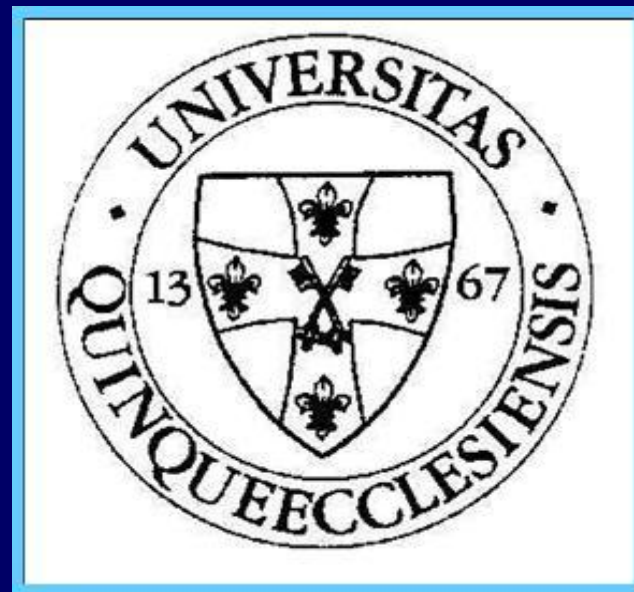
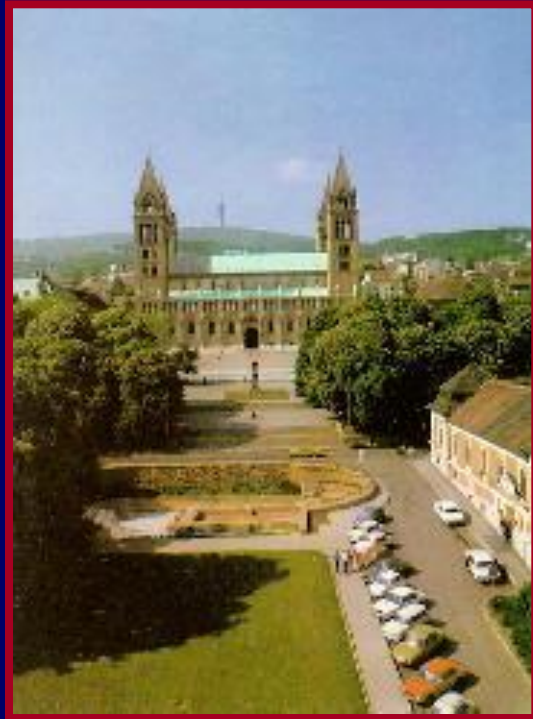


