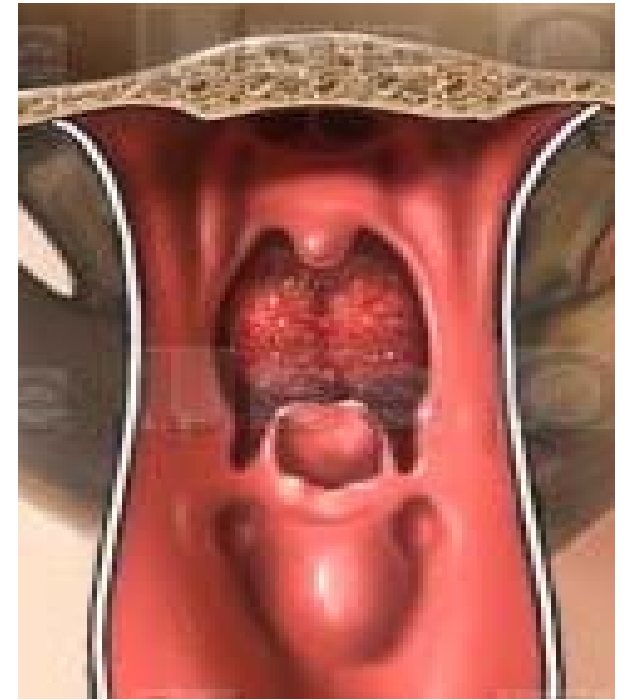


# *Pharynx*

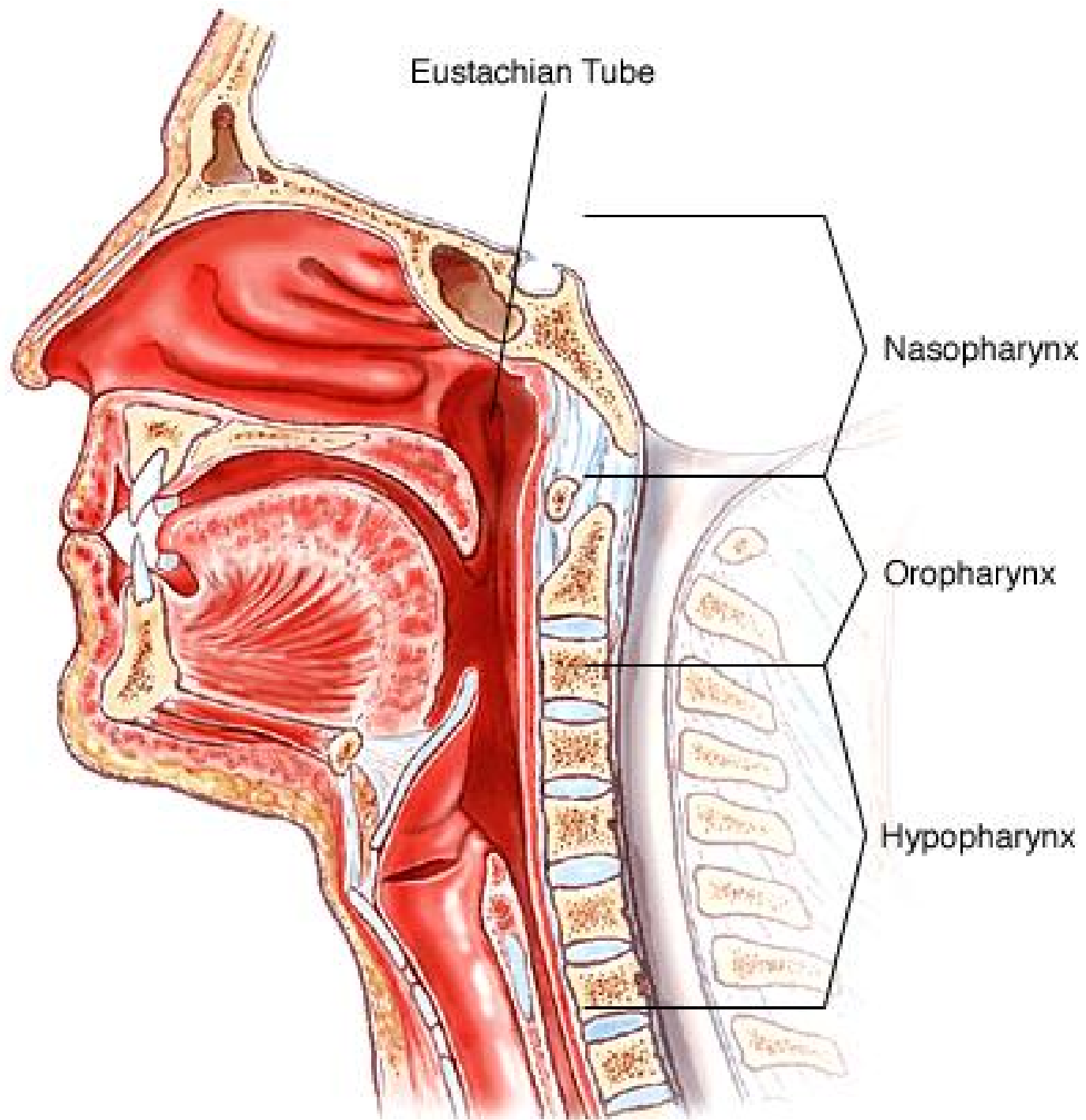


**Dr. Abdulrahman Hagr**  
**MBBS FRCS(c)**

**<http://www.drhagr.com>**

# *Pharynx*

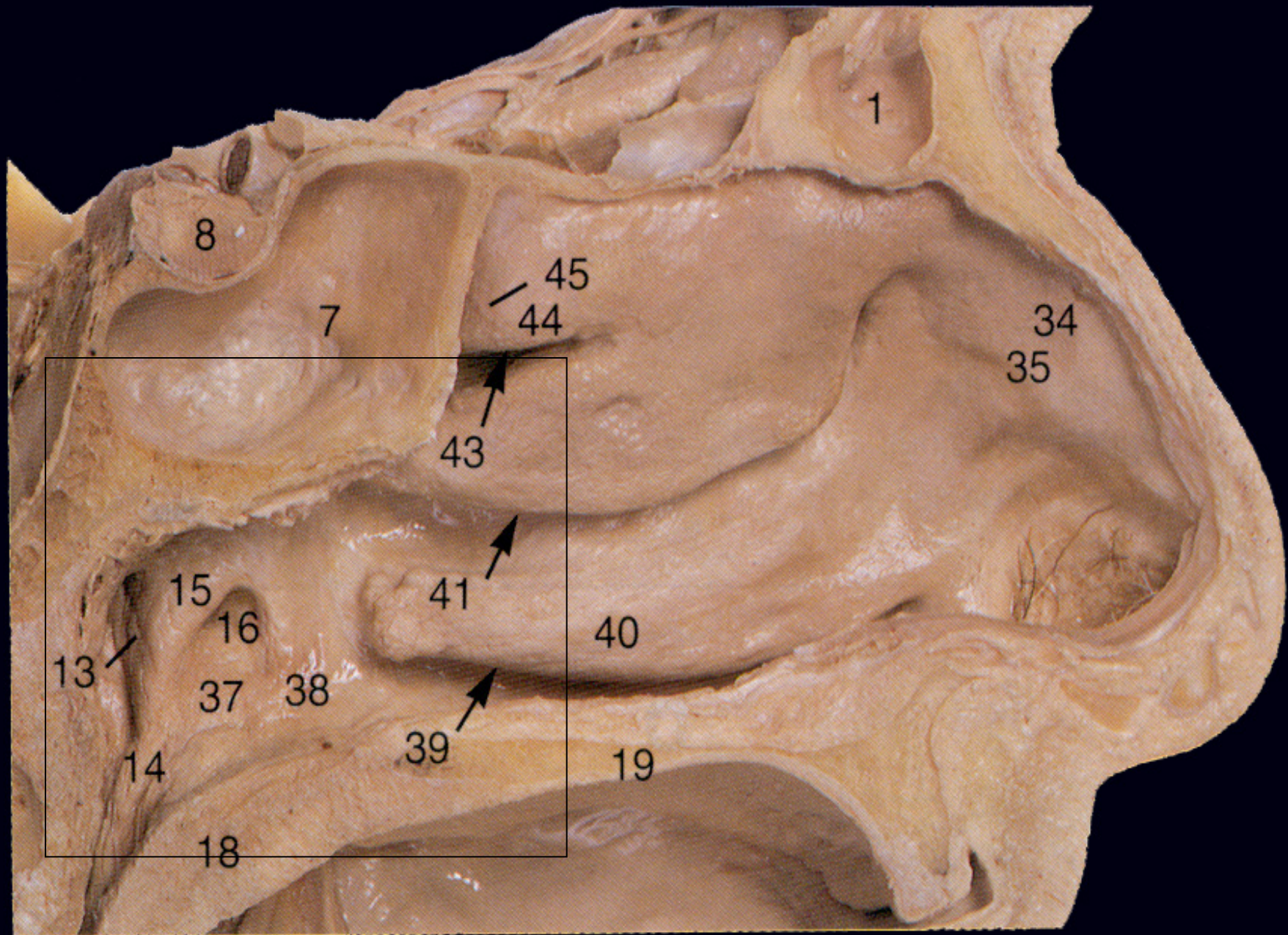
- **Anatomy (deep spaces)**
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  - **Snoring & sleep apnea**
  - **Acute infection**
  - **Complication of Infections**
  - **Chronic Pharyngitis**



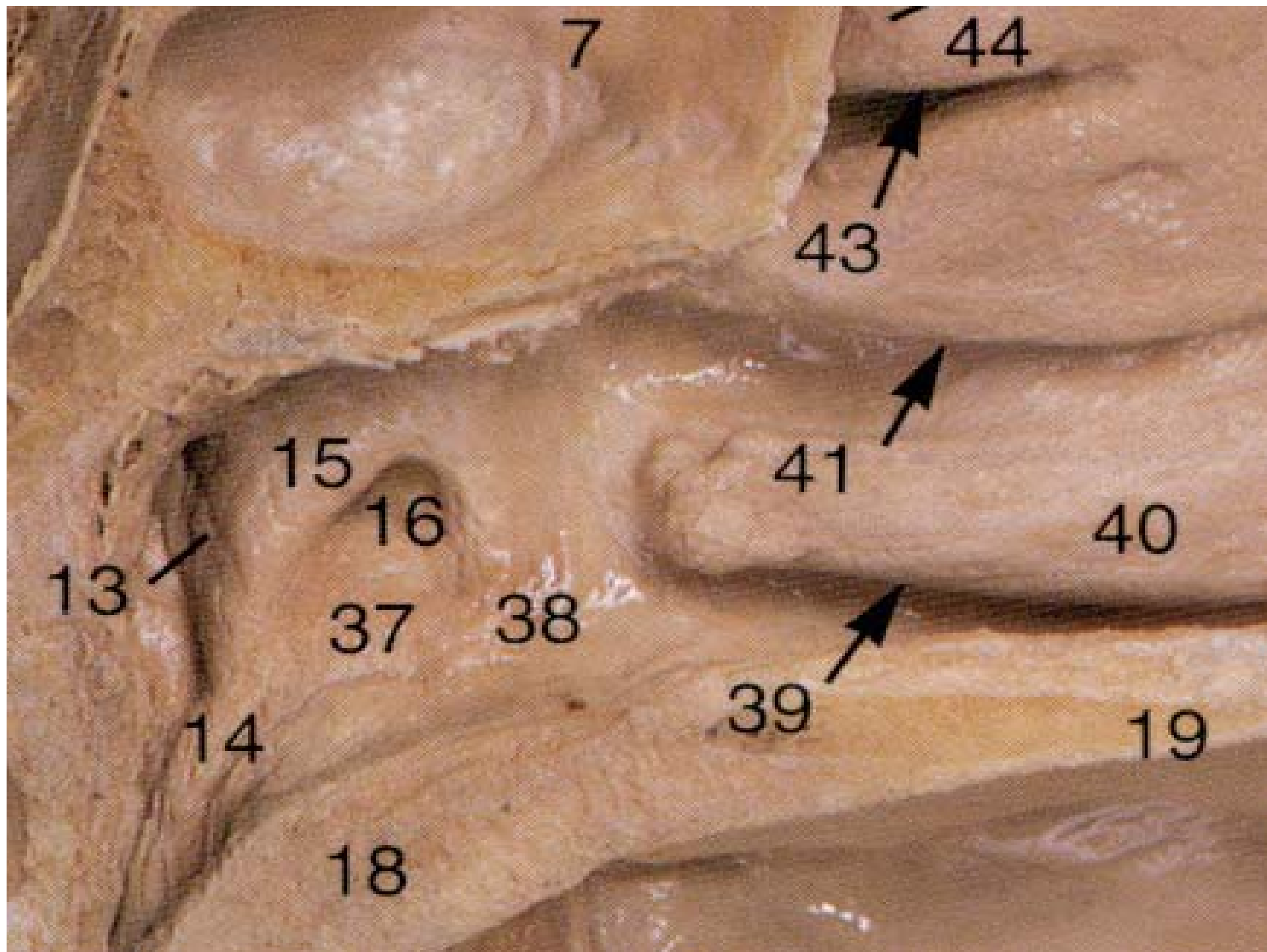
*Nasopharynx*

# *Nasopharynx*

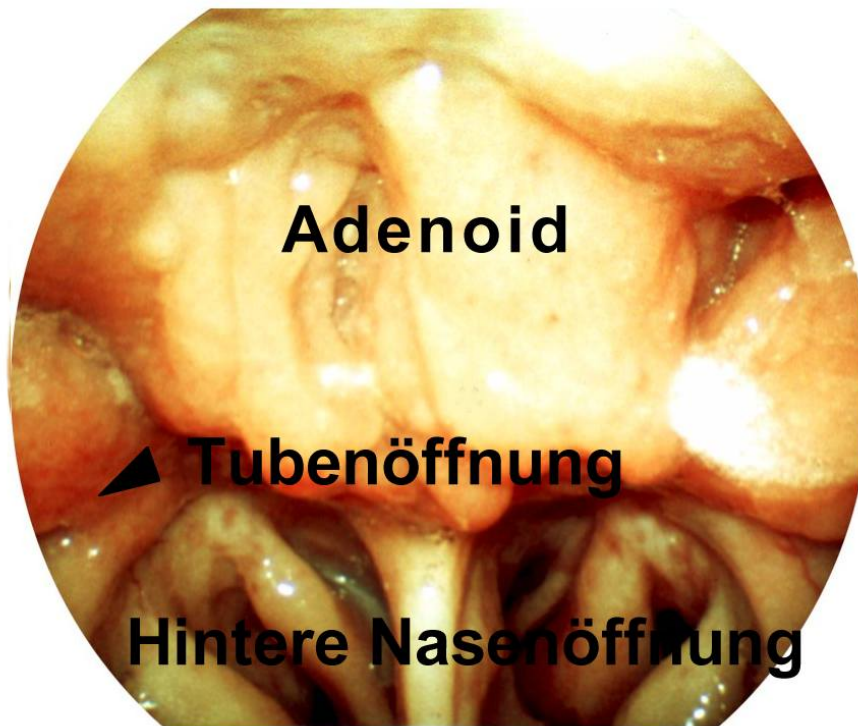
- Respiratory function
- Anterior: choana (posterior nasal aperture)
- Posterior: superior constrictor muscle
- Superior: basilar portion of occipital bone
- Inferior: soft palate







