Thyroid gland

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Thyroid gland

nbryology

in orgin

Median thyroid diverticulum (endodermal)

↳ why we learn about it?
to know that parafolicular C cells are neural in orgin

Floor of the pharynx

Base of the tongue

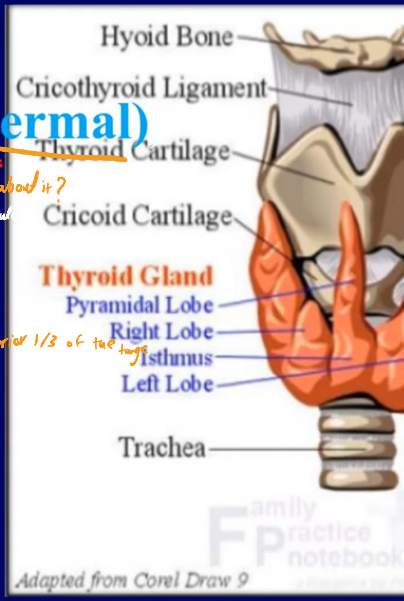
Start at

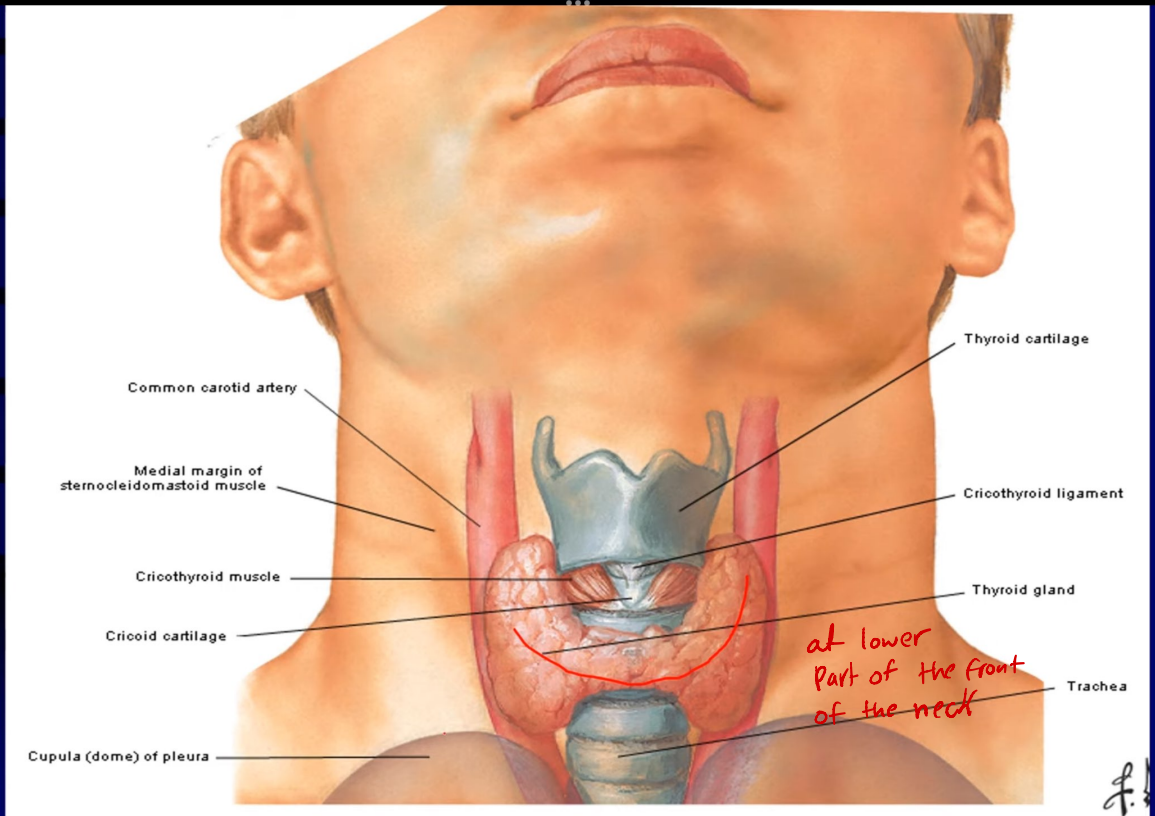
Foramen cecum. at the junction between anterior 2/3 & posterior 1/3 of the tongue where primative phrynx start

Descend caudally (anterior)

Para follicular C cells(neural creat)

↳ produce Calcitonin ($\downarrow Ca^{2+}$)




Thyroid cartilage
Common carotid artery
Medial margin of sternocleidomastoid muscle
Cricothyroid ligament
Cricothyroid muscle
Thyroid gland
Cricoid cartilage
at lower Part of the front of the neck
Trachea
Cupula (dome) of pleura

Anomalies

Pyramidal lobe → important to know it, so when you do total thyroidectomy you Remove it

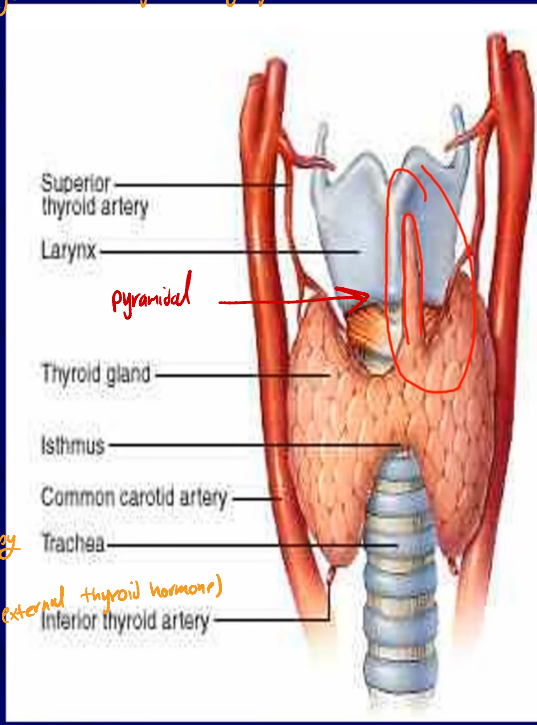
- Distal end of thyroglossal tract
- Left of midline 60%. / 40% Right side
- 30% of people reach hyoid bone

Lingual thyroid (بتتيجي كتير هيك)

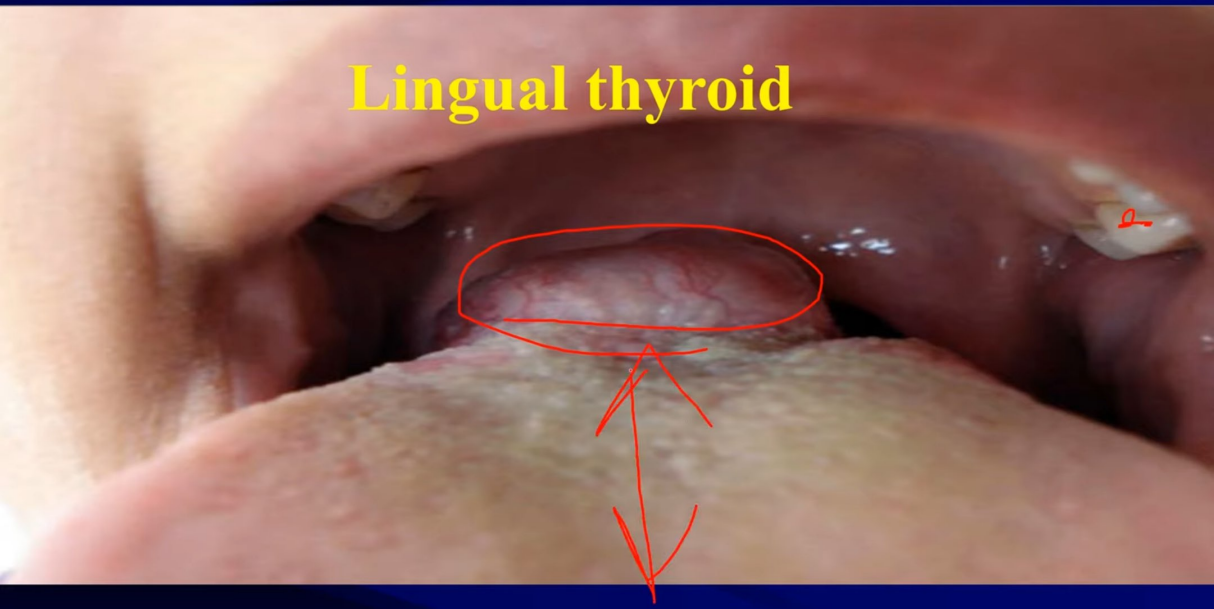
- Failure of descend.
- Asymptomatic posterior tongue mass.
- Only functioning thyroid (Sometimes it's the) → if Removed patient will need thyroid supplement therapy
- Treatment is by (thyroid suppression) → العلاج

we give thyroxine (external thyroid hormone) Make the mass non Functioning which will Cause it to shrink and disapper

Lateral aberrant thyroid



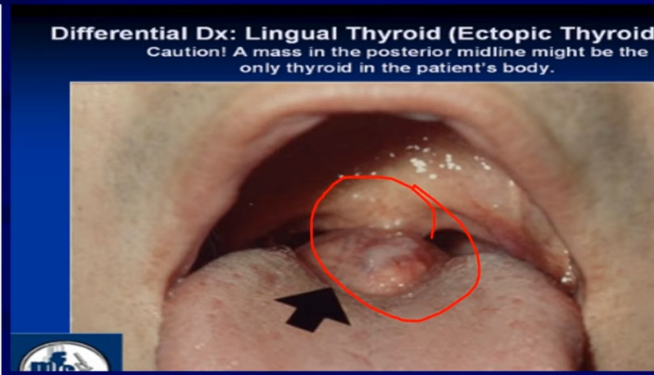
Lingual thyroid



Failure of descent of thyroid gland
Posterior tongue mass.
At foramen caecum, round swelling. at Junction of Anterior 2/3 and posterior 1/3 of the tunge
M:F 1:3 more in Female

Lingual thyroid







كبيرة
Do Blockage
or Bleed

Thyroglossal cyst

very common in OSCE

Remnants of thyroglossal tract.

Children and young adults 5-15 y

Midline swelling.

Move up and down with swallowing (attached to fasica)

and tongue protruding. (attached to tongue)

Below hyoid bone. (Comment site) HCP US

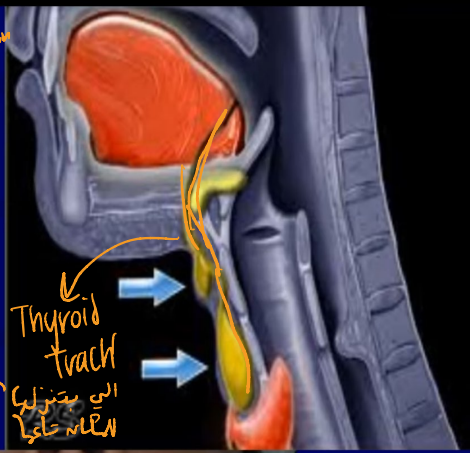
Infection lead to fistula.

Malignant changes? Papillary

arcinoma 1 %

what is opreation for thyroglossal cyst?

