Video link

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ABDULAZIZ ALSAIF

Communication and Swallowing Disorders I-II

Presented by Dr. Farahat

★ Lecture Objectives:

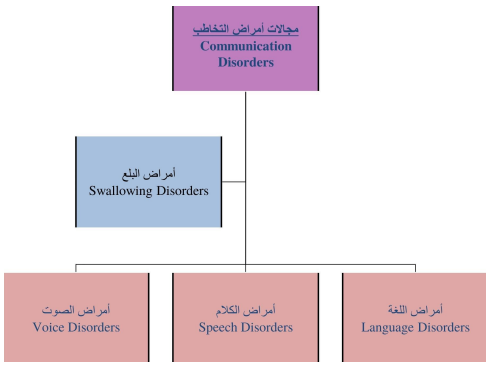
- Introduction of the main swallowing disorders and their assessment and management.
- Introduction of the main language disorders and their management.
- Introduction of the main speech disorders and their management.
- Introduction of the main voice disorders and their assessment and management.

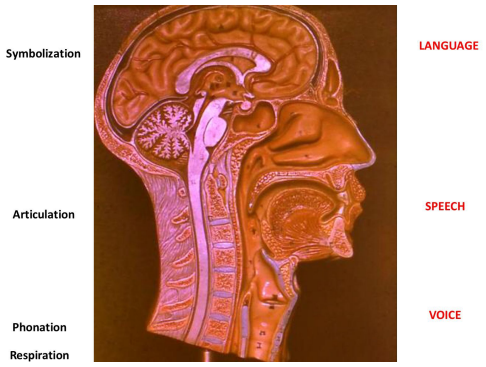
Dr. ALL PICTURES ARE IMPORTANT

Color Index:

Important Original content Doctor's notes[439] Doctor's notes[441] Golden Notes Extra

Definitions





- Communication:
  - Exchange of thoughts, ideas, emotions between two parties.
  - Types: Verbal, Non verbal.
  - Parts of communication: 1. Voice, 2. Speech, 3. Language (try to mention them in this order).

Voice

The result of vibration of the true vocal folds using the expired air.

Speach (Articulators)

A neuro-muscular process whereby language is uttered. It includes the coordination of respiration, phonation, articulation, prosody and resonation.

Language

A symbolic arbitrary system relating sounds to meaning.

Swallowing

The process of successful passage of food and drinks from the mouth through pharynx and esophagus into the stomach.

How communication happens ? Very Important

- In order to communicate, 4 physiological processes should happen in certain arrangement :

01

Inspiration → expiration → air passes through sound box larynx, expiratory phonatory airflow →

02

vibration of vocal folds “not cords!” → 1&2 gives voice, primary laryngeal sound.

03

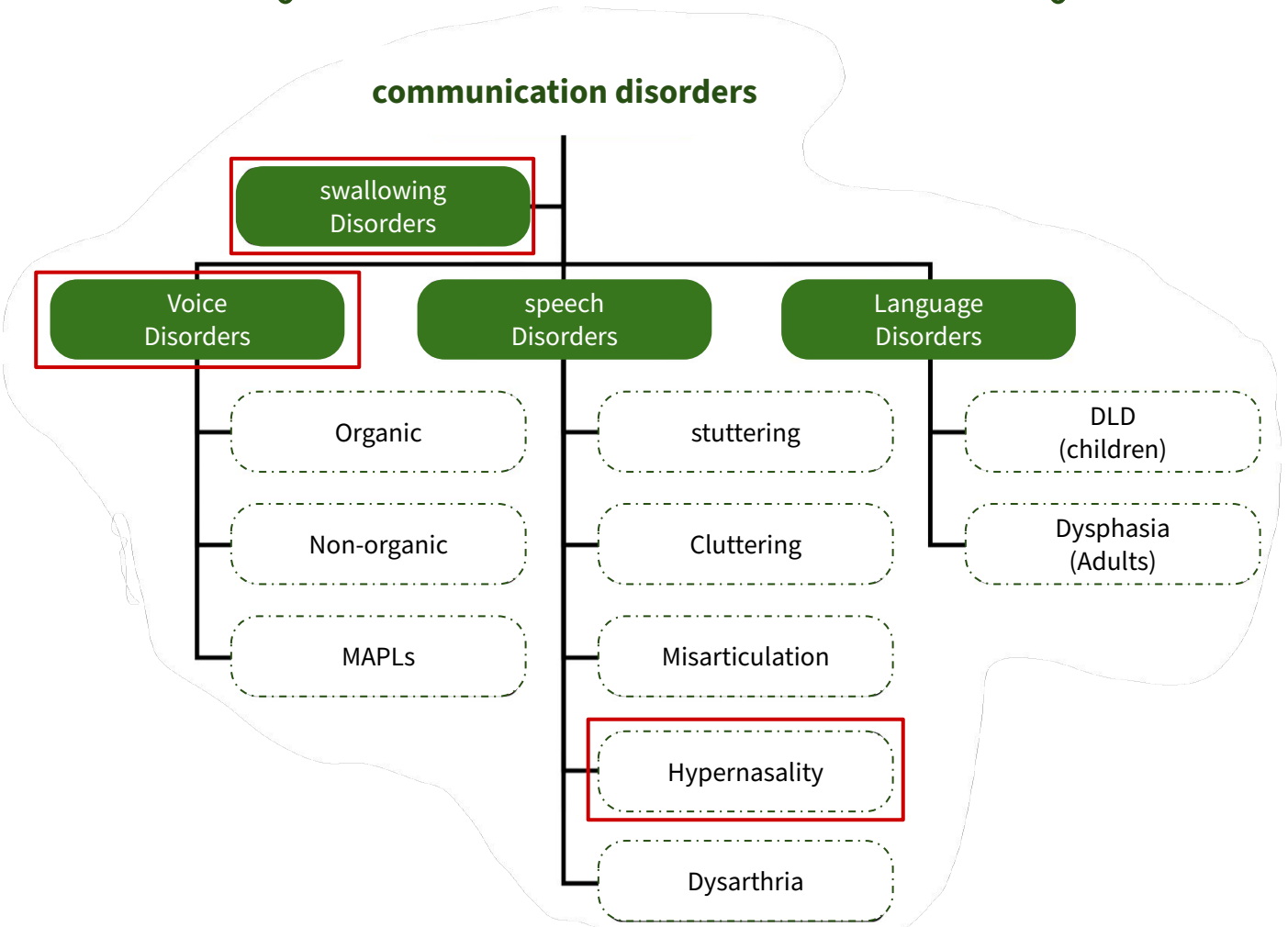
Articulation by supralaryngeal compartments (pharynx, epiglottis, tongue, soft palate, teeth, sinuses) to articulators or resonators/speech, they produce a person's recognizable voice “Speech”.

04

symbolization by the brain (language).

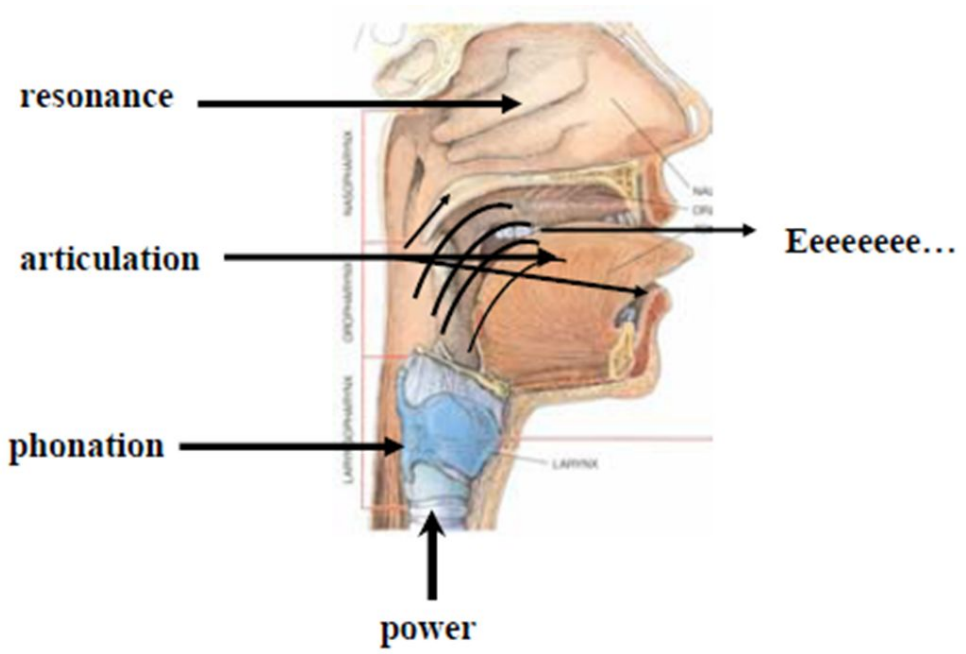
- Function of supralaryngeal compartments: change of primary laryngeal sound (voice) into secondary sound (speech).
- Disorders of communication can occur in each of the following: Language, Speech, Voice.

Lecture Layout



MCQS: It's very very important to know each disorder under which domain eg. DLD is under language disorders.

437A: The ones that circled with red are the most IMPORTANT



Voice Disorders

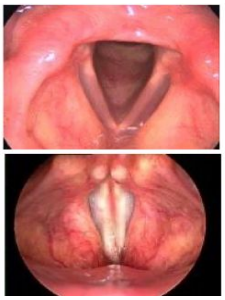
- 10% of communications disorders.
- Prerequisites of "normal" voice production:
  - Normal range of movement of vocal folds.
  - Normal mobility of mucosa on deep layers.
  - Optimal coaptation of vocal folds' edges.
  - optimal motor force
  - Optimal pulmonary support.
  - Optimal timing between vocal fold closure and pulmonary exhalation.
  - Optimal tuning of vocal fold musculature (int. & ext.)

- Functions of the larynx: Airway, Protection, Phonation, Increasing intrathoracic pressure.

Usually The Presenting Symptoms In Voice Disorders Are:

Dysphonia:	Any change of the patient's voice from his habitual one: ○ Difficulty in phonation. ○ Change patient's voice from his/her habitual. ○ Hoarseness: roughness & harshness of voice. ○ Objective term. Dysphonia is broader (includes high pitched).
Aphonia:	Loss of the patient's voice (functional or organic).
Phonasthenia:	A subjective complaint of dryness, tightness, globus feeling and voice fatigue, feeling somthing stuck in the throat, while the patient's voice and larynx is normal.
Dysodia:	Change of the singing voice while the speaking voice is normal. singers/ quran reciters.

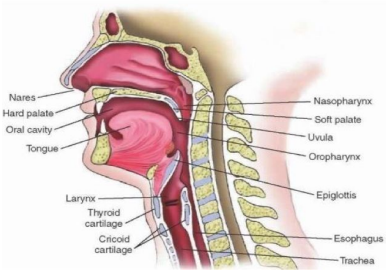
MCQ : Difference between Dysphonia (Change of habitual sound) and Dysodia (Change of Singing Sound).



True vocal cord movement:

→ During breathing (**Abduction**)

→ During Phonation (**Adduction**)



➔ Etiological classification of dysphonia

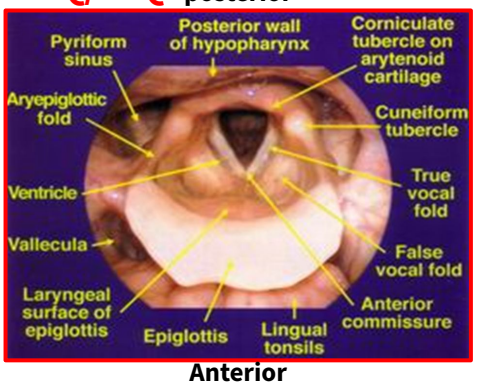
- Voice Disorders
  - Organic cause[1] — *F2 : ONLY TWO (vocal cord paralysis, laryngeal carcinoma)*
  - Non-organic cause[2] — *F2 : ONLY one (Phonasthenia)*
    - Habital
    - psychogenic
  - Benign vocal Fold Lesion ★
    - minimal Associated pathological lesions (MAPLs)

[1]You will find something abnormal in the examination

[2]No abnormality in the examination , They will tell you in the hx that by end of the day their voice is gone

➔ *Anatomical Landmarks Of The Larynx:*

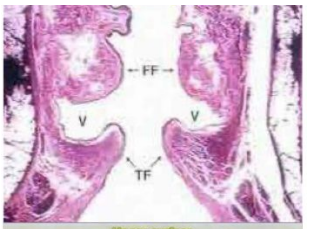
MCQ/SAQ posterior

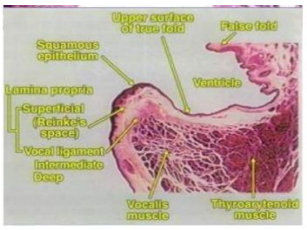


Right Left

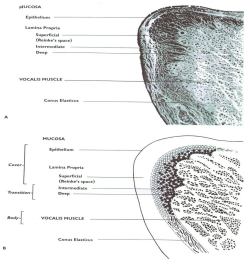
Anterior

- IMP understand the picture so you can locate the lesion.
- Anteriorly: Anterior commissure and epiglottis.
- Posteriorly: Arytenoid cartilage and hypopharynx.
- Pictures: As seen in the second picture (pic. 2) the false vocal cords are on top of the true vocal folds and not next to them as it might appear in the first picture.
- FF=False folds, V=Ventricle, TF=True folds.
- How to know Right from Left? By the Anterior commissure (no posterior commissure), so in the first picture the patient is facing us.
- Cross Section Of The Vocal Cords Which Contains: Mucosa:
  - Squamous epithelium.
  - Lamina propria which contains:
    1. Superficial layer.
    2. The intermediate and deep layers (vocal ligament).





pict. 2

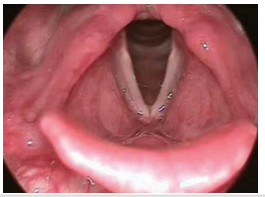
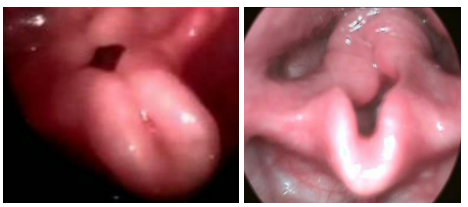


➔ *Etiology of dysphonia:*

1. Organic: there is clear seen pathology.
2. Non-organic: (normal Phx): no clear seen pathology, but there is complaint.
   - Habitual.
   - Psychogenic.
3. Benign vocal Fold lesion = Minimal Associated Pathological Lesions (MAPL) Both, Start as non-organic then become organic due to damage. Accompaniment of neuro-psychiatric ailments.
4. Accompaniment of Neuro-psychiatric Ailments.

