HEAD AND NECK TUMORS I[1]

A)NECK MASSES

➲ Introduction:

- It is common clinical finding.
- Very common in all age groups.
- The differential diagnosis is Very complicated.

➲ Anatomical consideration (to identify the location of the mass)

-Two main triangles (anterior and posterior).
-Anterior and posterior triangles are separated by sternocleidomastoid muscle.

➲ Boundaries of Anterior triangle :

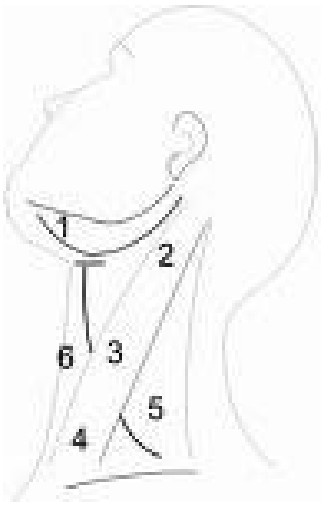
- midline of the neck, posterior border of sternocleidomastoid muscle, inferior border of mandible.(has 3 division mandipular triangle, carotid triangle and muscular triangle)

➲ Boundaries of Posterior triangle :

- clavicle posterior border of sternocleidomastoid muscle, anterior border of trapezius muscle. .(has upper part and lower part separated by omohyoid musle)

◎ ***Lymphatics level (Lymph node level)*** **Imp.★**

1- Level one → submental and submadibular triangles.
2- Level two →between base of skull and hyoid bone.
3- Level three → between hyoid bone and omohyoid muscle.
4- Level four → between omohyoid muscle and clavicle.
5- Level five → posterior triangle lymph node. (posterior to them)
6- Level six → tracheal and paratracheal lymph node. (anterior to them)



[1] Special Thanks for Turki AlDakhil for his help.

➲ Carotid sheath contents: **

1. the common carotid artery.
2. internal jugular vein.
3. vagus nerve.
4. deep cervical lymph nodes.
5. glossopharyngeal nerve.
6. accessory nerve.
7. hypoglossal nerve.
8. sympathetic trunk

Patients Age:

- In Pediatric (0-15) think of begnine

- Middle young adult(16-40) usually begnine but rule out malignant

- if the patient is above 40 years, you have to suspect malignancy until proven otherwise.

➲ Diagnostic steps

1. History

1) Age
   - (0-15 ys) benign
   - (16-40 ys) mostly benign
   - (above 40 ys) high risk of malignancy
2) Gender
3) Chief compliant (then analyze it)

Location is very important gives you clue about :
1- type of tumor 2-metastatic come from

- ➲ Congenital masses: consistent in location.
- ➲ Metastatic masses: key to primary lesion

4) Associated symptoms (e.g. Dysphagia , compression symptoms .. etc)
5) Family history (e.g. thyroid cancer)
6) Social history (e.g. smoking and alcohol are most common & imp .risk factor)**
7) Drug history →e.g. if pts. take aspirin you'll delay the surgery)
8) Past history
9) Allergy history →e.g. esp. for Abx. which's started empirically in pts. with neck mass)

2. Physical examination

1. The face. (skin and Facial nerve)
2. Parotid gland.
3. The ear(rarely) and nose.
4. The neck .
5. The lymph node.
6. Thyroid gland.
7. Oral cavity.
8. Endoscopy (very important)for 5 area(nose, naspharynx,oropharynx,layngiopharynx and larynx)

3. **Differential diagnosis**
   - we divide it into congenital and acquired
   - infection iatrogenic toxins trauma endocrine neoplasm systemic
   - neoplasm [benign or malignant] *[think about neoplasm if pt above 40 years]*

◎ If a pt has neck mass:

1. Give antibiotic empirically(coz it could be inflam. mass) for 2 weeks and Follow up (must follow up)
2. If not improve do Investigation

4. Investigation :

1) **FNA** :
   [the most sensitive one is Fine Needle Aspiration] *the best*
   Only contraindication is suspected vascular tumor)→like carotid body tumor.
2)
3) **CT** [for thyroid , don't use CT with contrast]always do it
   We do CT for character (cystic or solid) ,extent ,relationship this mass with other structure,vacularity by contrast,detection of unknown primary.
4) MRI →better for upper neck& skull base.
5) US → [we use it most of the time for thyroid gland]

🗣Indication of FNA:
1. any neck mass that's don't look like an abscess.
2. abscess which doesn't resolve after 2 w.

