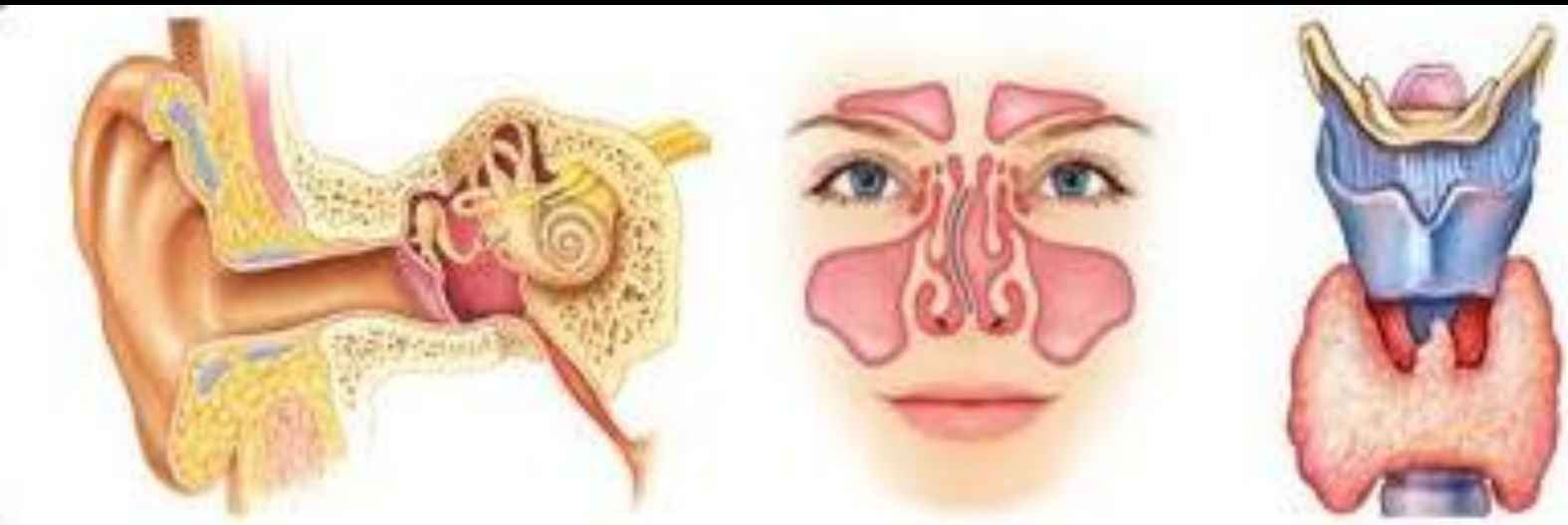


Diseases of the Ear, Nose and Throat



1st Lecture:

Pharynx

Done by: Alaa Al-Humaid and Yusra Al-Kayyali

The slides were provided by doctor (Dr. Manal Bukhari)