Sistrunk's operation OSCE US

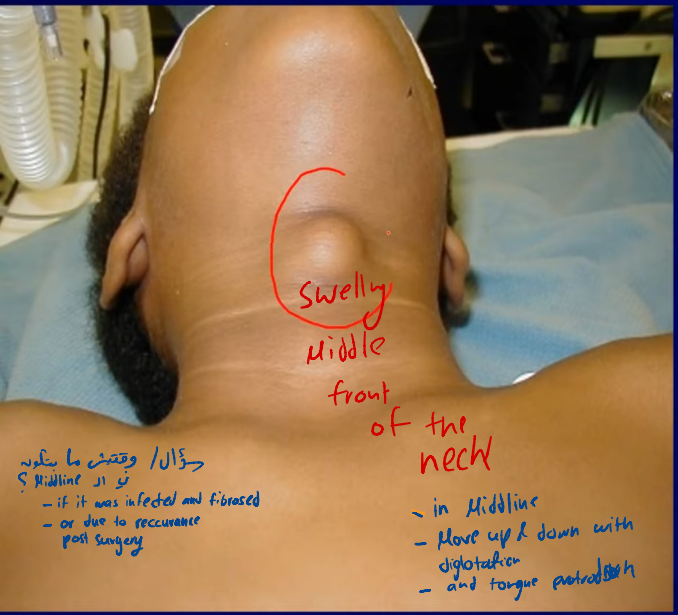


normally after the thyroid Reach it place the tract will Be closed

↳ if not part of it will cause the cyst

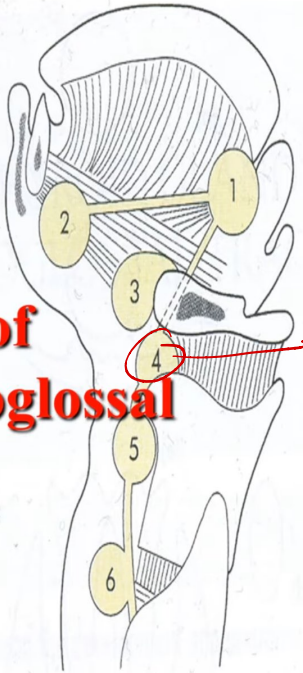


Thyroglossal cyst

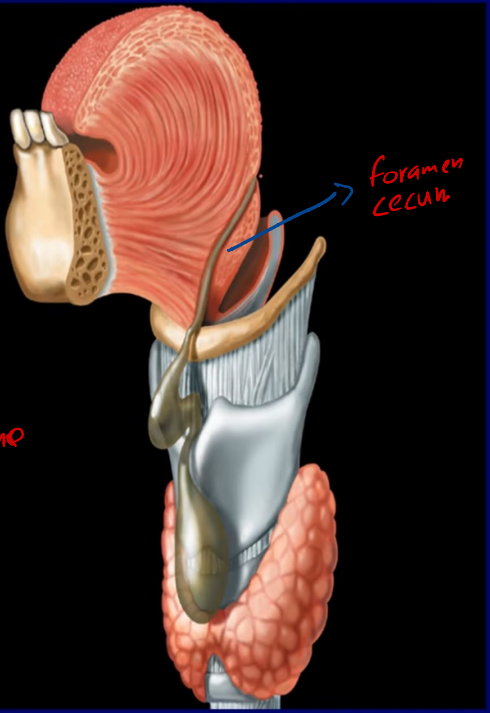




Sites of Thyroglossal cysts

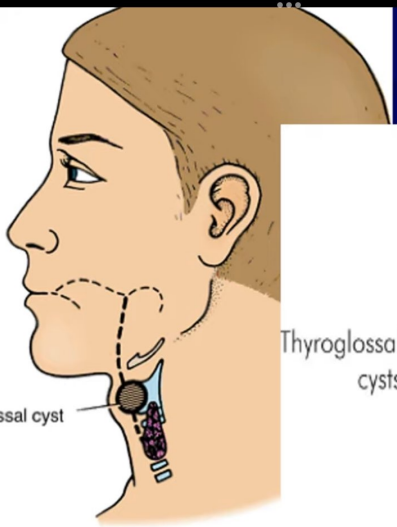


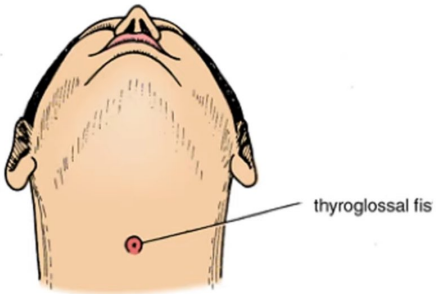
Commonest site is subhyoid Bone

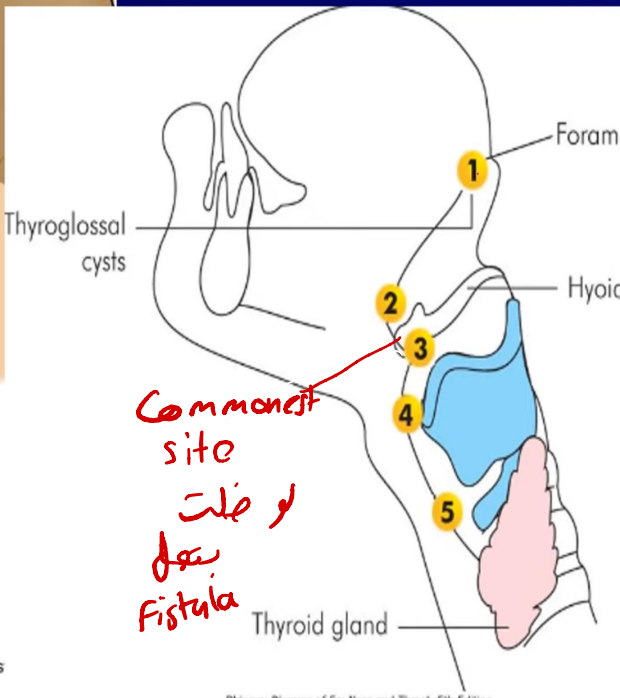




path taken by thyroid gland as it descends in the neck

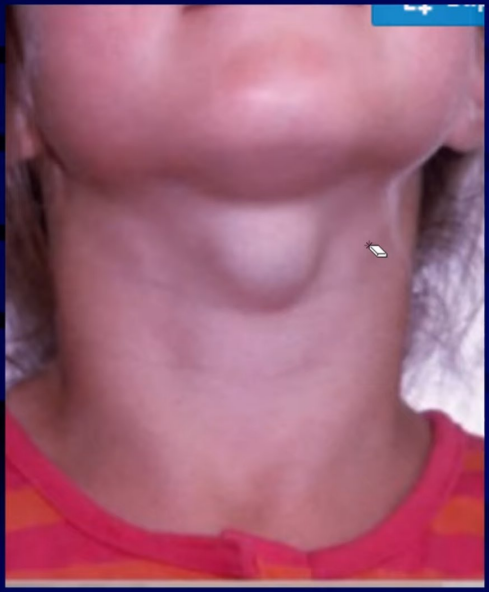




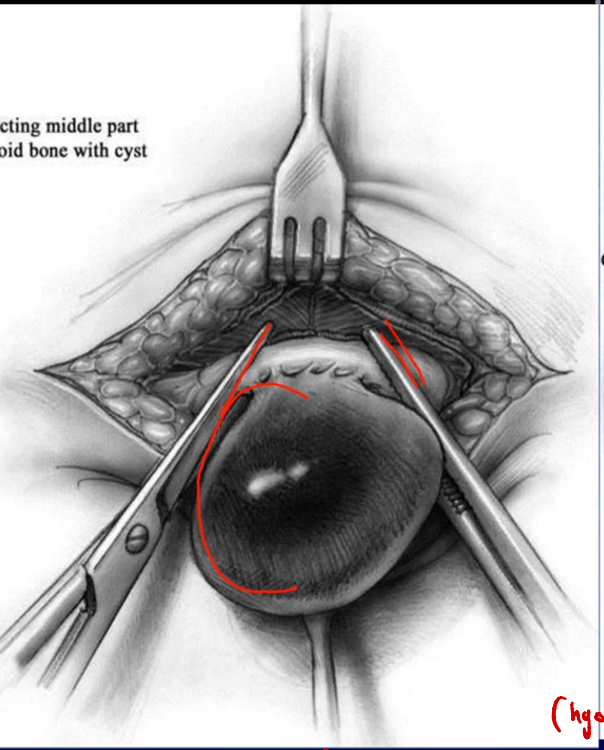


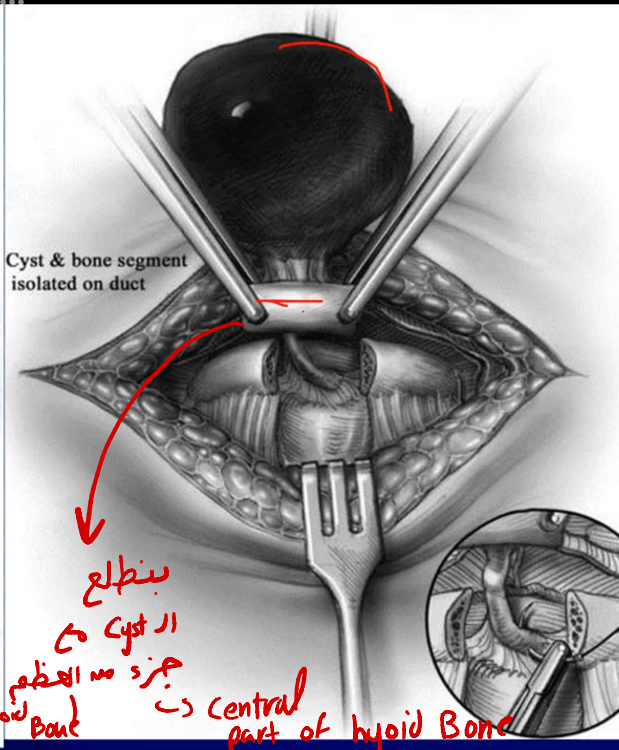
Dhingra: Diseases of Ear Nose and Throat, 5th Edition
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Thyroglossal cyst





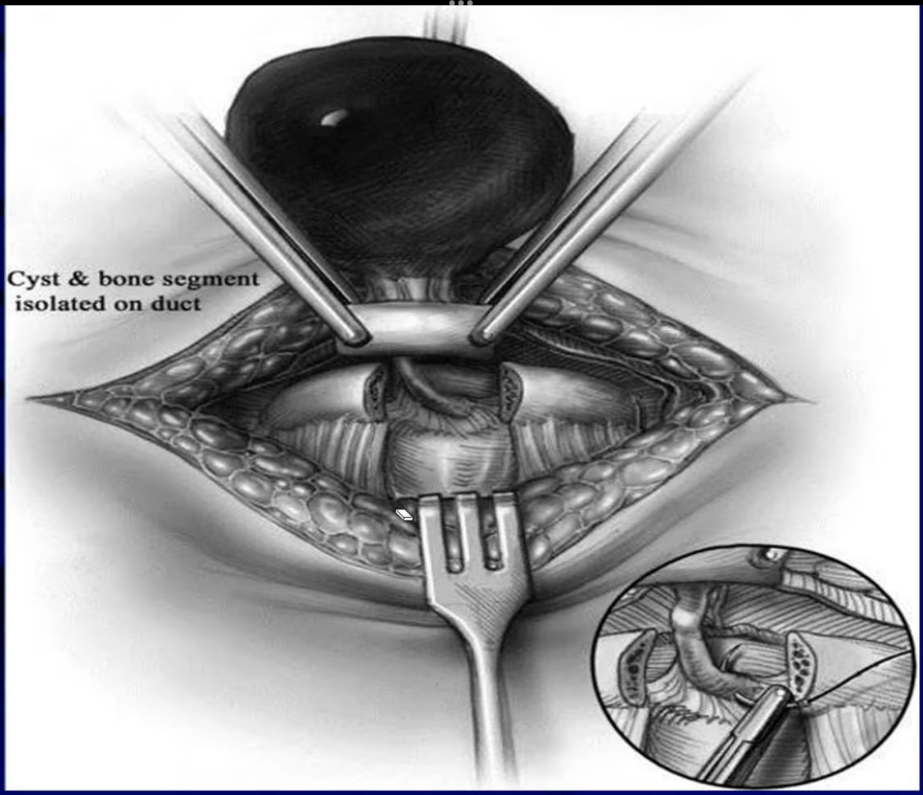




بنقطع
ال cyst مع
جزء من العظم
(hyoid Bone)
central part of hyoid Bone

لو ما شلت ال Bone
بصير اسم العلاج بس
cyst excision

Sistrunk's operation = cyst + central part of hyoid



Sistrunk's operation II

Lateral Aberrant Thyroid

Metastasis in a lymph node (cervical lymph node enlargment)

if you took a biopsy, it will be a Metastasis from a papillary thyroid cancer.

Metastasis in the deep cervical lymph node from a papillary thyroid cancer, But sometimes the primary tumor is small not obvious and not Removed



Sometimes when you examin the thyroid the primary tumor is small ↓ But lymph enlarged



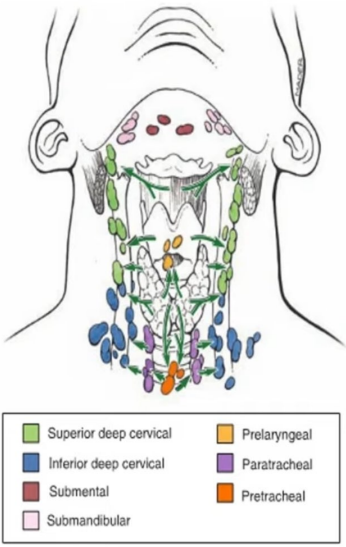
OSCE

Anatomy of thyroid gland

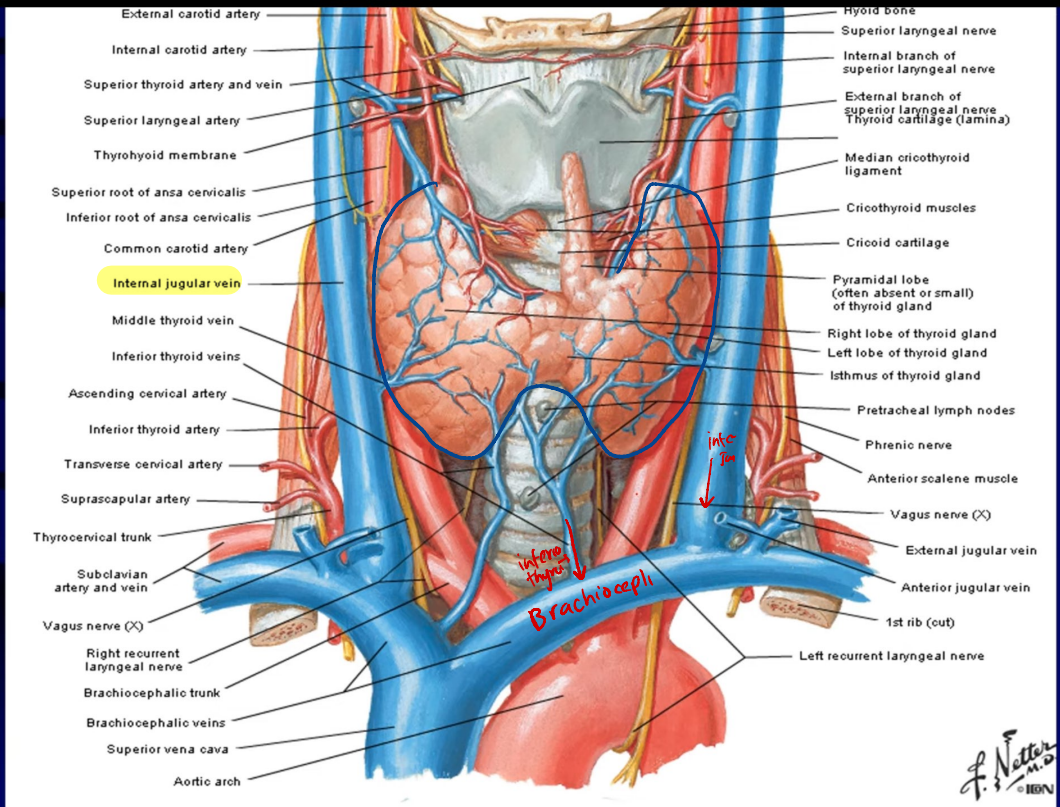
- Weight is 20 gm.
- Arterial blood supply
- Venous drainage
- Lymphatic drainage,
- Nerves related to thyroid
- Pretracheal fascia