🗣Indication of US:
1- in pediatric case & you want a quick investigation.
2- for thyroid gl.

◎ In general : **
- ♣ FNA + CT → the most imp. Invest. In any head & neck mass
- ♣ Except → thyroid masses → US + FNA .

Congenital Neck Masses

1) Epidermal&Sebaceous cyst: ناقصه بس الدوك ما ركز على الناقص ☺

1- -older age group.
2- Clinical diagnosis:
-elevation & movement of overlying skin.
-you do excsional biopsy to confirm.
Don't do excsional biopsy in pts. > 40 coz if it was malignant it'll drop the survival rate by 50%.

2-Branchial cleft cyst 💣

1- Common in pediatrics
2- It's common & present as fluctuant mass underlying SCM.
3- Usually after URTI
4- There are 4 types.
    1- Type 1 usually near to the mandible and parotid open through facial nerve to external auditory canal
    2- Type 2 is the most common type (95%) , and open in tonsillar fosea Usually *anterior* triangle deep to platysma.
    3- Type 3 and 4 are very rare
5- Some patient get it when they are 40 year (because it can be subside by immunity)
6- Could have SCC in it so, to confirm do MRI.
7- Can get infected by bacteria.
8- Treatment : surgical. (if it near facial nerve(type I) do superficial paritodictomy)
    - Most common as a smooth tract under the SCM.
    - Always do FNA + CT then excision .

3- Thyroglossal duct cyst

1- Most common congenital neck mass (70%)
2- 50% presents before age of 20
3- The most common midline mass (75% on midline, 25% on lateral)
4- Deferential diagnosis : ask the patient to swallow and protrude his tongue
5- DX by 1-clinical 2- CT scan
6- Rx : surgical excision → syst trunk: remove mass with body of hyoid bone

4- Vascular Tumor

❶Lymphangioma:
- Dosen't change
- Need surgical excision

❷Haemangioma:
- Resolve by its self
- Conservative treatment unless compression on organ

❸Lymphadenitis:
- any age gp .

Progressively enlarging ,solitary, supraclavicular
Abx. →If don't resolve in 2 weeks do FNA.

B)THYROID AND PARATHYROID GLANDS

1-Thyroid gland

Anatomy

- Setting between 2nd and 4th cartilage ring , lower border → 6th

Tow lobes(upper lobe reach → thyroid cartilage lower border reach →6th trachial ring

Arterial supply :

1- External carotid artery → (STA) superior thyroid artery (for the superior pole of thyroid)
2- Subclavian artery → thyrocervical trunk → (ITA) inferior thyroid artery.

☠inferior thyroid artery is important land mark

♣ Shortcut :
- superior → STA
- Inferior → ITA

Venous drainage :

1- Superior thyroid vein
2- Middle thyroid vein
3- Inferior thyroid vein

Evaluation of thyroid nodules

Investigation :

1st : by US then FNA.

2nd :CT

Dye can interfere with function testing & radioactive Rx. for up to 8w.

In another way : (not CT with contrast because the contrast has iodine so it will affect treatment of thyroid so if you do it wait 3 month)

CT is useful for cervical lymphadenopathy.

Can provoke hyperthyroidism.

♣ FNA (1- benign 2- malignancy 3- undetermined 4-nondiagnostic)

- In all: you repeat FNA except if it's malignant you go ahead &treat.
- In benign & non diagnostic you have 2 choices either you observe or you give TSH suppression it will shrink if it is benign.
- May do Thyroid function test (TSH to suppress the mass then evaluate by us if the mass suppress unlikely to be malignant)
- FNA disadvantage :

Cannot differentiate between **follicular** carcinoma and follicular adenoma (both of them in FNA don't have capsular invasion or vascular invasion)→ do hemithyroidectomy for DX

3rd : Evaluate recurrent laryngeal nerve.(by endoscope)
4th : we do NOT use MRI/CT unless we want to evaluate the Lymph Node (metastasis)

Thyroid cancer: types and treatment

1- Well-differentiated thyroid cancer : include papillary , Hürthle cell , follicular
→Rx.: total thyroidectomy +/- neck dissection with post op I 131.
2- Poorly- differentiated thyroid cancer : include medullary , anaplastic
3- Other : e.g. lymphoma and metastasis into thyroid gland

high Risk group (important)

1- Age : less than 20 or above 60
2- Sex : female more as % but male more aggressive
3- Comprisve symptom Rapid growth
4- Associated symptoms (infiltration of lymph node , hoarseness)
5- Family history (V.Imp) and radiation history.
6- Hx of thyroid disease.