Important Notes in red

Copied slides in black

Doctor's notes in blue

Alaa's Notes in green

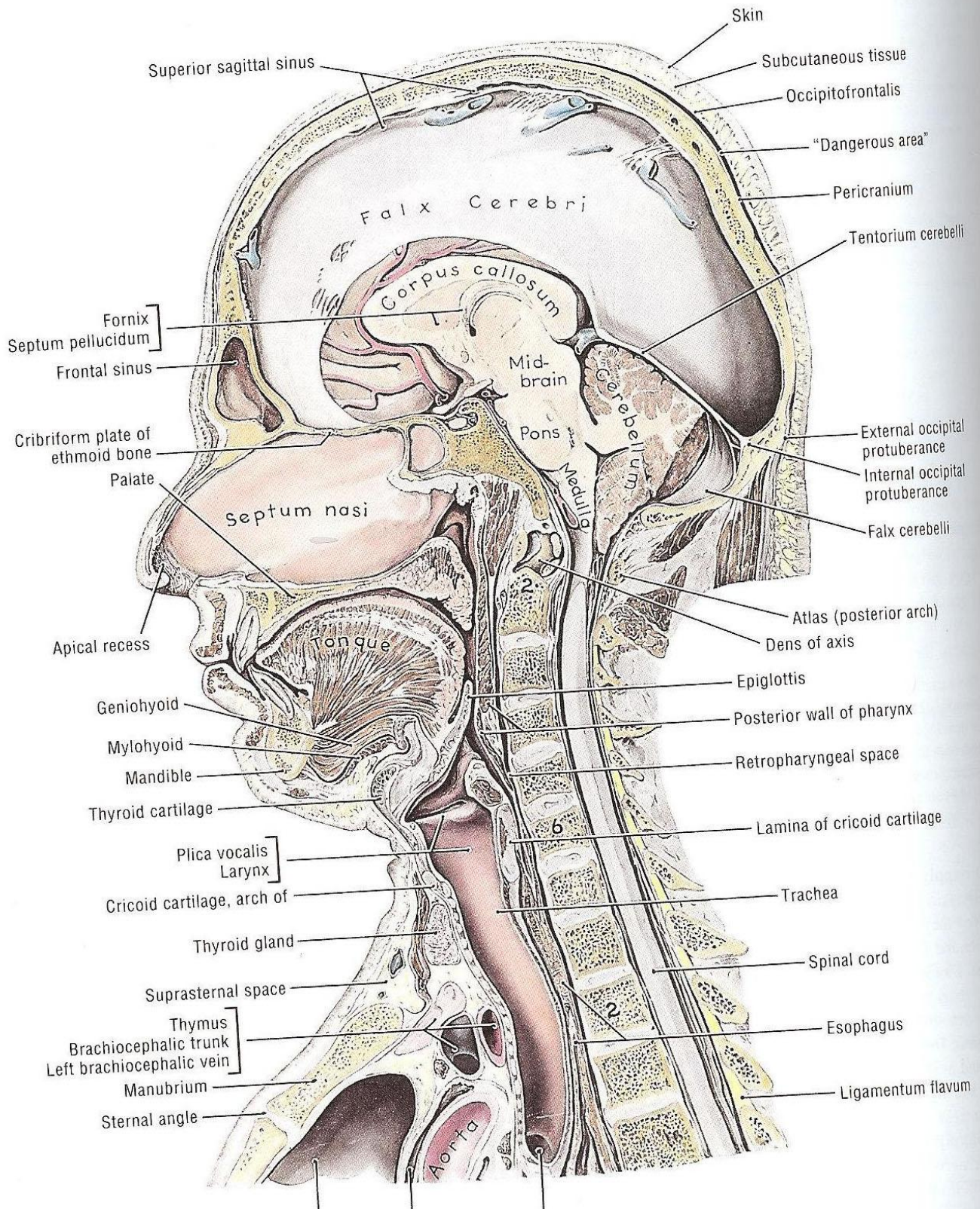
Highlight possible MCQ or OSCE questions mentioned or pointed out by the doctor

2 PHARYNX

PHARYNX:

It extends from the base of the skull to the level of the 6th cervical vertebra at the lower border of the Cricoid Cartilage.

It is funnel shaped that is 10 cms in length.



❖ Parts of the pharynx: 3 parts

1- NASOPHARYNX:

Opens Anterior to the nose,

Above: the base of skull

Below: soft palate (when u open your mouth u can't see it because it's opposite to the nose)

Laterally: opening of the Eustachian tube

Torus tuberosus

Pharyngeal recess (Fossa of Rosenmuller): the area where the nasopharyngeal cancer most commonly occurs.

Adenoid (lymph tissue): if the child has a big adenoid that causes him not to hear well, why? Because it block the Eustachian Tube the middle ear will not get good ventilation; the inside pressure and the outside pressure= negative pressure causing accumulation of fluid). fluid= glue ear.

Adenoids can reoccur. (Tonsils cannot)

Adult 45 years old smoker has nasal obstruction from time to time with ear blockage went to the doctor and was diagnosed with allergy?

Any adult + nose problem+ smoker = Have to examine the nasopharynx because of the risk of nasopharyngeal cancer (from pharyngeal recess).

Nasopharyngeal isthmus

Scenario: Adult patient and a smoker and nasal obstruction secretory otitis media . Coughing blood so must think of nasopharyngeal cancer and not adenoid because it grows in children

2- OROPHARYNX:

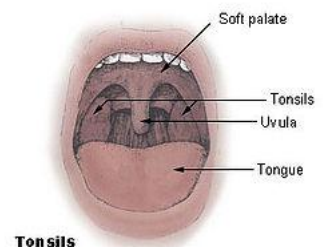
Open Anterior to mouth (opposite to the throat)

Above: soft palate.

Below: the upper border of epiglottis.

Palatine tonsils (these are the tonsils that mostly get affected in tonsillitis) the tonsils are between the anterior pillars and the posterior pillars.

Tonsil size grading: imaginary line from uvula and the 2 pillars are considered the house of the tonsils. If the tonsils are 25% out of the pillars grade 1, 50% grade 2. Grade 4 "kissing tonsils." Grades 3 and 4 cause difficult breathing



3- Laryngopharynx (hyopoharynx):

Open Anterior to the larynx

Above: the upper border of the epiglottis

Below: lower border of cricoid

Pyriform fossa

valleculae: between tongue and epiglottis contains the pyriform fossa



4 PHARYNX

STRUCTURE OF THE PHARYNX: Fibromuscular tube, four layers:

1-MUCOUS MEMBRANE:

- Ciliated epithelium
- Stratified squamous epithelium
- Transitional epithelium
- Subepithelial lymphoid tissue of the pharynx (Waldeyer's ring) : scattered rings of lymphoid tissue in lateral pharyngeal wall, in nasopharynx, in posterior wall

Palatine tonsils:

Some patients come complaining of small white tissue coming from their mouth and bad smell from the mouth (halitosis), without fever, sore throat or pain it is not tonsillitis --- it's the secretion of the crypt. Some patients will need tonsillectomy. Tonsils cannot reoccur.



