Non-neoplastic thyroid diseases

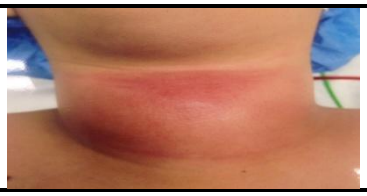
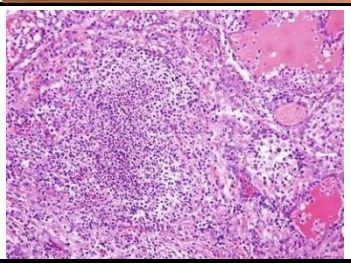
	Hyperthyroidism	Hypothyroidism
Primary	-Graves' disease -Toxic multinodular goiter -Toxic follicular thyroid adenoma	-Iodine deficiency -Hashimoto thyroiditis -Post ablative -Genetic defects in thyroid development -Thyroid hormone resistance
Secondary	TSH-secreting pituitary adenoma	Pituitary failure

Thyroiditis

I Types

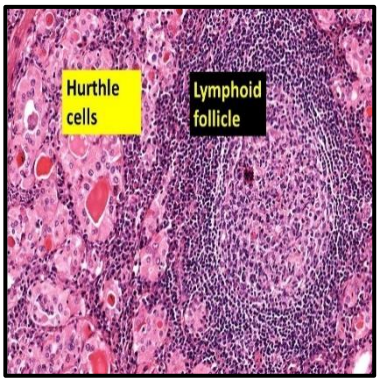
- Acute / infectious thyroiditis
- Autoimmune thyroiditis (Hashimoto's thyroiditis).
- Riedel thyroiditis
- Subacute granulomatous thyroiditis

Acute Infectious Thyroiditis

Risk Factors	- Malnourished infants, Debilitated elderly, Immunosuppression and trauma	
Etiology	**- Often** Strept haemolyticus, Strept pneumoniae, Staph aureus **- Via blood or direct** seeding from upper respiratory infections, causes sudden onset of pain and glandular enlargement	
N/E	- Normal or slightly enlarged thyroid gland. - May have suppurative areas	
M/E	- Neutrophils, possibly micro abscesses and tissue necrosis - Fungi are associated with necrosis, acute inflammation and granulomas	

Hashimoto Thyroiditis

- The **most common cause of Hypothyroidism** after iodine deficiency.



- **More common in females**

I Pathogenesis

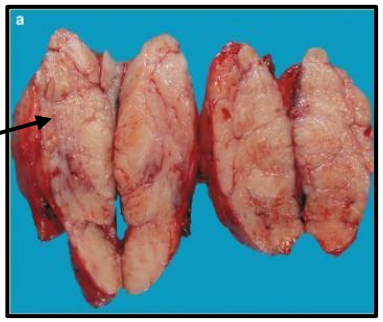
- **Auto-immune thyroiditis**

- **Activation of helper** (CD4+) T lymphocytes sensitized to thyroid antigens.

- **These helper T lymphocytes** stimulate proliferation of cytotoxic (CD8+) T lymphocytes, which attack thyroid follicular cells.

- **Activated helper T lymphocytes** also recruit reactive B lymphocytes to produce antibodies against thyroid antigens as anti-thyroglobulin and anti-thyroid peroxidase.

II Gross description



1- Early:

-There is symmetrical diffuse enlargement of the thyroid gland with vague nodularity

- The affected areas are pale (gray or yellow) and firm

- They lack the glistening appearance of colloid

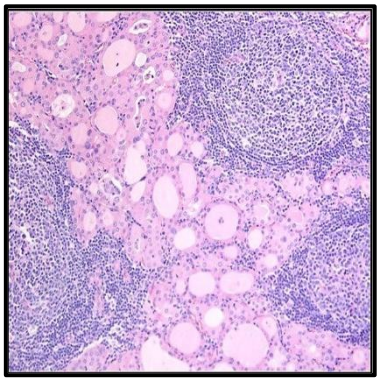
2- Late: The gland becomes symmetrically atrophic