# Adenoid = الناميات





*Oropharynx*

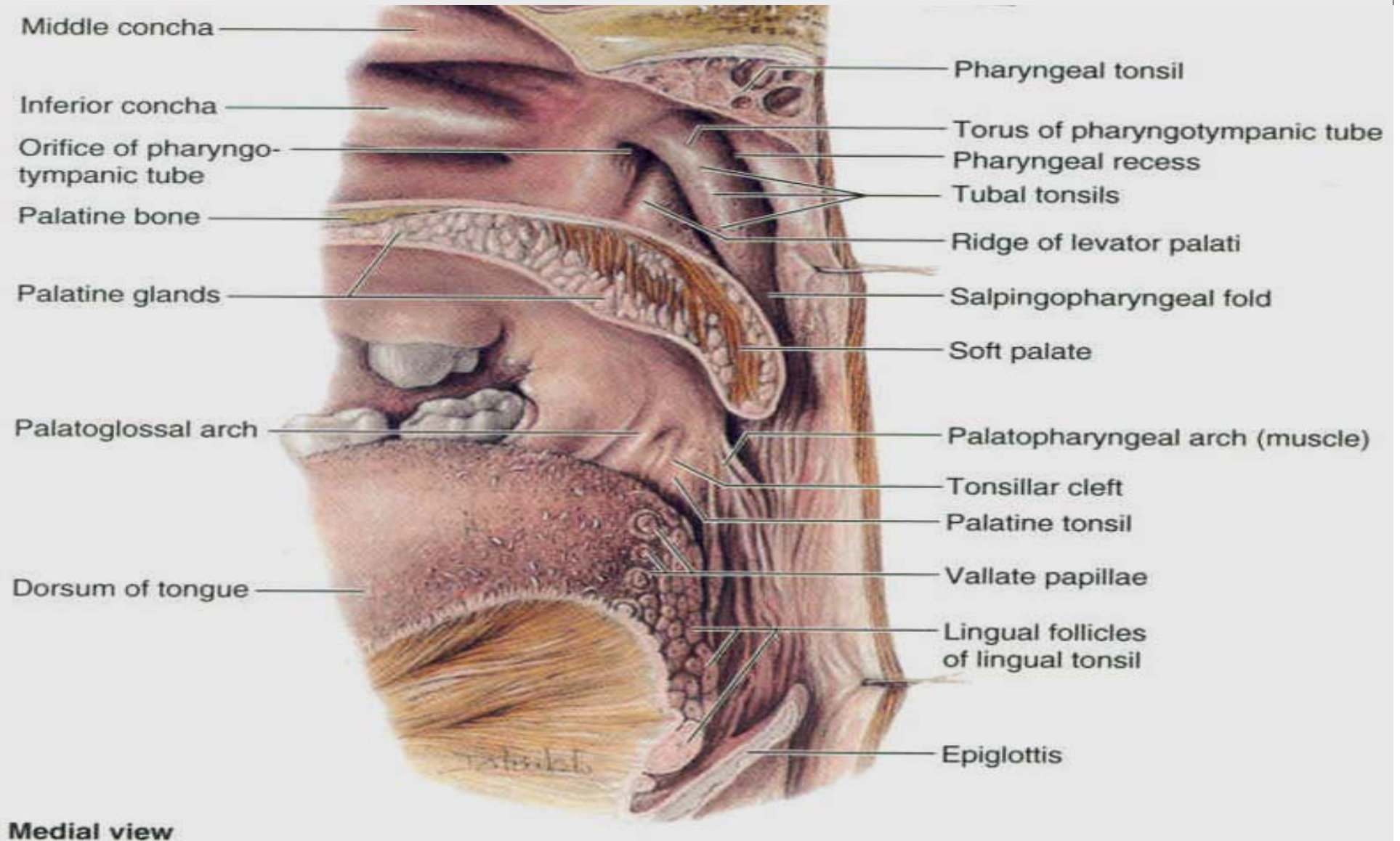
# الحلقوم = Orophaynx



(فلولا إذا بلغت الحلقوم و أنتم حينئذٍ تنظرون )

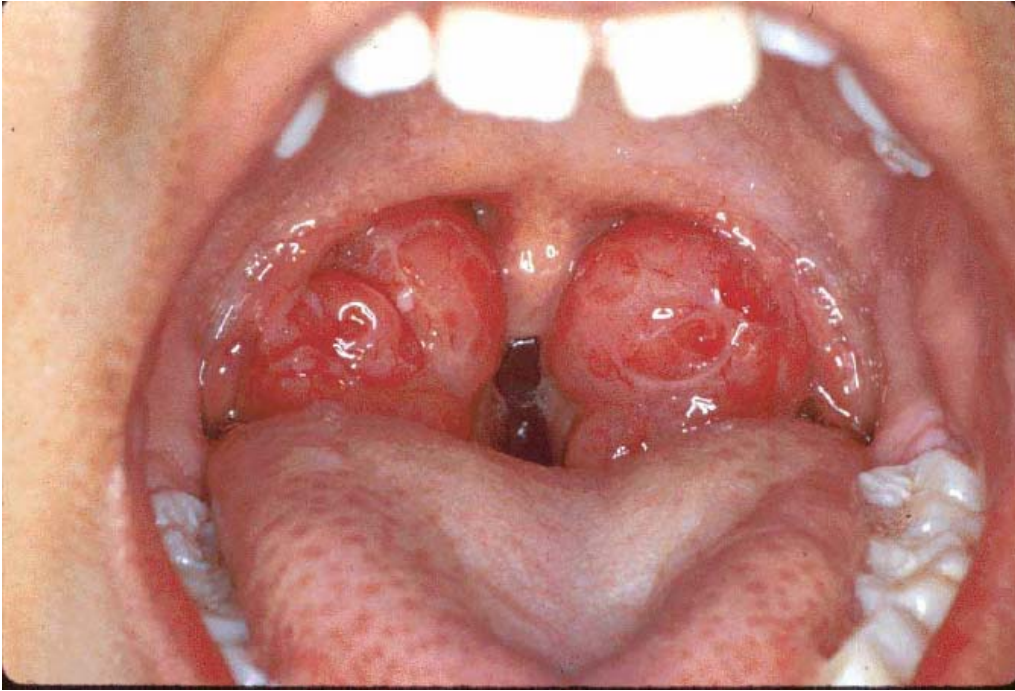
# *Oropharynx*

- Respiratory & Digestive function
- Anterior: anterior tonsillar pillar
- Posterior: superior & middle constrictors
- Superior: soft palate
- Inferior: base of tongue, superior epiglottis
- Laterally:
  - Palatoglossal
  - Palatopharyngeal arches
  - Parapharyngeal space





**Tonsil = لوزة**



*Hypopharynx*

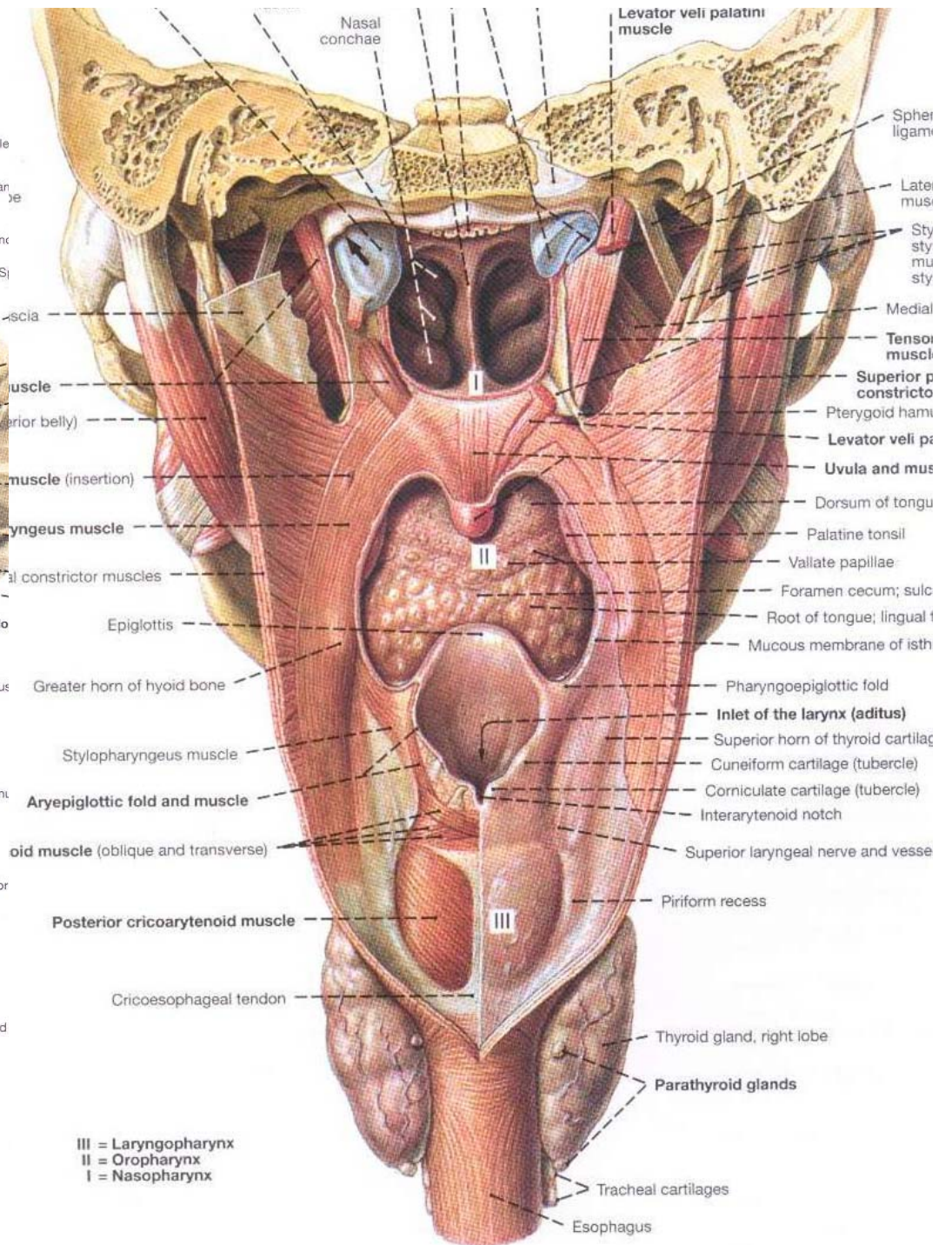
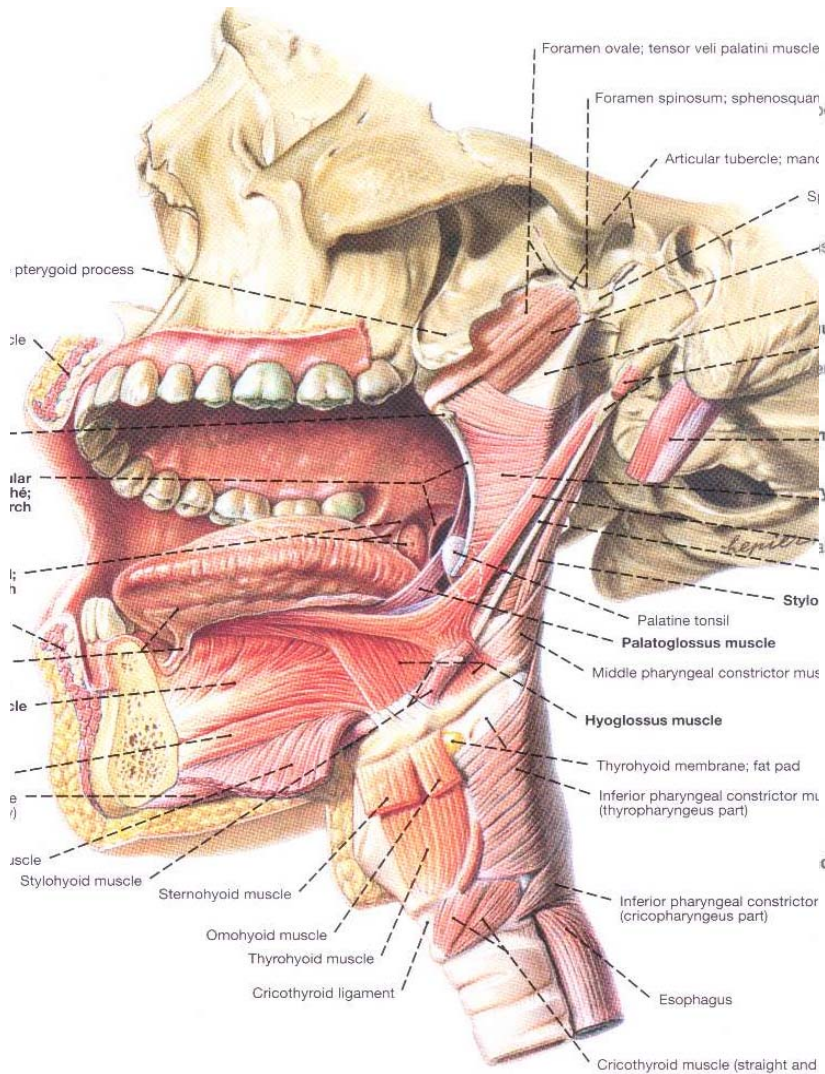


# *Hypopharynx*

- Digestive function
- Lies posterior to the larynx
- Superior: superior border of epiglottis and pharyngoepiglottic folds
- Inferior: inferior border of the cricoid
- Posterior/lateral: middle & inferior constrictors, bodies of C4-C6
- Anterior: laryngeal inlet

**Piriform = کھٹری**





III = Laryngopharynx  
 II = Oropharynx  
 I = Nasopharynx

# Pharyngeal muscles

- External circular and internal longitudinal (opposite in remainder of GI tract)
- External: 3 constrictors  
constrict wall of pharynx during swallow