Is attached to larynx

* Why thyroid moves up & down with deglutation?
  Because it is attached to the pretracheal fascia which is attached to the larynx



Lymphatic drainage of the thyroid gland. The arrows indicate the direction of th

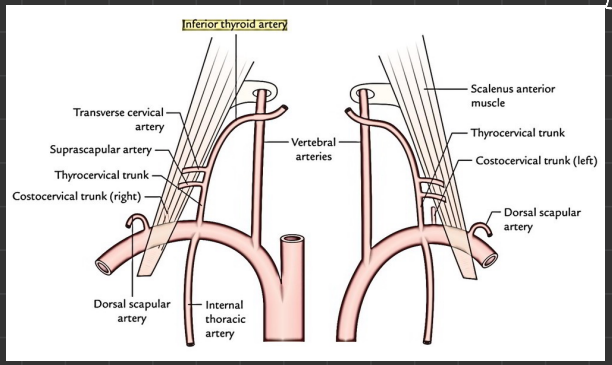

External carotid artery
Internal carotid artery
Superior thyroid artery and vein
Superior laryngeal artery
Thyrohyoid membrane
Superior root of ansa cervicalis
Inferior root of ansa cervicalis
Common carotid artery
Internal jugular vein
Middle thyroid vein
Inferior thyroid veins
Ascending cervical artery
Inferior thyroid artery
Transverse cervical artery
Suprascapular artery
Thyrocervical trunk
Subclavian artery and vein
Vagus nerve (X)
Right recurrent laryngeal nerve
Brachiocephalic trunk
Brachiocephalic veins
Superior vena cava
Aortic arch
Hyoid bone
Superior laryngeal nerve
Internal branch of superior laryngeal nerve
External branch of superior laryngeal nerve
Thyroid cartilage (lamina)
Median cricothyroid ligament
Cricothyroid muscles
Cricoid cartilage
Pyramidal lobe (often absent or small) of thyroid gland
Right lobe of thyroid gland
Left lobe of thyroid gland
Isthmus of thyroid gland
Pretracheal lymph nodes
Phrenic nerve
Anterior scalene muscle
Vagus nerve (X)
External jugular vein
Anterior jugular vein
1st rib (cut)
Left recurrent laryngeal nerve
inferior thyroid
Brachiocephali
F. Netter M.D.
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Blood supply !

there is 2 important arteries

- upper half → superior thyroid artery
  - supply upper half of isthmus, upper lobes
  - orgin from external carotid
    - How many Branch from external carotid?
      - 7 arteries
        - superior thyroid
        - lingual artery → tongue
        - fasial artery
        - posterior auricular-
        - occipital artery
        - ascending pharyngyal artery
        - 2 terminal Branch
          - Maxillary (Large)
          - superfical temporal artery
            small one feelt in front of tragus of the ear
- Lower half → inferior thyroid
  - originated from subclavian
    - First part of it give thyrocervical trunk that give thyroid

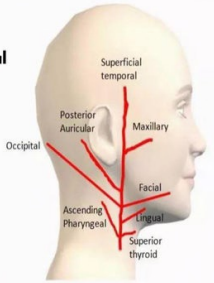
* Additional artery → thyroid ema artery (from arch of aorta)

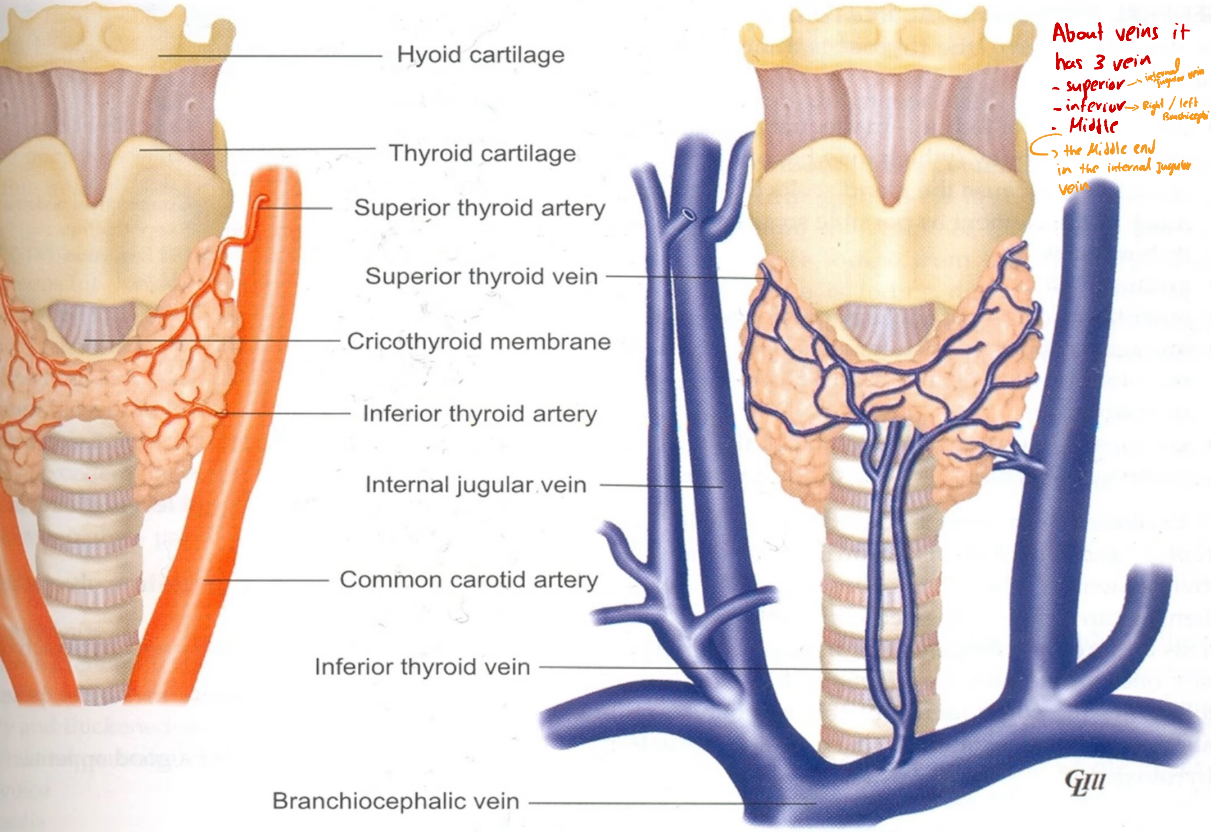


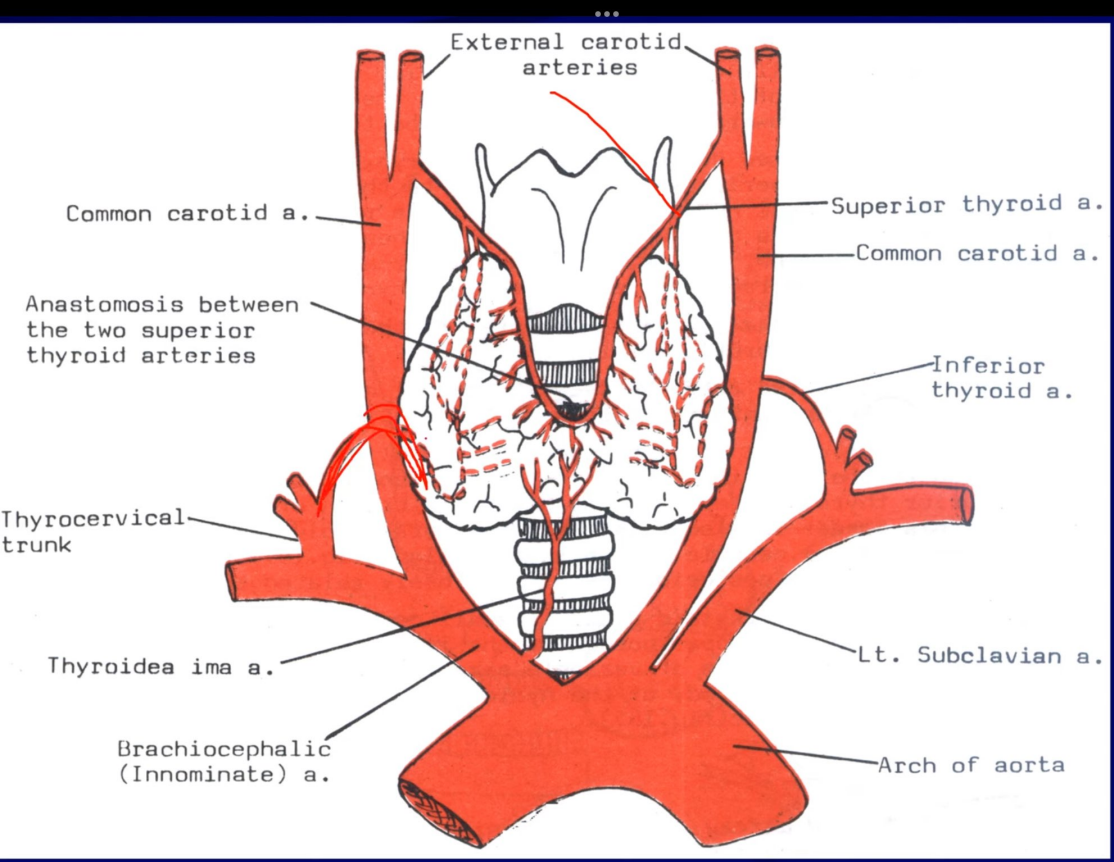
External Carotid Artery Branches

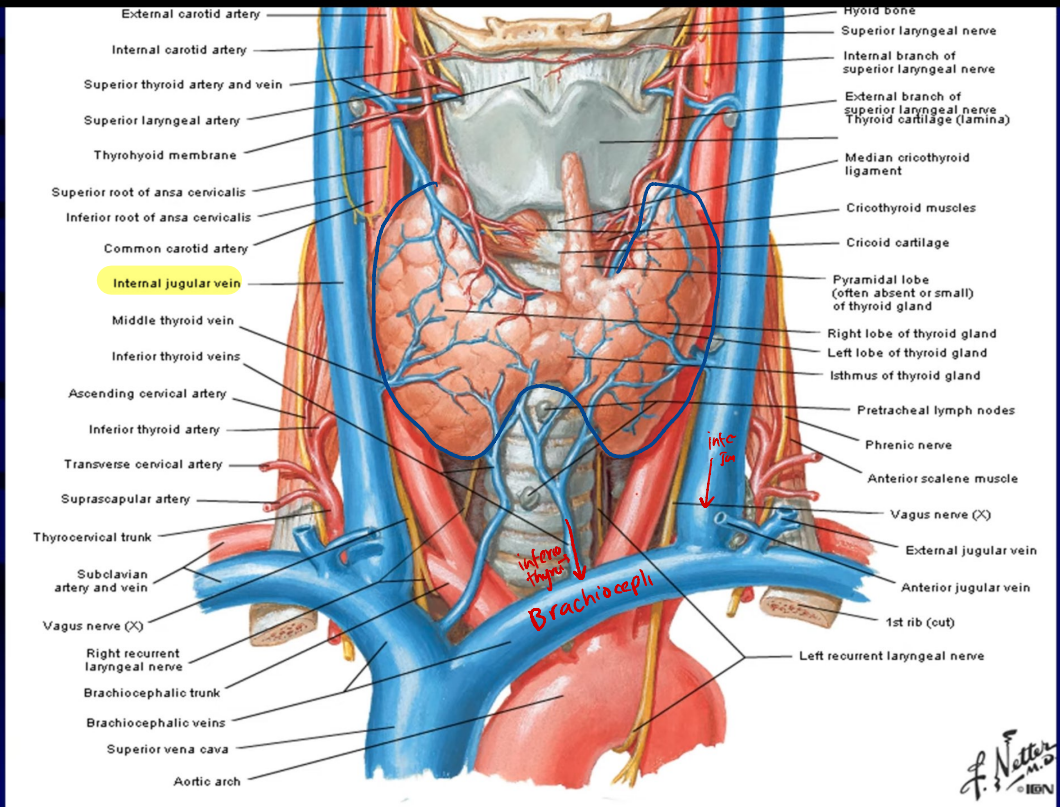
Mnemonic : She Always Like Friends Over Papa, Mama & Sister