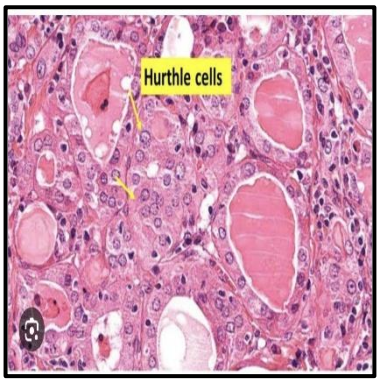
III Microscopic description

- **Follicles are atrophied**. Follicles are lined by large cubical cells with eosinophilic granular cytoplasm **(Hurthle cells).**

- **Inflammatory cells** (Lymphocytes, plasma cells, macrophages).

- **Reactive lymphoid follicles**.

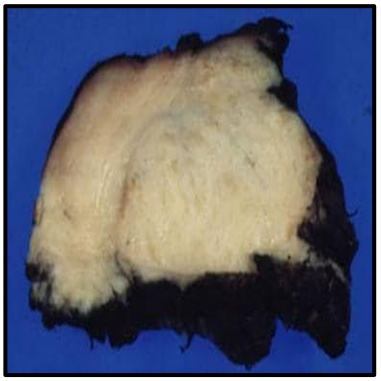




Riedel Thyroiditis

- **Rare** chronic disease of **unknown cause**.

- **Riedel thyroiditis** may be part of multifocal idiopathic fibrosclerosis.

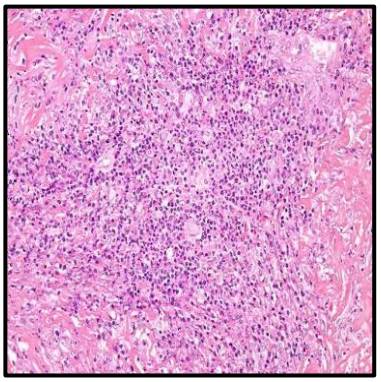


I Gross description

- The gland is stony hard and greyish white

- Adherent to the surrounding structures

II Microscopic description



- Follicles are atrophied

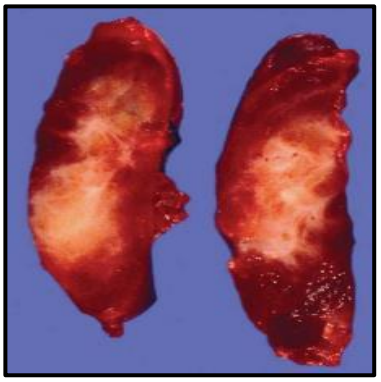
- Excess fibrous tissue may extend outside the gland

- Lymphocytic infiltrate

III Complications

Compression manifestations: dysphagia, dyspnea, recurrent laryngeal nerve paralysis

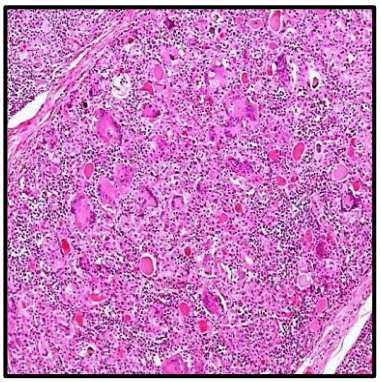
Subacute Granulomatous Thyroiditis



- **A self-limited disorder** in which patients present with a tender thyroid.

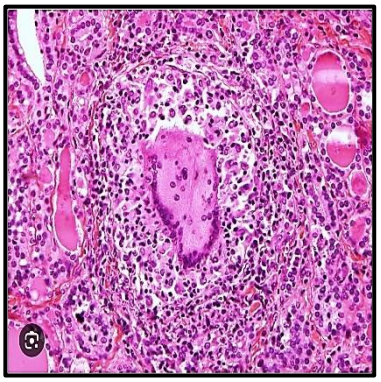
- **Etiology is not known** but clinical features of preceding respiratory infection suggest a possible viral etiology

I Gross description



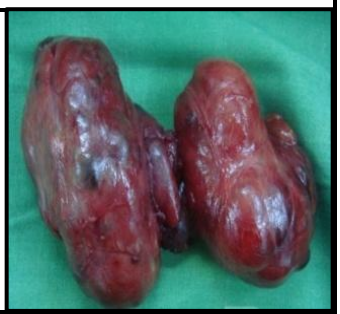
- **Moderate enlargement** of the gland which is often focal and asymmetrical.
- **The cut surface** of the involved area is firm and greyish white.