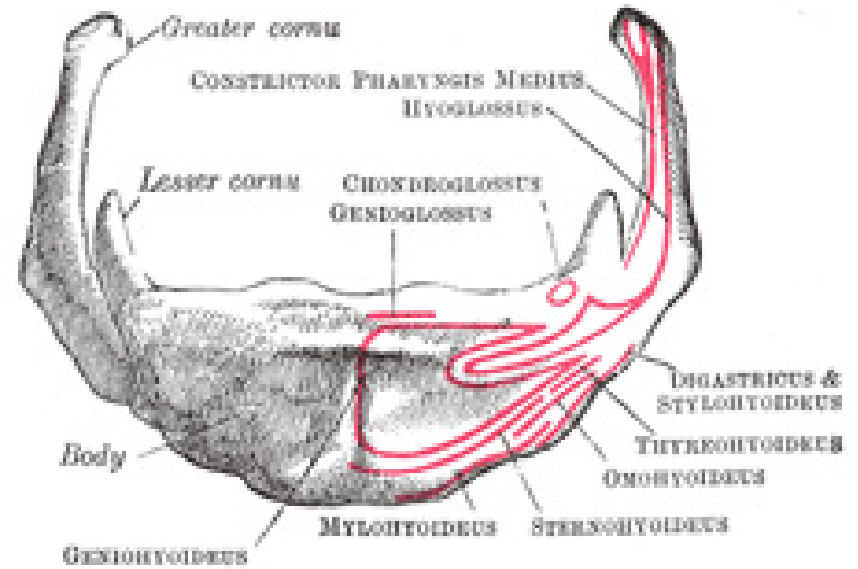
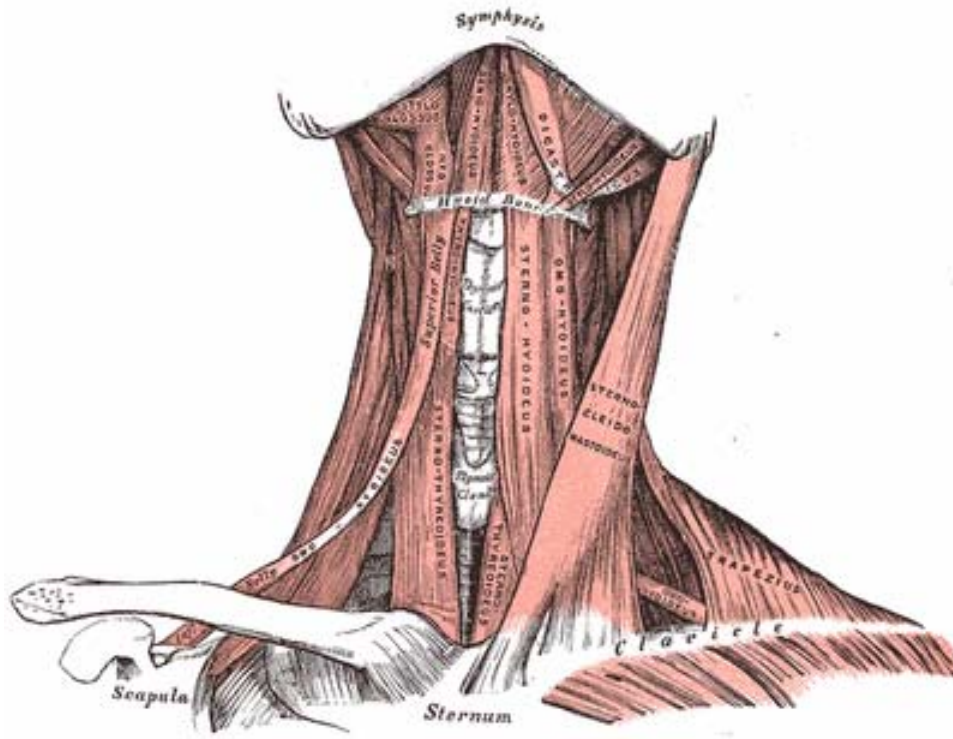
# ***Pharyngeal muscles***

## **Internal:**

- Elevate pharynx and larynx during speech/swallow
  1. Palatopharyngeus
  2. Salpingopharyngeus
  3. Stylopharyngeus
  4. Levator veli palatini
- Tenses soft palate & opens ET during yawn/swallow  
Tensor veli palatini (V3)
- Approximates tongue and soft palate  
Palatoglossus (CN XI via X)



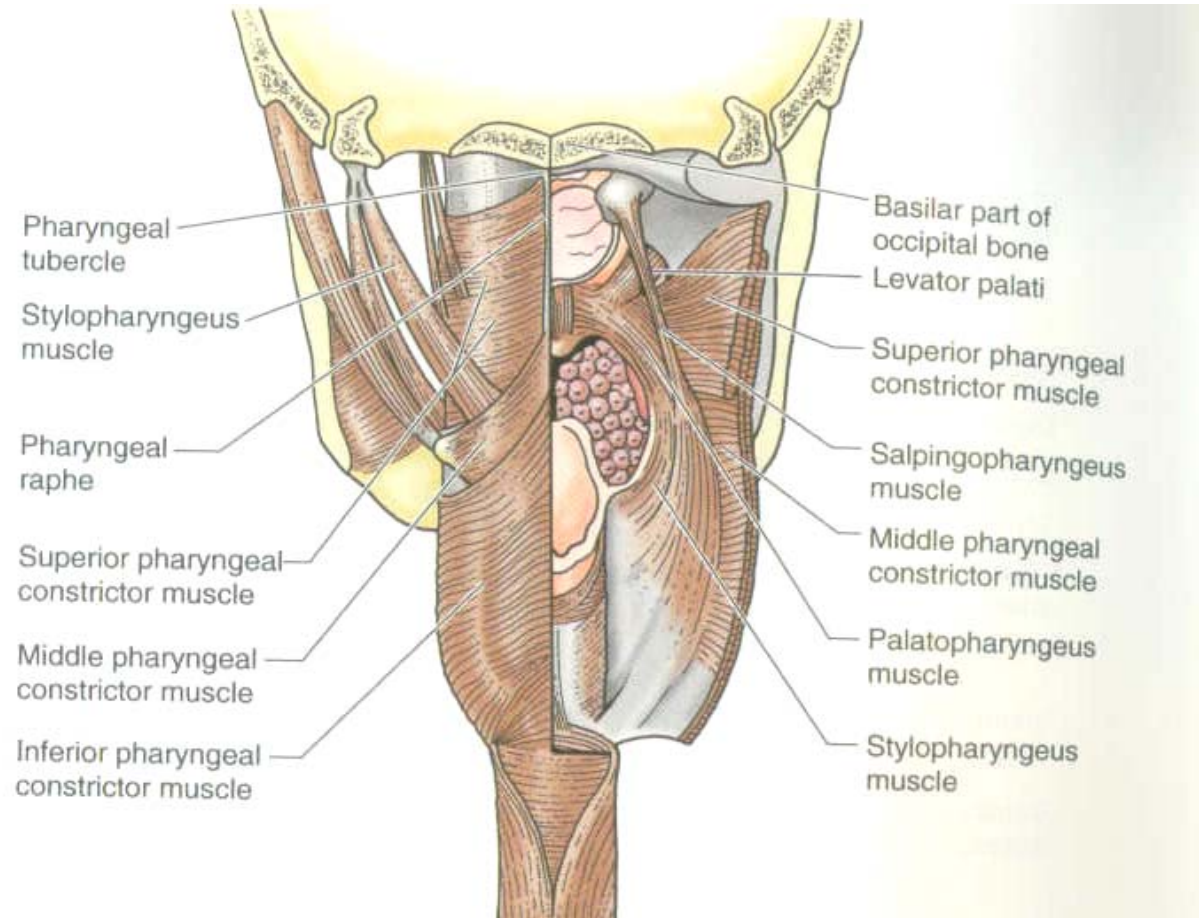
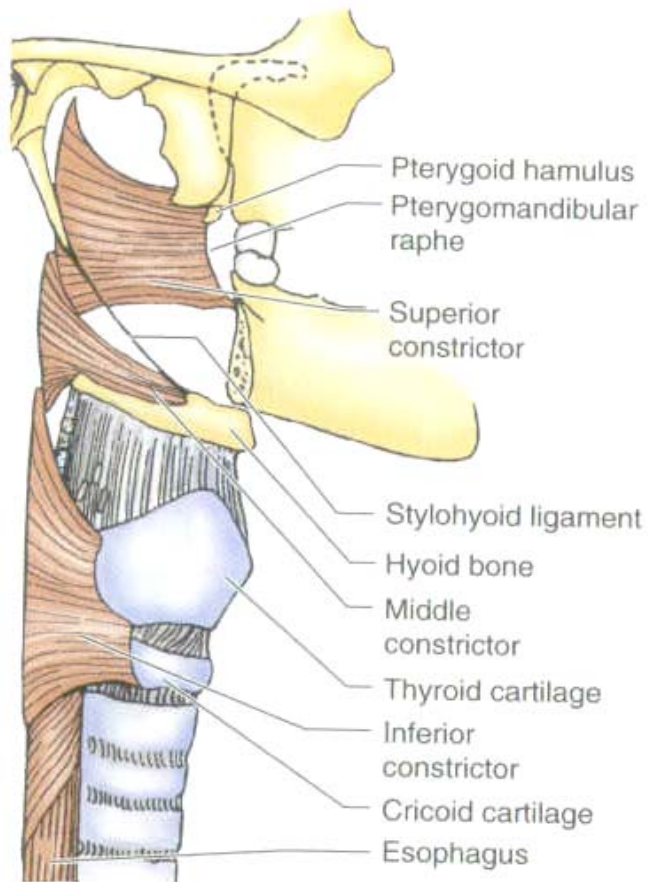
# لامى = Hyoid



(وَتَأْكُلُونَ الثُّرَاثَ أَكْثَرًا لَمَّا ) أي الجمع من كل اتجاه



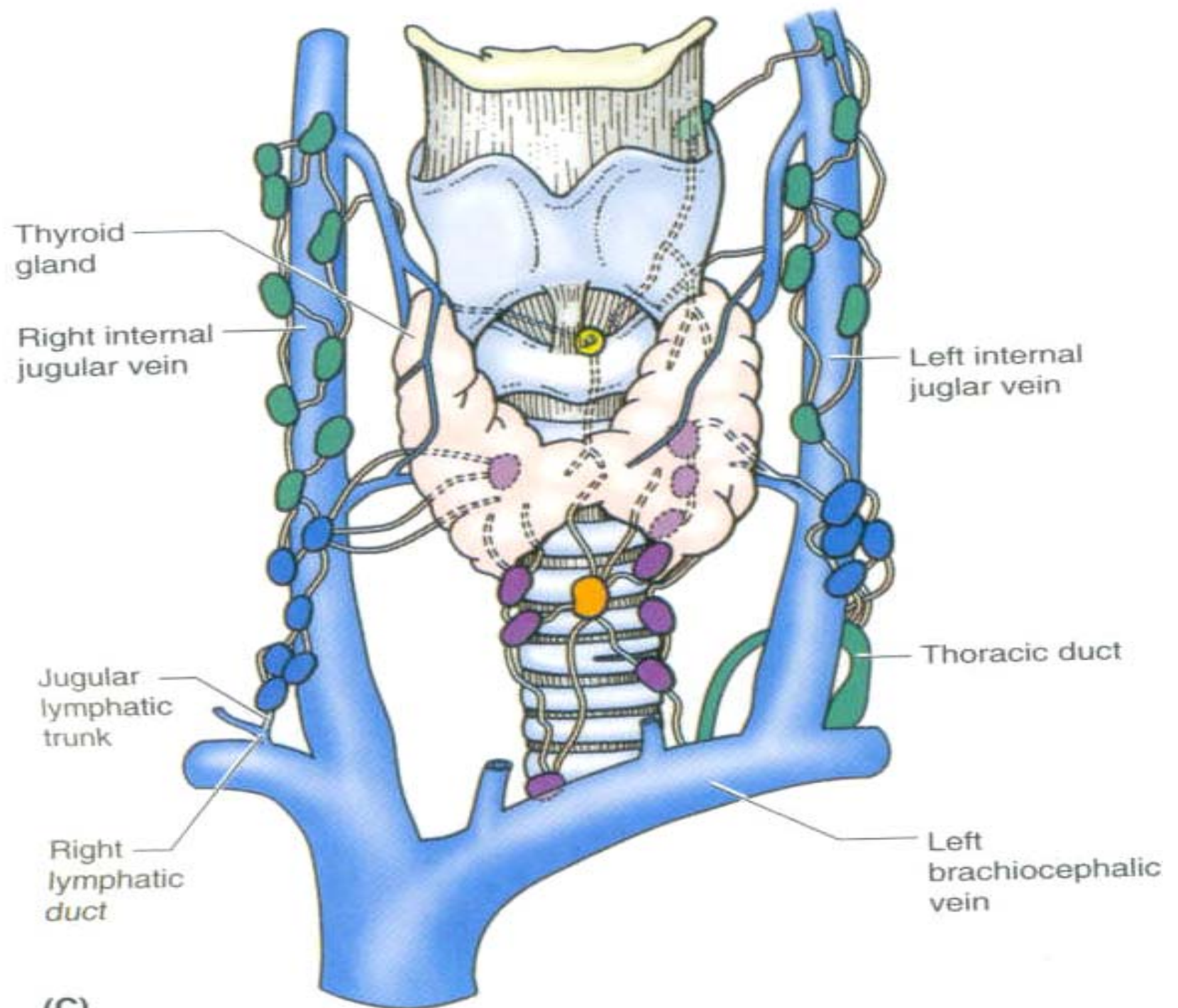
# Pharyngeal muscles



# Pharyngeal lymphatic drainage

- Nasopharynx → Retropharyngeal space
- Oropharynx → Parapharyngeal space
- Hypopharynx → Neck