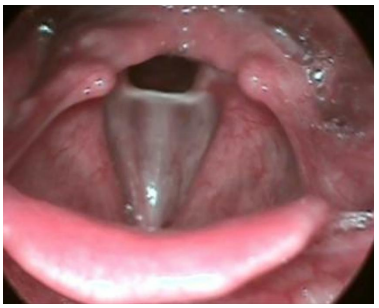
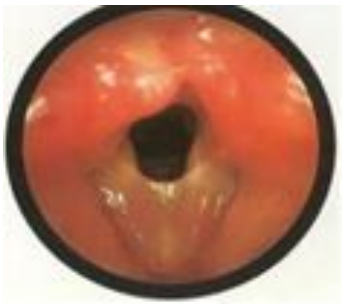
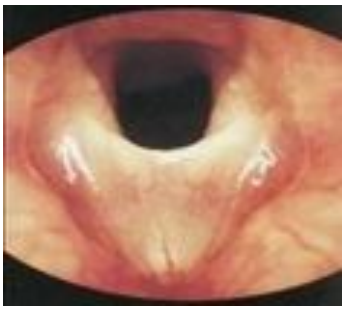
1. Organic Voice Disorders:

- Congenital (Laryngeal web, Subglottic stenosis, Laryngomalacia).
- Inflammatory.
- Traumatic.
- Neurological.
- Neoplastic.
- Hormonal.
- Status post-laryngectomy.

1.Normal.	
2.laryngomalacia (congenital).	• Epiglottis is folded, almost touching arytenoids and doesn't change shape during breathing. Collapse during inspiration. • Present complaint: dysphonia, Stridor. • Management: observation, resolves with time in 90% of cases, if severe supraglottoplasty. 

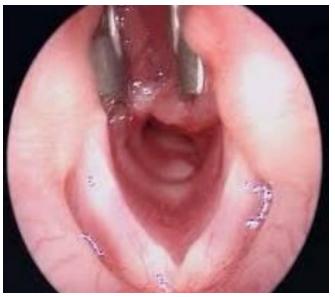
3- Congenital vocal folds web (congenital) Web.

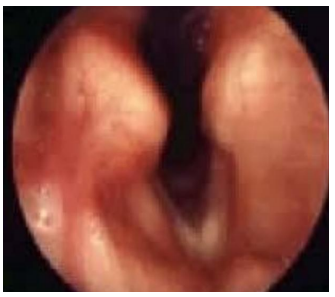
- Can be complete / incomplete (complete is life-threatening).
- Presenting complaint: SOB or dysphonia, breathing problems airway compromise.
- Management: excision of web and add laryngeal tube to avoid formation of new adhesions.
- Pt w/ incomplete web may be fine until they get the flu then from the inflammation and edema the airway narrows and they develop SOB.

4- Laryngeal cleft. (congenital) Arytenoid cleft.

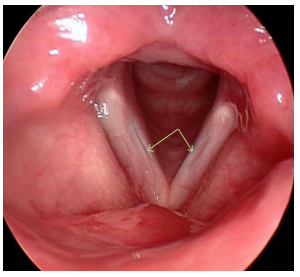
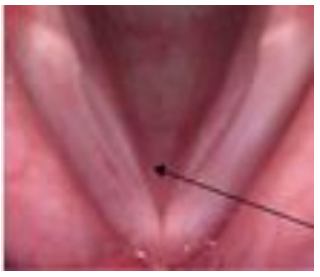
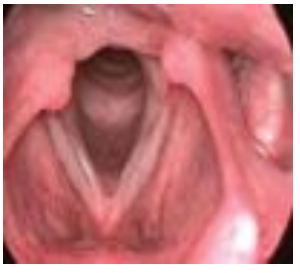
- Has 4 types, most imp is that it could lead to defect between trachea and esophagus
- Presenting complaint: **aspiration** and swallowing problem, food will go down trachea and breathing
- Management: surgical close.


grade 1

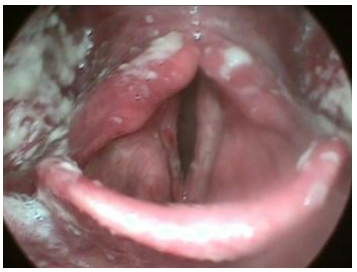
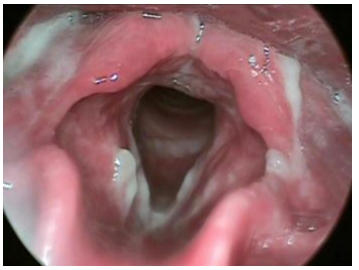
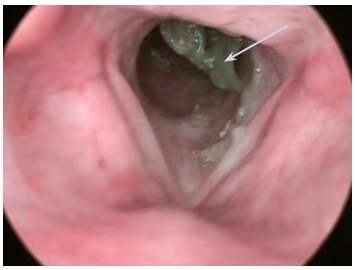
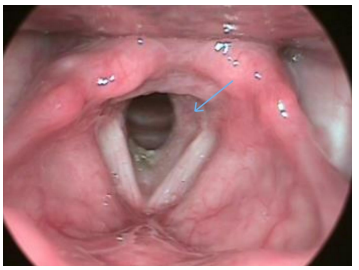
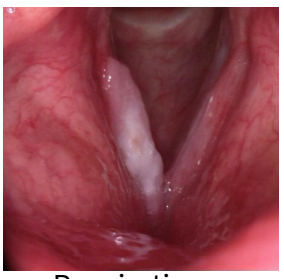
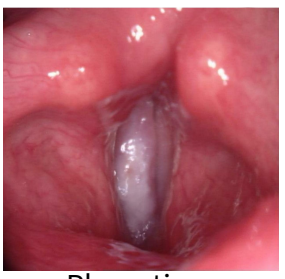

grade 4
fistula connected to the esophagus

5- Sulcus vocalis (congenital)

- common in ksa mostly genetic problem.
- Congenital lesion. On the free edge of the true vocal fold.
- Presenting complaint: **Dysphonia**.
- Treated by: in mild case: **voice therapy**, in severe case: vocal folds injection(filler) (**close the gap**).
- Typical bilateral sulcus vocalis.
- Grove on the vocal fold edge.
- Can be bilateral or unilateral, including the whole length or small portion of the vocal folds.

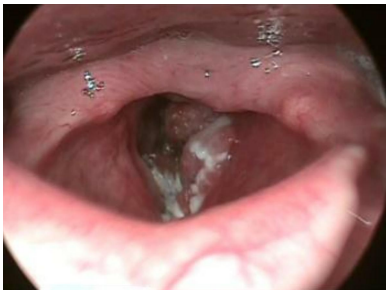




bilateral groove

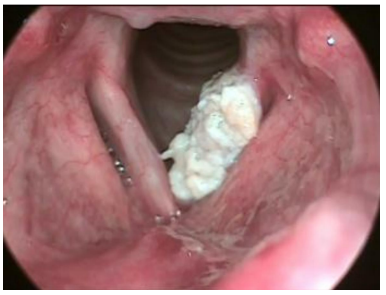
6- Fungal infection (inflammatory).	• Candidiasis. • Pt is DM/ Immunocompromised/ steroid treatment. • Presents with: dysphonia • Management: Medical therapy(antifungal agent).  
7-laryngoscleroma (Inflammatory).	• Chronic inflammation of the larynx if left untreated it will cause granulation tissue to form and narrow the airway with time subglottic stenosis. Notice the crusting of the mucous. • **treatment**: atibiotics and surgical excision • Etiology: infection with **Klebsiella Rhinoscleromatis** that targets respiratory epithelium.   granulation tissue in the subglottis area
8- LARYNGEAL CARCINOMA: (neoplastic).	• Severe **dysphonia**. • Whitish ill defined lesion occupying the full length of the right true vocal fold. Irregular surface with hyperkeratosis (suspicious). Needs biopsy. Right vocal cord carcinoma. • treatment: excision of the whole area Squamous cell carcinoma is the most common. • Risk factors: Tobacco use, Excessive ethanol use, Infection with human papillomavirus, Increasing age.   Respiration Phonation

9- Cancer (neoplastic).

- treatment: total excision of the whole area



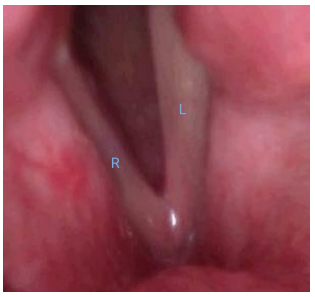
Extended lesions (transglottic carcinoma).



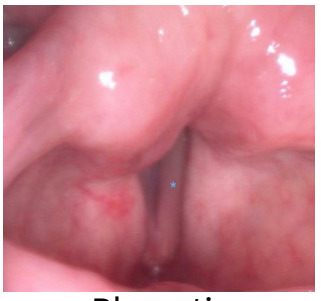
Left Mass.

10- Left vocal cord paralysis (neurological).

- **presentation**: aspiration and dysphonia
- **treatment**: injections to close the gap, temporary only lasts 6 months
- Left vs right? left true vocal cord immobility (don't describe it as paralysis, because the diagnosis could be something else).
  1-Determine anatomical landmarks (anterior and posterior) to know which side is left and which is right
  2-During respiration vocal cords should be abducted if one of them is not abducted → paralysis.
  During phonation vocal cords should be adducted if one is not → paralysis.
- You cannot determine which cord is paralyzed if you don't know if the picture is during inspiration or phonation. How it presents? Dysphonia- aspiration (if unilateral) Airway obstruction - swallowing abnormality (if bilateral) Management: vocal cord injection, augmentation, medialization thyroplasty.



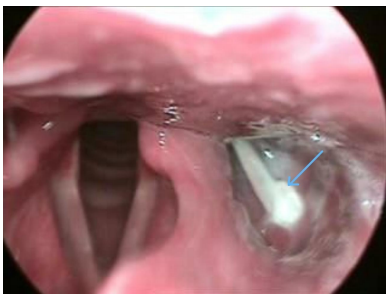
Respiration

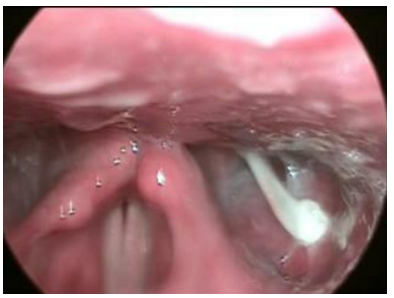


Phonation

11- Foreign body.