* **S** Superior Thyroid
* **A** Ascending Pharyngeal
* **L** Lingual
* **F** Facial
* **O** Occipital
* **P** Posterior Auricular
* **M** Maxillary
* **S** Superficial temporal




Hyoid cartilage
Thyroid cartilage
Superior thyroid artery
Superior thyroid vein
Cricothyroid membrane
Inferior thyroid artery
Internal jugular vein
Common carotid artery
Inferior thyroid vein
Branchiocephalic vein
About veins it has 3 vein
- superior → internal jugular vein
- inferior → Right / left Branchiocephalic
- Middle
→ the Middle end in the internal Jugular vein
GIII


External carotid arteries
Common carotid a.
Superior thyroid a.
Common carotid a.
Anastomosis between the two superior thyroid arteries
Inferior thyroid a.
Thyrocervical trunk
Thyroidea ima a.
Lt. Subclavian a.
Brachiocephalic (Innominate) a.
Arch of aorta

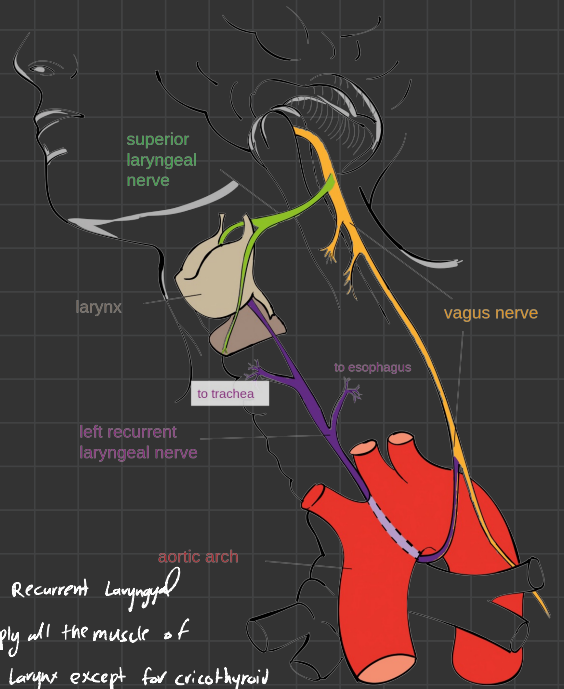

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1st rib (cut)
Left recurrent laryngeal nerve
inferior thyroid
Brachiocephali
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Related Nerves

1st nerve (External laryngeal)

* At the upper pole of the gland we have :- External laryngeal nerve which is a Branch of the superior laryngeal nerve

-> Superior laryngeal nerve give
- -> internal laryngeal -> Supply mucos. membrane of the larynx above vocal cords (sensori)
- -> External



2nd nerve (Recurrent laryngeal)

* pass in the groove Between trachea & esophagus

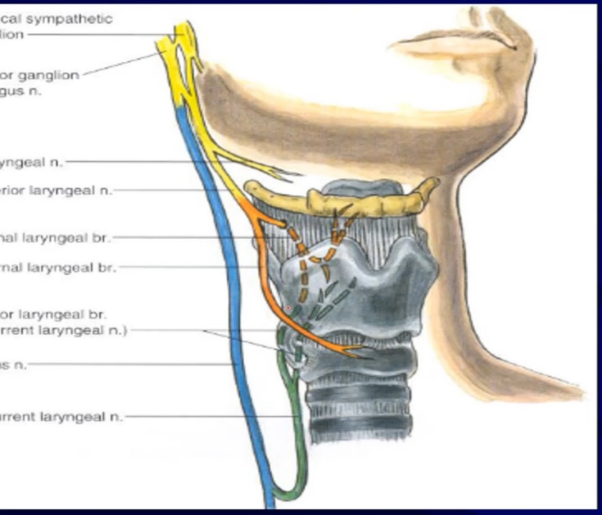
when vagus Reach the arch of Aorta, a Branch get from it and hook ↻, around arch of aorta (left), But the Right doesn't Reach chest, it hook around subclavian artery

- -> Left Recurrent (hook around aorta) Reach chest
- -> Right Recurrent (hook around subclavian) doesn't Reach chest

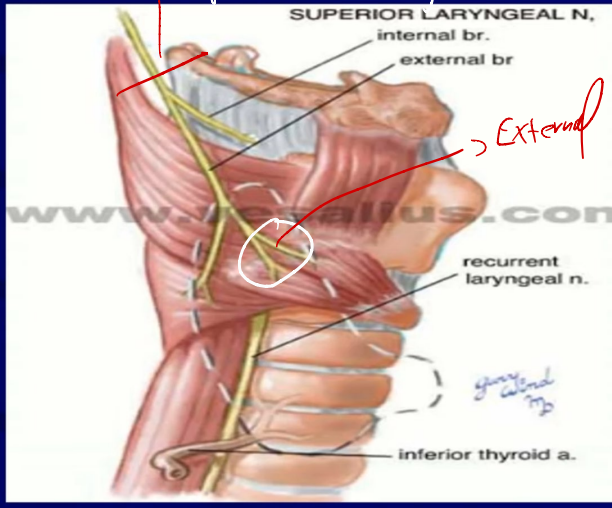
* the Recurrent Laryngeal
- Supply all the muscle of the Larynx except for cricothyroid
- Supply mucos membrane Below vocal cord
  - -> cricothyroid supplied by external laryngeal

(Both nerve are Branches of vagus)

Nerves related to thyroid



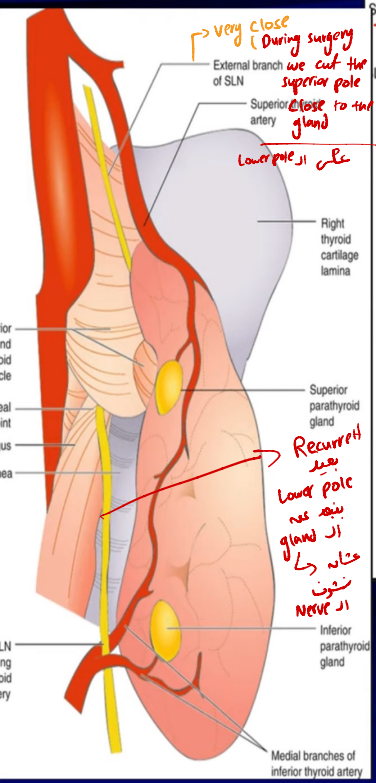
if injury of the superior, loss of sensation
patient will start choching (يشرق)

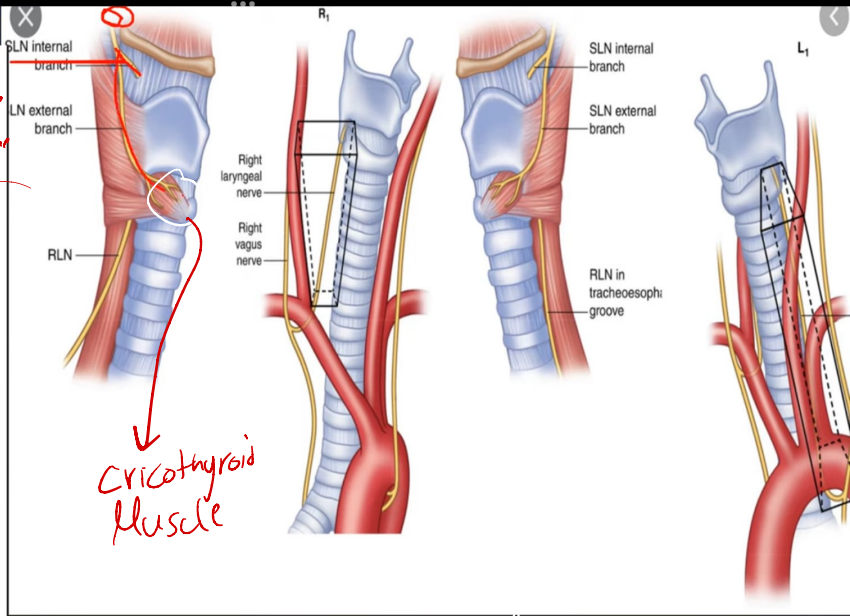


uperior laryngeal nerve: **divides into large ILN and small ELN**

ecurrent laryngeal nerve:

Note :- if the external laryngeal was cut
↳ patient will lose High pitched voice (مريض بقدرته على صوته)





* injury of Recurrent → unilateral → horseness
  → Bilateral → Stridor & loss of voice → aphonia

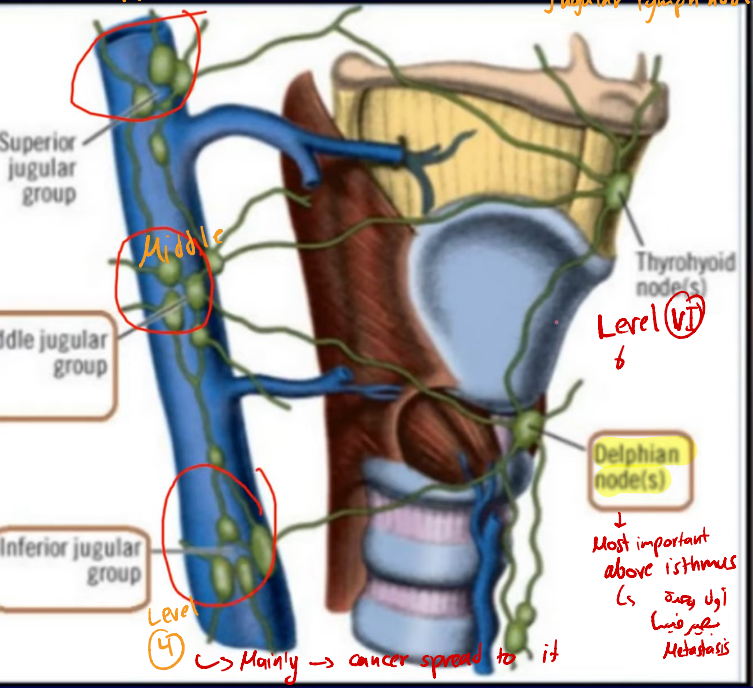
* parathyroid gland are supplied by inferior thyroid artery

Lymph drainage

upper

2, 3, 4 -> upper, Middle, lower Jugular lymph node

Cancer ... في ...



-> Mainly -> cancer spread to it

Most important above isthmus

-> lateral Compartment

1. Level III & IV nodes
2. Level VI nodes
3. Level VII nodes

Level VI
- -> pretracheal
- -> prelaryngeal
- -> paratracheal
- -> paralaryngeal

found in the middle compartment

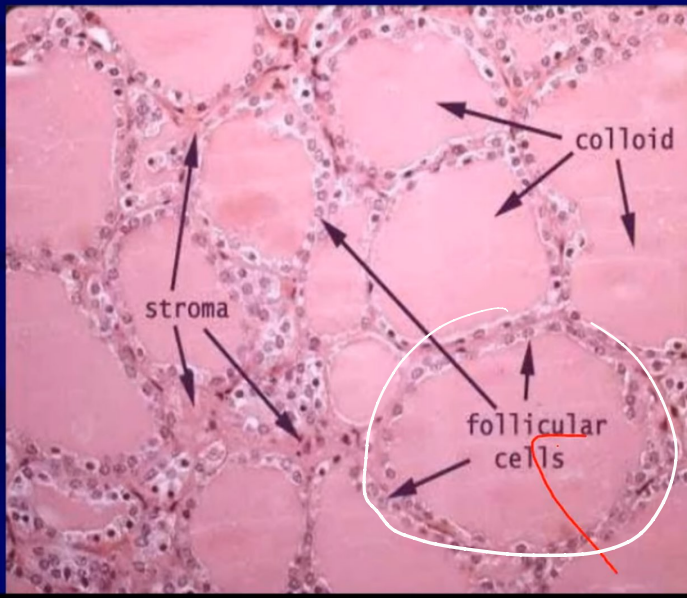
Thyroid histology

Lobule: **Is the functioning unit of thyroid supplied by a single arteriole.**

20-24 follicle = Lobule

Each lobule is made of 20 to 24 follicles lined by boidal epithelium.

Follicle : **Contains the lloid material where hyroglobulin is stored .**



Physiology of thyroid hormones

Tri-iodothyronine T3 ,Tetra-iodothyronine (Thyroxine) T4 are formed by :

Iodide trapping

Oxidation of iodide to iodine.

Binding of iodine to tyrosine.

MIT+ MIT = DIT

DIT + MIT = T3 TIT

DIT + DIT = T4

Calcitonin = parafollicular C cells.

Thyroid hormones

T4, T3. not free

Bound to TBG ,TBPA.