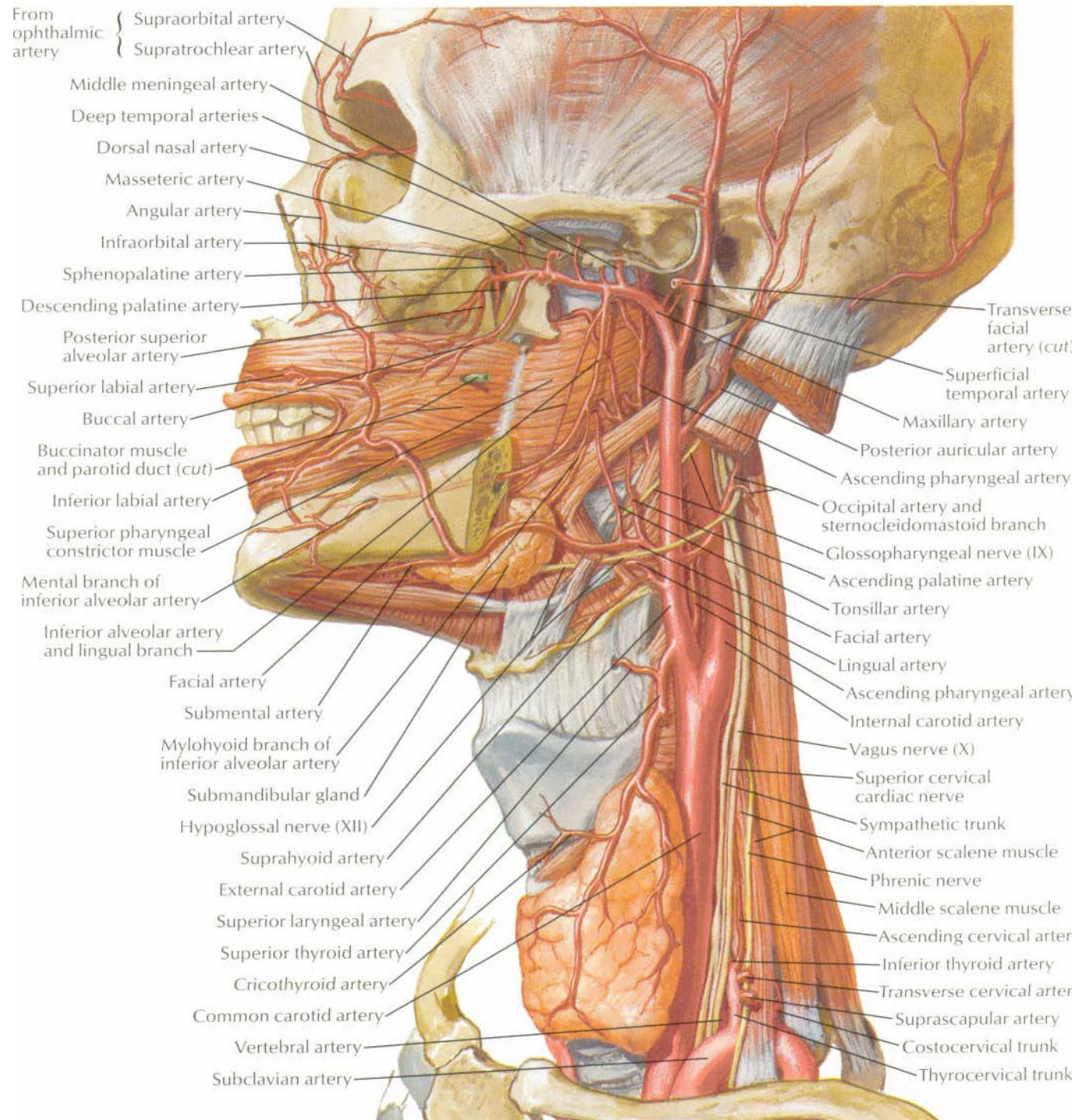


# وداجي = Jugular



"إِنْتَفَخَتْ أَوْدَاجُهُ."



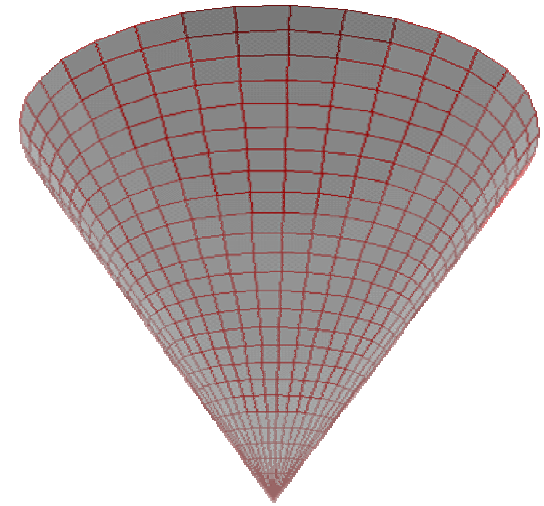


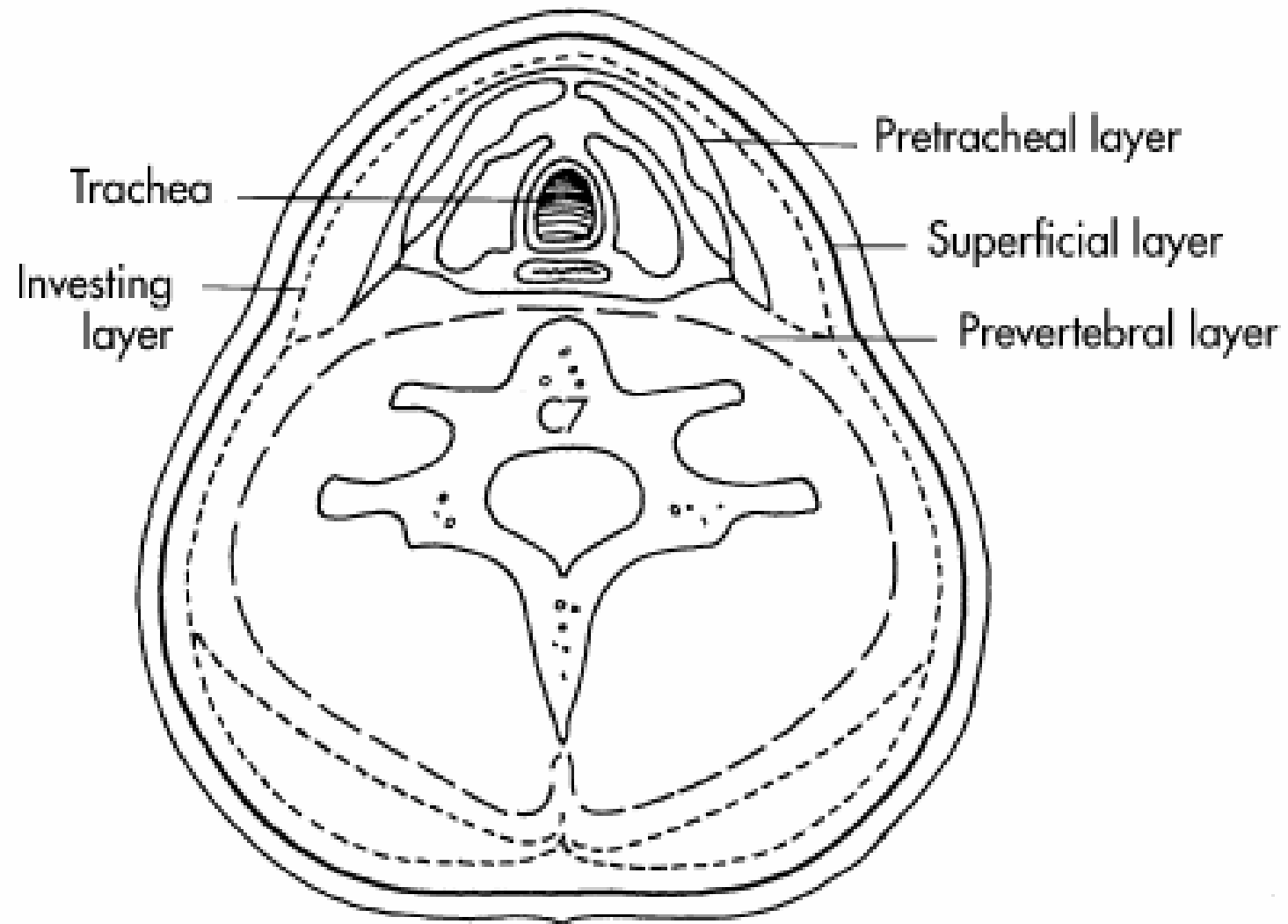
# **Parapharyngeal space (PPS)**

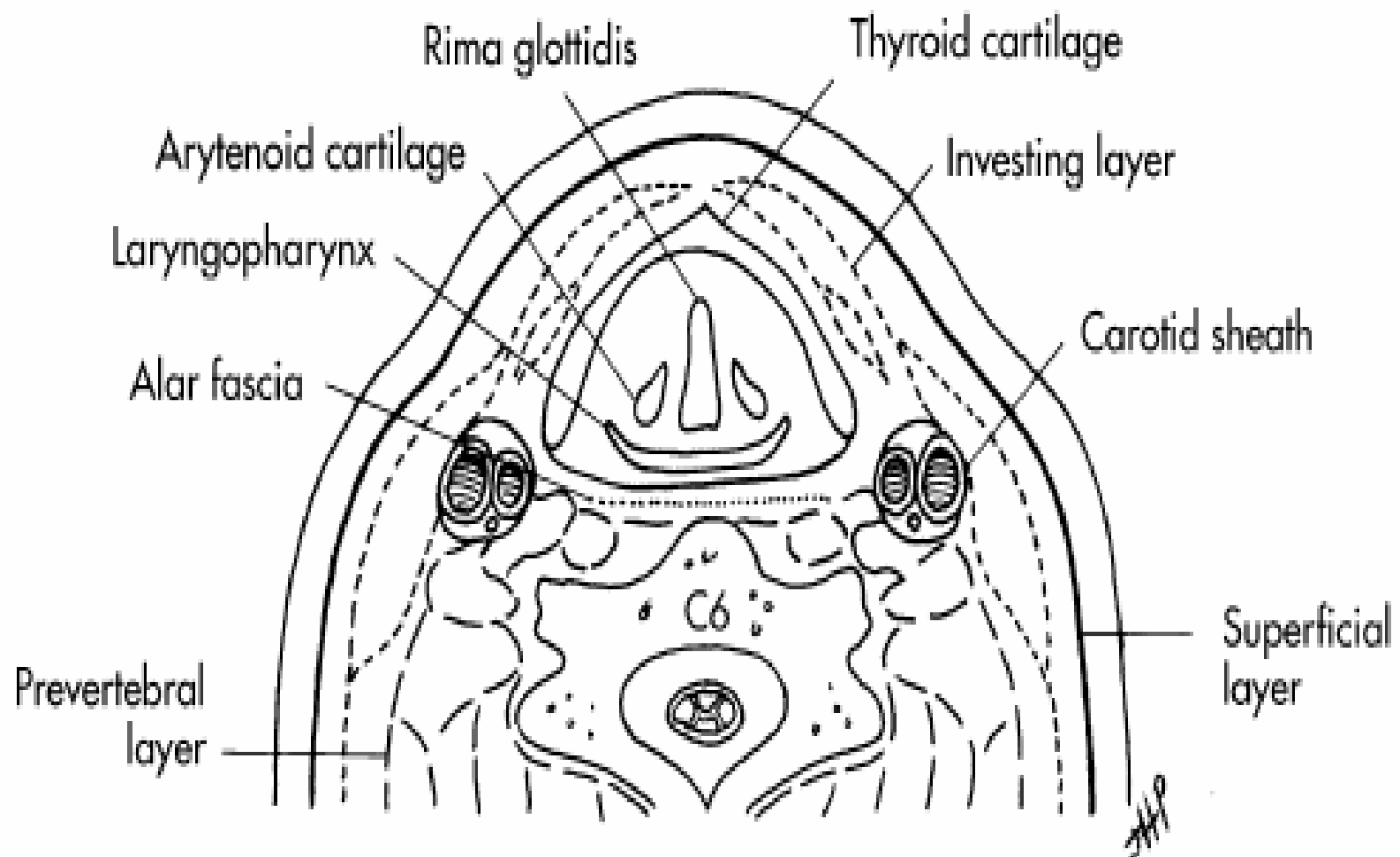


# The parapharyngeal space (PPS)

- Cone shaped
  - Base at temporal bone
  - Apex at the hyoid bone
- Between
  - Pharyngeal
  - Lat + med pterygoid muscles
- Most frequently involved with infections







# Contents

- Loose fibrofatty tissues
- Carotid artery
- Internal jugular vein
- Cranial nerves IX, X, XI, and XII;
- Cervical sympathetic chain
- Lymph nodes
  - Nasal cavity, paranasal sinuses
  - Nasopharynx and oropharynx,
  - Mastoid tip

# Communication

- Submandibular
- Retropharyngeal
- Parotid spaces
- Masticator
- Peritonsillar

# **Retropharyngeal space**



# Retropharyngeal space

- Between
  - Prevertebral fascia
  - Posterior pharyngeal wall and esophagus fascia
- From
  - Skull base
  - Tracheal bifurcation
- Major route → mediastinum.

# *Anatomy*

- Skull base
  - Cricoid cartilage anteriorly
  - Inferior border of C6 posteriorly
- Widest portion (5cm) at hyoid
- Narrowest portion (1.5cm) at caudal end
- Divided into 3 parts:
  - Nasopharynx
  - Oropharynx
  - Hypopharynx

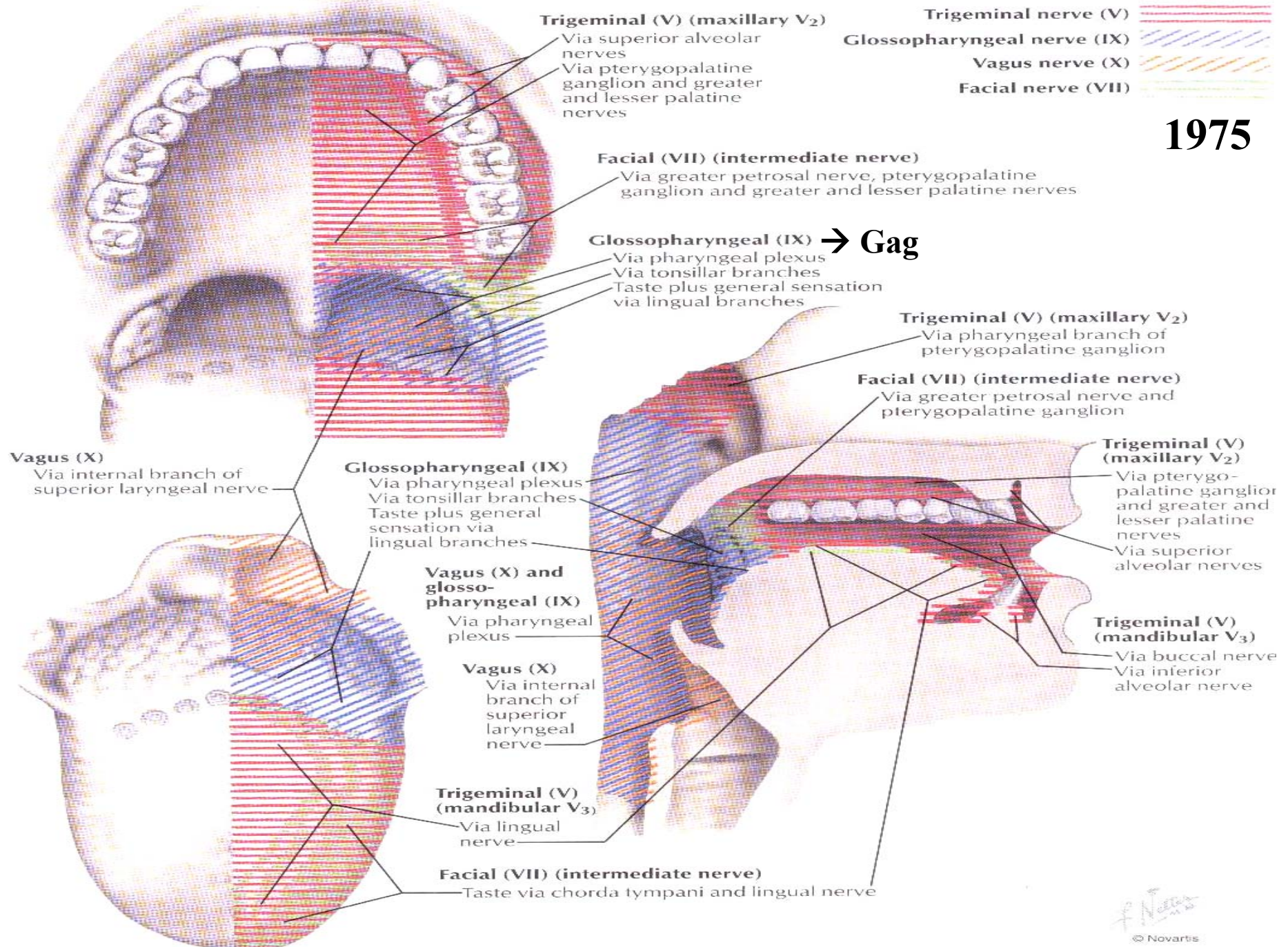
# Contents

Contains LN (<5 Y) that receive from

- Nose
- Nasopharynx
- Paranasal sinuses
- Oropharynx
- Middle ear

# **Afferent innervation of pharynx**

1975



# *Pharynx*

- **Anatomy (deep spaces)**
- **Physiology**
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  - **Complication of Ix**
  - **Chronic Pharyngitis**