Treatment

- who do surgery?

1- general surgery subspecialty in head and neck
2 general surgery subspecialty in endocrine surgery
3- ENT subspecialty in head and neck
If benign→ follow up

- If undetermined → repeat FNA at least 3 times if still undetermined

→hemithyroidectomy fo DX (because it tell pathologist about capsular and vascular invasion

- If malignant → surgery
  1. low-risk patient : either hemi- or total thyroidectomy
  2. high-risk patient : neck dissection : if there is involvement of lymph node

◎Well-differentiated

1-Papillary carcinoma

- the most common type of thyroid tumor ***

- Role of 80 80% have survivor rate for 10 years

80% have metastasis to the other lobe

- metastasize to cervical lymph node (30%) , distal mets. Less common .

-Rx: total thyroidectomy + neck dissection(if lymph node involve)

Not hemithyroidectomy coz there's 80% chance that it could affect the other lobe & when we do follow up with thyroglobuline it'll not be zero coz there's thyroid tissue left.

2-Follicular carcinoma

- more aggressive

Differ than follicular adenoma that there's capsular invasion. +/- vascular invasion

- less metastasize to lymph node but more with distant metastasis

-Rx: Total thyroidectomy , radioiodine.

** Hürthle cell carcinoma is subtype of follicular carcinoma but with lymph node metastatic→total thyroidectomy (imp)

◎Poorly- differentiated

3-Medullary carcinoma

- two types either sporadic or familial (20% assoaciated with MEN**II** A and MEN**II** B syndromes)
- more aggressive .(30% metastesis).
- if you have a patient with familial medullary thyroid carcinoma , do a screen test for all member of family and any body is +ve for **RET** gene do total thyroidectomy as prophylaxis
- Tx :total thyroidectomy and neck dissection(always)
- Radiation is palliative (but the treatment is surgery)

4-anaplastic carcinoma

- in elderly and huge neck mass (difficulty to breath)
- no adequate therapy , pt die in 6 months (NO Rx)

5-lymphoma

قال الدوك يكفي تعرفون اسمها وان فيه شي اسمه ليمفوما يصير بالثايرويد

Rarely presents within thyroid , F>M

🗣indication of thyroid surgery (thyroidectomy)

1- compression symptoms
2- suspicion malignancy
3- confirmed malignancy
4- uncontrolled hyperthyroidism
5- prophylactic from familial type

☠complication of thyroid surgery

1- Hematoma
2- injury to the nerve
3- hypocalcemia

2-ParaThyroid gland

Q. who should do parathyroidectomy ?
A. the same man who should do thyroidectomy

Embryology

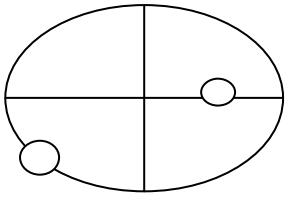
inferior parathyroid and thymus originates from → **3rd** pharyngeal pouch

superior parathyroid and parafolicular cells(belong to thyroid) originates from → **4th** pharyngeal pouch

- we have 4 parathyroid glands , but we need only one functional gland

Anatomy

- parathyroid glands get blood supply from inferior thyroid artery(90%).
- Superior parathyroid gland is above the inferior thyroid artery , posterior to recurrent laryngeal nerve.
- Inferior parathyroid gland is below the inferior thyroid artery , anterior to recurrent laryngeal nerve

anterior  posterior

the most common diagnosis is adenoma ether in one gland or more

→most common cause of hyperparathyroidism.

When you say: Parathyroid hyperplasia means all the 4 glands are involved.