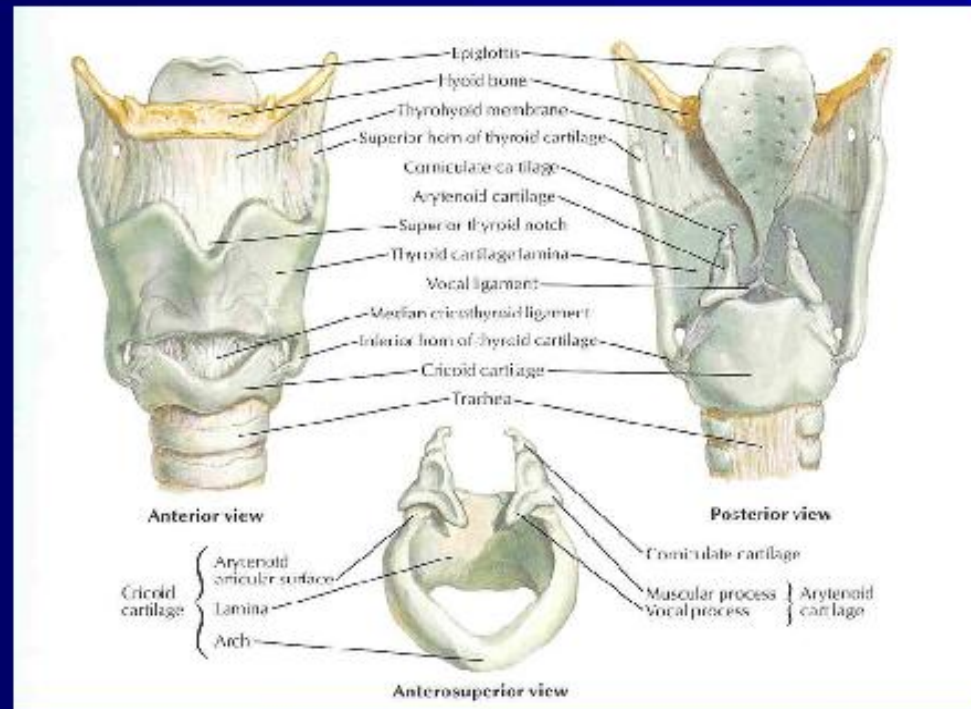
# ***Benign lesions of the larynx***

**Univ. ENT Dept.  
Pécs**

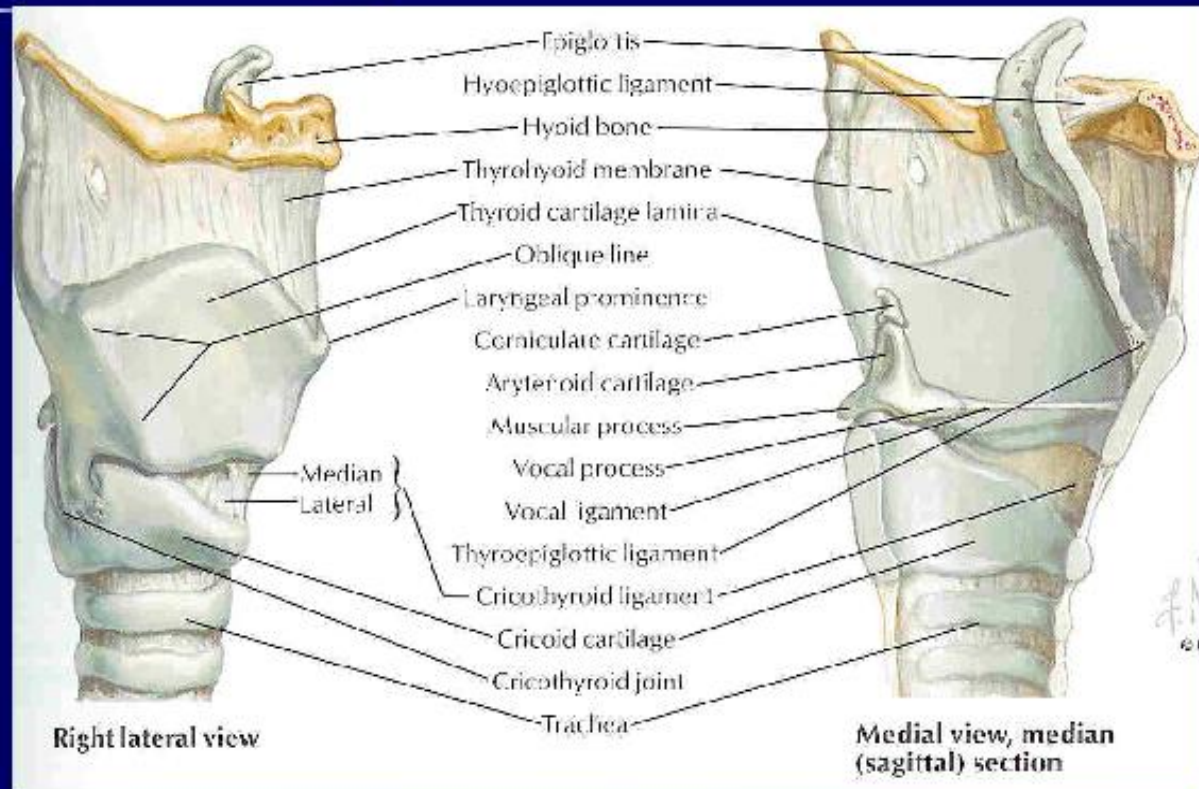


**Dr. Imre Gerlinger**

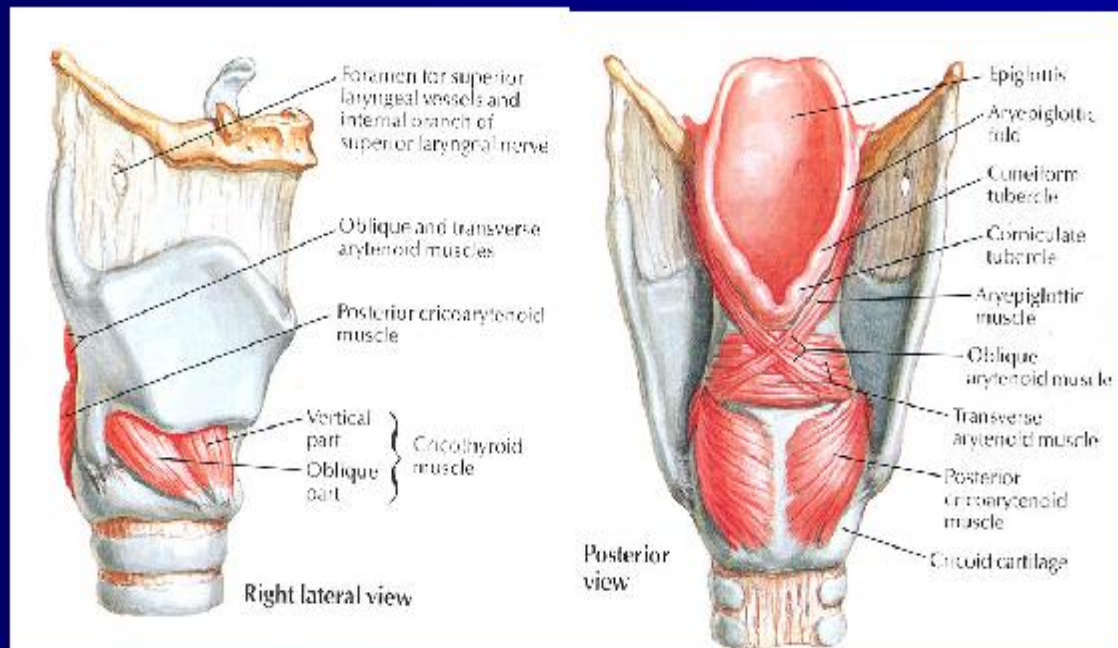
# Anatomy: Laryngeal Cartilage



# Anatomy: Laryngeal Cartilage

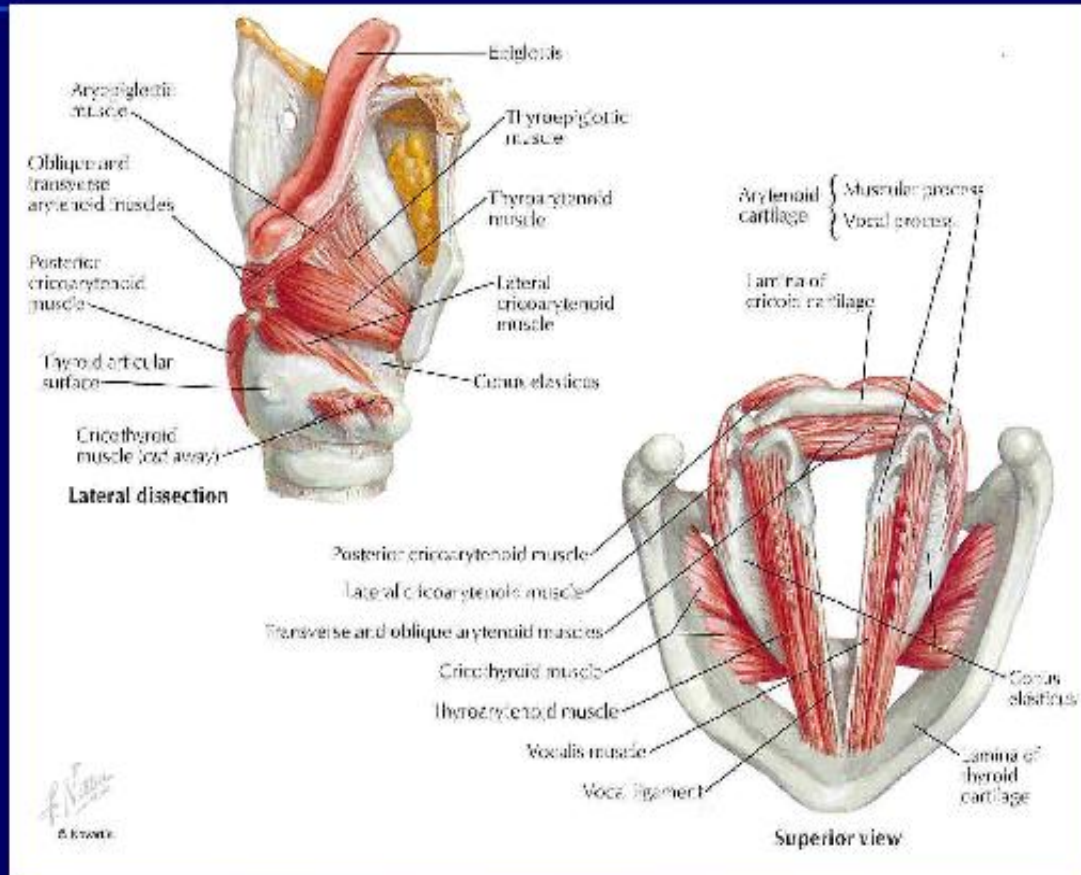


# Anatomy: Laryngeal Muscles

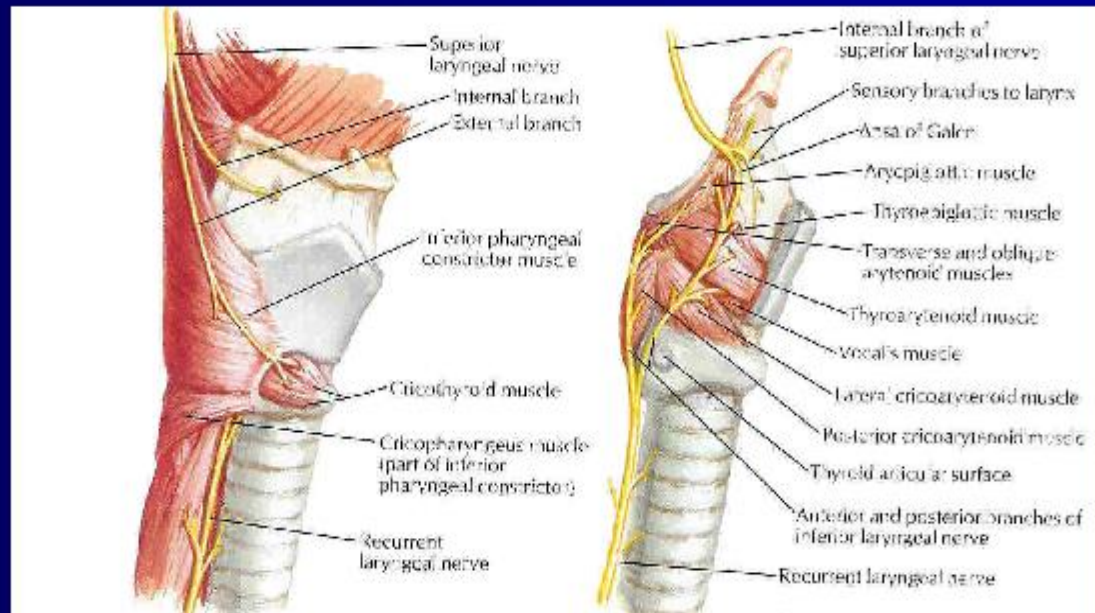




# Anatomy: Laryngeal Muscles

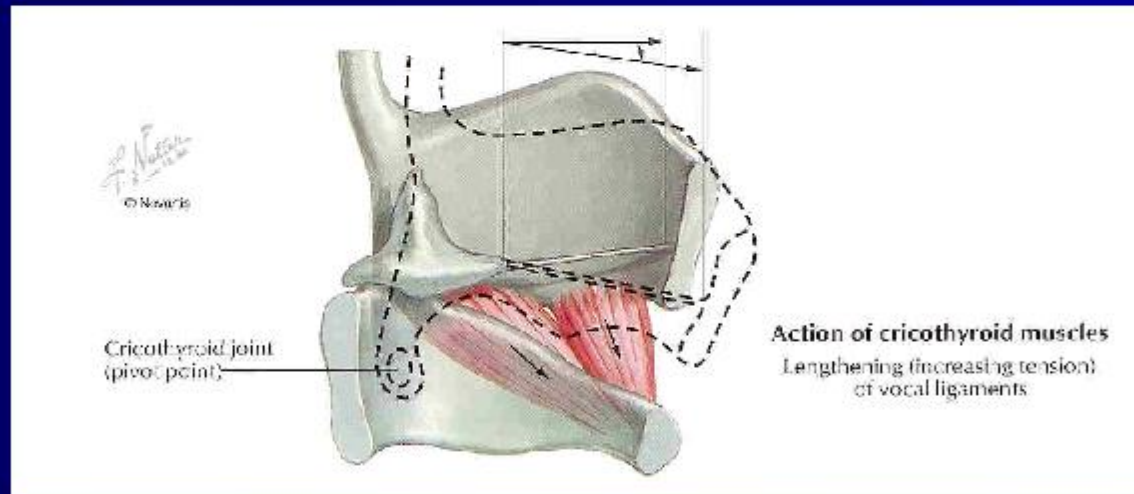