(12-----15 crypt)

The deep surface is separated from the constrictor muscles of the pharynx by connective tissue 'capsule'

So when we do tonsillectomy: we dissect the capsule and remove the tonsil (be in the capsule away from the muscles)

Adenoid - No capsule

Lingual tonsils

Tubal tonsils

Lateral pharyngeal bands

Discrete nodules

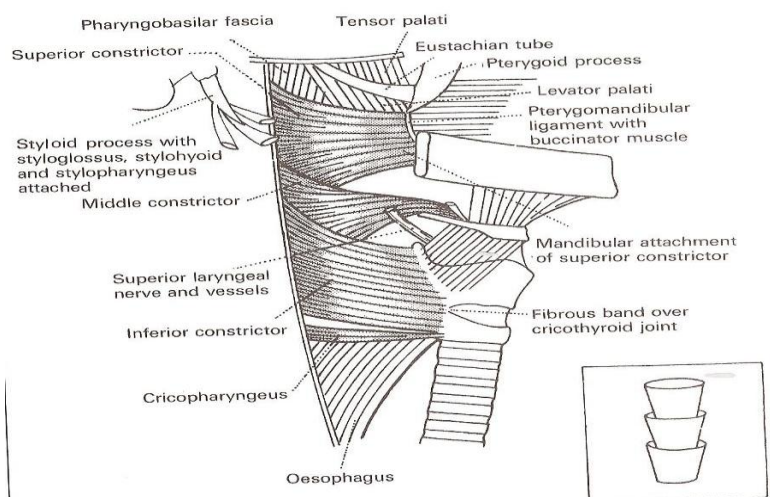
Halitosis is a common complaint:

Differential Diagnosis:

- 1- Teeth cavity
- 2- Diverticulum
- 3- Recurrent tonsillitis
- 4- Tongue (brush it)
- 5- Heart burn
- 6- Post nasal drip/discharge

2-Pharyngeal Aponeurosis

- Incomplete connective tissue coat in the lateral and posterior walls of the pharynx between the muscular layers (to strengthen the tube)
- Pharyngobasilar fascia: fascia that comes from the base of the skull covering the gap and the muscles giving them more strength.



3-Muscular Coat:

A. External : Three constrictor muscles:

1. **Superior constrictor:** arise from pterygoid, ptergomandibular ligament post end of mylohyoid fibers
2. **Middle constrictor:** Arise from the hyoid bone and stylohyoid ligament
3. **Inferior constrictor:** 2 parts
 - i. **Thyropharyngeus : from thyroid**
 - ii. **Cricopharyngeus : from cricoid**

Killian's Dehiscence: Potential gap between the thyropharyngeus and cricopharyngeus where the mucosa may herniate forming a small pharyngeal pouch, some food may get into it and later regurge. The pouch needs to be removed by diverticulectomy.

B. Internal: Three muscles:

1. **Stylopharyngeus**
2. **Salpingopharyngeus**
3. **palatopharyngeus**

Buccopharyngeal Fascia: covering the muscles from the outside giving more strength to the pharynx

Relations of the Pharynx:

- **Posteriorly : prevertebral fascia**
- **Anteriorly: Parapharyngeal space:** Potential space lies outside the pharynx, Triangular in cross section , it extend from the base of the skull above to the sup mediastinum and apex of hyoid bone
 - Anteromedial wall: buccopharyngeal fascia
 - Posteromedial wall : cervical vertebrae, prevertebral muscle and fascia
 - Lateral wall: (up) the mandible ,tergoid muscle, parotid gland
(Lower) sternomastoid muscle
- **Compartment:** divided into two parts by styloid process:
 - **prestyloid:** internal maxillary artery, fat, inferior alveolar, lingual, and auriculotemporal nerves.
 - **Poststyloid:** neurovascular bundle (carotid artery, internal jugular vein, sympathetic chain ,CN IX,X and,XI

**** If tonsillitis and not treated well they might get complicated by peritonsillar abscess in the Parapharyngeal Space leading to rupture of carotid or cranial nerve injury So it is dangerous if you don't treat it. MUST BE DRAINED**