- Chicken bone in posterior pharyngeal wall. In foreign bodies mostly are in sites of infection like in sinus and follicular.
- **presentation**: dysphonia & pain
- **treatment**: removal of the foreign body





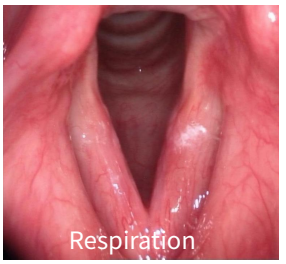
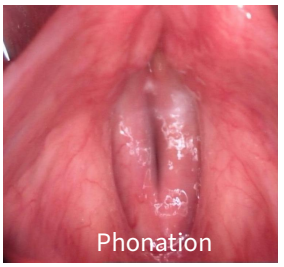
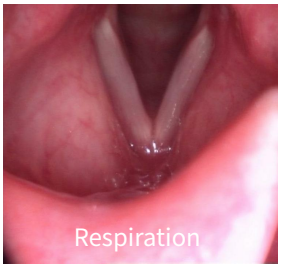
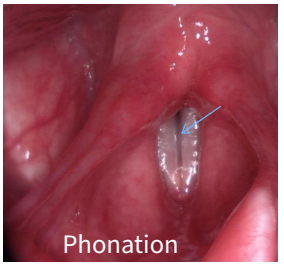
2. Non-Organic Voice Disorders:

A. Habitual:

Male and F1 slides

normal anatomy, medical treatment

1. Hyperfunctional childhood dysphonia. Bad habit. Child is always screaming.
2. Incomplete mutation, occurs in males, 13-17 years during puberty, change of voice from high frequency to low frequency voice.
3. Phonasthenia (voice fatigue) مشجع أو شخص يتكلم كثير They have dryness, tenderness, frequent throat cleaning. It's the only voice disorder that we can't see any abnormality or hear any abnormality, voice is normal but they feel pain with repetitive use (they used to speak for long periods put now they can't).
4. Hyperfunctional dysphonia, with excessive use. Also overuse could lead to 5&6.
5. Hypofunctional dysphonia, laryngitis > pain with speech > they start speaking with low and soft voice b/c it's painful > patient remain in this state of hypofunction even after the disease resolved b/c the brain got used to it. E.g. **acute pharyngitis.** Patient won't talk because of pain. If they stopped talking for more than 3 weeks, it will be difficult to get back normal voice.
6. Ventricular dysphonia, with very high voice and straining, they even start using the false vocal folds "which is not normal".
    - Misuse of voice will cause the ventricles to hypertrophy until they touch each other and dysphonia will occur (patient will sound like WWE fighter).
    - **Normal function of ventricle**: Helps shape the cords, holds glands which decrease friction between false and true vocal cords, fine tuning.

1. Hyperfunctional dysphonia.	• In professional voice users. **Normal anatomy > non-organic.** • This is a male.	 
2. Phonasthenia: most common	• Example: teacher can't talk after 5th period (fatigue).إجهاد صوتي • phonatory gap because of weakness and fatigue • خطيب يشتكي من هذا النوع • Won't hear or see anything on examination. IMP • If left untreated it can develop: 1.hyperfunctional dysphonia, 2.it can lead to vocal folds nodules or polyps (benign vocal fold lesions).	 

B. Psychogenic:

Males and F1's slides

it has happened before, mostly in female + middle age + low socioeconomic and education + history of recurrent attacks of voice loss.

1. Psychogenic dysphonia.
2. Psychogenic aphonia.

3. Benign Vocal Cord Lesion:

Minimal associated pathological lesions (MAPLs).

01 **Vocal folds nodules.**

02 **Vocal folds polyps.**

03 **Vocal folds cysts.**

04 **Reinke's edema.**

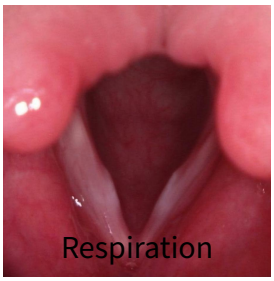
05 **Contact granuloma.**

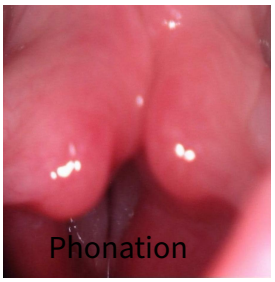
1. Vocal Fold Nodule

(bilateral true vocal fold nodule, In females) + voice therapy.

Juvenile type:

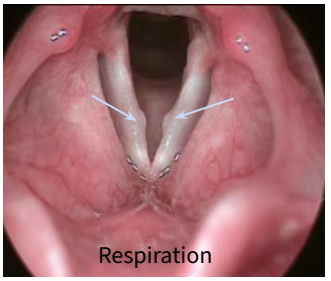
- Kissing nodules .
- More broad base not clear ;small.

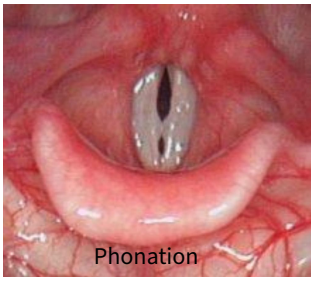




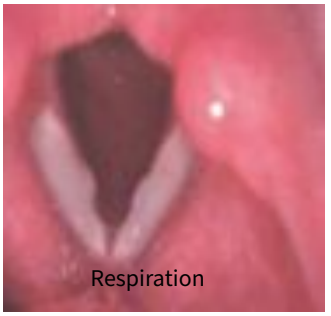
Adult type

- **Describe:** bilateral nearly symmetrical vocal cords lesions at junction of anterior 1/3 and posterior 2/3.
- **Presenting complaint:** dysphonia or hoarseness
- **Causes:** phono-trauma, voice misuse and abuse, shouting.
- **Treatment:** voice therapy and vocal hygiene advices. second line of treatment is surgery.
- More common in female adult and male children, very rare in adult male.



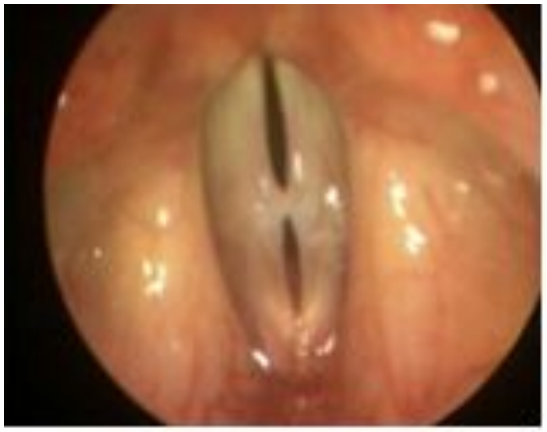
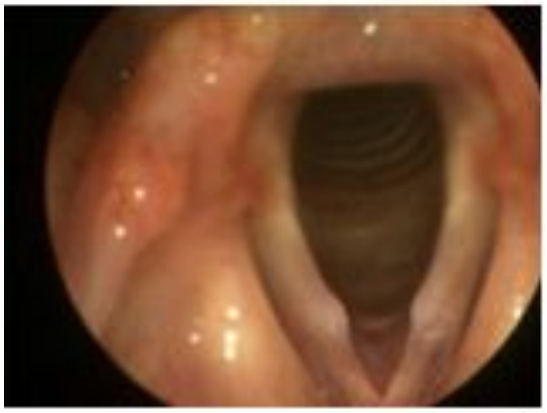
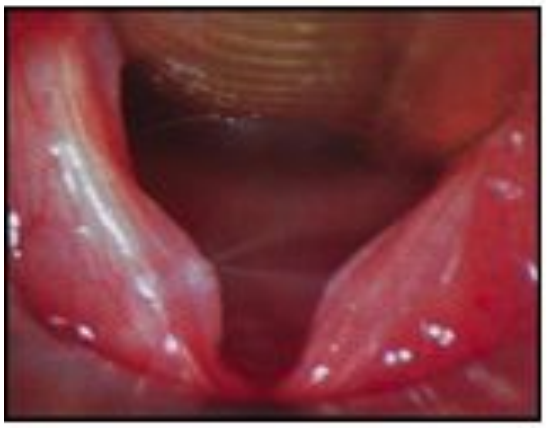
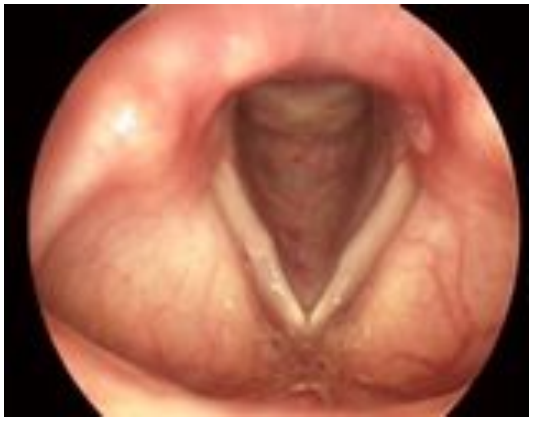


Glottal gad, due to facing of both nodules.

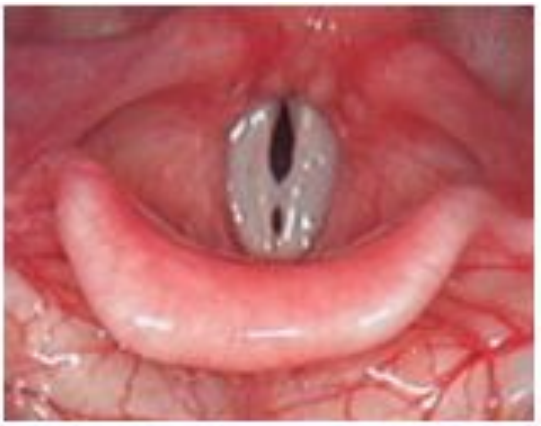
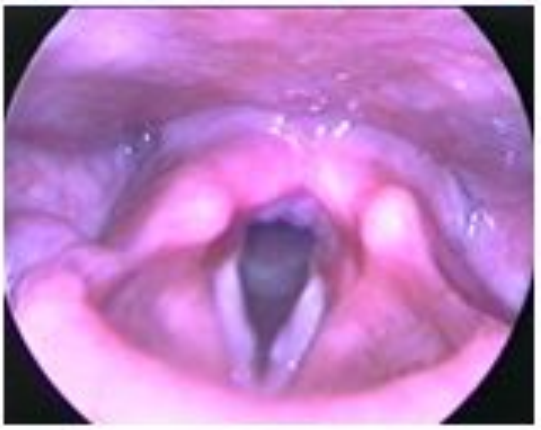
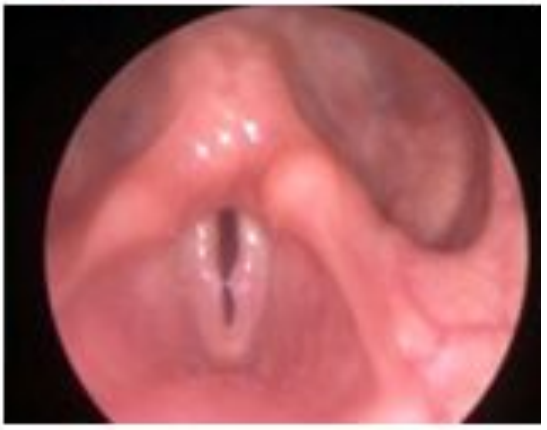
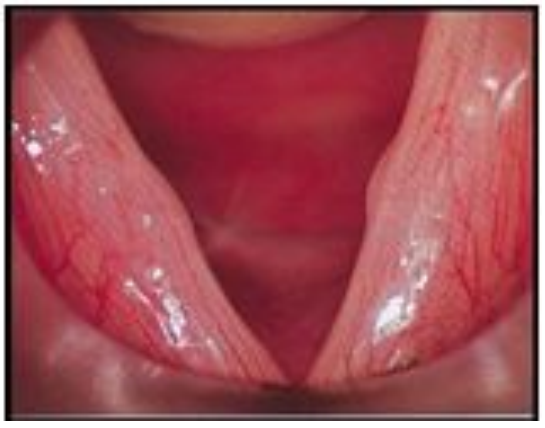


1. Vocal Fold Nodule

SAQ: What is the diagnosis?
Answer: Bilateral true vocal folds nodules.

Here it's very superficial

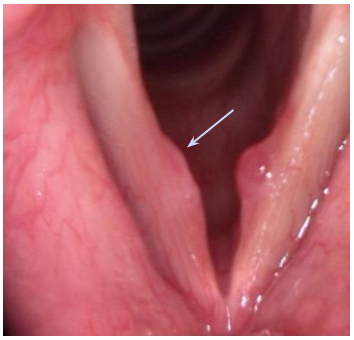





Here it's Asymmetrical

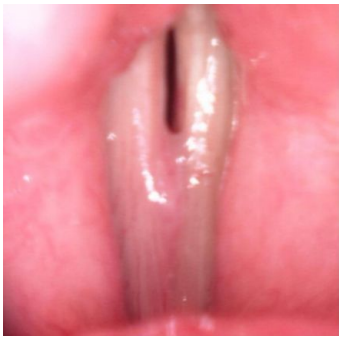
2. Vocal Fold hemorrhagic Polyp

- Non bilateral, non symetrical, more common in males.
- From epithelial layer (muscoa) ⟶ **well defined**.
- ***Treatment***: Surgical excision.

- **Left vocal fold polyp with reaction:**
  - Reaction occurs on the opposite side of the polyp due to friction during phonation.
  - Reaction disappears with the excision of the polyp.

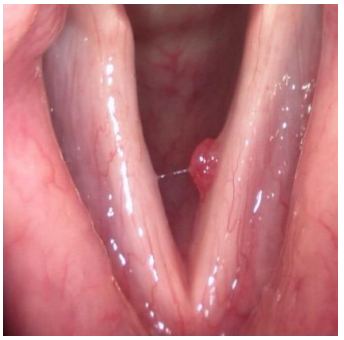


Respiration

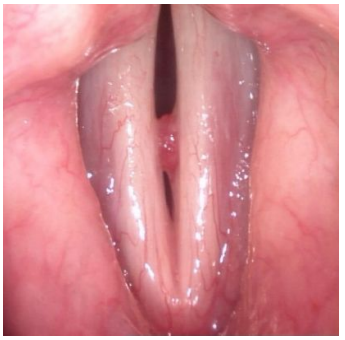


Phonation

- **Left true vocal fold polyp:**
  - Describe: unilateral reddish and hemorrhagic vocal fold mass or lesion at the left side in the middle third protruding medially.
  - Presenting complaint: dysphonia or hoarseness.
  - Causes: phono-trauma, voice abuse and sudden shouting.
  - Treatment: mainly surgical excision.