# Anatomy: Laryngeal Innervation



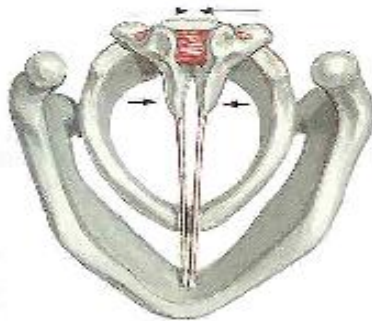
# Anatomy: Laryngeal Motion

- Tension of vocal ligament

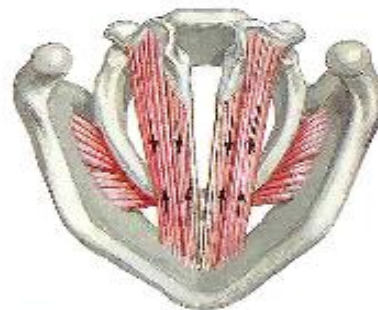


# Anatomy: Laryngeal Motion

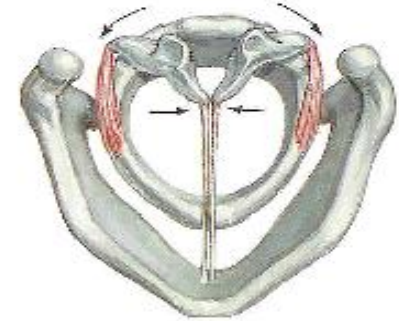
- Adduction of vocal ligament



Action of transverse arytenoid muscle  
Adduction of vocal ligaments



Action of vocalis and thyroarytenoid muscles  