# *Physiology*

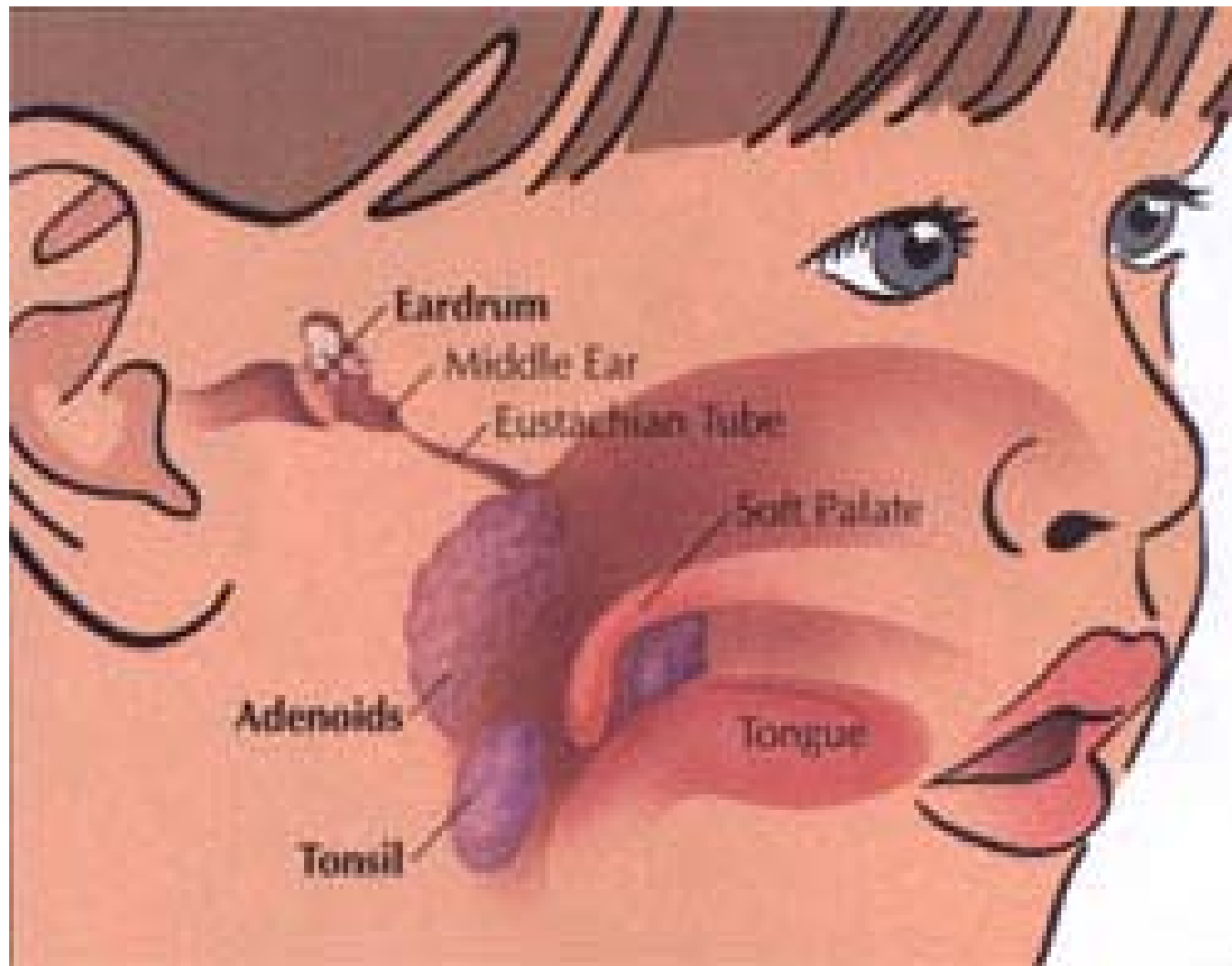
- Breathing (Inspiration + Expiration)
- Speech (Expiration)
- Swallowing (Expiration) **2000/day**
- Ventilation (ME)
- Immunity



# *Pharynx*

- **Anatomy (deep spaces)**
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# ***Adenoid***



# Adenoid

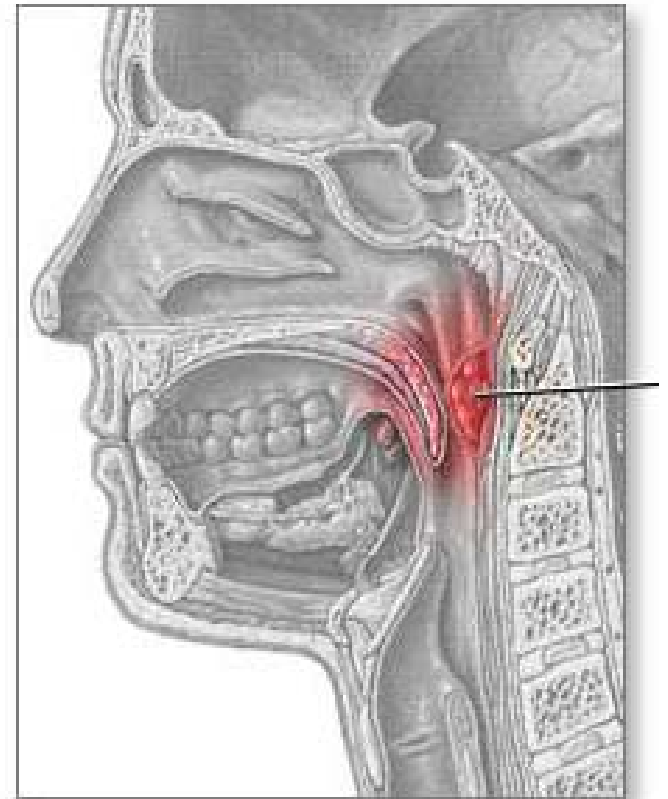
---

- **Child**
- **Snoring**
- **Mouth breathing**
- **Nasal Tone**
- **Bilateral OME**
- **Bilateral nasal obstruction**



# PreOp Evaluation of Adenoid Disease

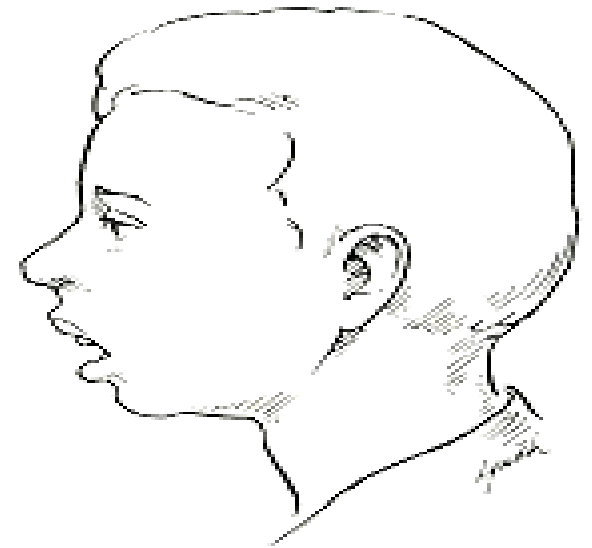
- Triad of
  - Hyponasality
  - Snoring
  - Mouth breathing
- Rhinorrhea
- Nocturnal cough
- Post nasal drip



# Pre-Op Evaluation of Adenoid Disease

## “Adenoid face”

- “Micky Mouse”
- Overbite
- Long face
- Crowded incisors



# PreOp Evaluation of Adenoid Disease

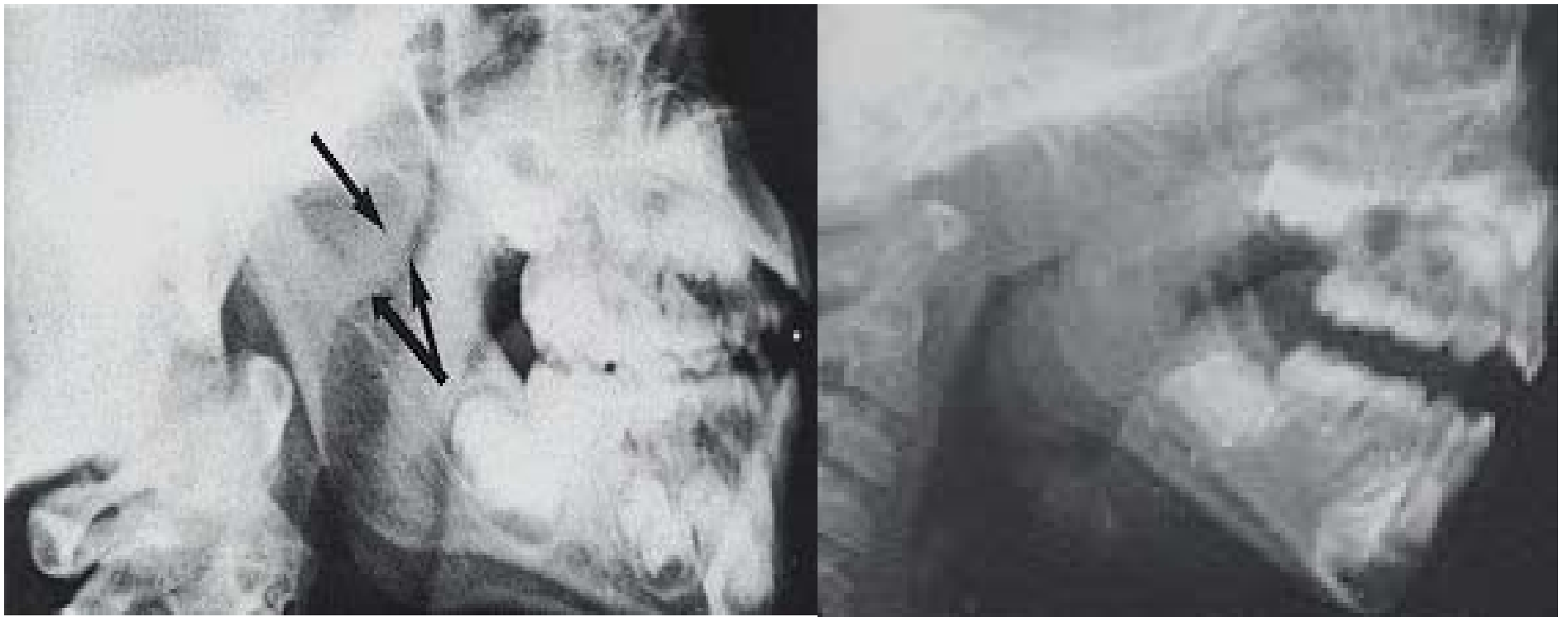
## Differential diagnoses

- Allergic rhinitis
- Sinusitis
- GERD
- DNS

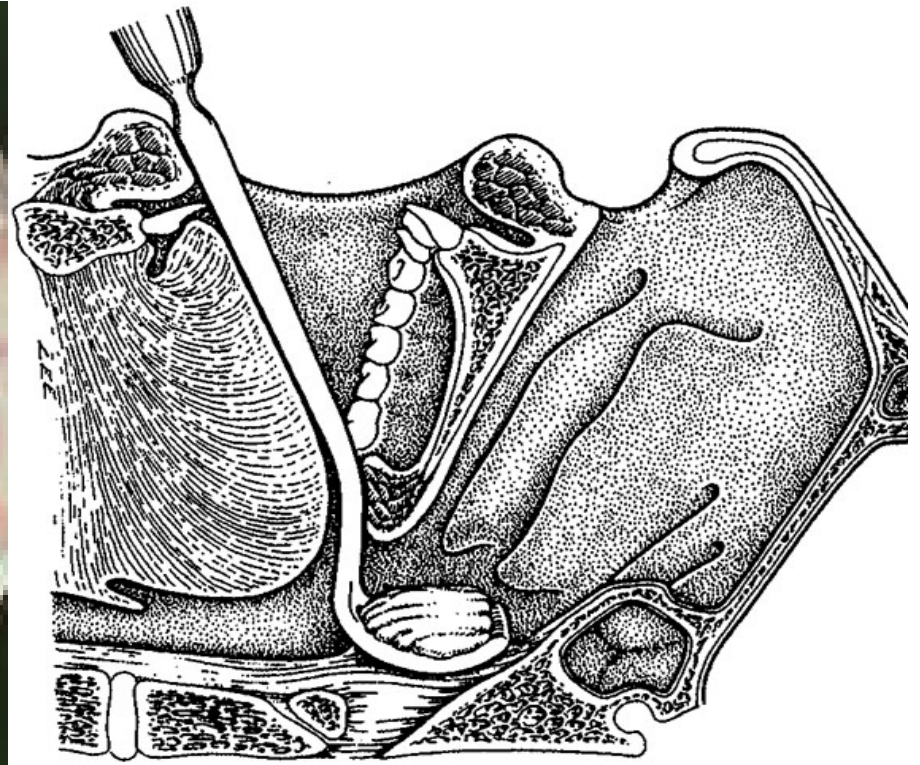




# **PreOp Evaluation of Adenoid Disease**



**Lateral neck films**



# *Pharynx*

- **Anatomy (deep spaces)**
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# **Obstructive Sleep Apnea**

- 1. Cessation of air flow**
  - 2. > 10 Seconds**
  - 3. Chest and abdominal effort**
- 3 % children**