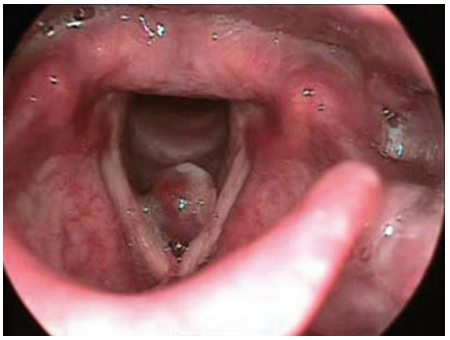


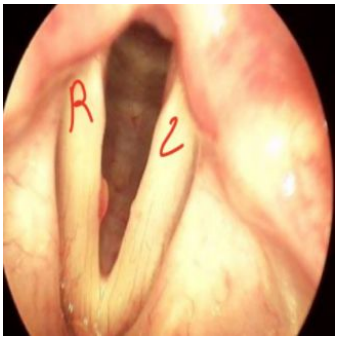
Respiration



Phonation

- **Right Vocal Fold Polyp**
  (Pedunculated Polyp)
  - Movable with breathing.

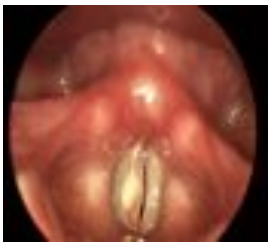




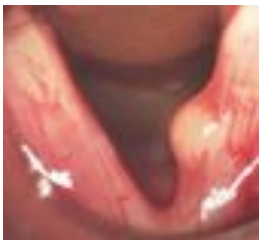
3. Vocal Fold cyst

- Arises from **deeper** layers causing elevation of the covering mucosa⟶ **ill defined** (unlike polyps)
- **Treatment**: Surgical excision.

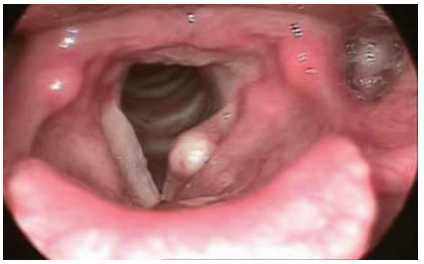
- Causes: phono-trauma, congenital, duct closure voice abuse.
- Treatment: Primary management Surgery (Excision).
- We can differentiate between the polyp and the cyst by the outer mucosa, in the polyp is changing, reddish and hemorrhagic. cyst is ill-defined unlike polyp.



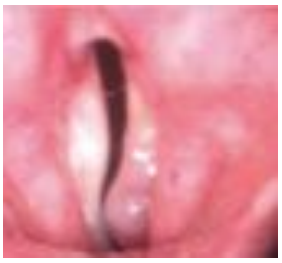
Right vocal cord cyst

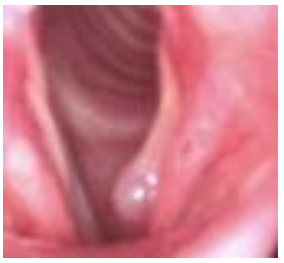


Left True Vocal folds cyst

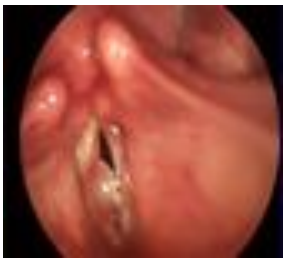


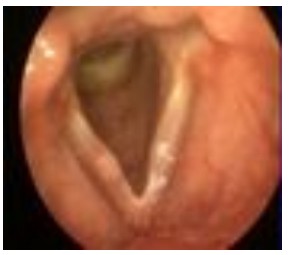
Left vocal cord cyst





Left True Vocal folds cyst

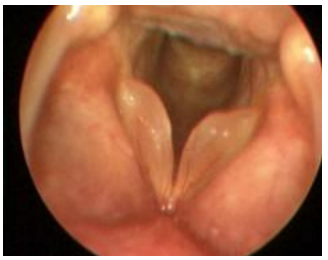


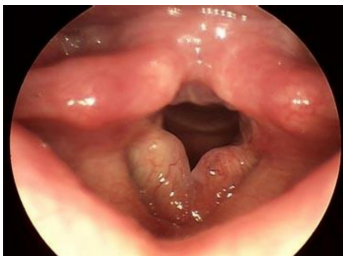


Right True Vocal folds cyst

4. Reinke's Edema

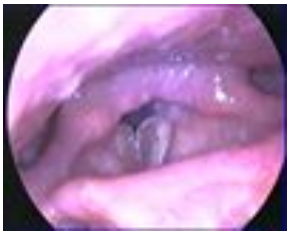
bilateral swelling of the vocal cords

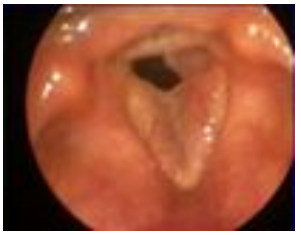


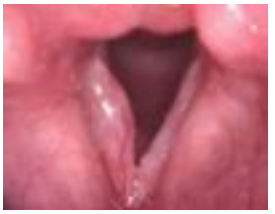


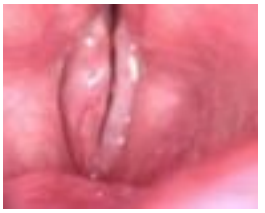
Bilateral Reinke's Edema:

- *Causes:* smoking, laryngopharyngeal reflux, voice abuse.
- presentation: dysphonia
- Common amongst middle aged female smokers but also in male.
- **Treatment:** Surgical excision , smoking cessation and reflux management.









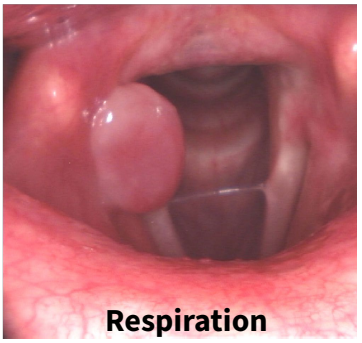
Right-sided Reinke's edema

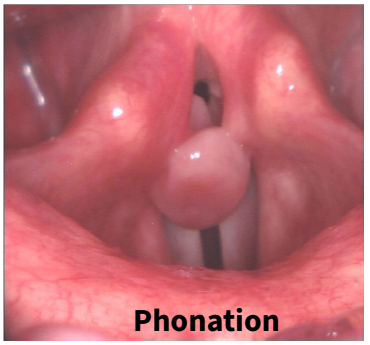
5. Contact Granuloma:

- It is very similar to polyps but differ in location, here it involves the posterior cartilaginous part (Posterior third) which does not vibrate, therefore no dysphonia.
- ***Treatment:*** Voice therapy and Laryngopharyngeal reflux management e.g.: PPIs, etc… , AVOID surgery

Right-sided Intubation vocal cord Granuloma:

- because of prolonged intubation
- No dysphonia, pain and foreign body sensation, hoarseness
- conservative treatment

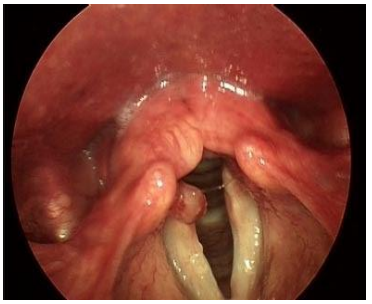


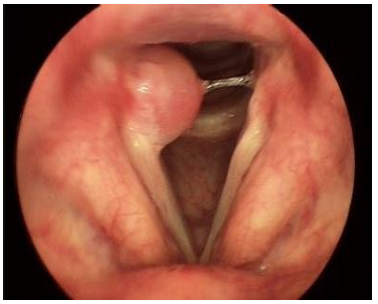


on the posterior surface of the vocal cords

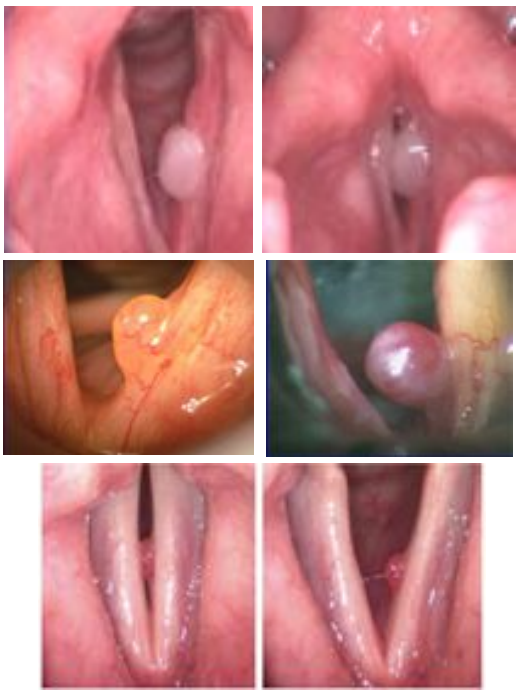
Right-sided Contact Granuloma:

- Etiology is irritation caused by the reflux which is why surgery here won't benefit because patient will come back later with another granuloma if the reflux wasn't treated.
- no dysphonia, voice fatigue, and foreign body sensation

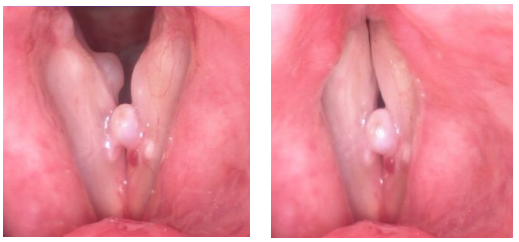




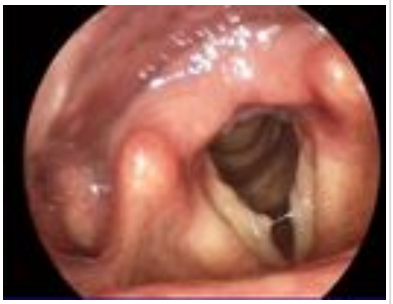
Extra from 437; Vocal Fold Polyp:



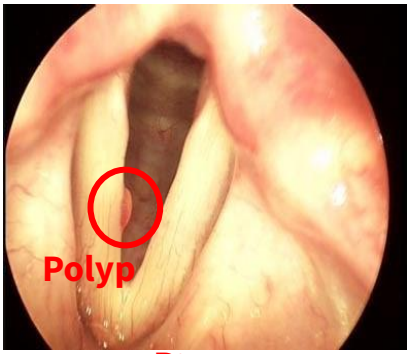
SAQ: What's the diagnosis?
Left True Vocal Fold Polyp.

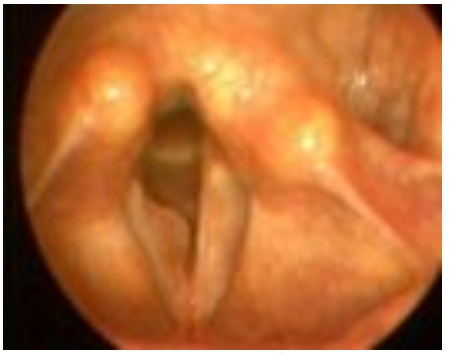


Multiple polyps, Bilateral and Asymmetrical



Right true vocal fold polyp





Right True Vocal Fold Polyp, We know it's right from the anterior commissure.

➔ Assessment Of Dysphonia:

- History Taking (Onset, course, deterioration...).
- Physical Examination: APA, neck…

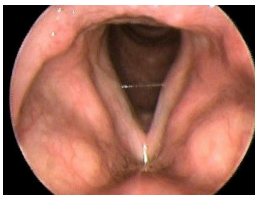
Investigations:

- Audio recording.
- Digital laryngostroboscopy is gold standard.
- Digital laryngokymography.
- Digital high speed imaging.
- Acoustic analysis (MDVP). “Multidimensional voice program”
- Aerodynamic analysis (Aerophone II).
- GERD (LPR) work-up.
- CT neck.
- Stroboscopy.
- Pharyngeal pH Monitoring.
- Phonatory aerodynamic system (PAS).
- Computerized speech lab (CSL): Acoustic analysis of voice, intensity and frequency (Quantities).

Male and F1’s slides

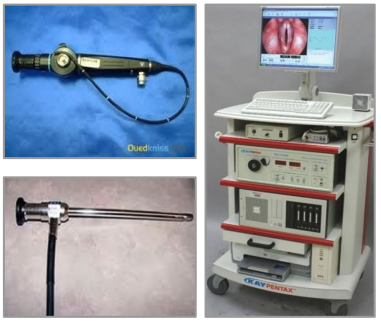
(PAS)
Phonatory Aerodynamic System

CSL (MDVP)
CSL: Computerized Speech Lab.
MDVP: Multidimensional Voice Program

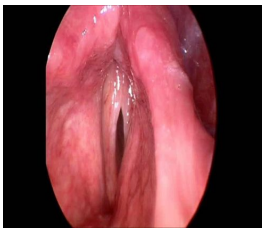


Stroboscopy[2]

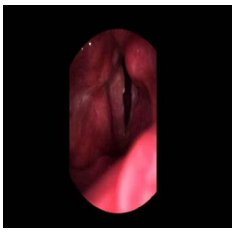
High speed laryngeal imaging



Laryngostroboscopy[1]



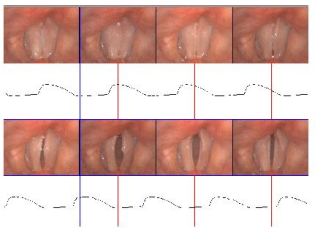
Strobe



High Speed

Pharyngeal pH monitoring

(CSL)
Computerized Speech Lab.