Shortening (relaxation) of vocal ligaments

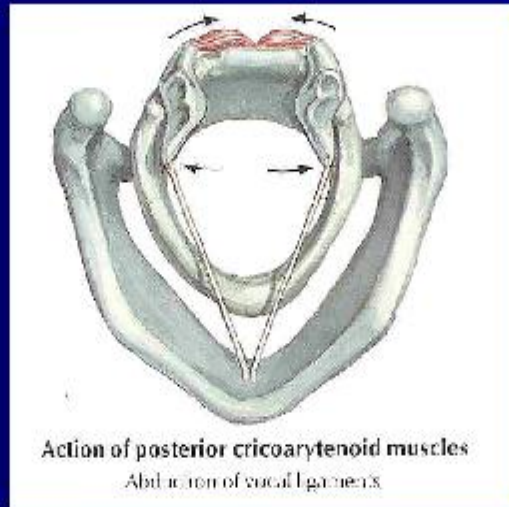


Action of lateral cricoarytenoid muscles  
Adduction of vocal ligaments



# Anatomy: Laryngeal Motion

- Abduction of vocal ligament





# Definitions regarding pre-malignant lesions 1.

- ❑ **Metaplastic changes**: respiratory epithel is replaced by squamous epithel (good vitality)
  - ❑ **Hyperplastic changes**: 6-10 cellular layer becomes wider (str. spinosum !), with or without keratosis, however, no atipic cells!
  - ❑ **Keratoi changes**: metaplastic changes of the non-keratic squamous cells, abnormal degree of keratin procuction (hyper-para-daskeratosis).
  - ❑ **Leukoplakia, pachydermia**: clinical definitions!
-



# Definitions regarding premalignant lesions 2.

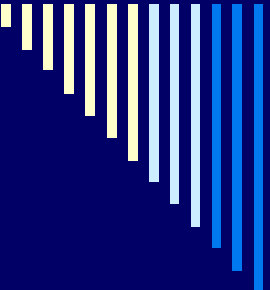
- **Dysplastic changes:** appearance of atypic cells and structural changes in the epithel.