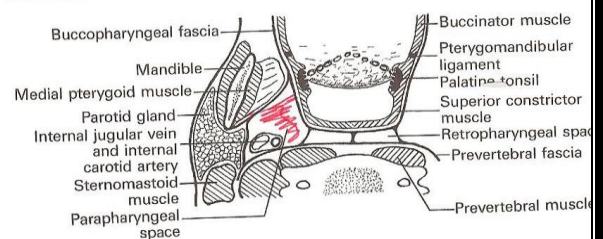
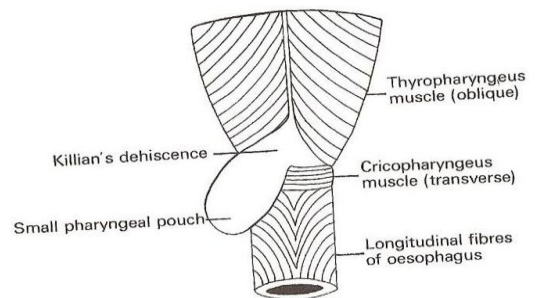
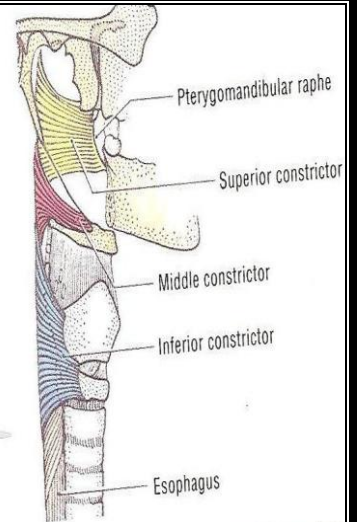
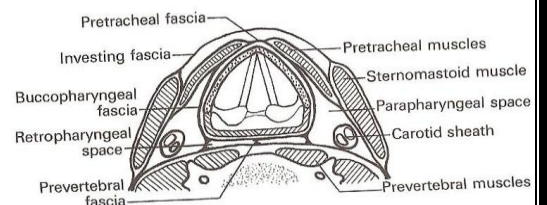


figure 11.6 Fascial compartments of neck at level of C2



6 PHARYNX

Retropharyngeal space: It extends from the base of skull to super mediastinum

Lies behind the pharynx

Contains only lymph nodes

- Ant: posterior pharyngeal wall and its covering buccopharyngeal fascia
- Post: cervical vertebrae and muscles and fascia

Contents: Retropharyngeal lymph nodes

Scenario: A 50 year old patient with torticollis and bulging in posterior pharyngeal wall (seen when opening mouth) should take it seriously because it is a site of lymph nodes so think of TB IF adult; in child think of tonsillitis that spread to this space.

Physiology:

Functions of the sub epithelial lymphoid tissue:

→ **Protective functions:**

- Formation of lymphocytes
- Formation of antibodies
- Acquisition of immunity
- Localization of infection

→ **Salivation:**

→ **Deglutition:** Three stages

1. **Oral stage:** voluntary, closure of mouth, cessation of respiration, rising of larynx, sudden elevation of the tongue, press the tongue against the palate, and pushes it backwards towards the oropharynx
2. **Pharyngeal Stage:** nonvoluntary reflux, contraction of nasopharynx sphincter, larynx rises more, laryngeal inlet closure, epiglottis diverts the food into cricopharyngeal sphincter, contraction of constrictor muscles, relaxed cricopharyngeal sphincter.

If the soft palate is not closed by the nasopharynx the food will get regurgitated through the nose so you must check for nasopharyngeal incompetence and the patient will complain of hypernasality.

-if sphincter is not functioning properly food will remain in the airway

3. Esophageal Phase

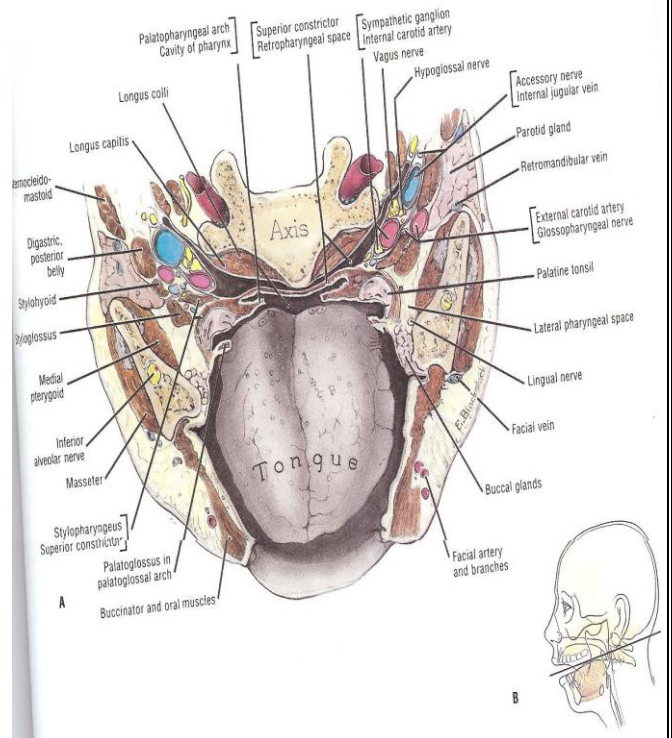
→ **Respiration**

→ **Speech**

→ **Resonating cavity** any mass in the mouth will affect the resonance of your voice

→ **Articulation**

→ **Taste:** taste buds in the oral cavity



Adenoid: A hypertrophy of the nasopharyngeal tonsil to produce symptoms, most commonly between the ages of 3 to 7 years, **most common cause of nasal obstruction in children.** Very common in pediatrics but may regress after the age of 7. We only remove it if it causes sleep apnea or secretory otitis media.