أهم فحص

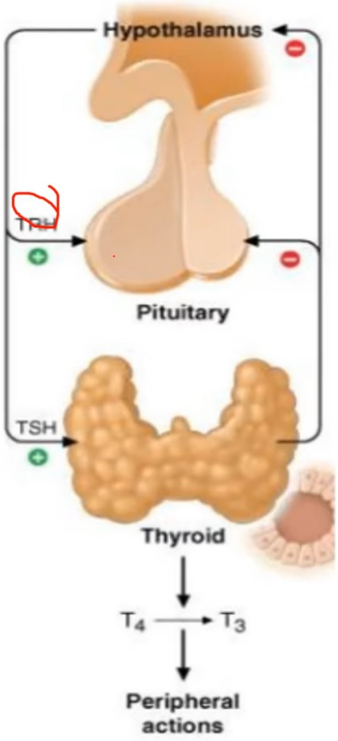
TSH (0-5U l) single most sensitive test of thyroid functio

T3 20% / stronger	*T4* (80%)
80 % from T4	Less active(pro-hormone)
0. 3 % Free 99.7% Bound	0. 03 % Free 99.97% Bound
Half life one day	Half life one week
Act within hours	Act within two weeks

N.B 80% of thyroid hormone produced by thyroid G is T

ill patient take T_4 (T_3 مشاكل الجسم بحول قد ما هو محتاج)

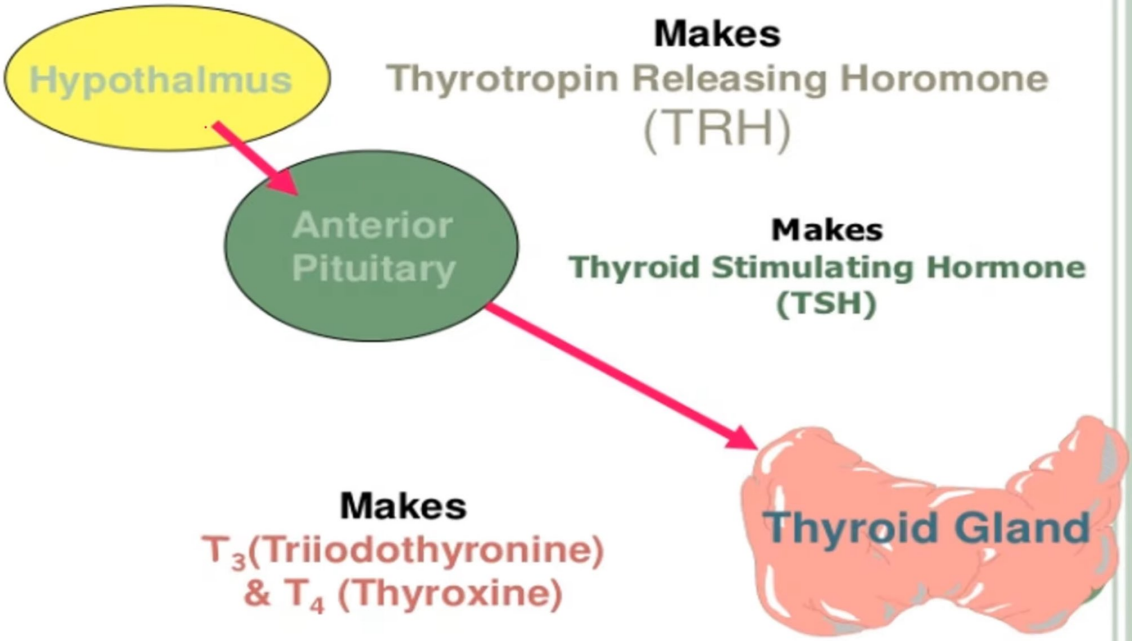
T_3 cause from peripheral Conversion T_4



- Thyroid hormones T_4 and T_3 feed back to inhibit hypothalamic production of thyrotropin-releasing hormone (TRH) and pituitary production of thyroid-stimulating hormone (TSH).

- TSH stimulates thyroid gland production of T_4 and T_3

THYROID PHYSIOLOGY



Thyroid antibodies

Thyroglobulin

Found in graves' disease.

Used as tumor marker to detect recurrence and metastasis for DTC after thyroid suppression .

Thyroid peroxidase (thyroid microsomal antigen) ***TPO***

TSH receptor antibody.

Tumor markers

Thyroglobulin. in thyroid lobule → patient, you did for him thyroidectomy then the Thyroglobin is High → Recurrence / Metastasis

Calcitonin.

CEA.

Thyroid isotope scanning

half life: 10 hours
Can used for diagnosis

يود مشع نوعين

Half life: 10 days → used for treatment

Use I 123 ,Tc 99. or I 131

Hot, cold and warm nodules .

Use in solitary toxic nodule . ← why we use

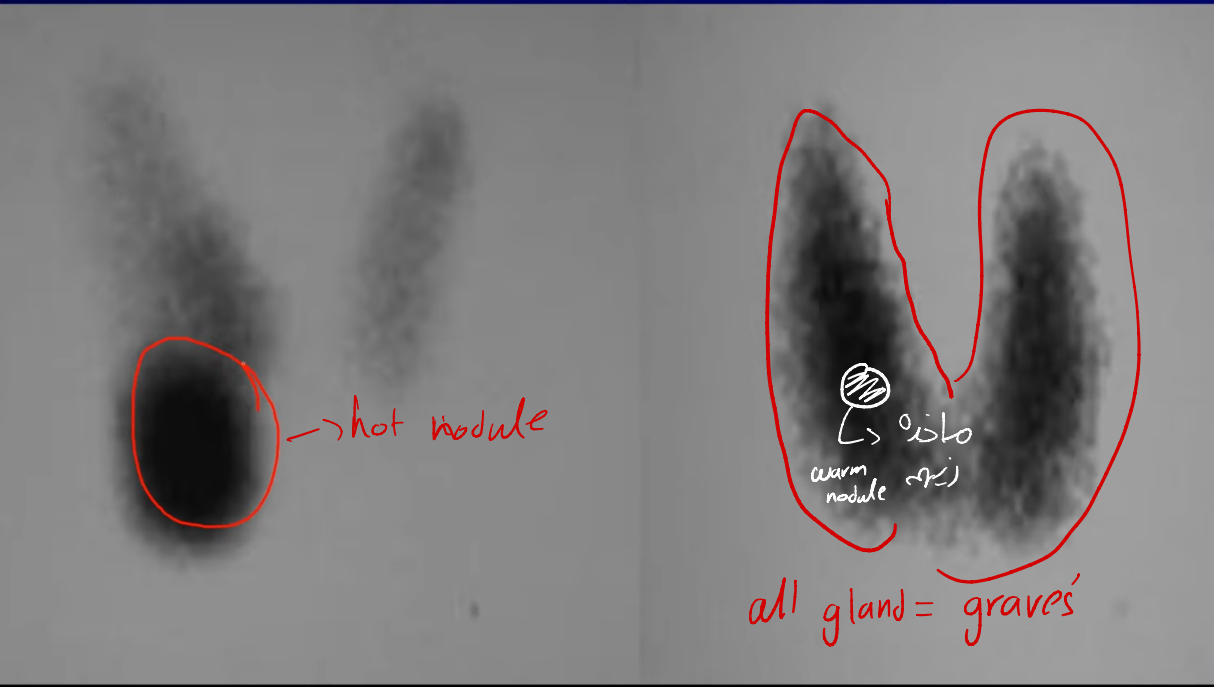
Locate ectopic thyroid tissue .

Identify incomplete surgical resection .

Localize metastasis .

I 131 → for Bone or lung Metastasis

Thyroid isotope scanning



warm nodule → nodule took same amound of the other part

- Cold nodule

Hot nodule





Cold nodule

doesn't take the Iodine But the sorrund do.

* Cancer 10 - 15%

hot nodule Cancer less than 1%

Ultrasonography

Solid or cystic, solid more danger

Single or multiple., single more dangerous

Large nodule , Micro calcification , Hypo echoic , Border irregularity, Taller than wide Hypervascular. all of that signs of malignancy

CT scan and MRI scan.

Fine needle aspiration cytology (FNA) all nodule above 1-2 cm depends on US criteria .

-> give about all type except follicular

Follicular neoplasm ?

Vascular, capsular invasion .

70% benign,5% malignant ,15% suspicious .

Sensitivity is 83%.

Specificity is 92% .

Symptoms of thyroid disease

Mass

Symptoms related to the Lump in the Neck

pressure

essure symptoms

(+)if tve → indicative of svc

- Dyspnea
- Dysphagia
- Hoarseness of voice
- Dilated veins in neck
- d face. → pemberton due to pressure on svc, due to Retrosternal goiter



Pain related to thyroid gland

Painless Except

Rapid increase in size.

Acute and sub acute , hashimoto's thyroiditis .

Anaplastic carcinoma.

L> 6 months life expectation

Symptoms of Endocrine Dysfunction

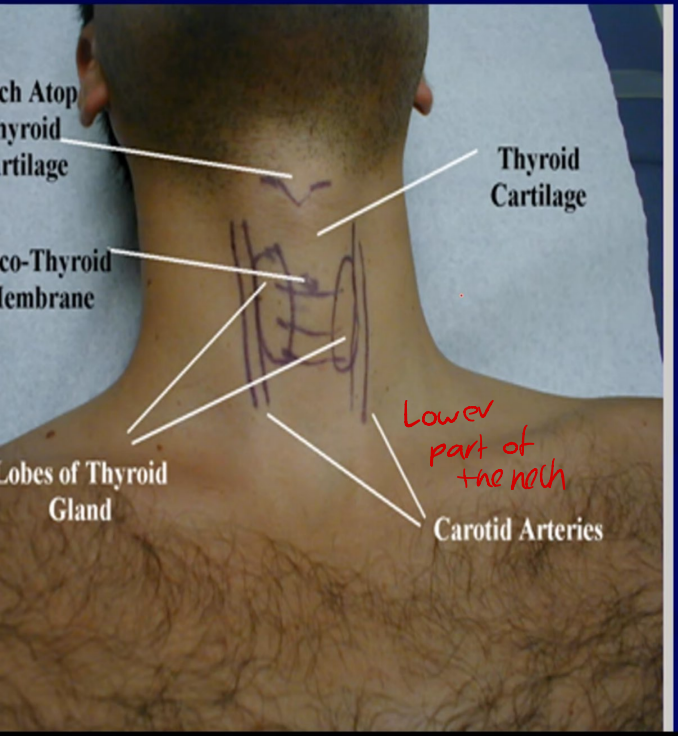
symptoms of hypo/hyper

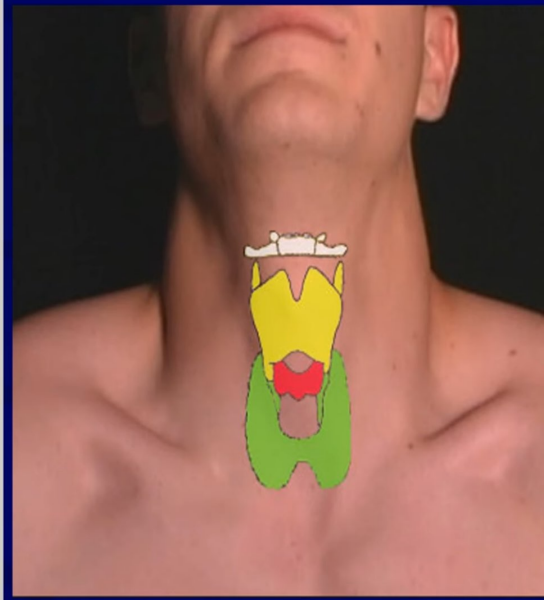
- **Nervous symptoms.** irritability, tremor, insom
- **Cardiovascular symptoms.** Af, tachycard
- **Metabolic symptoms.** Basel Metabolic Rate chang
- **GIT symptoms.** → hypersecr → Diarrhs
  → hyposecretion → constipation

Symptoms of metastasis

- **Lung** → usually / in papillary cancer
- **Bone** → follicular cancer
- **Liver** → Medullary cancer