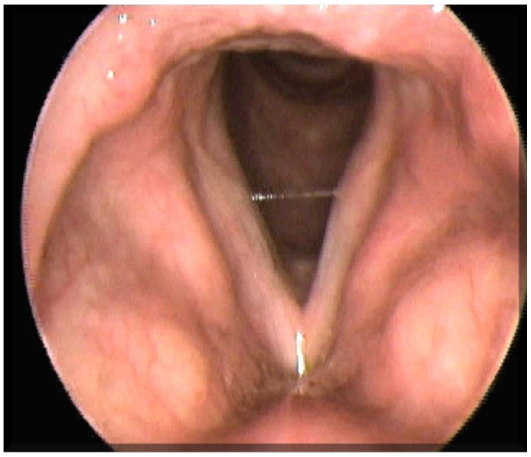


Video laryngostroboscopy

1- see all structures but doesn't see vocal vibration
2- can see vocal vibration
3- air flow with phonation

SAQ: important to know what is the device? computerized speech lab
what is it used for? acoustic analysis of the voice.

- **Stroboscopy:**
  - Is a special method used to visualize vocal fold vibration.
  - It uses a synchronized, flashing light passed through a **flexible** (used for children, high gag reflex, in some anomalies that can't be approached with rigid) or **rigid** telescope.
  - The flashes of light from the stroboscope are synchronized to the vocal fold vibration at a slightly slower speed, allowing the examiner to observe vocal fold vibration during sound production in what appears to be slow motion.
  - **Females** reach 300 cycle/sec up to a 1000.
  - **Males** reach 120-130 cycle/sec up to 200.



Male's slides

KAUH-Strobe Examination Report

Name:	Al-Bulaihi, Haila, M	**Patient ID:**	00465849 RKH
Exam Original Date:	3/13/2004 9:46:18 AM		

Selected Stills (Image Compression - 15:1)

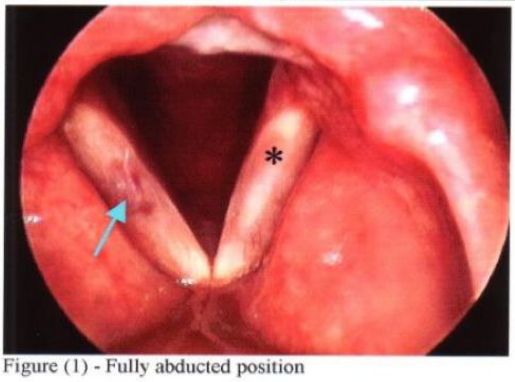


Figure (1) - Fully abducted position

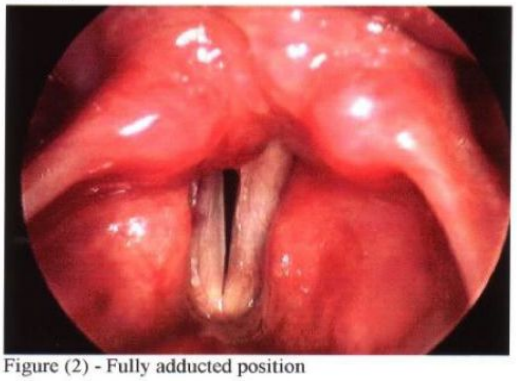


Figure (2) - Fully adducted position

Thank you for referring this patient.

Telescopic videolaryngostroboscopy done, and showed:

I. Continuous light examination:

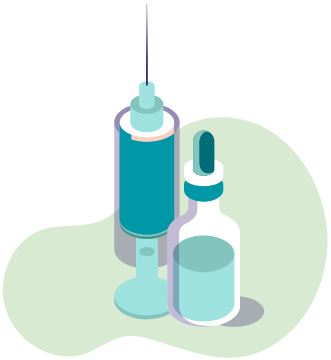
- Left vocal fold paralysis (asterisk).
- Paralytic phonatory glottal gap of about 2-3 mm at maximum width posteriorly (Figure 2).
- A patch of submucous hematoma at the middle third of membranous part of the right vocal fold (arrow).
- Mild ventricular hypertrophy.

II. Stroboscopic light examination:

- Decreased amplitude and mucosal waves on the left vocal fold.
- Asymmetry in amplitude and mucosal waves between both vocal folds.
- Aperiodecity in amplitude and glottal cycle time at the left vocal fold.
- Phase is predominantly open.

Diagnosis:

Left vocal fold paralysis with glottal gap of about 2-3 mm at maximum width posteriorly.



Management of Voice Disorders:

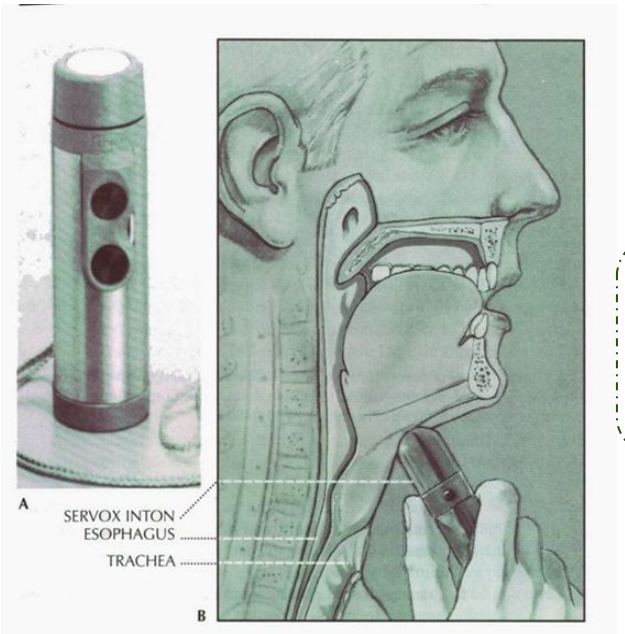
- Pharmacological agents, ex. GERD.
- Surgical procedures (Phonosurgery) polyp, cyst, Reinke's Edema.
- Technical aid devices in total laryngectomy, like artificial larynx.
- Voice therapy.

➔ ***Treatment of Benign Vocal Folds lesions in summary:*** **(IMP)**

- Polyps.
- Cysts.
- Reinke's Edema.

} **Surgical removal followed by voice therapy.**

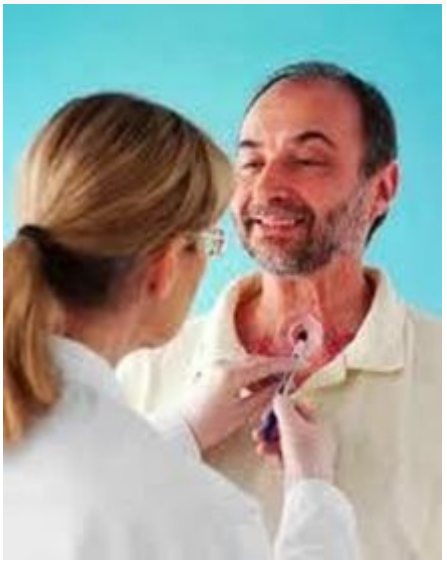
- Nodules **> Voice therapy.**
- Contact Granuloma **> Voice therapy and Anti-reflux management.**



Technical aid device (Artificial Larynx)

In case of total laryngectomy.

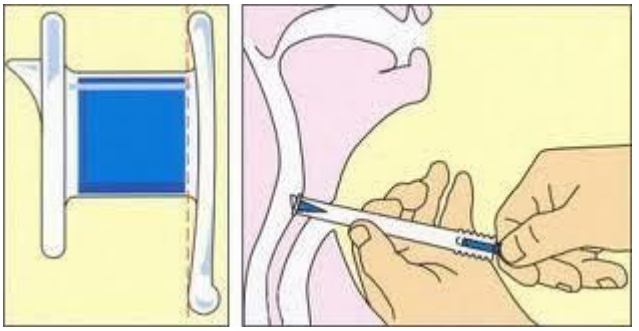
produces vibration assisting assessing phonation



Tracheo-esophageal Puncture

In case of total laryngectomy.

restore the patient's ability to speak



Speech Disorders

01 **Dyslalia (Misarticulation)**

02 **Stuttering**

03 **Dysarthria**

04 **Hypernasality**

1. Dyslalia (Misarticulation) لدغة

➔ **Definition:**

Faulty articulation of one or more of speech sounds not appropriate for age (normal in young age). And it is consistent.

➔ **Types:** the first two are the most important

A. **Sigmatism (/s/ defect):** سبورة
   - Interdental stigmatism ثبورة
   - Lateral stigmatism شبورة
   - Pharyngeal sigmatism خبورة

B. **Rotacism (/r/ defect):** مركب : ملكب = موكب = مكب = مغكب more common in female.

C. **Back To Front Dyslalia:** كورة posterior part of the tongue to the anterior part
   - k → t تورة , g → d

D. **Voiced To Nonvoiced Dyslalia:** الاصوات المجهوره بتفقد
   - g → k, d → t, z → s etc...

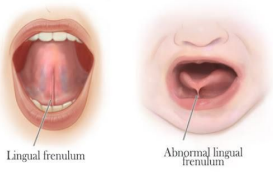
E. **Imitational Dyslalia:** parents have dyslalia → child never learned the correct sound.

Sigmatism & back to front dyslalias are more common in pediatric patients.

Male and F1's slides

➔ **Assessment Of Dyslalia:**

- History Taking.
- Physical Examination "Tongue": check the articulators and tongue tie " a problem in the frenulum, is advanced anteriorly and it attaches the tip of tongue and prevents elevation of the tongue, can't say **La** or **Ra** 'mostly letters affect'".



Investigations

- Audio recording.
- Articulation test which letters are affected.
- Psychometry (IQ).
- Audiometry for high frequency phonemes loss: pt who has problem in high frequency phonemes which can't hear letters well like ص ،س and pronounce them wrongly.

Management

- Treatment of the cause:
  - Tongue tie treat by cutting the frenulum.
  - Dental anomalies, open bite affects esp س.
  - Hearing aids.
  - Dyslalia sheet.
- Speech Therapy with assistance and counseling. Most cases treated this way and it very helpful.

Speech Disorders

2. Stuttering تأتأة أو تلعثم

Time of onset is 1-13 years usually, most devastating psychosocially

➔ Definition:

The intraphonemic disruptions resulting in sound and syllable repetitions أأأأحمد , sound prolongations أأأأحمد (first sound or whole word is prolonged), and blocks worst prognosis, hardest (MCQ!).

➔ **Types:**

1. Repetition . أحمدااا they only repeat the first letter
2. Prolongation حمد----ا
3. Blocking احمد -----

❑ Most important problem facing children with stuttering is the avoidance:

يبدأ الطفل يتجنب المشاركة والتحدث ويصير كل أحد يتجنبه وهذا من أكثر الأشياء اللي يزيد المشكلة سوء.

➔ **Normal Disfluency:** هنا اسمها عدم طلاقة طبيعية يعني ممكن تعدي بدون مشاكل ولكن الطفل عرضة للتلعثم + يقول كلام أكبر من عمره

- Less than 6 years - Only repetitions they repeat the first word NOT the letter - No associated muscular activity - Not aware - NO blocks, any blocks is pathologic.
- need careful behaviour from parents to not turn it into a true stuttering

➔ **Management:**

- Family and patient counseling. Ignore the problem (don't make them aware of the problem) and speak slowly
- Speech therapy: a. Indirect therapy: if not aware.
  b. Direct therapy: if aware.

Male and F1's slides

➔ **Incidence of Stuttering:** 1%.

➔ **Onset:**

- Earliest = 18 Months.
- Latest = 13 Years.

➔ **Epidemiology:**

- More in families with history of stuttering.
- Can occur in mentally retarded.
- Very rare in the hearing impaired.
- Gender ratio: 4:1 (male: female) worse in females, because they are more shy and they get anxious about the problem too much that makes them deteriorate.

➔ **Theories of Stuttering:**

The exact cause is unknown. Although the cause it's not psychological, but this problem has a huge psychological impact.

- Organic/Genetic theory.
- Neurosis theory.
- Learning theory.

➔ **Assessment Of Stuttering:**

- History Taking.
- Physical Examination (**APA**, VPA, …).

Speech Disorders

Male and F1's slides

Auditory Perceptual Analysis (APA)

Core Behaviors:

01

- Intraphonemic disruption. بكسر الحروف
- Repetitions.
- Prolongations.
- Blocks: speaks then stops then tries to speak but no sound is produced

Secondary Reactions:

02

- Muscular activity and struggle (tremors).
- Interjection will say مثلا a lot.
- Word substitutions and circumlocution to avoid saying the word they cannot pronounce.

Concomitant Reactions:

03

- Fear.
- Eye contact (poor).
- Skin pallor/flushing.
- Breathing (antagonism, interruption, prolongation, cessation, ...).