## Atypia:

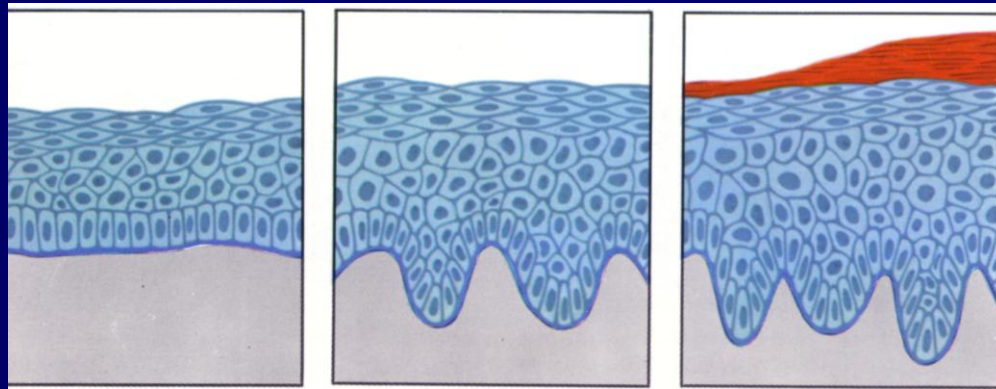
- a.) cell and nuclear polymorphism
- b.) hyperchromatic nuclei (content of DNA increases)
- c.) nucleus-cellular plasm ratio increases
- d.) more and greater number of nuclei
- e.) more atypic changes

## Structural changes:

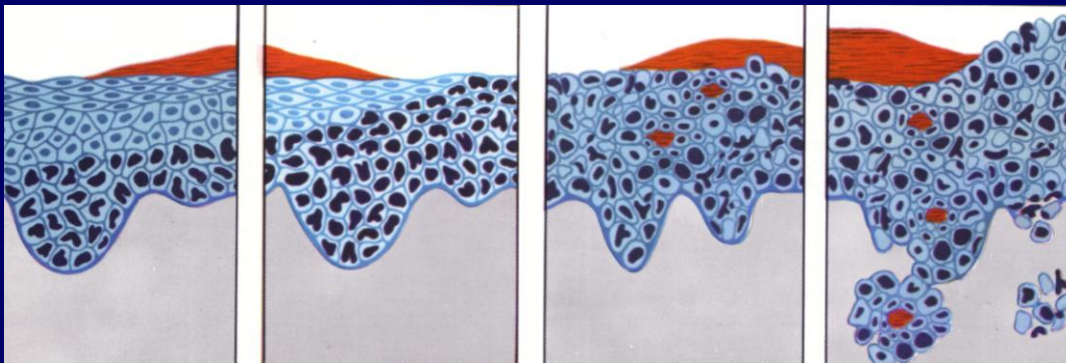
- a.) layering disappears unified cellular layers
  - b.) keratotic changes
  - c.) loose cellular connections
  - d.) papillary changes in the stroma
  - e.) basal membrane still intact, content of laminin, p53, collagen IV. increases
-



Hyperplastic, metaplastic, dysplastic changes, cc. in situ, invasív cc.



**hyperplastic,  
metaplastic  
changes**



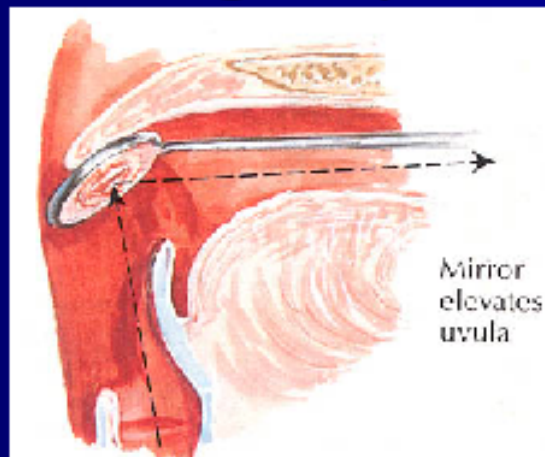
**Dysplastic  
changes, cc. in  
situ, invasív cc**



# Physical Examination

## ■ Laryngeal mirror

- Advantages: fast, inexpensive, minimal equipment
- Disadvantages: gag, nonphysiologic, no permanent image capability



# Physical Examination

- Rigid Laryngoscopy (70 or 90-degree telescope)
  - Advantages: best optic image, magnifies, video documentation
  - Disadvantages: gag, nonphysiologic, expensive