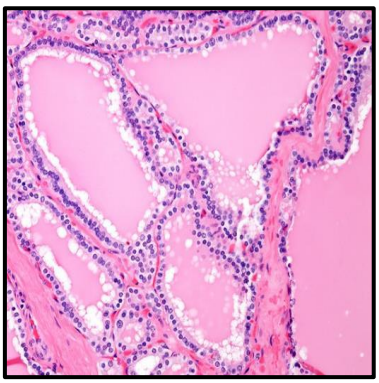
II Microscopic description

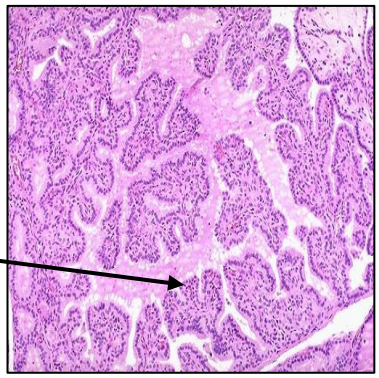


- **Early:** Acute inflammatory destruction of the thyroid follicles.
- **Late:** Granulomas consist of central colloid material surrounded by histiocytes and scattered multinucleated giant cells.
- **Advanced cases**, Fibrosis

Graves' Disease

Etiology	**Autoimmune disease**, more common in females.
Pathogenesis	- Due to auto-antibodies. **Most common is TSI** (thyroid stimulating Ig). - **Stimulate TSH receptors** leading to diffuse hyperplasia and hyper functioning thyroid follicles with excess thyroid hormone secretion
N/E	- The thyroid gland is **symmetrically enlarged**. - The gland appears fleshy. **- Cut surface** is firm and dark red. **- Loss of the normal** translucence of stored colloid 
M/E	- The gland is diffusely Hyperplastic and highly vascular. **- The follicles are lined** with tall columnar cells. -The **colloid** is depleted and scalloped **(moth-eaten)** at the periphery. **- Hyperplastic** papillae project into the lumen of the follicles. **- Lymphocytes** and **plasma cells** infiltrate the interstitial tissue and may form reactive lymphoid follicles





Goiter

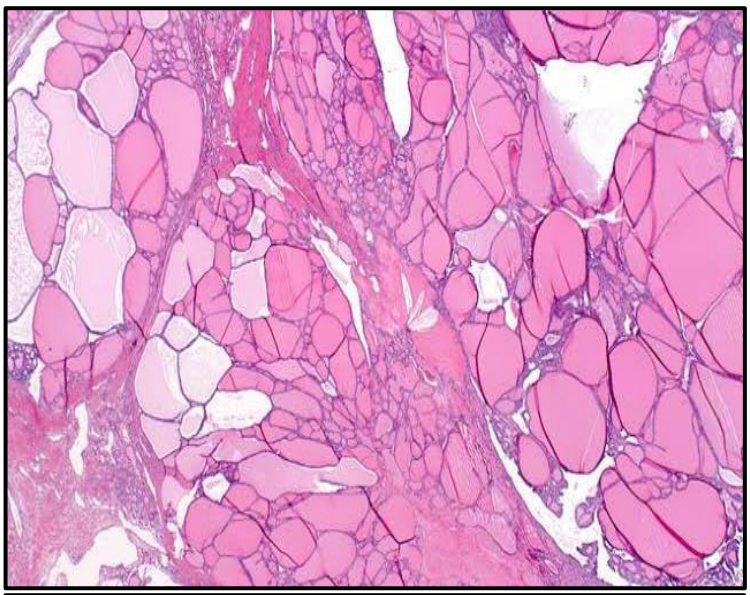
Goiter: Non inflammatory, non-neoplastic enlargement of the thyroid gland

Goitrogen: agents that **suppress thyroid hormone synthesis**, and so elevating TSH levels and leads to hyperplastic changes of thyroid (goitrous enlargement) as cabbage and cauliflower.