Investigations:

- Audio & video recording if there are reactions do during stuttering and try to avoid them.
- Stuttering severity index (SSI).
- Psychometry (IQ).
- Articulation test.

Management:

- The only treatment till now is speech therapy
- Family and patient counseling. may increase severity if not handled propely by family
- Speech therapy: يكون فيها تعويد الطفل على إبطاء سرعة الكلام + التحكم في النفس
    A. Indirect therapy: if not aware. on the family side (slowing their talk).
    B. Direct therapy: if aware.

Speech Disorders

3. Dysarthria

Here Language Center is intact, not like dysphasia.

➔ **Definition:**

Any combination of disorders of respiration, phonation, articulation, resonance, and prosody* (*like parkinson's patients, masking of tone and emotion in speech) (intonations), that may result from a neuromuscular disorder. Brain and language are normal, the problem is in brainstem or nerves that supply muscles that produce speech sound. It affect the supralaryngeal compartments.

➔ **Types Of Dysarthria:**

Male and F1's slides

Type	Flaccid	Spastic	Ataxic	Dyskinetic	Mixed
Extra					
Lesion	Lower motor neuron level	Upper motor neuron level	Cerebellum level	Basal ganglia level	Maybe the most common
Communication	- Breathy phonation. - Hypernasality.	- Strained strangled phonation. - Labored breathing.	- Increased equal stresses. - Irregular articulatory breakdown.	A. Hypokinetic type (Parkinsonism): - breathy phonation. - rapid rate. - short rushes of speed with final decay. B. Hyperkinetic type: i. Quick hyperkinetic (Chorea): variable rate and loudness. ii. Slow hyperkinetic (Athetosis): slow rate.	- Examples: A. Motor neuron disease (Flaccid+Spastic). B. Multiple sclerosis: (Ataxic+ Spastic). c. Wilson's disease: (Ataxic + Spastic + Hypokinetic).

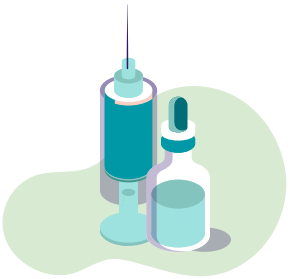
Speech Disorders

Male and F1's slides

➔ **Assessment Of Dysarthria:**
- History Taking.
- Physical Examination: Mouth, Palate, Neurological Exam...

Investigations:

- Audio recording.
- Fiberoptic nasopharyngolaryngoscopy.
- CT/MRI brain.
- Dysphasia test dysarthria can come with dysphasia (Mixed).
- Psychometry (IQ).
- Articulation test.
- Audiometry.
- Nasometry.
- MDVP "multidimensional voice program"
- Aerodynamics (Aerophone II).



Management:

Individualized: no language therapy b/c it's intact unless it's mixed.
- Management of the cause.
- Patient counseling and speech therapy. →
- Communicative therapy: depending on the area affected
  - Articulation - Phonation - Resonance - Respiration - Prosody.
- Alternative and augmentative communication. If no response.

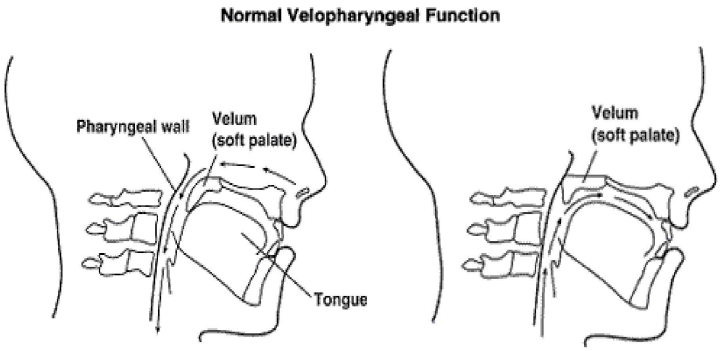
Pt tries to speak fast which is not appropriate with speed of articulators (muscles) so need counseling for how to slow speed of speech and exaggerate the production of sound.

4. Hypernasality: Important

Definition:

Faulty contamination of the speech signal by the addition of nasal noise. It results from velopharyngeal dysfunction (VPD) or insufficiency (VPI).
- Is a disorder that causes abnormal resonance in a human's voice due to increased airflow through the nose during speech.
- Nasal tone (soft palate is open) is used in the letter M (M nasal = B oral) and N.
- Hyponasality→ soft palate closed (closed nasality) e.g. common cold, polyp inflammation, edema,, deviated septum adenoid, turbinate hypertrophy, chronic sinusitis. (M becomes B).
- Hypernasality→ soft palate open (open nasality) → velopharyngeal dysfunction (VPD).

➔ *Causes of hypernasality:*



velum: at rest and with letter N & M

velum: during speech.

Organic:

1- Structural (VP insufficiency):

A. Congenital:

- Overt cleft palate.
- Submucous cleft palate.
- Non-cleft causes:
  1. Congenital short palate.
  2. Congenital deep pharynx.

B. Acquired cause velopharyngeal insufficiency:

- Palatal trauma.
- Tumors of the palate and pharynx.
- Adenotonsillectomy injury to tonsil during surgery.

2-4 weeks => temporary (pain=> decrease movement=> more inx are needed if it exceeds 4 weeks> surgical error.

2- Neurogenic (VP Incompetence):

A. Palatal upper motor neuron lesion.
B. Palatal lower motor neuron lesion.

Male and F1's slides

Non-organic (functional) VP mis-learning:

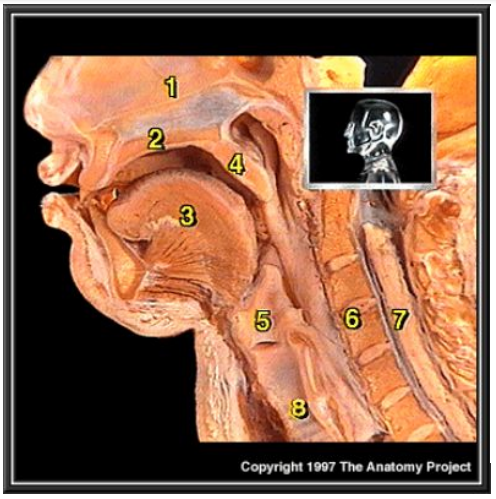
- Faulty speech habits.
- Mental retardation.
- Hearing impairment.
- Post-tonsillectomy pain so pt doesn't move palate, temporary. more than 3 weeks= surgical or iatrogenic trauma.
- Neurosis or hysteria.

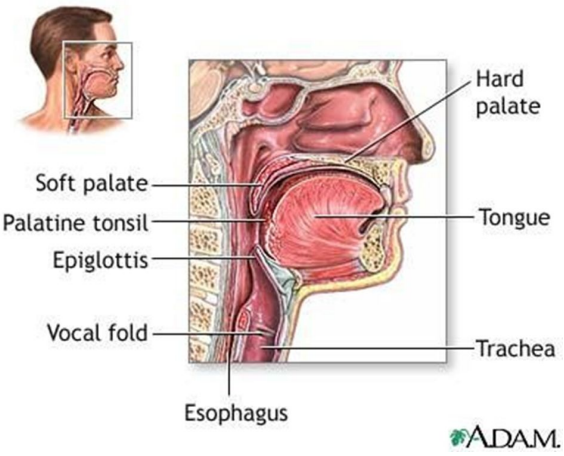
➔ Effects of VPD:

- Feeding problems: nasal regurgitation = cleft palate. the mother is the first to notice.
- Psychosocial problems.
- Communicative problems:
  1. Speech: hypernasality
  2. Language: DLD like in cleft palate pts, undergo many surgeries and are hospitalized which prevent patients from being exposure to environment also compensate leakage in velopharyngeal on vocal cord = hyper abduction during phonation.
  3. Voice: hyper or hypofunction
  4. Ear Infections (tensor palati : CN V).

velopharyngeal: consists of *soft palate + anterior, posterior and lateral pharyngeal walls.
function: be closed during swallowing or speech.
During speech completely close velopharyngeal with posterior and lateral walls, which separates oral and nasal cavities so the speech production comes from the mouth except in two letters "m" and "n" it'll be open and resonance happen in nasal cavity.
In submucous cleft, the velum doesn't close the passage and air is allowed to pass through the nasal passage. This is what gives hyper resonance.

Important for SAQ (from 437)
1- Nasal Cavity.
2- Hard Palate.
3- Tongue.
4- Soft Palate
5- Larynx.
6- Spinal column “Cervical part”.
7- Spinal cord “Cervical part”.
8- Trachea.

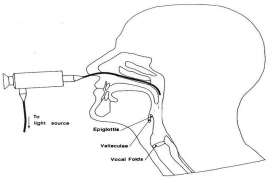




Assessment Of Hypernasality

- Parent interview: trauma, cleft abnormality.
- Perceptual:
  1. Simple test[1]: Gutzman’s (a/i) test - Czermak’s (cold mirror)[2] test.
  2. Resonance.
  3. Articulation.
  4. Nasal air emission audible in severe.
  5. Voice.
- Intra-oral evaluation.
- Instrumental: Nasopharyngoscopy - Nasometry.

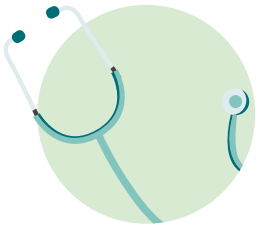
I. History taking.



Flexible Nasopharyngoscopy.

Early Condensation on surface of cold mirror.

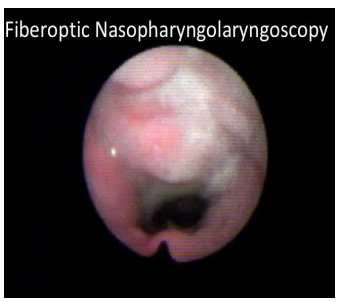
Examination

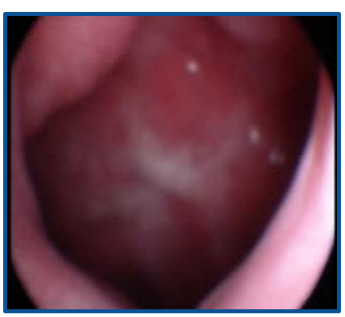


- General.
- ENT examination: palate inspection, palpation
  1. Examine soft palate (Speech and Hypernasality).
  2. Examine swallowing.
  3. Examine vocal folds (Voice).
- Simple tests:
  Gutzman’s (a/i) test.
  Czermak’s (cold mirror) test.

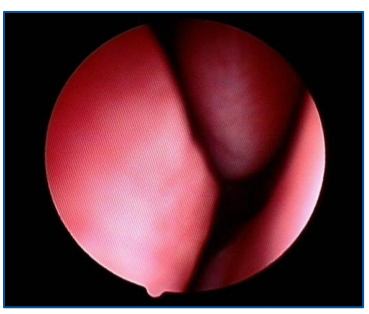
Investigations

- Audio recording.
- Psychometry (IQ).
- Audiometry.
- Fiberoptic Nasopharyngolaryngoscopy is gold standard.
- Articulation test.
- Hypernasality sheet.
- Nasometry: Hypo or Hypernasality.

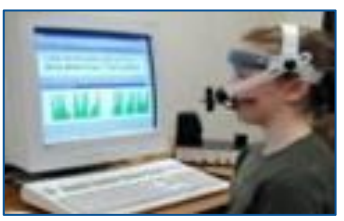




VPD (incomplete closure).



Normal closure



Nasometry

Management

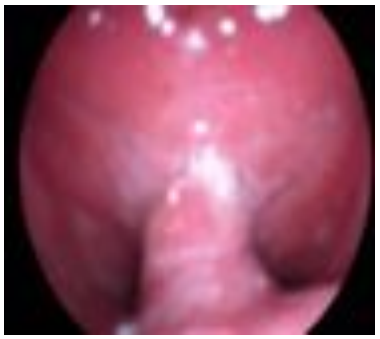
- Multidisciplinary team.
- **Family counseling.** long journey for the patient thats why they need a lot of support
- Management of feeding problem. regurgitation.
- Management of otological and audiological problems.
- Surgical intervention. close the gap.
- Orthodontic intervention.
- Phoniatric intervention (language, speech, voice).
- Feeding,
- Hearing,
- Maxillofacial,
- Palatal and lip surgeries, Obturators.
- Communication (Phoniatric intervention):
  1. Language: Language therapy.
  2. Speech: Speech therapy.
  3. Voice: Voice therapy.

Male and F1's slides

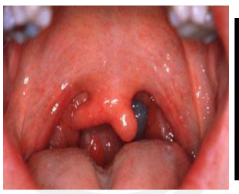
➔ *Treatment Decision:*

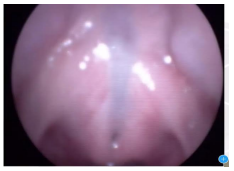
- Velopharyngeal insufficiency (organ dysfunction): surgery (speech therapy post-op).
- Velopharyngeal incompetence (neurological):
  - surgery (speech therapy post-op).
  - prosthetic devices.
  - speech therapy.
- Velopharyngeal mislearning: speech therapy.