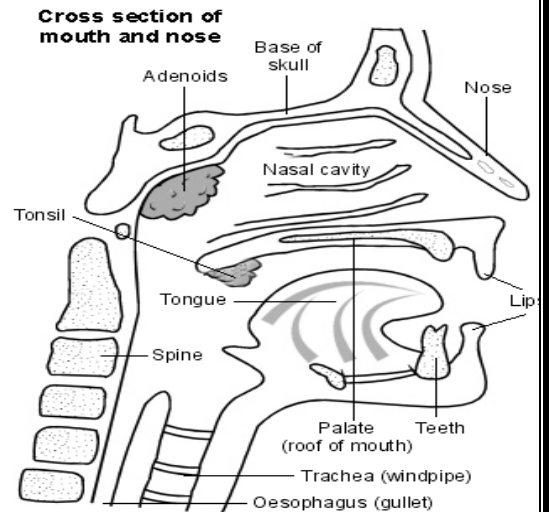
Pathological types:

- 1- simple inflammatory
- 2- tuberculosis

Clinical features: Mouth breathing, snoring, sleep disturbance, toneless voice, adenoid face (**mickey mouse face don't say it especially in rounds!!**), nasal discharge, Eustachian tube obstruction if big enough because it opens in the nasopharynx, so interferes with the aeration of middle ear and it is not equalizing the outside and inside pressure secretory otitis media (glue ear) affecting hearing- adenoid face.

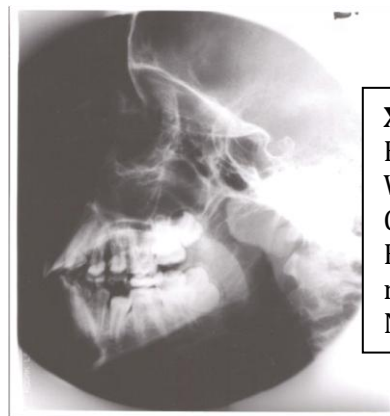
How do you see the adenoid: introduce the scope through the nose.

- Grade the obstruction by adenoid grade 1 : 25%
- grade 2 : 50%
- grade3 : 75%
- grade 4: 100%



Diagnosis:

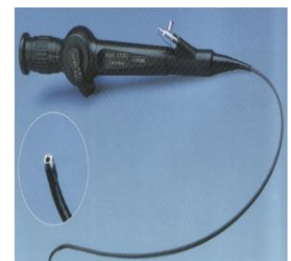
- X ray: if no endoscope, you follow air column if there is a cut in it then adenoid, to comment on xray neck must be extended and at the end of inspiration so difficult but sometimes for medico-legal reasons its necessary.



X-Ray:

Black air
White bone
Grey soft tissue
Bulge at nasopharynx
Narrowing of

- Flexible Fiberoptic: better than the X-Ray because there is no radiation and could see the exact grade of the adenoid.



Treatment:

- if small adenoid: conservative steroidal nasal spray
- Surgical: adenoidectomy if complete obstruction

SLEEP APNEA AND SNORING:

Snoring is a sign of partial obstruction of the upper airway during sleep

Snoring is always present during type of sleep apnea

Sleep apnea: Cessation of airflow at the mouth and nostrils lasting 10 seconds for at least 30 apnoeic episodes **(OSCE)**

Types:

- **Central sleep apnea:** Failure of respiratory drive from the brain, **no movement of the chest , should be treated by neurologist**
- **Obstructive sleep apnea (OSA):** Due to anatomical narrowing of the upper airway **due to adenoid , large tonsils, his chest is moving**
- **Mixed**

If left untreated will develop Cor Pulmonale, pulmonary edema, heart failure, and or HTN; they do not go into deep sleep so hormonal changes

Sleep Apnea is diagnosed by sleep study.

Stage of sleep:

- **Slow wave sleep :** Brain waves are slow deep restful sleep decrease in vascular tone and respiratory rate and basal metabolic rate
- **Rapid eye movement :** Brain quite active active dream

Pathophysiology of OSA:

- During REM or deep sleep ,obstructive occurs resulting in decrease arterial oxygen and increased arterial carbon dioxide pressure
- Nocturnal desaturation(decreased oxygen) arouses patient and causes increase pulmonary artery, systemic arterial pressure
- lead to hypersomnolence

Investigation:

Sleep study: EEG, EKG, EOG, pulse oximeter, respiration rate, and nasal and oral air flow for **7 hours**. The number of times apnea hypopnea happens, they calculate the apnea hypopnea index and decide whether the case is mild, moderate or severe obstructive apnea, or if it is not apnea at all.

