familial variety can also exist as isolated hyperparathyroidism and exists as hyperplasia.

Q5 Explanation: A, D
Depending on the cells of origin, thyroid cancers can be classified as originating from:
• papillary cells
– differentiated such as papillary and follicular carcinoma – undifferentiated anaplastic carcinomas
• lymphocytes – lymphoma
• C-cells – medullary carcinoma.
The relative incidence of primary malignant tumour of the thyroid cancer is as follows: papillary cancer, 60 per cent; follicular carcinoma, 20 per cent; anaplastic cancer, 10 per cent; medullary and malignant lymphoma, 5 per cent each. The annual incidence of thyroid cancer is 3.7 cases per 100 000 population and the female:male sex ratio is 3:1. It is commonest in adults aged 40–50 years.

Q6 Explanation: E
The thyroid descends from the foramen caecum at the junction of the posterior and middle thirds of the tongue to its position in front of the trachea. If a remnant of this thyroglossal tract fails to involute, a thyroglossal duct cyst is formed. The path of the thyroid hooks around the hyoid bone, so surgical treatment requires excision of the middle of the body of the hyoid to prevent recurrence. Excision of these cysts involves a midline neck dissection to include all branches of the cyst, removal of the hyoid, as described, and excision of a cuff of tongue base tissue.

Good Luck!

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