Surface anatomy





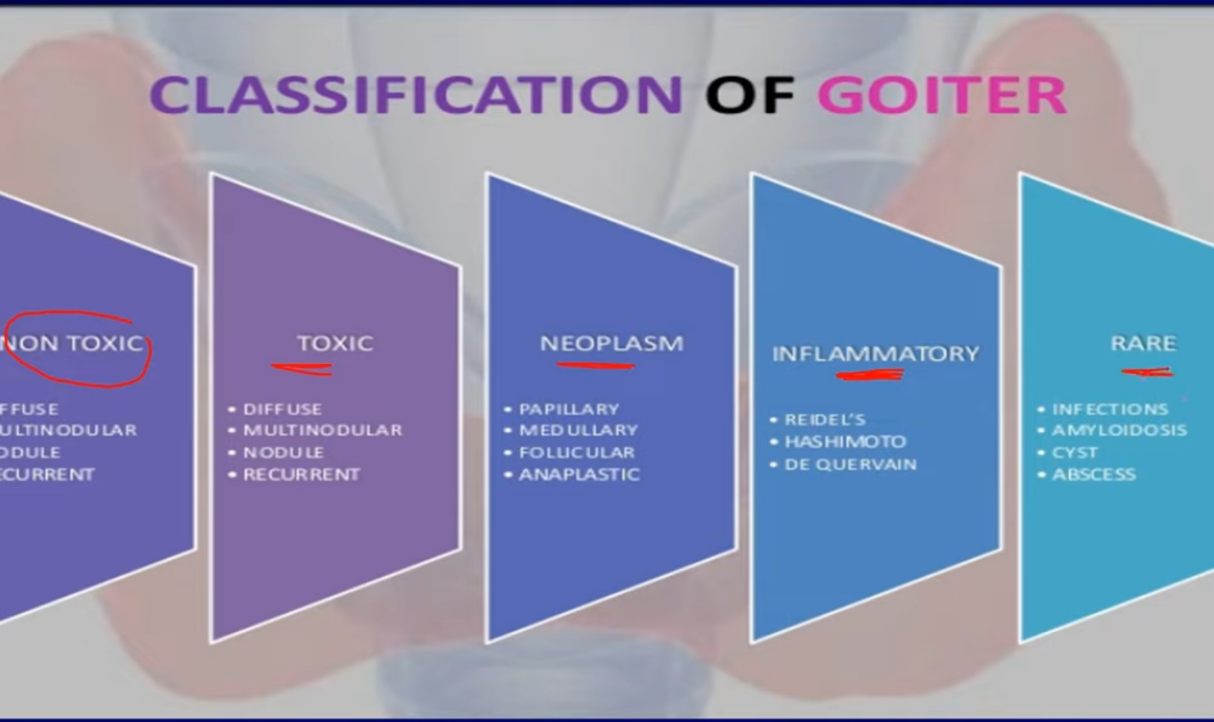
Goiter: *Enlargement of thyroid*

↳ usually at least double it size & double it weight

lassification goiter

Simple goiter (non toxic)	**Diffuse hyperplasic nodular**
Toxic goiter	**Graves' disease** **Toxic nodular** **Toxic nodule**
Neoplastic goiter	**Benign** **Malignant**
Thyroditis ↳ usually doesn't need surgery	**De Quervains'** **Hashimotos'** **Riedels'**
Miscellaneous	**TB, Actinomycosis** **Amyloidosis**

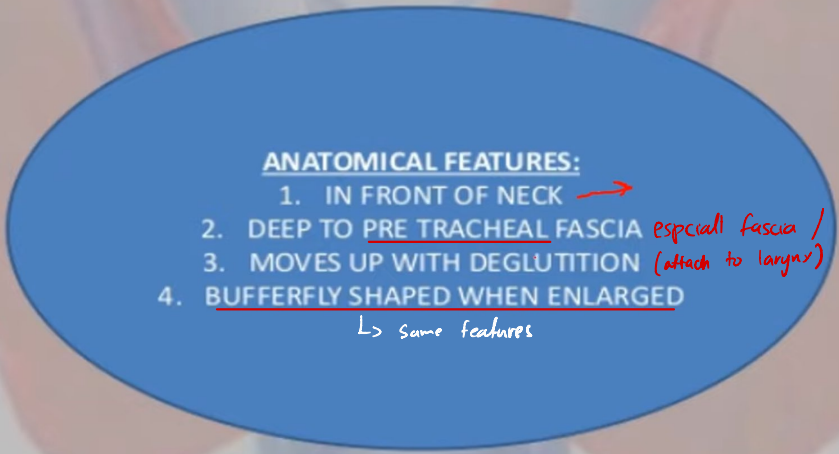
oiter: Swelling in the neck from thyroid enlargeme



Clip slide

DIAGNOSIS

- Based on its anatomical location and features.



Thyroid nodule

↳ usually solitary

Asymptomatic, 60% are *Benign Colloid Nodule.* / Cancer thyroid in solitary nodule ↳ (10 - 15 %)

30% → follicular adenoma.

Rapid enlargement

* Most common cause ↳ Benign colloid nodule (60%)

Hemorrhage into it.

* if it Rapidly enlargment within days think about → Bleeding

Malignant nodule.

* Bad enlargment within weeks of few month → Malignancy

Malignant change 5 -15 %.

Solitary (SN) or dominant nodule in MNG.

Multiple nodular goiter



Dominant nodule ↳ we took Biopsy from it

Risk of malignancy is double in solitary and solid nodule ,

↳ cyst (water) simple
↳ solid in cavity
↳ complex → solid & water

four Times in males . Risk in male more , old especally

Solitary Nodule in children. → Risk of malignancy High (30%) usually papillary

↳ Hereditary (10%) of all cancer

Positive family history? MEN II A , MEN II B . → type IIB more aggressive and come in young age

Hyperparia, Medullary thyroid cancer, pheochromocytoma | Medullary, pheochro, Mucosal adenoma

Calcified thyroid nodules are usually benign.

Macrocalcification → good / Microcalcification Bad

Bethesda Reporting system

Ls for FNA

The Bethesda System for Reporting Thyroid Cytopathology

(Baloch et al.DiagnCytopathol, 2008)
(Ali &Cibas(eds) 2009 The Bethesda System for Reporting Thyroid Cytopathology. Springer, NY)

	(risk of malignancy)
I. **Nondiagnostic** → Benign	
II. **Benign**	< 3 %
III. **Follicular lesion/Atypiaof undetermined significance**	5-10 %
IV. **Follicular neoplasm**	20-30 % → Do Molecular testing to insure your Diagnosis
V. **Suspicious for malignancy**	50-75 %
VI. **Malignant**	100 %

Treatment for solitary thyroid nodule

L> not toxic not malignant
L> Based on size

Hyperthyroid

More than 3cm operate.

Less than 3cm radioactive iodine

Euthyroid

FNA

Malignant Suspicious → Operate

Benign with pressure symptoms → operate

Cystic

Recurrent after 2-3 aspiration

Bloody → operate

More than 4 cm

Inadequate repeat FNA

Thyroid cancer

Colon
↳ 13% , lung 20%

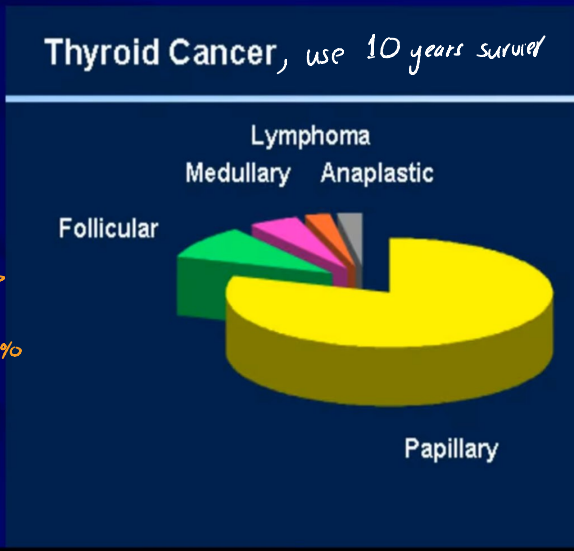
Un common cancer 4 per 100.000 . in Gaza Common
↳ good prognosis especally in young age
↳ except anaplastic 1% lethel

M:F 1:3 , 4% of all cancers .

Only endocrine cancer spread by all means (1) lymphatic (2) blood , (3) local spread .

Differentiated thyroid cancer

- Papillary thyroid cancer 80%
- Follicular thyroid cancer 10%
- Medullary thyroid cancer 5- 10%
- Anaplastic thyroid cancer. < 1%
- Malignant lymphoma. 1%
- Squamous cell carcinoma.



Risk factors for thyroid cancer

Head neck radiation , especially in childhood

MEN II A , B.

Hoarseness . especially in old age, then duration (3 weeks or more) → Caused by 2 tumor :-
- Laryngx
- thyroid

15-15% malignancy

Single , firm , cold nodule.

Enlargement on thyroid suppression . Thyroid suppression → shrink → normal gland; → enlarged → think about cancer

Thyroid nodule in old males , and children.

20% 70-40%

FAP. familia polypo

Cowden's, Gardner's syndrome. → type of FAP

↳ type of hamartoma (Autosomal dominant)

Mostly caused Cancer → 20% Breast cancer, 7% thyroid

Papillary carcinoma

Commonest thyroid cancer 75-80% more common in female 30 - 40 y. (young age) → good prognosis

Commonest in children 85%.

Previous radiation to neck.

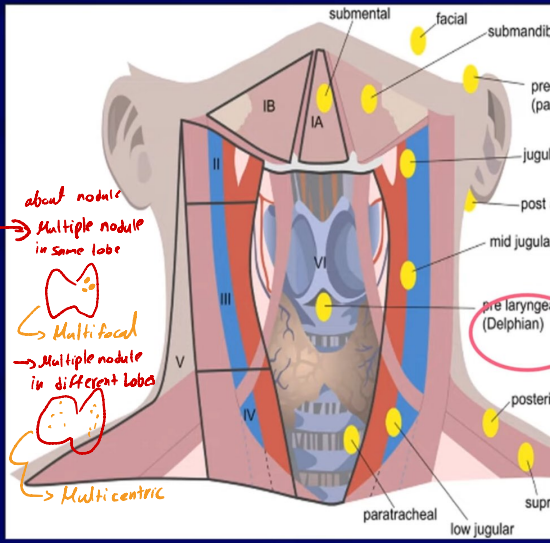
Multi-focality is common 85%. → tumor same area no pap

Not capsulated. follicular is

Lymphatic spread to cervical → Reach Nasty Level ④ then ⑥

nd paratracheal , lymph nodes .

Blood spread is late . (



Rare variants subtypes are bad prognosis tall , columnar, diffuse sclerosing. More aggressive Clear

Clinical presentation

Slowly growing thyroid nodule. over weeks or months
Painless.
Enlarged cervical lymph nodes .
Pressure symptoms. Dyspnea, Dysphagia
Distant metastasis MC (Lung). then Bone, then liver

Both follicular Mostly to the Bone

rognostic indicators (AGES SCALE) → Most common

: **Age** Female Below age of 50, Male Below 4 → Good prognosis
: **Grade** well differentiated Better
: **Extent**
: **Size** **T1 < 1cm T2 more than 1cm and less than4 cm T3 > 4 cm**

hyroid Cancer Statistics

yroid cancer is the most rapidly increasing
ncer in the U.S., but compared to other
ncers, the death rate is relatively low.

2 out of 3
ases are found in people
younger than 55

About **2%**
of cases of thyroid cancer occur in children and teens

↳ common in young age



Thyroid cancers occur
3 times more frequently in women
than in men

Most women are diagnosed in their 40s or 50s



Most men are diagnosed in their 60s or 70s

↳ usually Bad prognosis

Prognostic Factors

Patient factors	Tumour factors	Management factors
Age	Tumour size	Delay in therapy
Sex	Tumour histology	Extent of surgery
	Nodal metastases (in elderly patients)	Experience of surgeon
	Local invasion	Thyroid hormone ther
	Distant metastases	Treatment with postoperative radioiodine

Poor prognostic factors

Poor Prognostic Factors

- Age >45 years
- Male sex
- Poorly differentiated
  - Differentiated thyroid cancer – 10 year survival ~90%
  - Anaplastic thyroid cancer – median survival <1 year
- Tumor Size
- Extrathyroid extension

Pathology

Minimal : **tumor less than 1 cm , no invasion to thyroid capsule, no lymph nodes metastasis.**

Intra Thyroid : **larger, confined to thyroid gland .**

Extra Thyroid : **advanced tumors through capsule and adjacent structures .**

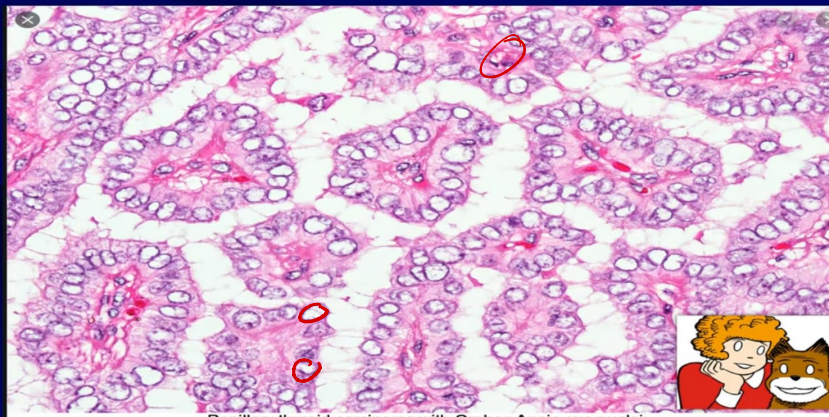
Histological characteristics of PTC

Papillary projections

Orphan annie nuclei Ground glass).

Psammoma bodies .

MCQs important



Papillary thyroid carcinoma with Orphan Annie eye nuclei:
optically clear (empty, ground-glass) nuclei with thick nuclear membrane (H&E, ×40)

Follicular carcinoma

2nd commonest

↳ the only type of Tumor not Diagnosed via FNA

* we know via Biopsy of tissue post surgery
↳ encapsulated + vascular invasion

Less common 10%.

More common in females 3:1

Older age group 50 years.

Common in endemic goiter areas. → what makes it different

Usually solitary, encapsulated tumors. فرقه عن الـ Papil

Vascular and capsular invasion.

Blood spread more common ,lymphatic spread rare 5%. بيرقه فرقه

Hemorrhage into lesion is common.

important

Bone secondries are typically vascular warm pulsatile vertebrae ribs ,skull and long bones. especiall feature

Subtype

ما بتاخد iodine زيها زي ال Medullary & anaplastic

HURTHLE CELL CARCINOMA

↳ have features of papillary

↳ Multifocal ↳ lym

Variant of follicular carcinoma ,

3% of thyroid cancer.