# Pathophysiology

- Desaturation
- arousal with restoration of airway
- sleep fragmentation → hypersomnolence
- core pulmonale

# **Pathophysiology - complications**

- Desaturation → Polycythemia
- Hypercapnia → pulmonary hypertension
- Systemic hypertension
- Arrhythmias

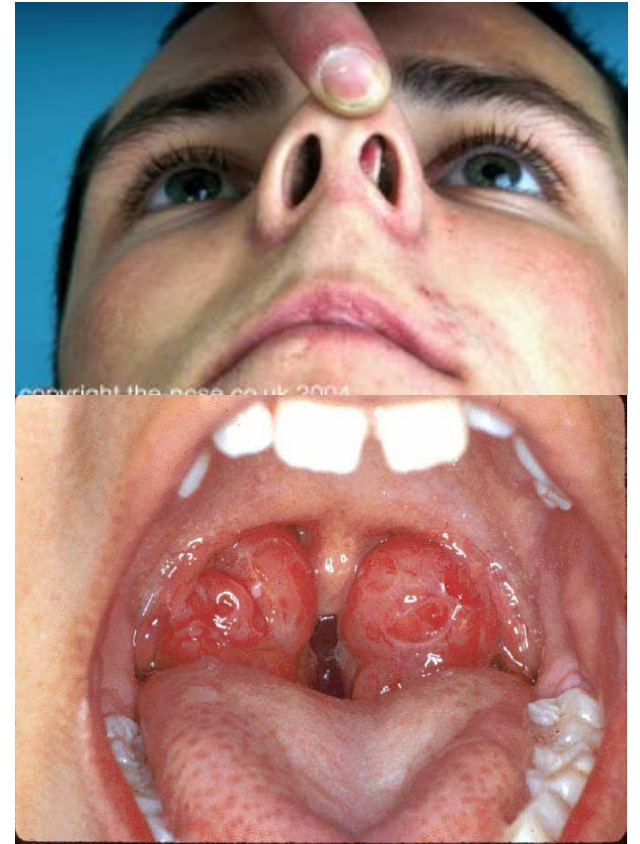


# **Obstructive Sleep Apnea Syndrome**

- Snoring
- Disturbance of sleep
- Sleepiness, difficult arousal
- Failure to thrive
- Behavioral concerns
- Impaired cognitive skills (school performance)
- Behavioral problems
- Nocturnal enuresis

# Evaluation - physical exam

- Nose DNS, Turbinate
- Throat
- Fiberoptic examination

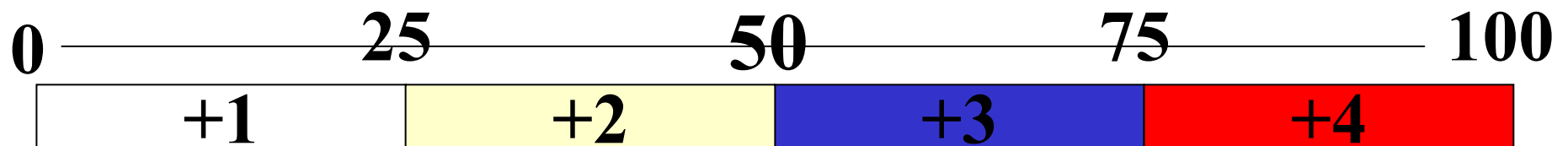
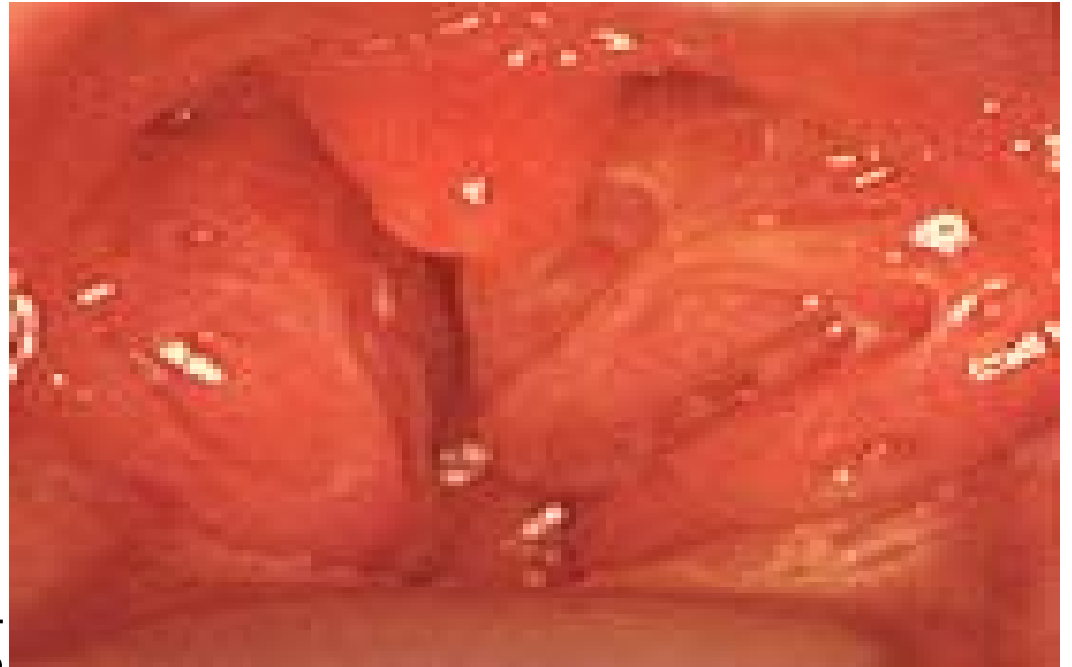




# Pre-Op Evaluation

Tonsil size (occupation of oropharynx)

- 0 in fossa
- +1 <25%
- +2 25-50%
- +3 50-75%
- +4 >75% kissing



# Complications

- Growth
- Cardiovascular
- Gastrointestinal
- Pulmonary
- Behavioral
- Neurologic
- Surgical

# Complications

## Growth

- Failure to thrive
- Short stature
- Impaired growth hormone release

## Cardiovascular

- Cor Pulmonale/Pulmonary hypertension
- Polycythemia
- Arrhythmia
- Possible systemic hypertension



# Complications

## Gastrointestinal

- Feeding difficulties
- Gastroesophageal reflux

## Pulmonary

- Chronic aspiration
- Pulmonary edema (Post operative)
- Pectus excavatum



# Complications

## Behavioral

- Developmental delay
- Behavioral problems
- School problems



## Neurologic

- Nocturnal enuresis
- Lethargy/dull effect
- Hypoxia induced headaches



# Nocturnal Enuresis

Surgical removal of upper airway obstruction  
led to a significant decrease in or complete  
cure of nocturnal enuresis in 75% of  
children studied



# **Guidelines for evaluation**

## **Provisional diagnosis**

History/physical

## **Screening tests**

Brief observation in the clinic

Overnight oximetry

## **Tests to diagnose**

Sleep studies.

# Treatment

- Treat underlining cause
- Adeno-tonsillelectomy
- ICU

# *Pharynx*

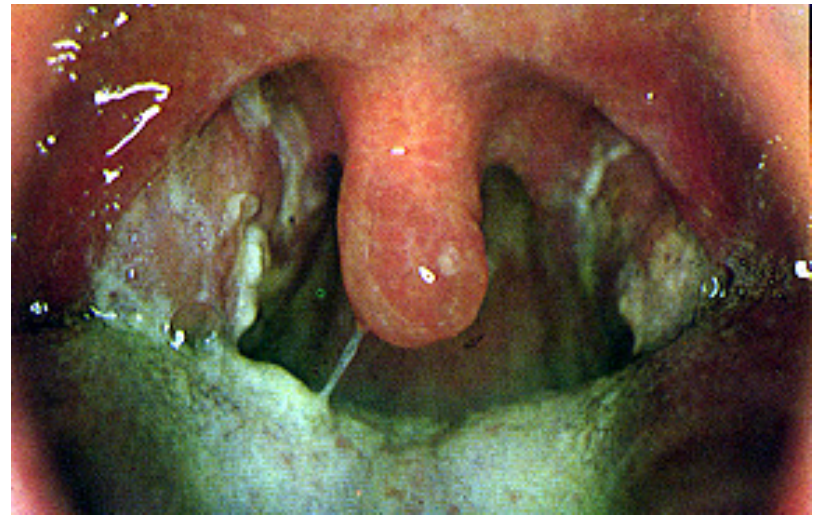
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# Acute Adenotonsillitis

## Etiology

- 70% viruses
- 20% bacterial
- 40% are beta-lactamase-producing
- GABHS



# S/S

- Dysphagia,
- Headache,
- Painful cervical lymphadenitis,
- Fever
- Exudate,
- Absence of cough, and hoarseness.

# **Microbiology of Adenotonsillitis**

Most common organisms in chronic tonsillitis  
(recurrent/chronic infection, hyperplasia)

- Strept pyogenes (Group A beta-hemolytic) GABHS
- H.influenza
- S. aureus
- Streptococcus pneumoniae

# **Acute Adenotonsillitis**

## Differential diagnosis

Infectious mononucleosis

Malignancy: lymphoma, leukemia,  
carcinoma

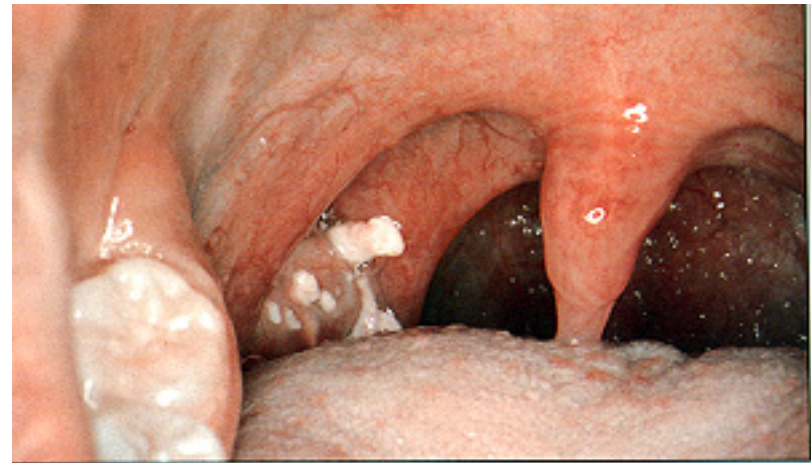
Diphtheria

Scarlet fever

Agranulocytosis

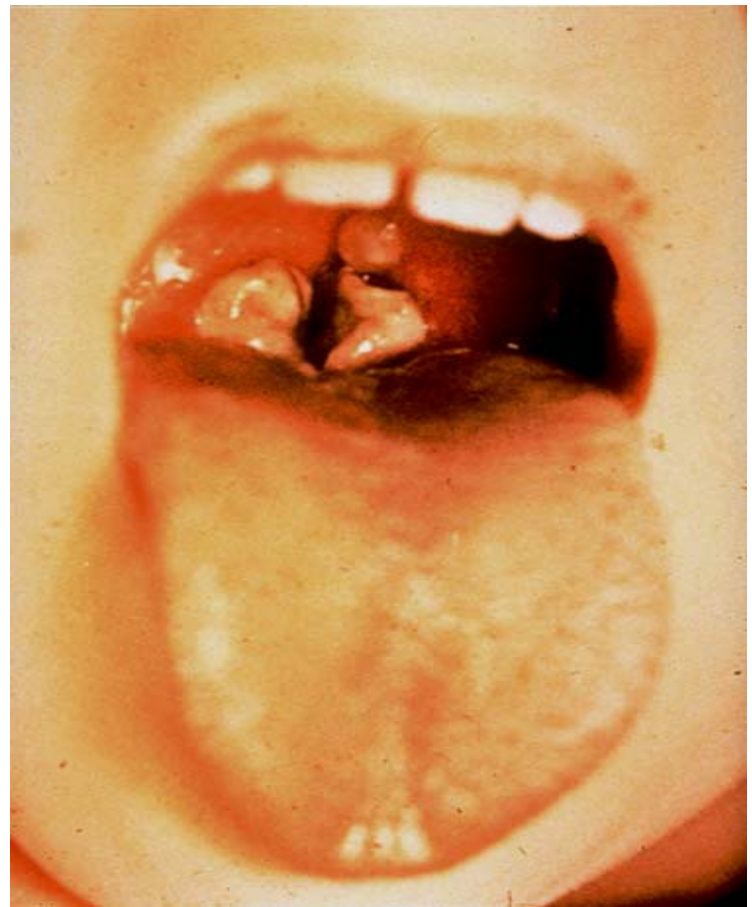
# Other Tonsillar Pathology

- Hyperkeratosis,  
mycosis leptothrica
- Tonsilloliths



# Diphtheria

- Sore throat
- Malaise
- low-grade fever
- Pseudomembrane
- Airway obstruction
- Unimmunized patient



# Vincent angina

- **Acute oropharyngeal ulcerative**
- **G-ve anaerobic**
- **Poor oral hygiene (fetid breath) → malnutrition → fatigue**
- **Pseudomembranous ulceration**
- **Cervical lymphadenopathy**
- **Penicillin and metronidazole**



# Infectious mononucleosis

- Fever
- Fatigue
- Cervical LN
- Jaundice
- Epstein-Barr virus
- Atypical lymphocytes
- “Monospot”





**Scarlet fever = الحمى القرمزية**



# Thrush = السلاق

- Fungal infection  
Candidiasis is the most common
- Pseudomembranous candidiasis (thrush)
- DM or immunodeficiency



سَلَقَ الْوَلَدَ بِالْعَصَا : أَيِ ضَرْبَهُ ضَرْبًا مُبَرِّحًا إِلَى أَنْ نَزَعَ جِلْدَهُ فَبَيَضَ  
"سَلَقَهُ بِالْكَلَامِ" : لَدَغَهُ، آذَاهُ. (فَإِذَا ذَهَبَ الْخَوْفُ سَلَفُوكُمْ بِأَلْسِنَةٍ حِدَادٍ )

# Syphilis



# Retention Cysts



# ***Tonsillar Cleft***



# Medical Management

- PCN is first line
- Steroids
- IV abx,
- Recurrent, chronic tonsillitis or obstruction  
→ tonsillectomy

# Complications

- Nonsuppurative complications of GABHS
  - poststreptococcal glomerulonephritis
  - acute rheumatic fever (ARF).
- unclear pathogenesis ? immune mediated.