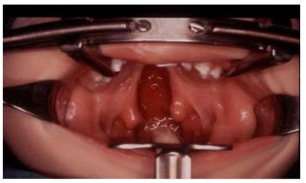
Surgery:	**Prosthetic Device:** (For Elderly) **non favorable**	**Submucous Cleft:** Difficult to diagnose > triad:
• Pharyngeal flap most common. • Sphincter - palatoplasty • Post-pharyngeal wall augmentation. (Insert an artificial device in the posterior pharyngeal wall)	• Palatal lift: to raise the velum when there is poor velar movement (i.e. dysarthria). • Palatal obturator: to occlude an open clef or fistula. • Speech bulb: to occlude nasopharynx.	• Triad of : 1. Bifid Uvula (1st sign). 2. Bluish central line in soft palate. 3. Post nasal notch (instead of spine). • Contraindicated to adenoidectomy > Hypernasality.



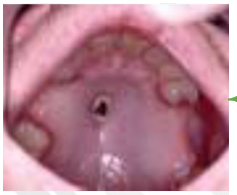
Pharyngeal flap







Cleft palate



hard Palatal Fistula after surgical repair from cleft palate, fistula causes hypernasality

5. Cluttering:

definition: Is a fluency disorder characterized by a **rapid** and/or irregular speaking rate, excessive disfluencies. Rx: first by making the person aware of this problem.

Language disorders

01

Delayed Language Development (DLD)

02

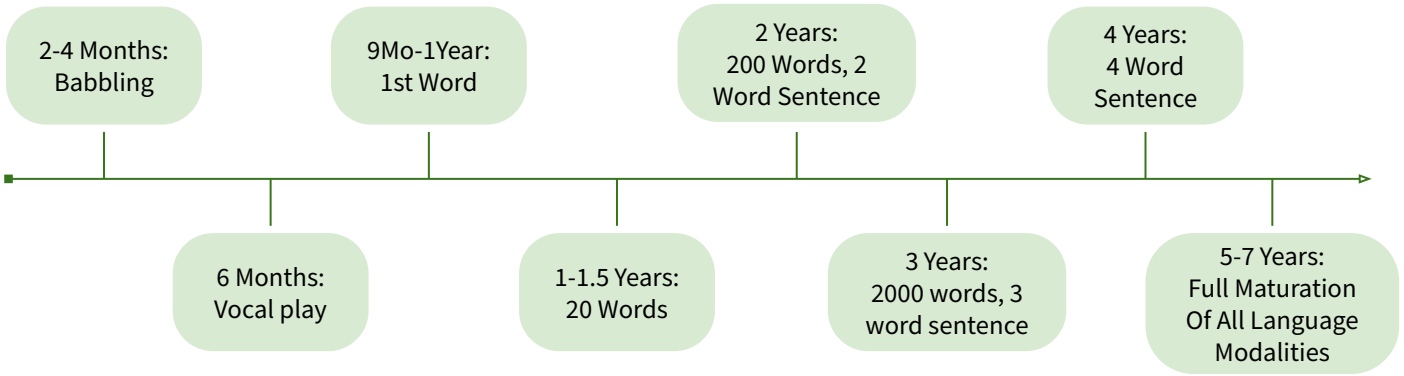
Dysphasia
deterioration of an already acquired language

1. Delayed Language Development (DLD)

➔ **Definition:** Delay or failure to acquire language matched with age.

Male and F1's slides

➔ **Stages of normal language development:**
any delay in a stage could be considered as DLD



➔ **Pre-requisites Of Normal Language Development:**

1. Intact brain functions (conceptual, motoric and cognitive abilities).
2. Intact sensory channels: Auditory, Visual, Tactile, Kinesthetic.
3. Intact psyche. (ADHD , Autism)
4. Stimulating environment, very important If everything is normal but the kid is left alone → will not talk.

- Central Language Control:
  - The left hemisphere is the processor of language functions in almost all people regardless handedness. It is the dominant hemisphere.
  - Language areas are distributed along the rolandic fissure.
  - Anterior language area mainly in the temporal region concerned with expressive aspect.
  - Posterior language area mainly in the parietal region concerned with receptive aspect.
- Structural Domains Of Language:
  - Semantics: meaning.
  - Phonology: articulation.
  - Syntax: grammar.
- 435 notes:
  - Babies should say their first word at their 1st year (9 months – 1yr).
  - At their 3rd year they should be able to say more than one sentence, if not, they may have DLD.
  - A parent with a baby who speaks no more than 2 words at age of 2 should seek advice.
- If you suspect hearing problem seek advice immediately at any age

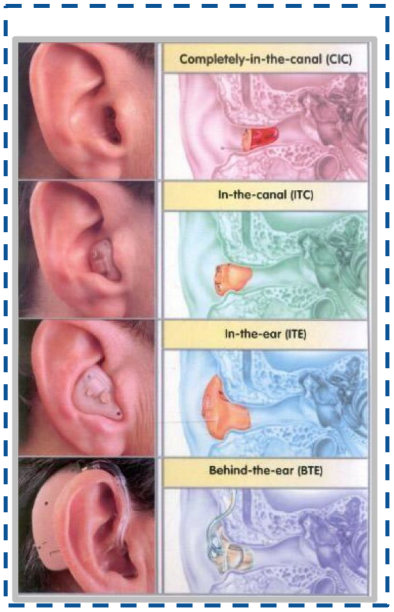
Language disorders

➔ **Etiology Of Delayed Language Development:** opposite of pre-requisites

1. Brain damage:
   - Diffuse subcortical lesion (Mental Retardation).
   - Localized brain damage with motor handicap (BDMH).
   - Minimal brain damage (ADHD), medication then speech therapy.
   - Cerebral palsy (CP), hypoxia or trauma during delivery.
2. Sensory deprivation:
   - Hearing impairment: Conductive, Sensorineural, Mixed, Central Auditory Processing Disorder.
   - Visual impairment.
3. Psychiatric illness:
   - Autism, Autism Spectrum Disorder (ASD), childhood schizophrenia.
4. Environmental deprivation: everything else is normal
   - Non-stimulating environment: lonely child, first and last child.
5. Idiopathic (Specific Language Impairment), best prognosis. Everything intact.

➔ **Assessment Of Language Development:**

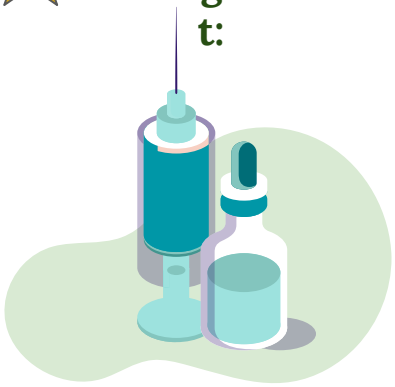
- History taking.
- Physical Examination of articulators.



Investigations:

- Psychometry (IQ) mentally challenged or not.
- Audiometry.
- Brain Imaging for injury.
- EEG.
- Ophthalmological consultation.
- DLD sheet.

Management:



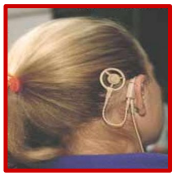
- Early detection, the earlier the better the prognosis due to brain plasticity being higher the younger a child is.
- Providing the suitable aid: Hearing aid or cochlear implant (HA or CI) - Visual Aid - Physiotherapy.
- Family counseling, it is important for how to deal with the child and enhance his language.
- Direct language therapy (individual - group)
- Medications (autism and ADHD)

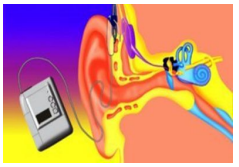
Language disorders

[Male and F1's slides]

SAQ Stop: very important

- **What is this device called ?** Cochlear Implant. Cochlear Implant is contraindicated in children over 5 years old as they will benefit very little due to low brain plasticity.
- **What are the indications for CI ?** Bilateral severe to profound sensorineural hearing loss.



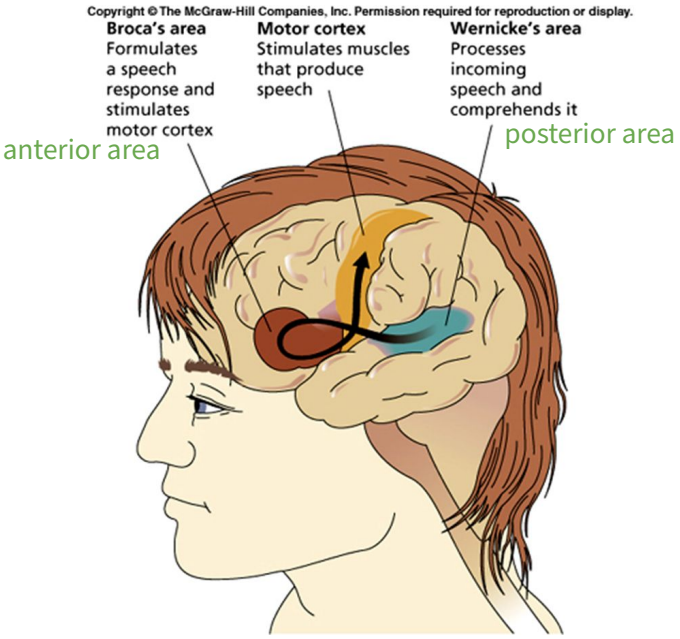


2 is Implant part

2. Dysphasia

➔ Definition:

Language deterioration after its full development (> 5 years old) due to brain insult: infarction, hemorrhage, atrophy, etc. Language center is in (Dominant) left hemisphere: anterior language zone is responsible for speech production and posterior language zone is responsible for comprehension. So when these areas are affected will lead to Broca's aphasia or wernicke's aphasia according to affected area, or expressive and receptive aphasia. When pt comes with infarction of left hemisphere could come with language problem; while in infarction of right hemisphere lead to dysarthria without language problem.



- Full development of speech:
  - Females: 7.5 years (more stutter).
  - Males: 8 years.

Language disorders

2. Dysphasia

➔ **Etiology:**

- CVA
- Neoplastic
- Traumatic
- Inflammatory
- Degenerative
- Metabolic
- Poisoning

➔ **Types of dysphasia:**

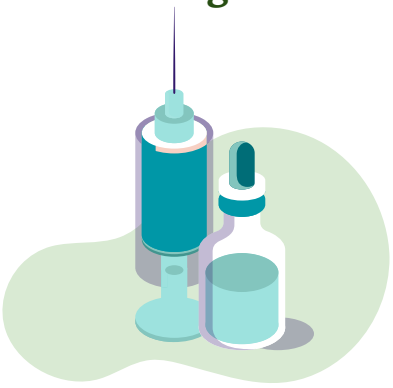
- Expressive. most common
- Receptive.
- Mixed predominantly expressive.
- Mixed predominantly receptive.
- Global.

Assessment of Dysphasia

➔ History taking.
➔ Physical examination: … , neurological exam.
➔ Investigations:

- CT / MRI brain.
- Dysphasia test.
- Psychometry (IQ).
- Audiometry.

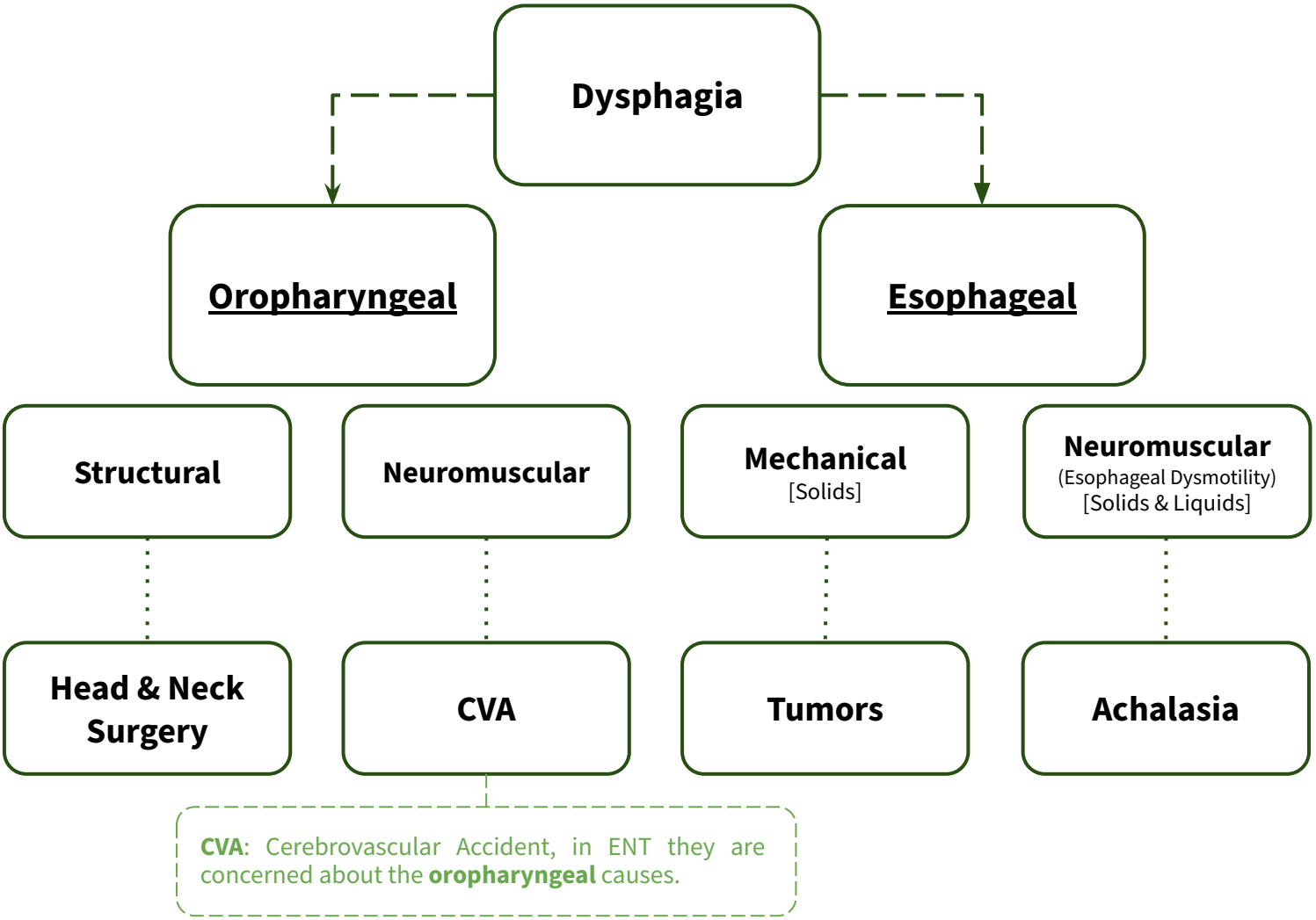
Management:



➔ Management of the cause.
➔ Physical rehabilitation (Physiotherapy).
➔ Family counseling.
➔ Language therapy.
➔ Alternative and augmentative communication.