From oxyphilic cells cannot be diagnosed by FNA.

Rarely trap iodine 5%.

(1) Multifocal , bilateral , lymph (2) nodes metastasis is common .

Aggressive high mortality rate 20% at 10y. But Better than Medullary & Anaplastic

Total Thyroidectomy : is treatment of choice.

Treatment of differentiated thyroid cancer

Objectives

Eradicate primary tumor.

Reduce incidence of recurrence.

Cure maximum number of patients.

Facilitate treatment of metastasis.

Achieve all this with minimal morbidity.

Medullary carcinoma

Neuroendocrine tumor Para follicular C cells (Neura Crest) origin.

5% of Thyroid malignancies .

Upper two thirds of lobes Bilateral , multicentric.

Amyloid stroma .

Spread by lymphatic and blood.

Serum calcitonin , CEA are high .

Medullary thyroid cancer

Sporadic in 80%

Age more 30 year.

Unilateral.

Familial in 20% MEN II A , B

Age less 30 years

Bilateral

MEN II A: **Sipple less aggressive.**

MEN II B: **Sizemore more aggressive.**

Clinical features

Solid mass in the neck.

Painful ,rapidly enlarging.

Lymph nodes enlargements.

Recurrent laryngeal nerve involvement.

Respiratory, and swallowing problems.

Diarrhea .

Flushing.

→ feature of carcinoid cells

Liver metastasis. Mostly as its neuroendocrine

Diagnosis and treatment

Family history.

FNAC.

Serum calcitonin, CEA levels.

Urinary vanillyl mandelic acid (VMA).

Total Thyroidectomy, and Central para tracheal lymp
nodes are cleared? modified neck dissection.

Anaplastic tumor

one of worst type

- Highly aggressive tumor
- Old age female usually above 70-80, kills in duty 6 month
- Area of endemic goiter
- Surgery to relive airway obstruction.
- Radiotherapy, chemotherapy?
- Kill in 6 months

* Pay from tracheal invasion → بتخنق

Malignant lymphoma

- Non –Hodgkin B type.
- ***Long standing hashimoto's thyroiditis.***
- Elderly females.
- Primary thyroid tumor ,or part of generalized lymphoma.
- Rapid growing, painful mass.
- Treatment by ***Chemo and Radio Therapy.***

Metastatic thyroid cancer

secondry cancer

1. Kidney
2. lung
3. Breast
4. Melanoma

if I can Remove primary → then Remove Metastasis

Treatment by Resection *IF* Primary tumor is controlled.



Preoperative assessment

- T4 T3 TSH Thyroid antibodies.
- Serum Ca level.
- CEA, Calcitonin Thyroglobulin.
- US to cervical LNs to detect mez.
- Indirect direct laryngoscopy .
- Doppler US.
- CT for Retrosternal goiter.
- Lugol's iodine 10 days pre op.
- ECG cardiac fitness Thyrotoxic.

→ to protect ureter

→ Means 50% or more of thyroid gland under the sternum


Complication of Thyroidectomy
Recurrent laryngeal nerve injury.
External superior laryngeal nerve injury.
Hypo para-thyroidism.
Laryngeal edema
Bleeding-haematoma
Upper air way obstruction in 12 hours
Hypothyroidism.
Keloid , granuloma.
Wound infection.

Total Thyroidectomy

↳ treatment of choice

Treat multifocal tumors.

Decrease local and distant metastasis.

Facilitate treatment with radio-active I 131.

Permit measurement of thyroglobulin as tumor marker.

Reduce risk of anaplasia in thyroid remnants.

Types of thyroid surgery

- Hemi thyroidectomy
- Subtotal thyroidectomy
- Near total thyroidectomy
- Hartely-Dunhil thyroidectomy
- Total thyroidectomy
- ***Modified neck dissection.***

HEMI THYROIDECTOMY

Clip slide

It involves removal of **one entire lobe plus entire isthmus** is removed.

It is performed in benign diseases involving only one lobe

Also done in Follicular Carcinoma involving only one lobe

Other Indications-

1) Solitary toxic or nontoxic Nodule

2)Thyroid cyst

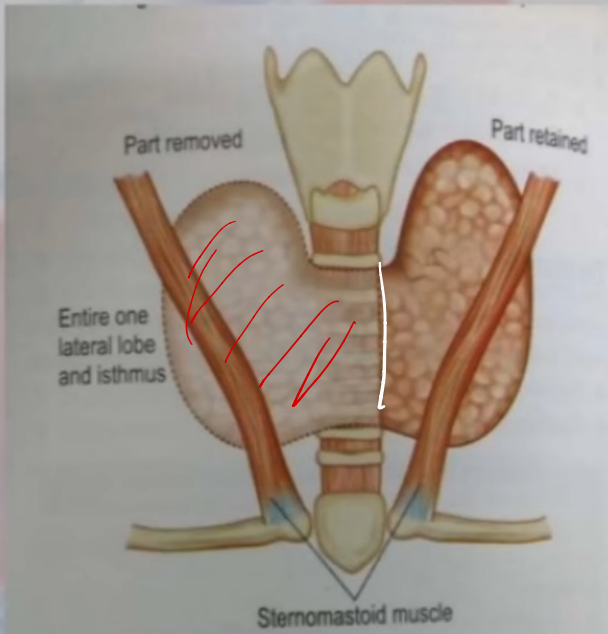


Fig. 6.53: *Hemithyroidectomy:* Entire one lateral lobe and entire

SUBTOTAL THYROIDECTOMY

- Here, **about 8gm ,or tissue, size of pulp of finger, is retained on lower pole of thyroid on both sides** and rest of thyroid gland is removed
- Indications –
- 1)Toxic Thyroid(Primary or Secondary)
- 2)Non-toxic Multinodular Goitre

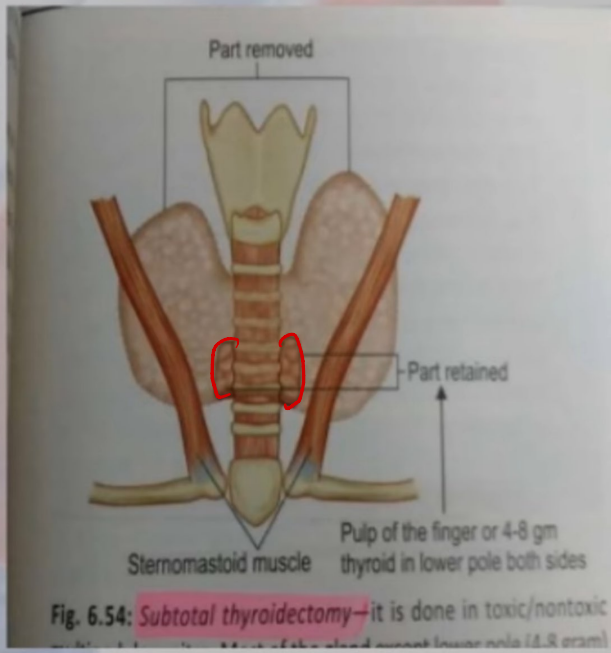


Fig. 6.54: *Subtotal thyroidectomy*→it is done in toxic/nontoxic

NEAR TOTAL THYROIDECTOMY

Here, **both the lobes, except less than 2 gm of thyroid tissue on the lower pole,** near to the recurrent laryngeal nerve and parathyroid, are removed (to retain blood supply to parathyroid gland)

Mostly done in Papillary Carcinoma of thyroid

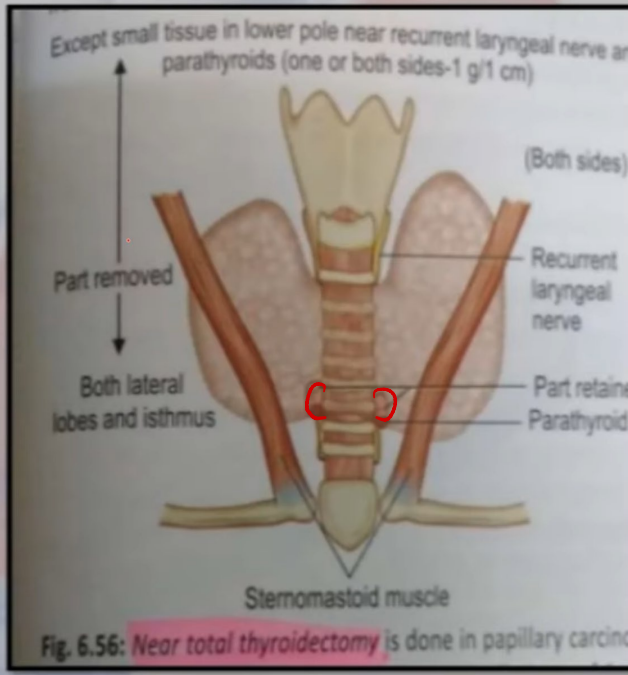


Fig. 6.56: *Near total thyroidectomy* is done in papillary carcino

HARTLEY-DUNHILL OPERATION

It involves **removal of one entire lateral lobe along with isthmus and partial/subtotal removal of opposite lateral lobe**

It is done in non-toxic multinoduar Goiter (4 gm of thyroid tissue is left behind only on one side)

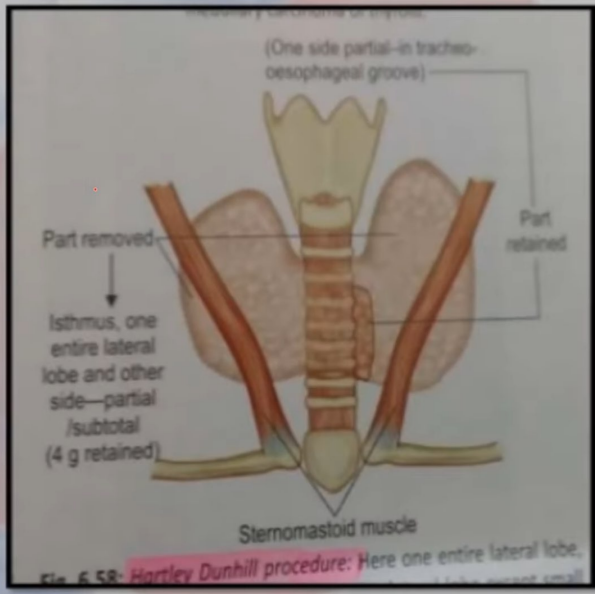


Fig. 6.58: Hartley Dunhill procedure: Here one entire lateral lobe.

Postoperative treatment

yroxine

- Replacement
- Suppress TSH

yroglobulin

- Residual tumor or tissue
- Recurrence

dioactive iodine

- Detect and treat metastasis
- Ablate residual thyroid tissue

PROCEDURE

POSITION

Under general anesthesia, patient is put in supine position, with neck hyper extended by placing a sand bag under the shoulder– table tilt of 15 degree head up to reduce venous congestion (***ROSE POSITION).***





INCISION :

Horizontal crease incision is given, two finger breadth abov
the sternal notch, from one sternomastoid to other
(KOCHER'S thyroid incision)





SUBPLATYSMAL FLAPS :

- Subcutaneous tissue and platysma are incised *(subplatysmal plane)* remaining superficial to **Anterior Juglar Vein** -

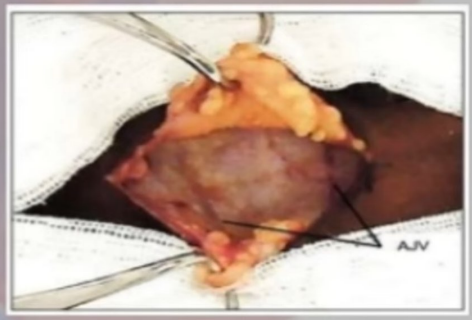
  Upper Flap is raised up to the **Thyroid Cartilage**

  Lower Flap is upto the **Sterno-Clavicular joint.**

- Deep fascia is opened <u>vertically</u> in the midline.



Figure 18: Subplatysmal flaps elevated

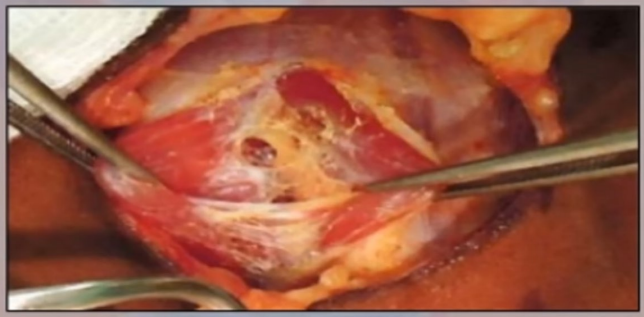


eparating the Strap Muscles and Exposing the nterior Surface of the Thyroid :

The fascia between strap muscles *(sternohyoid, sternothyroid and mohyoid)* , is divided along the midline and **muscles are retracted terally.**

n case of a large goiter or any neoplasm, strap muscles are ivided in upper part

Often, the Anterior Juglar Vein needs to be ligated.