→ The most common presentation is hypercalcaemia
Symptoms of hypercalcaemia are fatigue, depression and renal stone

CA is very rare, it leads to severe hypocalcaemia & treated by surgery .

Investigation

Pre-op workup :

1- US→(usually solid) and blood work
2- Sestamibi scan.
3- No FNA

C) Salivary glands

Anatomy & physiology

➲ We have 6 major salivary glands 2 parotid 2 submandibular 2 sublingual, & 100-1000 m minor salivary glands.

◎ Parotid gland :

1. the largest gland
2. secrete serous (only) **
3. its ducts –tensen duct- open in upper 2nd maxillary molar teeth.
4. The duct run parallel to the buccal nerve branch from VII CN. 1.5 cm below dialoma .

◎ Submandibular gland

1. secrete mixed saliva (serous +mucous)
2. located in submandibular triangle (level1) .
3. Wharton duct→ related to 2 nerves hypoglossal XII CN & lingual.
4. arranged from medial to lateral as the mnemonic(HDL)& opens just lat. To lingual frenulum.

Hypoglossal nerve [medial] +Wharton **D**uct + **L**ingual nerve [lateral]

◎ Sublingual gland

1. secrete mucus saliva
2. it has many ducts called ducts of Rivinus **& opens in floor of mouth.**

◎ Minor salivary gland →produce saliva

➲ -Function of saliva : **

lubricant , moisten mastication , buffering , cooling the hot Food ,…etc.

➲ the glands composed of:

secretory units =(tubules +collecting ducts +acinus). Has to be hypotonic

it is an active process . first it secrete isotonic saliva from the acinus then before it leave the collecting ducts the saliva change into hypotonic & secreted to the oral cavity .

❖ nerve supply :

The salivary glands innervated by the parasympathetic nervous system. Carried by →lingual N .

- ◎ Brain stem → glossopharyngeal IX CN → otic ganglion → auriclotemporal nerve → parotid gland
- ◎ Facial VII CN →chorda tympani n. → lingual N. branch from V CN → submandibulary ganglion → sublingual & submandibular glands.
- ➲ The main neurotransmitter is Ach
- ➲ the salivary flow is 1ml/min or 1-1.5L/day **

INFECTIONS & BENIGN LESIONS

The most infection of salivary glands occurs in the parotid by: **

♣ mumps (non-suppurative)

1) usually comes bilaterally
2) caused by paramyxo virus.
3) it is highly contagious infection .
4) Rx : rehydration , isolation ,rest & pain killers .

➲ Bilateral enlarged cystic parotid rule out cystic HIV infection → Rx by antiHIV Drugs & confirm Dx by biopsy.

♣ Acute Suppurative Sialadenitis (surgical parotitis)

- Acute painful swelling of the salivary glands with fever.
- Can occur in postoperative patients and in elderly patients with chronic medical conditions.
- Untreated acute suppurative sialadenitis may lead to an abscess.
- Risk factors include:

1. Dehydration → most common coz
2. Bacterial → most commonly → staph. Aureus
3. Trauma
4. Immunosuppression
5. debilitation.

- Saliva from the affected gland should be cultured
- An underlying pathogenesis begins with the stasis of salivary flow in patients. main organism causing it is Staph. Aureus.

Rx :
→Antibiotic,steroids , analgesic,rehydration, cold compressors, give lemon & orange to stimulate salivation → if patient don't improve after 48 hr do CT scan if there an abscess do surgery.

♣ Chronic Sialadenitis

- Usually the patient complaining of pain & inflammation not that significant

- no stone or tumor
- recurrent

- Rx is tympanic neuroectomy or ligation.

♣ Sialolithiasis (stones in the ducts)

➲ The most common gland affected is→ submandibular (89%) (Wharton duct)due to:

1. the secretions are alkaline & viscous
2. composed of Ca & phosphate
3. vertical orientation of the duct
4. the angulation over mylohyoid.

The last 2 factors against gravity .

- most important symptoms is Recurrent swelling and pain with eating
- the stone too small & the patient present after stone released from the duct & the other stone reacclumate again.
- Rx :remove the gland , open the ducts

TUMORS

Tumors are not common, 95% in adults

➲ The most common benign tumors are →pleomorphic then warthin tumors.
➲ The most common 2 malignant tumors are mucoepidermoid then adenoid cystic carcinoma.[but it most common for minor glands].