# Acute rheumatic fever

- 2 major manifestations, or 1 major and 2 minor
- **Major manifestations CASE**

1. Carditis
2. Polyarthritits
3. Chorea
4. Erythema marginatum
5. Subcutaneous nodules.



- **Minor manifestations *FLAP***

1. Arthralgia
2. Fever
3. laboratory elevated ESR or C-reactive protein
4. prolonged PR interval on



# Unilateral Tonsillar Enlargement

Apparent enlargement vs true enlargement

Non-neoplastic:

- Acute infective
- Chronic infective
- Hypertrophy
- Congenital

Neoplastic

# **Indications for Tonsillectomy**

## **AAO-HNS:**

- 3 or more episodes/year
- Hypertrophy causing malocclusion
- PTA unresponsive to non-surgical Mx
- Halitosis, not responsive to medical therapy
- UTE, suspicious for malignancy
- Individual considerations

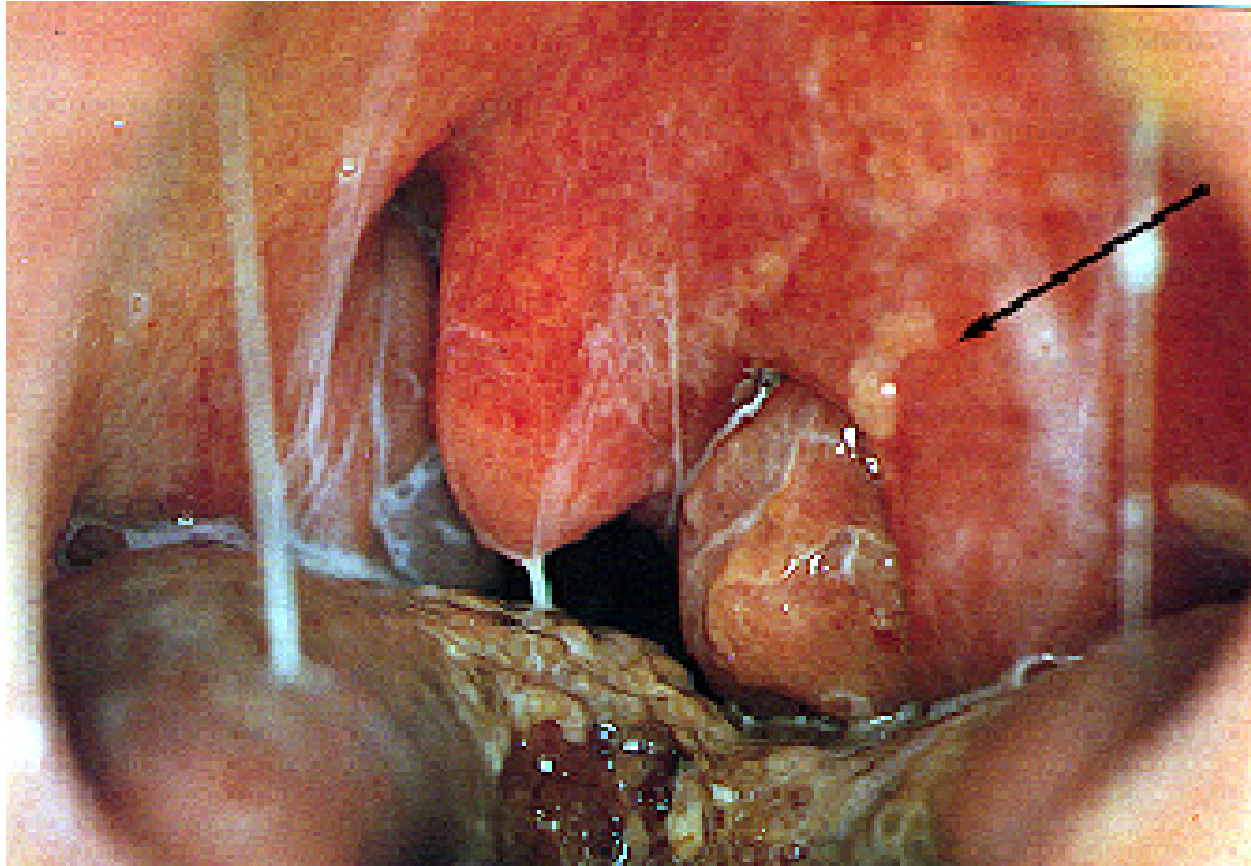
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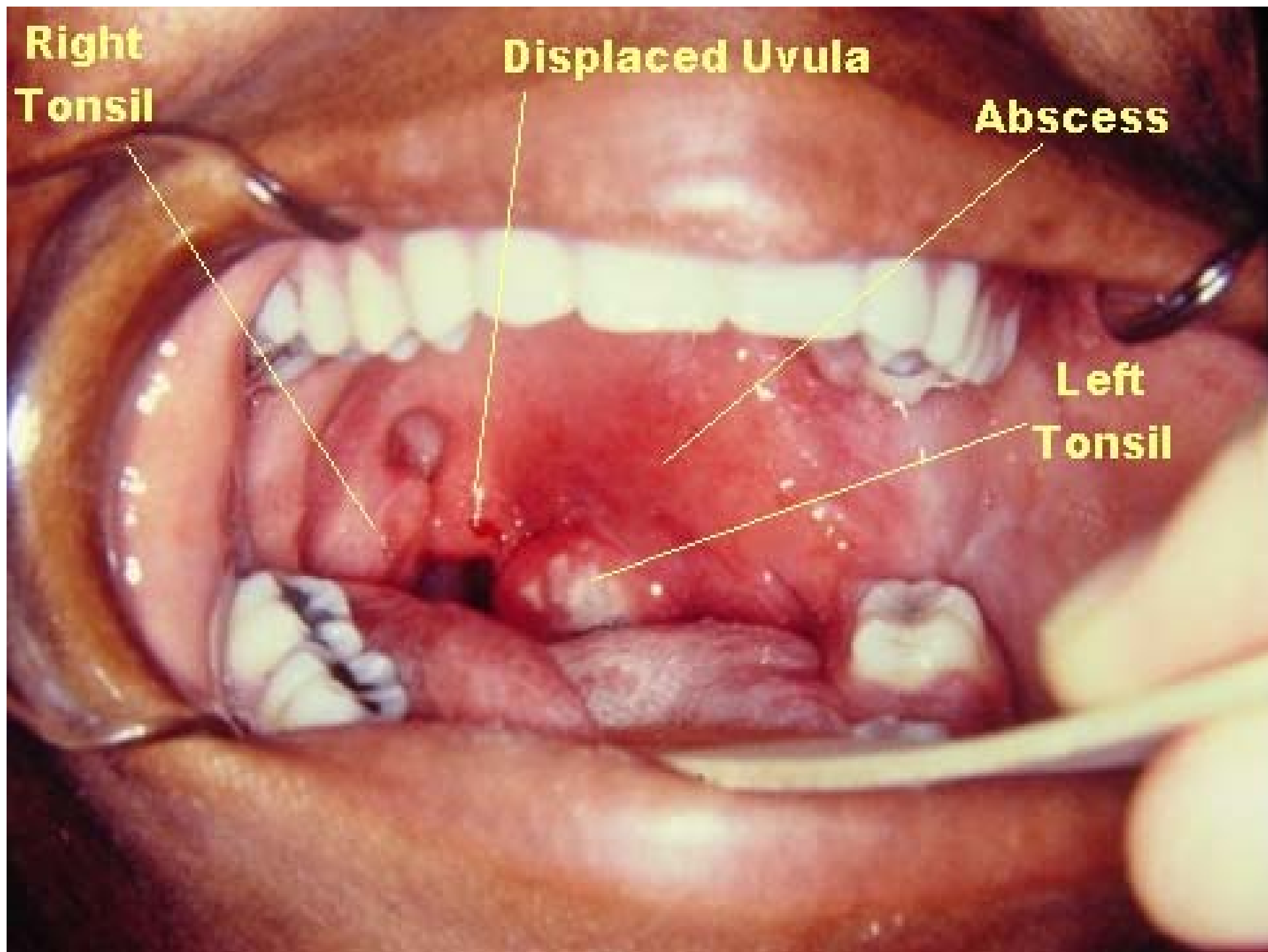
# **Complication of Ix**

- **Peritonsillar Abscess (Quinsy) PTA**
- **Parapharyngeal infection PPA**
- **Retropharyngeal infection RPA**
- **Ludwig's angina**

# Peritonsillar Abscess

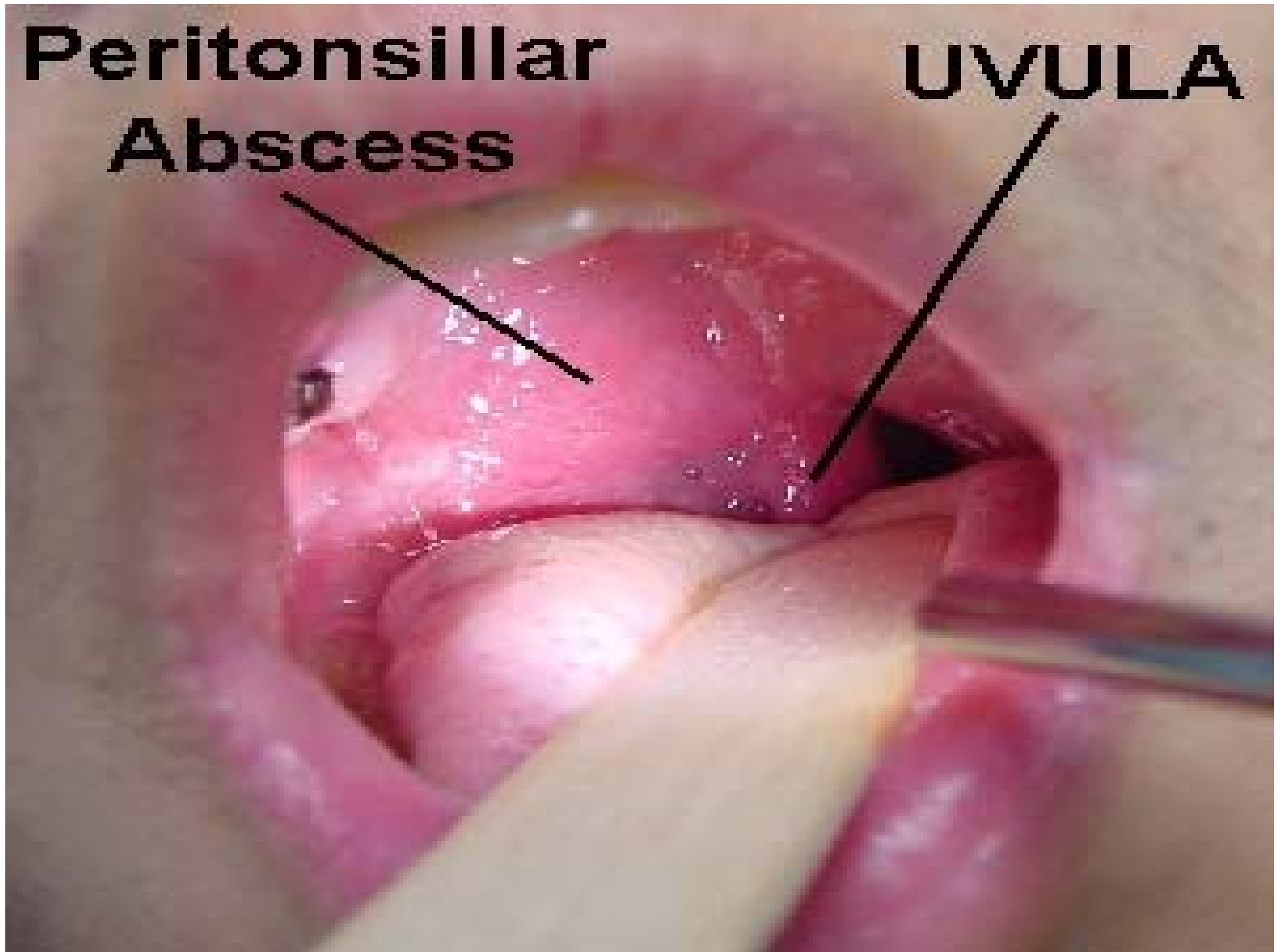






**Peritonsillar  
Abscess**

**UVULA**





# **Parapharyngeal abscess**

# **Parapharyngeal abscess**

## **clinical features**

- Dysphagia
- Trismus
- Fever
- Neck erythema
- Neck swelling
- Medial displacement of lateral pharyngeal wall

# Parapharyngeal abscess

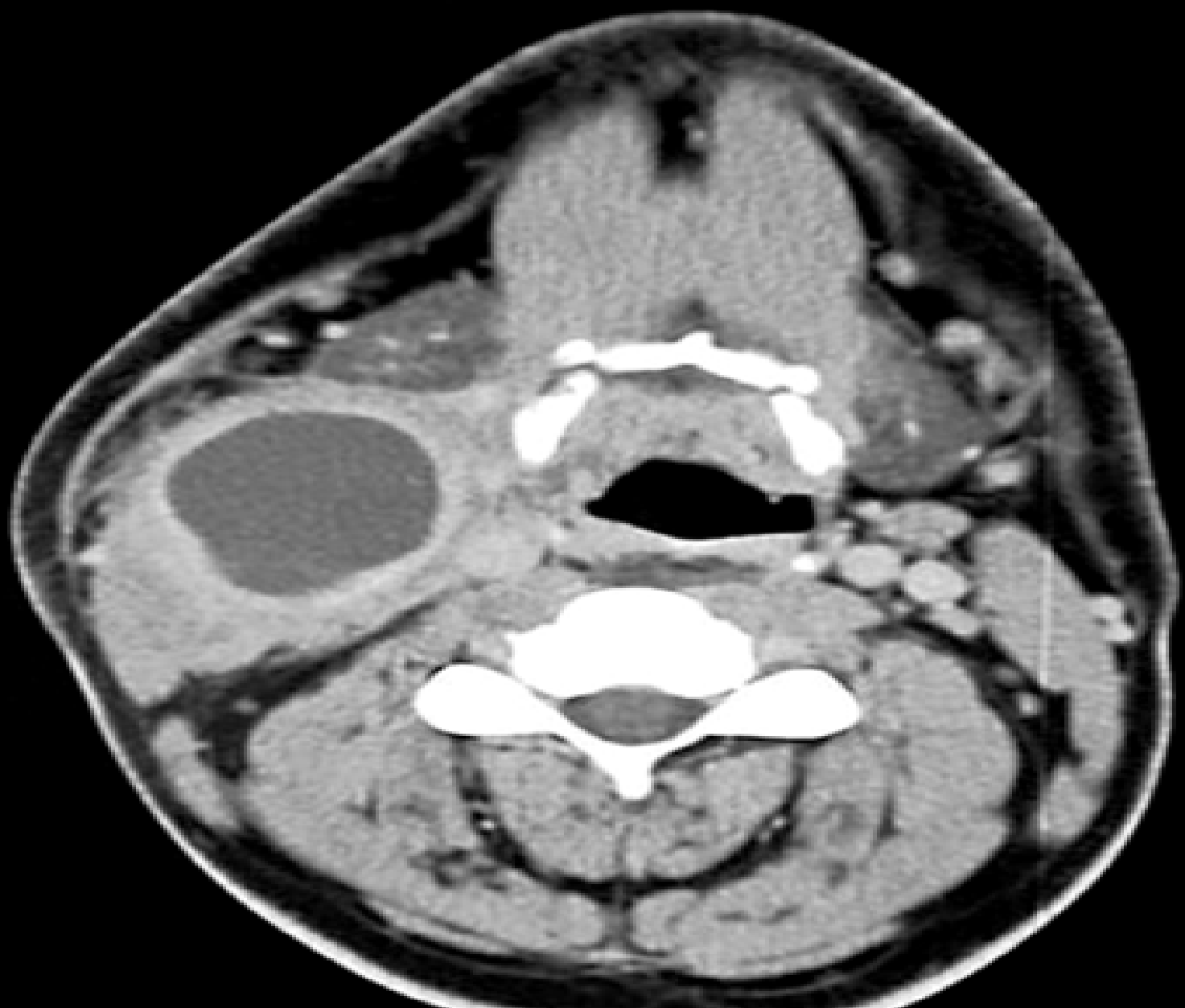
- Source of infection
  - Tonsils \*\*Quinsy
  - Pharynx
  - Lower 3<sup>rd</sup> molar
  - Ear infection
  - Parotid deep lobe