Swallowing Disorders

• Causes of dysphagia:



Definitions

- **Dysphagia:** Difficulty in moving food from the mouth to the stomach (pain, discomfort and/or difficulty in initiation or completing the act of swallowing).
- **Odynophagia:** Painful swallowing due to a disorder of the esophagus.

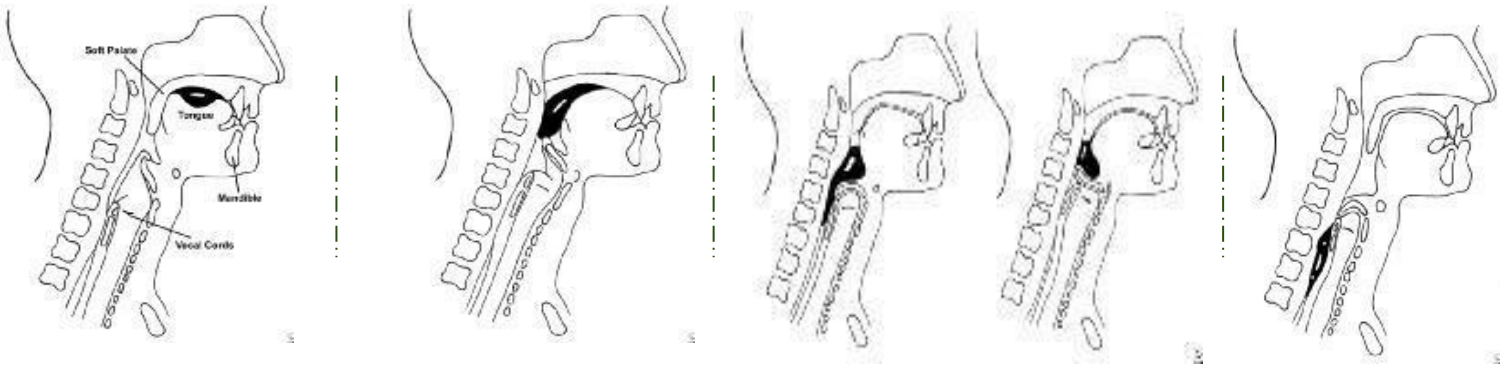
➔ Phases of normal swallowing:

1. **Oral** (Voluntary).
2. **Pharyngeal** (most important and crucial phase).
3. **Esophageal**.

➔ Consequences of Dysphagia:

- Dehydration.
- Weight loss.
- Aspiration pneumonia (Most dangerous).
- Airway Obstruction.
- Loss of joy of eating.

Phases of normal swallowing:



1- Oral Preparatory Phase	2- Oral Propulsive Phase	3- Pharyngeal Phase	4- Esophageal Phase

➔ Assessment Of Dysphagia:

1. **History Taking.**
2. **Physical Examination:**
   - General examination.
   - Language and Speech assessment.
   - Vocal tract examination.
   - Neck examination.
   - Trial feeding (bedside assessment) give them food and let them try to swallow to see if there is choking or aspiration
   - Dysphagia sheet.

Investigations:

- FEES “Fiberoptic endoscopic evaluation of swallowing”.
- VFES (MBS) “Video fluoroscopic evaluation of swallowing” (Modified barium swallow) It shows the pathway from lips to upper esophageal sphincter (oral and pharyngeal steps).
- GERD (LPR) Workup.

(FEES)

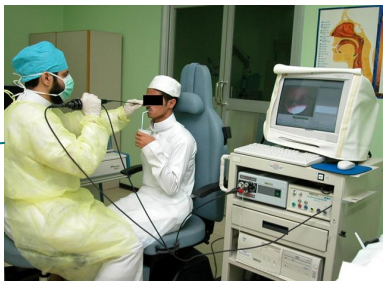
give the patient different types of food and observe the swallowing

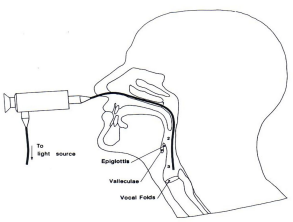
FEES protocol of evaluation (Langmore, 2003):

a. Anatomic and physiologic assessment.

b. Assessment of food and liquid swallowing.

c. Assessment of therapeutic interventions.





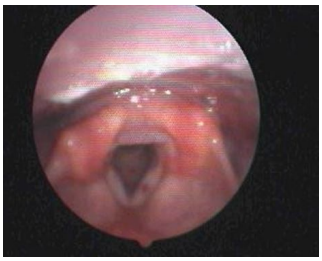
What area will you see ?

1- nasopharynx

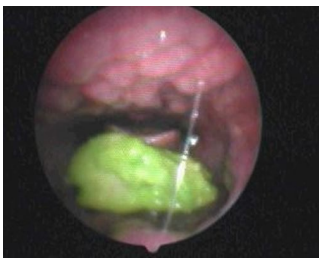
2- larynx and pharynx

3- anything below the true vocal cords (eg. aspiration)

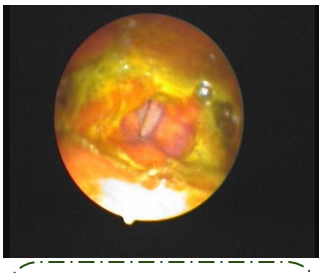
• Investigations continued :



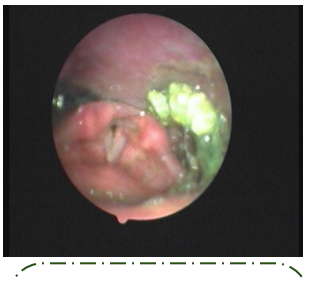
Normal FEES



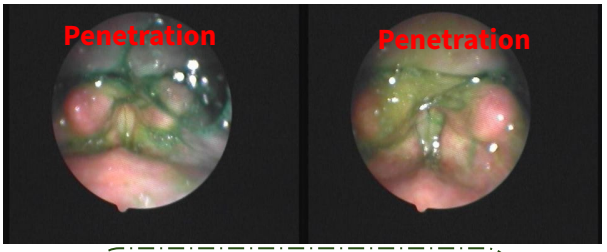
Residue



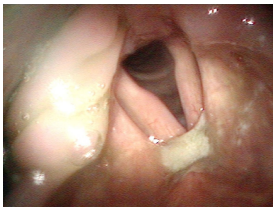
Residue in piriform fossa, laryngeal vestibule.



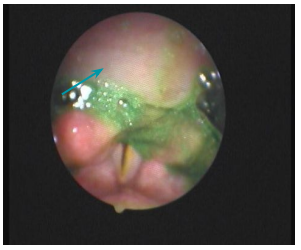
Residue
Post swallow in the left piriform sinus due to pharyngeal weakness



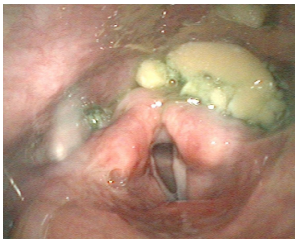
didn't pass below the vocal cords if it did pass ➜ aspiration



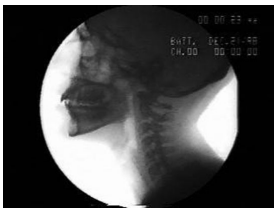
Penetration on anterior commissure



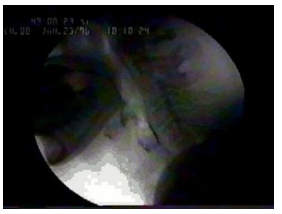
Aspiration
passed in



Residue in left piriform fossa



Normal VFES (MBS)

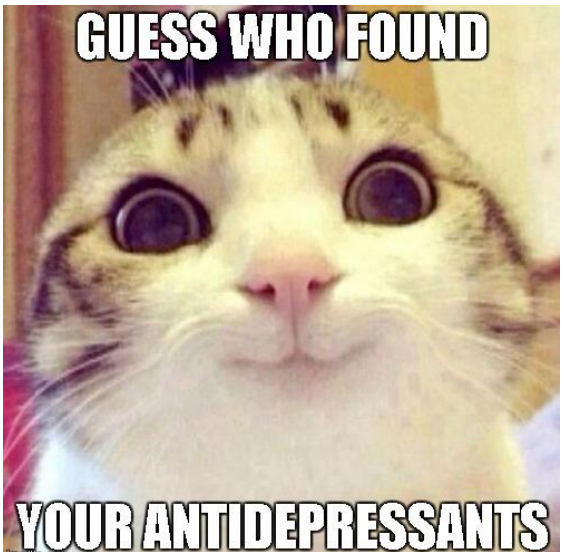


Aspiration

- Residue = in the pharynx.
- Penetration = at the true vocal folds.
- Aspiration = below vocal folds, you will see bubbles after you ask the patient to say “aaa”
- Normally when drinks or food enters the airway there’s cough reflex, but if for e.g. an old patient with CVA or stroke and the fluids enter the airway and no cough reflex, this is called **Silent Aspiration** which is very dangerous.
- If aspiration occurs, **penetration** must have occurred first (except in tracheoesophageal fistula where aspiration without penetration).
- Aspiration of liquid is **more common** but less severe than aspirated solids.
- “Above vocal folds= penetration, Below vocal folds= aspiration”

Management of Dysphagia:

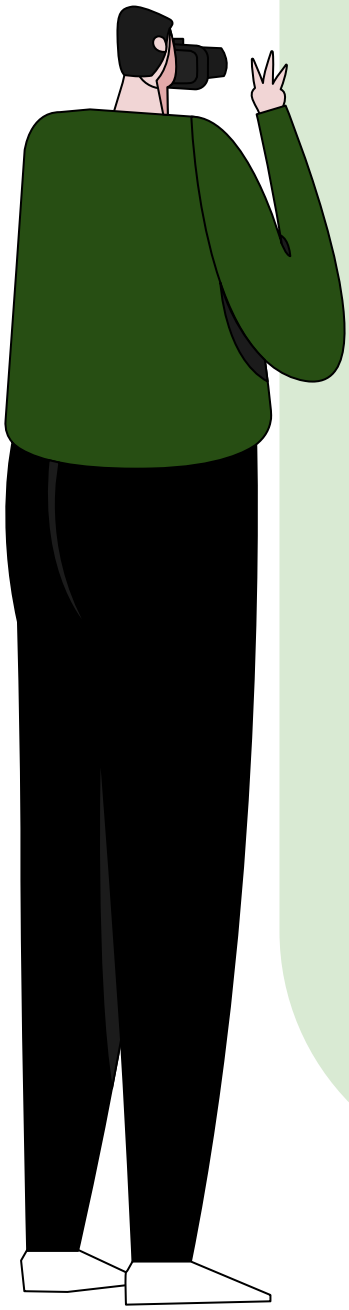
1. **Swallowing therapy:**
   a. Diet modification (if the problem is with solids only or fluids only).
   b. Postural techniques. Chin tuck to protect the airway
   c. Swallowing maneuvers. Cough after swallowing
   d. Sensory enhancement techniques.
   e. Motor exercises.
   f. Bolus control cup
2. **Surgical treatment,** e.g. medialization laryngoplasty. Like in vocal fold paralysis, cricopharyngeal muscle spasm.
3. **Medical treatment**, e.g. anti-parkinsonism drugs.
4. **Intraoral prosthesis**, hypernasality VPD, VPI insufficiency/nasal regurg.
5. **Alternative routes of feeding**, e.g. NG tube feeding. Temporary (not more than 6 weeks), >6 weeks = gastrostomy.



THANK YOU!

This work was done by:

Abdullah AlQarni.



Team Leaders:

Naif AlFahed.
Nawaf AlGhamdi.
Abdullah AlQarni.

Special Thanks to

TEAM 438 & 439
AND
For your patience :)