Treatment:

Nonsurgical :

- **behavior modification :** if excess weight must lose weight, don't eat before sleeping
- **medical treatment :** nasal spray
- **CPAP:** continuous positive air pressure (causes driness)

Surgical :

UPPP : **uvulopalatopharyngioplasty, it is very painful.**

Diseases of Oropharynx

A. ACUTE INFECTION OF OROPHARYNX

1. ACUTE TONSILLITIS:

Causes:

- viral infection mostly, followed by bacterial
- bacterial group AB-hemolytic streptococcus, Moraxella, H. influenza, Bacteroides

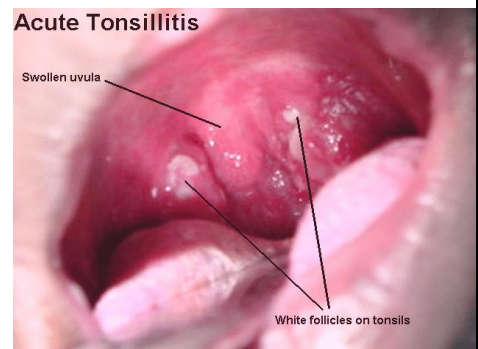
Signs and symptoms: fever, sore throat, odynophagia, trismus, halitosis, and dysphagia

Phases: erythema (tonsils enlarge), exudative, follicular tonsillitis

Serious and needs to be treated. Give fluids

Complication:

- peritonsillar abscess,
- parapharyngeal abscess,
- retropharyngeal abscess,
- rheumatic fever (palpitations)
- glomerulonephritis (comes with flank pain)



Treatment of Acute Tonsillitis: oral antibiotics, bed rest, hydration, analgesia

If patient does not respond well to oral antibiotic we admit and give IV antibiotic and fluids.

2. INFECTIOUS MONONUCLEOSIS (VIRAL)

Pathogen: Epstein barr virus

Signs and Symptoms: fever, sore throat, lymphadenopathy, malaise, exudative tonsillitis, hepatosplenomegaly, white membrane of tonsils

Diagnosis:

- monospot test
- Paul-Bunnell test (heterophil antibodies in serum)
- white membrane (yellowish white) over the tonsils
- bilateral lymphadenopathy in the neck
- in children: hepatosplenomegaly
- 80% mononuclear and 10% atypical lymphocytes on smear
- CBC: mainly lymphocytes



Yellowish – white membrane over the tonsils

****Differs from tonsillitis by the white membrane over the tonsils and the systemic involvement (hepatosplenomegaly and lymphadenopathy).**

Complications: cranial nerve involvement, meningitis, autoimmune Hemolytic A., splenic rupture

Treatment: hydration, analgesia, oral hygiene. Child should be kept at home for supervision; antibiotic is not needed as this is viral.

3. SCARLET FEVER: (OSCE: fever + red tongue = Scarlet fever)

Endotoxin produced by type A beta-hemolytic streptococcus

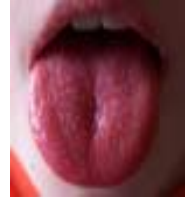


10 PHARYNX

SSX: red pharynx, **strawberry tongue**, perioral skin erythema and desquamation, dysphagia, malaise, severe cervical lymphadenopathy, **fever, sore throat**

Differential Diagnosis: Dick test

Treatment: Antibiotic



4. DIPHTHERIA:

it is a differential diagnosis of Infectious Mononucleosis

Organism: *Corynebacterium diphtheriae*

Signs and Symptoms: sore throat, fever, green plaques friable membrane, white membrane on the tonsils

Diagnosis: culture

Complications: nephritis, airway obstruction, death

Treatment: Antibiotic, antitoxin

No cases of diphtheria due to vaccinations.

5. VINCENT'S ANGINA:

Acute ulcerative lesion (**ulcer on tonsils causing severe pain**)

Gram negative fusiform bacillus and a spirillum with anaerobic

Signs and Symptoms: Sudden in onset, severe pain, fever, cervical adenitis, the base of the deep ulcers bleeds when the membranous slough is removed; the symptoms subside in 4—7 days.

Treatment: Metronidazole (flagyl), antiseptic, and mouthwash

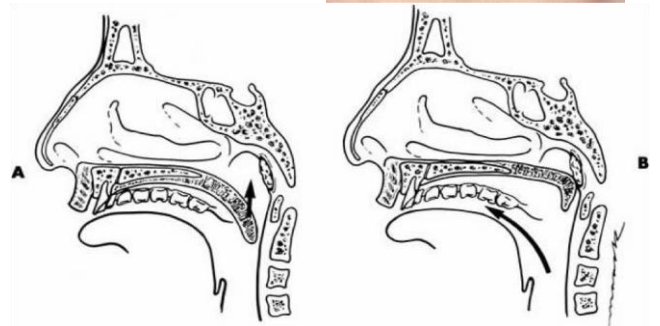
6. BIFID UVULA:

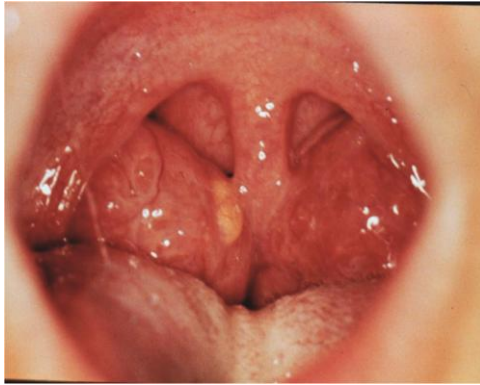
Signs and symptoms: snoring and mouth breathing

Sometimes the adenoid helps close the soft palate. Before deciding on doing an adenoidectomy the doctor has to make sure the uvula is not short, there is no submucoidal cleft, and no bifid uvula: any of those 3 is a reason to not do the adenoidectomy. If the adenoidectomy is done it will cause hypernasality and regurgitation from the nose.