# Parapharyngeal abscess

- Management:
  - Iv antibiotics
  - CT scan
  - I&D
  - ?tracheostomy

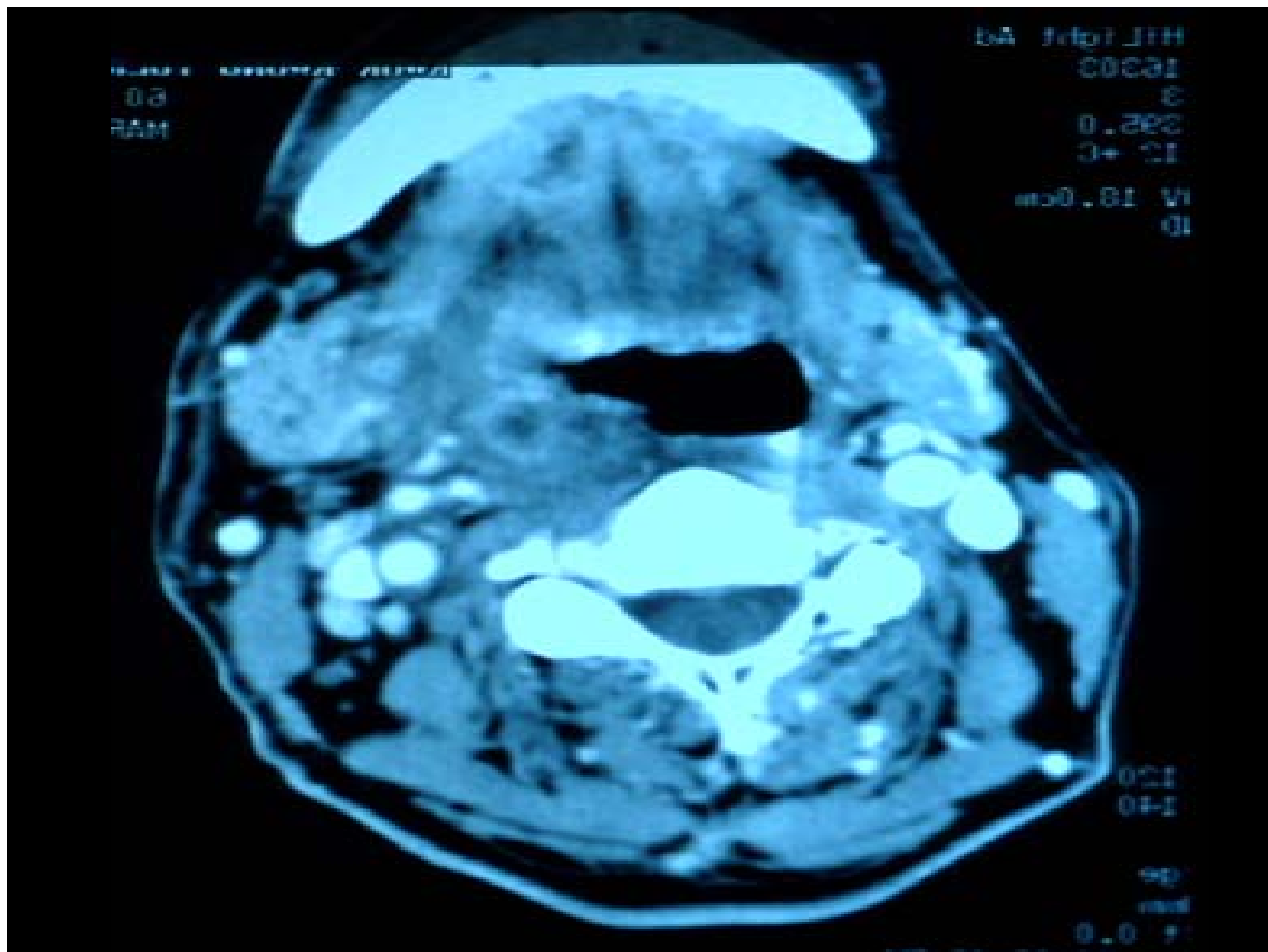




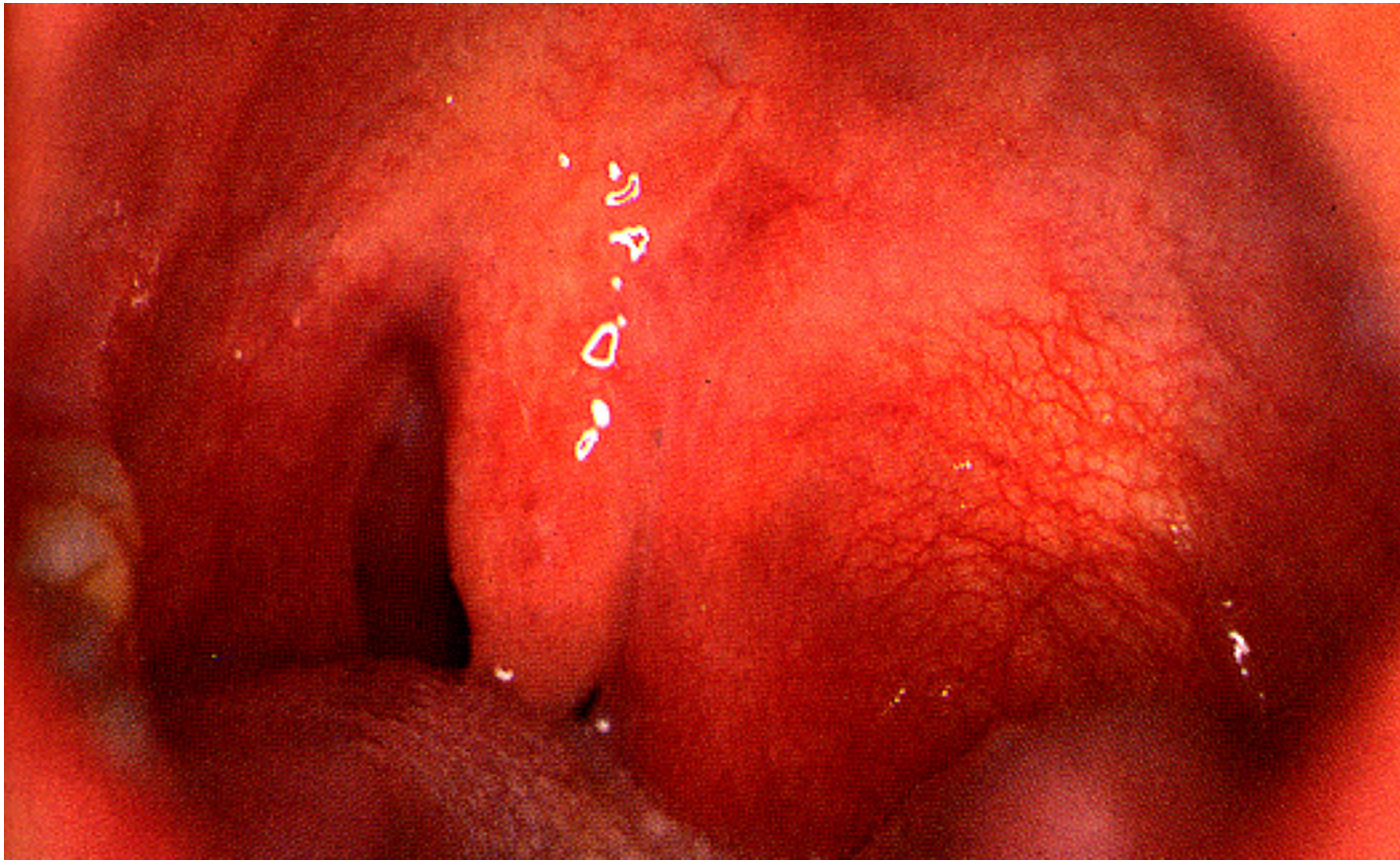








# Parapharyngeal space mass



# **Retropharyngeal abscess**

# **Retropharyngeal abscess-**

## **Clinical features**

- Fever
- Dysphagia
- Drooling
- Neck rigidity
- Unilateral posterior pharyngeal wall bulging
- Hot potato voice
- Airway compromise

# **Retropharyngeal abcess**

## **Source of infection**

- Infection of tonsils, teeth, pharynx, sinus
- Retropharyngeal LN suppuration
- Foreign body
- Extension from other deep spaces infection
  - Parapharyngeal space
  - Prevertebral space

# **Retropharyngeal abscess**

## **Management:**

- ABCD
- Imaging
- IV antibiotics
- ?I&D





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# Ludwig's Angina

# Ludwig's Angina

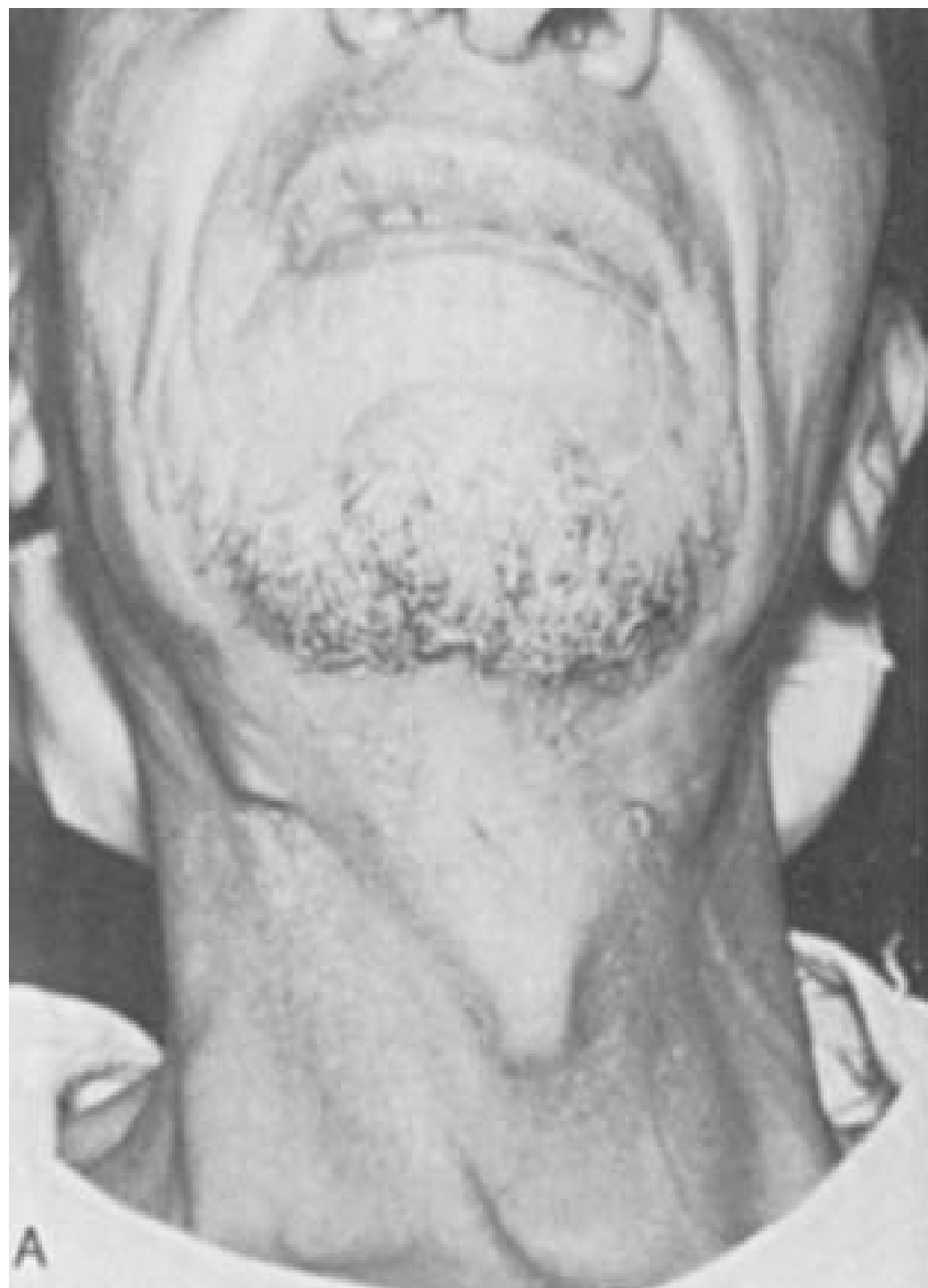
- Extension of localized periapical infection
  - Anterior mandibular → Sublingual
  - Posterior mandibular (molar) → Submandibular
- Fascial planes

# Historical clues

- Recent dental extraction or work
- Dental caries
- Fever
- Swelling of mouth, face, neck
- Compromised host
- Co-morbidities (diabetes)

# Physical exam

- Toxicity
- Brawny bilateral boardlike edema
- Submandibular, submental, sublingual
- Trismus
- Tongue elevation
- No fluctuance



# Etiology

- Streptococcus
- Staphylococcus
- Mixed aerobic/anaerobic infection
  - B. Fragilis
- $\beta$ -lactamase resistance (40%)

# Diagnosis

- Clinical
- CT scan

4 year with fever, irritability, and decreased oral intake x 24 hours. Swelling x 10 hrs





# Treatment

- ABCD
- Tracheostomy/ Intubation
- Drainage and debridement
- ICU
- Extended spectrum or
- Clindamycin + penicillins/ Cipro
- Steroids

# Deep Neck Space Infections

## Complications

- Upper airway obstruction
- Reinfection
- Asphyxiation
- Descending mediastinitis
- Spread to other spaces
- Death

# *Pharynx*

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# Chronic Pharyngitis

- Nasal obstruction
- Smoking
- Sub-acute infection
- Reflux
- Allergy
- Idiopathic



***Thank***

***You***