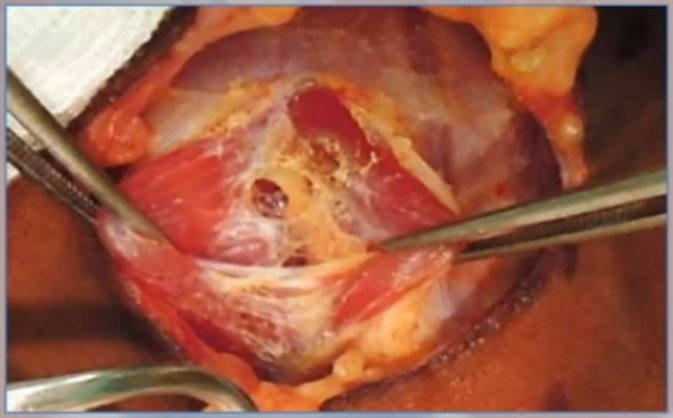


Strap muscles retracted laterally, fascia white tissue between them.

Pretracheal Fascia:

Clip slide

- It covers the thyroid gland.
- It is opened Vertically to expose the thyroid gland.

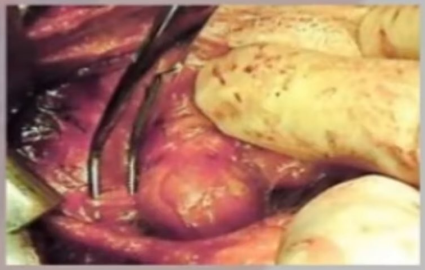


Identify the Middle Thyroid Vein.

- The thyroid gland is rotated medially (using the surgeons fingers).
- The middle thyroid vein is identified (it will be tightly stretched by the medial rotation of the gland), which s then ligated.
- This permits further mobilization of the gland.



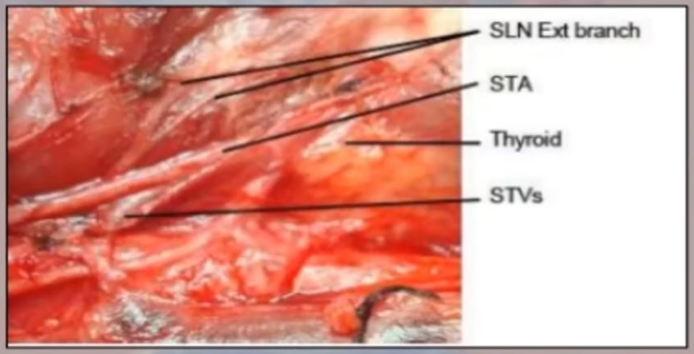
Medial rotation of the right thyroid lobe to expose the middle thyroid vein



Identifying the middle thyroid vein(above the tip of the forces)

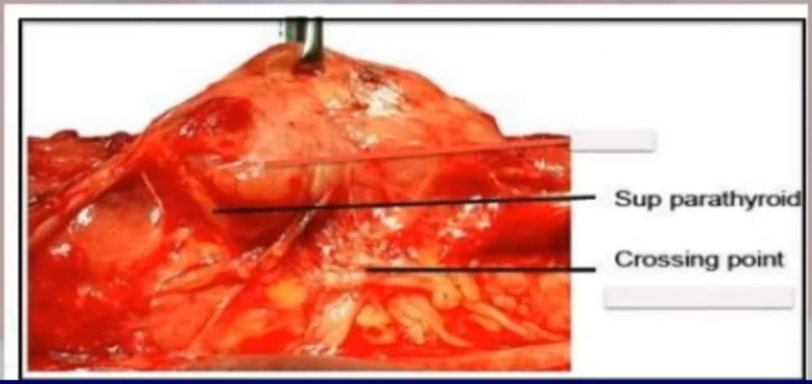
Superior Pole of Thyroid

- Superior pole is dissected
- Identify the superior thyroid artery, close to the superior pole of the thyroid parenchyma , and ligate it.
- Dissection is done in an avascular plane between upper pole of gland and cricothyroid muscle to avoid trauma external branch of superior laryngeal nerve , entering cricothyroid.



Identifying Superior Parathyroid Gland.

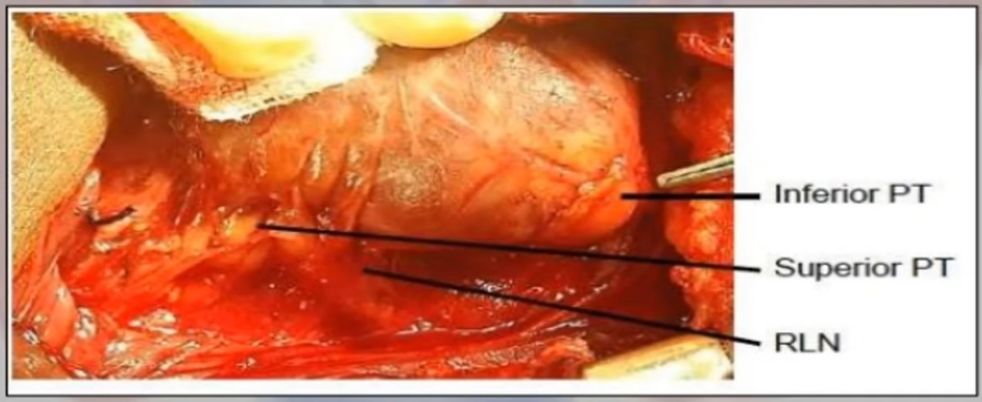
- **Location:** In a posterior position, at the level of the upper 2/3 of the thyroid and approximately 1 cm above and behind the crossing point of the recurrent laryngeal nerve and the inferior thyroid artery.
- It is orange- yellow in color.
- They are identified and dissected.
- The gland must remain in situ with blood supply intact.



Identifying The Inferior Parathyroid Gland

Clip slide

- Location : **Between the lower pole of the thyroid and the isthmus , below and in front of the crossing**
- Care must be taken to preserve it in situ and to avoid damaging its inferior thyroid artery(supplying both glands)



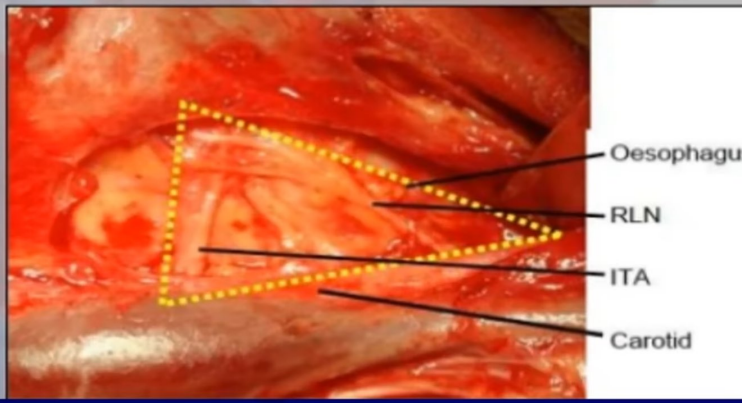
Capsular Ligation of Inferior Thyroid Artery:

- It is a branch of thyrocervical trunk.
- Its ligation is done at the capsular level at the lower pole of thyroid gland where it turns toward midline ,behind the carotid artery.
- It retains the blood supply of PARATHYROID GLANDS, which is very important.

Identifying The Recurrent Laryngeal Nerve.

- RLN should be identified with dissection through its entire course
- Recurrent laryngeal nerve is located in *Riddle's Triangle*
- If nerve is not found along its course, anomalous (non-recurrent) nerve should be suspected.

Lateral: Common Carotid Artery
Medial : Trachea
Superior: Inferior Thyroid Artery



Removing The Thyroid Gland

Clip slide

f the patient is undergoing a Total Thyroidectomy, attention should firs
e turned to the opposite thyroid lobe and RLN.

Once the entire specimen has been dissected it can be removed.

The removed specimen should be inspected.



Complication of Thyroidectomy

Recurrent laryngeal nerve injury. — Uni → Hoarseness; Bi → aphonia or stridor

External superior laryngeal nerve injury.

Hypo para-thyroidism.

Laryngeal edema

Bleeding-haematoma ↓ Upper air way obstruction in 12 hours

Hypothyroidism.

Keloid , granuloma.

Wound infection.

RLN Injury

Unilateral

hoarseness of voice,

Choking , coughing with drinking liquids

Bilateral : Stridor

Transient Recovery within 6-12 m

Permanent 3 times more common

lways identify RLN during Thyroid Surgery

Thyroiditis

Different subtypes mimic each other

Self limited symptoms

Local, and systemic symptoms

Clinical manifestation

- Goiter (bruit, and thrill)
- Eye symptoms
- Tachycardia, palpitation , arrythmias
- Insomnia , irritability , tremors
- Weight loss, increase appetite, diarrhea
- Menstrual irregularity, Gynecomastia
- Hyperreflexia, myopathy
- Hair loss, thin warm skin leg swelling
- Peritibial myxoedema

Chronic lymphocytic thyroiditis

Most common inflammatory thyroid condition.

Most common cause of goiter and hypothyroid

Autoimmune disease with high titer of circulating thyroid antibodies.

95% occur in 30-50 y old women.

Linked to other autoimmune diseases.

Associated with B cell non Hodgkin lymphoma.

Presentation

- Asymptomatic
- Most common cause of hypothyroid
- Enlarged non tender gland, and pyramidal lobe
- ***Treatment***
- Non surgical

Subacute Granulomatous de quervain thyroiditis

- Most common cause of painful thyroid.
- Caused by viral infection
- Associated with fever, Enlarged thyroid
- Last for weeks
- Destruction of thyroid follicles lead to hyperthyroid
- Hypothyroid at the end
- Return to euothyroid in 6 months.

Acute suppurative thyroiditis

- Bacterial,fungal,parasitic infection
- Thyroid usually resistant to infection
- Most common in young women20-40 y
- Majority has goiter
- Pyriform fossa sinus
- Neck pain, high fever
- Conservative treatment

Hyperthyroidism

auses of Thyrotoxicosis

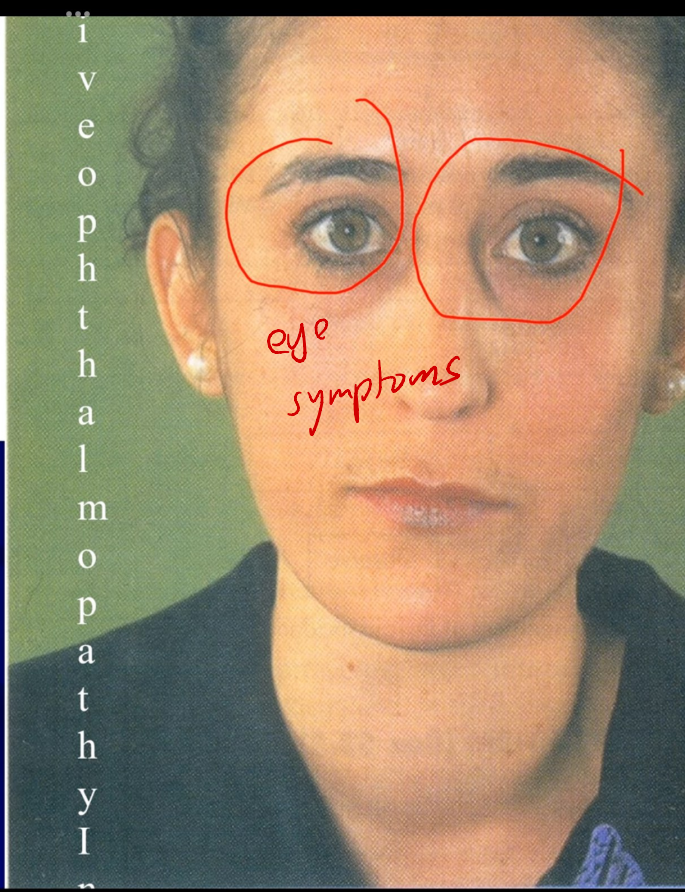
irish surgeon

- Diffuse toxic goiter (Grave's disease). primmun
- Toxic multinodular goiter (Plummer's disease).
- Toxic nodule. → secondy
- Thyroiditis.
- Exogenous thyroid excess
- Excess HCG.
- Pituitary adenoma

80% of thy
→ Grave's
Autoimmun



on-infiltrative
ophthalmopathy
filtrative
ophthalmopathy



	PRIMARY THYROTOXICOSIS	SECONDARY THYROTOXICOSIS
ge & signs	Young;Appear simultaneously for short time	Older; long duration of swelling & short duration of signs
onsistency & surface	Soft/firm ; smooth	Firm/hard ; Nodular
redominant symptoms	CNS	CVS
ye signs	Common	rare
retibial myxoedema	1-2% patients	Never seen
roximal myopathy	5% patients	Never seen
lalignant Exophthalmos	Can be seen	Never seen
uscultation	Bruit is common	Bruit uncommon

Grave's disease Diffuse toxic Goiter

MC cause of hyperthyroidism caused by autoantibodies to TSH-

Autoimmune disease with strong familial predisposition.

More common in female peak incidence 40-60y.

Hyperthyroid symptoms: ***Heat*** **intolerance, sweating thirst, weight loss.**

Symptoms of Adrenergic stimulation: **Palpitation, nervousness, fatigue , emotional liability, fine tremors.**

GIT symptoms: **frequent bowel motion and diarrhea.**

Female patient: **Amenorrhea, decrease fertility increase possibility of abortion , males gynecomastia.**

Heart problems in elderly **: AF CHF.**