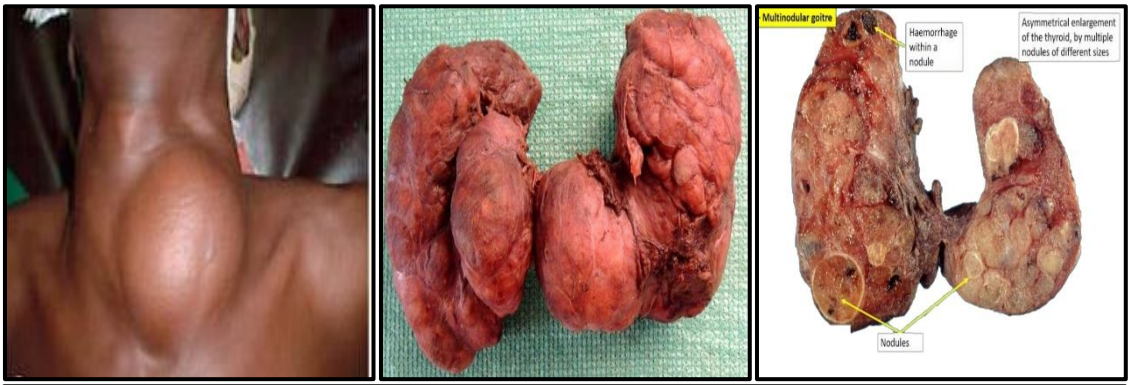
Classification

-**Simple (non-toxic)**: Diffuse or Multinodular

-Toxic (associated hyperthyroidism)



M/E of Simple (Nontoxic) Goiter



N/E of simple multinodular goiter

	Diffuse Simple (Nontoxic) Goiter	Simple Multinodular (Nontoxic) Goiter
Site & Incidence	**- Diffusely** involves the thyroid gland without producing nodularity. **- Common in females**	---
Causes/Results	**Physiologic Goiter**: Usually seen at times of increased physiological demands as puberty, pregnancy. **Forms:** • **Endemic form:** occurs in geographic areas where the soil, water, and food supply contain low levels of iodine • **Sporadic form**	**- Repeated cycles** of stimulation and involution of a diffuse goiter lead to rupture of some follicles **followed by** fibrosis, hemorrhage, scarring, and sometimes calcification. **- This produces** an irregular enlargement of the thyroid gland (variable nodularity and scarring
Phases	**1-Hyperplastic stage:** there is **diffuse** and **symmetric enlargement** of the thyroid gland. There is hypertrophy and hyperplasia of the follicular epithelium with scant colloid. **2-Colloid involution stage:** if iodine correction and decreased demand to thyroid hormones occur after a short period of hyperplasia, there is colloid accumulation and atrophy (involution) of follicular epithelium. Most patients are clinically euthyroid.	---
Gross	---	- The thyroid gland is asymmetrically enlarged with nodular surface. - The cut surface shows numerous irregular nodules contain glistening colloid. - Fibrosis, calcification, hemorrhage & cystic degeneration may be present.
Microscopic	- Nodular thyroid gland separated by fibrous tissue. - Hyperplastic nodules, tall columnar follicular epithelium, papillary structures, formation of small new follicles. - Involuted nodules, large follicles distended by colloid and lined by flat follicular epithelium. Large colloid-containing follicles may fuse to form colloid cysts. - Calcification, chronic inflammation, hemorrhage & cystic degeneration are common in the old standing cases	
Complications	**- Pressure effects:** on trachea, esophagus and recurrent laryngeal nerve **- Malignancy:** rare in 2% of cases **- Some of these nodules** may become hyper functioning and cause hyperthyroidism **(no exophthalmos)**	