➲ That's for parotid but in submandibular gl. :

× Most common malignant tumors in submandebular Gland are→ adenoid cystic carcinoma(ACC) followed by mucoepidermoid,

× & it's same as parotid in benign tumors.

- Parotid tumors →80% overall 80% are benign.
- Submandibulartumors→15% overall 50% are benign.
- sublingual tumors & minor →5 overall 40 % are benign.

Tumors origin theories

1-multicellular theory :

Which mean each tumor arise from different place. [e.g. acinus ➔ acinic cell CA , intercalated duct ➔warthin tumor]

2- Bicellular theory :

All tumors arise from intercalated duct except mucoepidermoid & squamuos CA which arise from excretory duct

BENIGN TUMORS

① Pleomorphic adenoma :

- 70% of parotid tumors.
- 50% submandibular
- . 45% minor.
- 6% sunlingual.

- Present as slow growing painless mass.
- role of 80: [80% of tumor → in the parotid →80% benign → 80% are pleomorphic]
- 90% in the superficial lobe.

➲ Treatment : superficial parotidectomy(complete surgical excision) → because possibility to transform to malignancy , no open biopsy (enucleation) because ↑the rate of recurrence by 20-45%. About warthin tumor the surgery here is an optional.

② warthin's tumors:

- You can observe without surgery coz there's no chance for recurrence or change into malignant.
- Risk factors: white, male and old ppl.
- No need for surgery.

MALIGNANT TUMORS

- mucoepidermoid & adenoid cystic carcinoma they spread through nerves .

◎ Mucoepidermoid Most common

- has 2 types high & low grades
- high grade treated aggressively [total parotidectomy + neck dissection +post op radiotherapy]
- low grade treated by partial [superficial] parotidectomy.

◎ Adenoid cystic carcinoma 2nd most common

have 3 subtybe :

1- cribriform type → most common
2- tubular subtype
3- solid subtype → aggressive one

➲ treated by total parotidectomy + post op radiotherapy .

◎ COMPLICATIONS OF POST-OP

1- Facial nerve weakness or paralysis.
2- Frey's syndrome (flushing & sweating of the face resulting from eating due to damage of auriclotemporal nerve-parasympathetic post ganglionic-)

♣ *minor Starch iodine test* → to confirm Dx of Frey syndrome

- after eating we test for sweating in which iodine in oil is painted on the skin followed by dusting with a starch powder which turn blue-black in the presence of iodine & moisture.
- Rx.:
  - ① Non surgical:
    1) Topical glycopyrrolate.
    2) Topical antiperspirant.
    3) Botox injection
  - ② Surgical:
    1) Fat grafting.
    2) Dermal grafting .
    3) Temparolis fassia interposition flap.
    4) SCM interposition flap .
    5) Tympanic neuroctomy

Malignancy in parotid: (order from most common):

→Mucoepidermoid, Adenoid cystic

Malignancy in minor: (order from most common):

→Adenoid cystic, Mucoepidermoid.

MCQ:

1) Obstruction of Stenson's duct may affect the :

a) parotid gland ✓
b) submandibular gland
c) sublingual gland
d) fossa of Rosenmuller
e) middle ear

2) The advised initial procedure in a 50 year old Pnt with a neck swelling is:

a) block neck dissection
b) fine needle aspiration (FNA) ✓
c) incisional biopsy.
d) excisional biopsy.
e) do nothing.

3) The most common thyroid cancer has lymph node metastasis

a) Papillary thyroid carcinoma (PTC) ✓
b) Follicular thyroid carcinoma (FTC)
c) Hurtle cell carcinoma (HCC)
d) Mudilliary thyroid carcinoma (MTC)
e) Anaplastic thyroid carcinoma (ATC)

4) The most common location of salivary gland obstruction is a stone in:

a) Stenson's duct
b) Wharten's duct ✓
c) Ducts of Rivinus
d) Collecting ducts
e) None of the above

5) The treatment of pleomorphic adenoma is:

a) observation
b) excisional biopsy
c) superficial parotidectomy ✓
d) total parotidectomy
e) radiotherapy

GOOD LUCK

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