Therefore it is contraindicated. However if necessary do partial adenoidectomy: remove the part against the nose but keep the oral part because it supports the defect in the soft palate.





Left picture: Kissing tonsils grade 4 tonsils.

Right picture: unilateral tonsilar enlargement.



TONSILLECTOMY: under GA

In Down Syndrome patients they have neck subluxation so must be gentle and keep that in mind during the surgery to prevent injuring them

Adenoid is approached from the oral cavity.

Indications for tonsillectomy:

- 1- If recurrent: 6-7 attacks per year, 4 attacks per year for 2 years, or if 3 attacks per year for 3 years.
- 2- snoring, mouth breathing, causing obstruction (hypertrophied tonsils)
- 3- asymmetrical tonsillar enlargement suspecting malignancy (smoker or not)
- 4- Peritonsillar abscess (quinsy) (mostly unilateral) fever, and dysphasia. Has hot potato voice due to the big mass. Abscess collection between lateral wall and capsule, so the tonsil is pushed to the midline, pushing the uvula also. Treat it by incision and drainage, but if recurrent tonsillitis and peritonsillar abscess you treat the abscess, wait for 6 weeks then do the tonsillectomy.

Procedure:

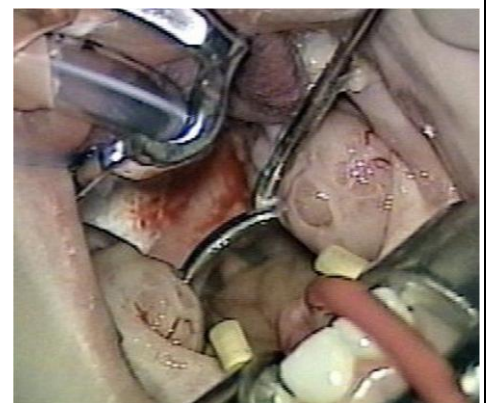
- **Cold technique:** knife and scissors, adenoid is one of its indications.
- **Hot technique:** laser or lasek, suction diathermy

Adenoids can reoccur because they do not have capsules but not commonly

Complications of Tonsillectomy:

1. Hemorrhage (most common)

- **Primary hemorrhage:** Bleeding occurring during the surgery
- **Causes**
 1. Bleeding tendency
 2. Acute infections
 3. Bad technique
- **Management**
 1. General supportive measures
 2. Diathermy, ligature or stitches



12 PHARYNX

3. Packing

- **Reactionary hemorrhage:** within the first 24 hours postoperative period

- **Causes**

1. Bleeding tendency
2. Slipped ligature

- **Diagnosis**

1. Rising pulse & dropping blood pressure
2. Rattle breathing
3. Blood trickling from the mouth
4. Frequent swallowing
5. Examination

- **Treatment**

1. General supportive measures
2. Take patient back to OR
3. Control like reactionary hemorrhage

- **Secondary hemorrhage:** very important

Occur 5-10 days postoperatively

Due to infection

Treated admit and give 2 IV antibiotics

May need diathermy or packing

Slough tissue which is white forms after few hours after the surgery and may stay for 2-3 weeks so the doctor must inform the mother or any other caregiver about it or else they may think its abscess. We need to instruct them about the food habits needed postop to help with the healing process. The caregiver needs to be well informed about the food, the antibiotics and the analgesia (they need regular analgesia). They also need to be well informed about the slough tissue so that they would not think it's a complication and change the patient's medications or worry.

2. Respiratory obstruction

3. Injury to near-by structures

4. Pulmonary and distant infections



7. MONILIASIS: White patches (thrush) caused by candida albicans fungus. in bronchial asthma patients(using inhaled steroids), or immunocompromised patients. Such as patients on renal dialysis.

Treatment: nystatin gel can gargle with it then swallow it.



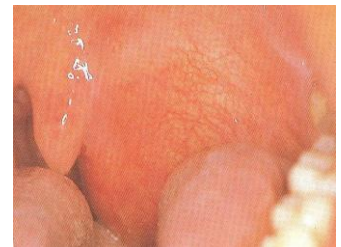
8. PERITONSILLAR ABSCESS (QUINSY):

It is an abscess between the tonsil capsule and the adjacent lateral pharyngeal wall.

