

# HEAD AND NECK TUMORS I<sup>1</sup>

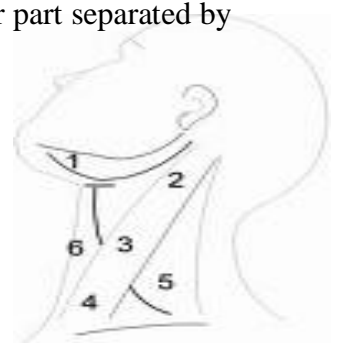
## A) NECK MASSES

### ★ 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 mandibular 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 muscle)
- **Lymphatics level (Lymph node level )**
  - 1- **Level one** : submental and submandibular 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)
- **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.



- In Pediatric think of benign
- Middle young adult usually benign but rule out malignant
- if the patient is above 40 years, you have to suspect malignancy until proven otherwise.

<sup>1</sup> Special Thanks for Turki AIDakhil for his help.

7. hypoglossal nerve.
8. sympathetic trunk

### ★Diagnostic steps

#### - History

1. Age , Gender
2. Chief complaint ( then analyze it)

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

3. Associated symptoms (e.g. Dysphagia , compression symptoms .. etc)
4. Family history (e.g. thyroid cancer)
5. Social history (e.g. **smoking and alcohol are risk factor**)
6. Drug history
7. Past history
8. Allergy history

#### - 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, nasopharynx, oropharynx, laryngopharynx and larynx)

#### - 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***

- **Give antibiotic empirically for 2 weeks and Follow up (must follow up)**
- **If not improve do Investigation**
- **Investigation**

= **FNA** [the most sensitive one is Fine Needle Aspiration ] 🌟 *the best*  
 Only contraindication is suspected vascular tumor)

= **CT** [ for thyroid , don't use CT with contrast ]always do it  
 We do CT for character ,extent ,relationship this mass with other structure



- = MRI
- = US [ we use it most of the time for thyroid gland ]

## Congenital Neck Masses

### Branchial cleft cyst 🌟

- There are 4 types.
- Type 1 usually near to the mandible and parotid open through facial nerve to external auditory canal
- Type 2 is the most common type and open in tonsillar fossa
- Usually *anterior* triangle deep to platysma.
- Type 3 and 4 are very rare
- Some patient get it when they are 40 year (because it can be subside by immunity)
- Treatment : surgical. (if it near facial nerve(type I) do superficial paritodictomy)

### Thyroglossal duct cyst

- The most common midline mass
- Deferential diagnosis : ask the patient to swallow and protrude his tongue
- DX by 1-clinical 2- CT scan
- Rx : type of surgical excision : syst trunk: remove mass with body of hyoid bone

## B) THYROID AND PARATHYROID GLANDS

### 1-Thyroid gland

#### ★Anatomy

- Setting between first and fourth cartilage ring (mainly the second).
- Two lobes(upper lobe reach is thyroid cartilage lower border reach 6 trachial ring
- **Arterial supply :**
  - 1- External carotid artery → superior thyroid artery (for the superior pole of thyroid)
  - 2- Subclavian artery → thyrocervical trunk → inferior thyroid artery

inferior thyroid artery is important land mark

- **Venous drainage :**
  - 1- Superior thyroid vein
  - 2- Middle thyroid vein
  - 3- Inferior thyroid vein

#### ★Evaluation of thyroid nodules

- Investigation :



1-FNA ( 1- benign 2- malignancy 3- undetermined)

FNA disadvantage :

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

2- US (not CT with contrast because the contrast has iodine so it will affect treatment of thyroid so if you do it wait 3 month)

May do Thyroid function test (TSH to suppress the mass then evaluate by us if the mass suppress unlikely to be malignant )

- Evaluate recurrent laryngeal nerve.(by endoscope)
- 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
- 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- Comprised symptom Rapid growth
- 4- Associated symptoms (infiltration of lymph node , hoarseness )
- 5- Family history and radiation history because

### ★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 for DX (because it tell pathologist about capsular and vascular invasion )**

**If malignant** → surgery

- low-risk patient : either hemi- or total thyroidectomy



- high-risk patient : neck dissection : if there is involvement of lymph node

### Well-differentiated

#### ***Papillary carcinoma***

- the most common type
- Role of 80      80% have survivor rate for 10 years  
80% have metastasis to the other lobe
- metastasize to lymph node
- Rx: total thyroidectomy + neck dissection(if lymph node involve)