Signs and Symptoms: fever, otalgia, odynophagia, uvular deviation, trismus, and drooling of saliva, the patient looks sick and dehydrated.

Complication: Para and retropharyngeal abscess, aspiration pneumonia

Treatment: Incision and drainage done in the ER, aspiration, and are given IV antibiotic.



9. PARAPHARYNGEAL ABSCESS:

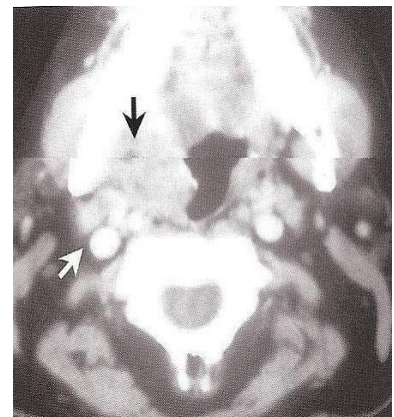
Source of the infection: odontogenic, tonsils, parotid, teeth

Signs and Symptoms: trismus, fever, muffled voices, intraoral bulge

Complication: aspiration, cranial nerve palsy 9, 10, 11 - airway compromise, septic thrombophlebitis, carotid blowout, endocarditis

Treatment: external drainage, IV antibiotic, airway management is very important,

In picture: axial CT scan, with contrast, white blood vessels, patient has history of tonsillitis, fever, trismus, can't open his mouth, and neck swelling. You can see abscess in the parapharyngeal space (dangerous area). The abscess may rupture causing aspiration inside the mouth; the puss will go into the airway causing obstruction and the other complications.



10. RETROPHARYNGEAL ABSCESS:

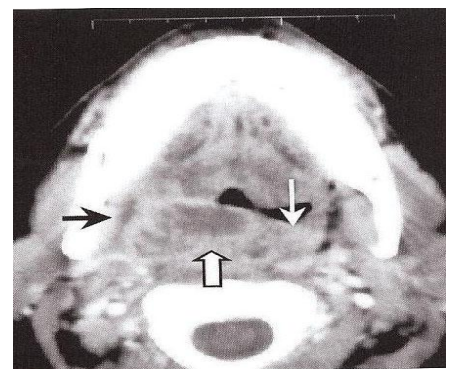
More common in children

Signs and Symptoms: odynophagia, hot potato voice, drooling stiff neck, fever, and stridor.

Complications: mediastinitis, respiratory distress, and ruptured abscess

Treatment: drainage, IV antibiotic, airway management is very important

Picture shows both retro- and para- pharyngeal abscesses. The black is the airway. Patient is barely breathing and might need a tracheostomy



14 PHARYNX

11. LUDWIG'S ANGINA:

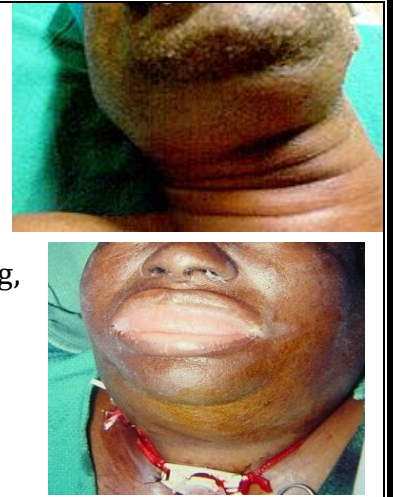
Bilateral cellulitis of submandibular and sublingual spaces

Signs and Symptoms: wooden floor of the mouth due to cellulitis, neck swelling and indurations, can't open their mouth, drooling, respiratory distress, swollen tongue, dysphagia and trismus.

Complications: airway distress, sepsis

Treatment: tracheotomy, external drainage, IV antibiotic

Top emergency



12. CHRONIC PHARYNGITIS:

Pathogenesis: postnasal drip, irritant (dust, dry heat, smoking, alcohol), reflux, esophagitis, chronic mouth breathing, allergy, granulomatous disease, connective tissue disease, malignancy

Signs and Symptoms: Constant mouth clearing, dry throat, pharyngeal crusting, thick granular wall

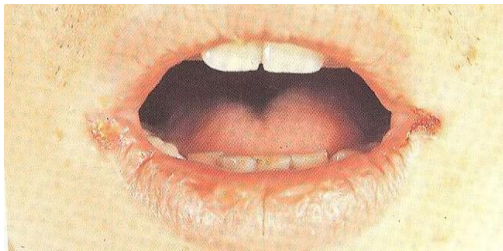
Treatment: address underlying etiology



13. APHTHOUS ULCER: caused by stress, dehydration...

Probably has family history ...

Tx: goes spontaneously.



14. ZANKER'S DIVERTICULUM:

Herniation of the mucosa at Killian's triangle due to increased intraluminal pressure

Signs and Symptoms: dysphagia, regurgitation of

Diagnosis: Undigested food aspiration, do barium swallow

Treatment:

- excision by endoscope or surgery
- Cricopharyngeal myotomy.
- Diverticulectomy