#### ***Follicular carcinoma***

- more aggressive
- less metastasize to lymph node but more with distant metastasis
- Rx: Total thyroidectomy
- \*\* Hürthle cell carcinoma is subtype of follicular carcinoma but with lymph node metastatic

### Poorly- differentiated

#### ***Medullary carcinoma***

- two types either sporadic or familial
- 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 )

#### ***anaplastic carcinoma***

- in elderly and huge neck mass
- no adequate therapy , pt die in 6 months

### **★indication of thyroid surgery (thyroidectomy)**

- 1- compression symptoms
- 2- suspicion malignancy
- 3- confirmed malignancy
- 4- uncontrolled hyperthyroidism



- 5- prophylactic from familial type
- 6- cosmetic

### ★ 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

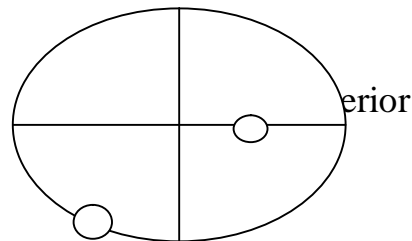
### ★Embryology

- **inferior** parathyroid and thymus originates from the **third** pharyngeal pouch
- **superior** parathyroid and parafollicular cells(belong to thyroid) originates from the **fourth** 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



- the most common diagnosis is adenoma either in one gland or more
- The most common presentation is hypercalcaemia
- Symptoms of hypercalcaemia are fatigue, depression and renal stone

### ★Investigation

US and blood work



## C) Salivary glands

### ★ Anatomy & physiology

- We have 6 major salivary glands 2 parotid 2 submandibular 2 sublingual, & 100-1000 minor salivary glands.
- Parotid gland the largest gland secrete serous saliva & its ducts –**tensen duct**- open in **upper 2<sup>nd</sup>** maxillary molar teeth. The duct run parallel to the buccal nerve branch from VII CN. 1.5 cm below dialoma .
- **Submandibular gland secrete** mixed saliva located in submandibular triangle . **Wharton duct** related to 2 nerves hypoglossal XII CN & lingual. arranged from medial to lateral as the mnemonic **HDL**
- Hypoglossal nerve [medial] -----Wharton duct----- lingual nerve [ lateral]**
- Sublingual gland secrete mucus saliva it has many ducts called **ducts of Rivinus**
- Function of saliva : lubricant , moisten mastication , buffering , cooling the hot Food ,...etc.
- the glands composed of secretory units & tubules , collecting ducts & acinus . 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 .

@ The salivary glands innervated by the parasympathetic nervous system.

## Brain stem →→→ glossopharyngeal IX CN →→→ otic ganglion →→→ auriculotemporal nerve →→→ parotid gland

## Facial VII CN →→→ chorda tympani n. →→→ lingual n. branch from V CN →→→ submandibular 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 gl occurs in the parotid by mumps usually comes bilaterally caused by paramyxo virus. it is highly contagious infection . treatment : 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*



- 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 dehydration, trauma, immunosuppression, and 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.

Treatment: Antibiotic  
 , analgesic, 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 . they has complaint but there no stone nor tumor to remove but the has symptoms so the - Rx is tympanic neuroectomy or ligation.

### ***Sialolithiasis (stones in the ducts)***

-The most common gland affected is submandibular [Wharton duct] due to the following:

- 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.

-Treatment remove the gland , open the ducts

## **★ Tumors**

-The most common benign tumors are pleomorphic & warthin tumors.

- The most common 2 malignant tumors are mucoepidermoid then adenoid cystic carcinoma.[but it most common for minor glands].

- Parotid tumors →→ 80% are benign. submandibulartumors →→ 50% are benign.  
 sublingual tumors & minor →→ 60% are malignant.

### **★ 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 & squamous CA which arise from excretory duct

### **Benign tumors**

- Pleomorphic adenoma :
- role of 80: [ 80% of tumor →→ in the parotid →→80% benign →→ 80% are pleomorphic ]
- Treatment : superficial parotidectomy because possibility to transform to malignancy , no open biopsy because ↑the rate of recurrence. About warthin tumor the surgery here is an optional.

### **Malignant tumors**

- mucoepidermoid & adenoid cystic carcinoma they spread through nerves .

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

[B] -Adenoid cystic have 3 subtype [cribriform type, tubular subtype, solid subtype]  
 -treated by total parotidectomy + post op radiotherapy .

### **COMPLICATIONS OF POST-OP**

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

-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.

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