# Physical Examination

- Flexible fiberoptic nasolaryngoscope
  - Advantages: well tolerated, physiologic, video documentation
  - Disadvantages: time consuming, expensive, resolution limited by fiberoptics



# Physical Examination

## ■ Videostroboscopy

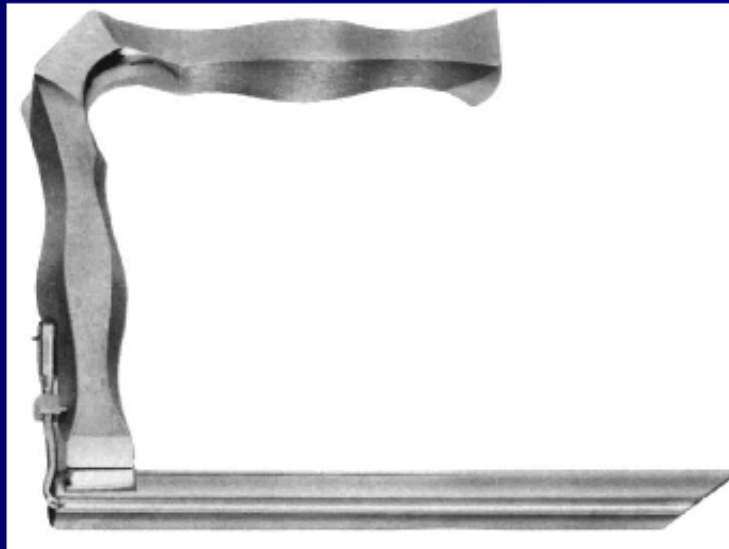
- Advantages: allows apparent “slow motion” assessment of mucosal vibratory dynamics, video documentation
- Disadvantages: time consuming, expensive





# Physical Examination

- Direct laryngoscopy
  - Available for use with treatment





# Benign lesions of the larynx

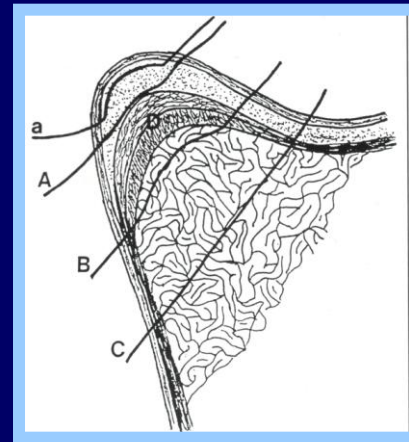
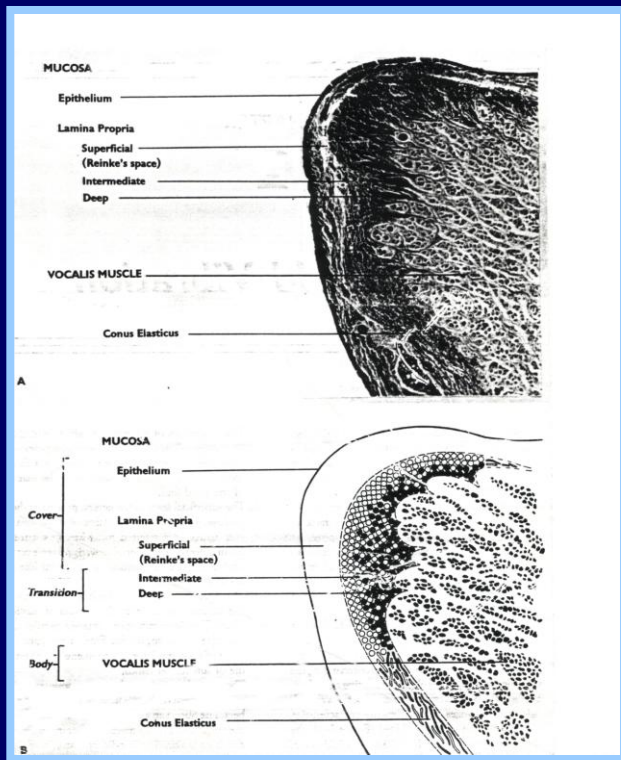
- Reinke oedema
  - Vocal cord polyp
  - Singers' nodul, vocal cord cyst
  - Juvenil papilloma of thew larynx
  - Granuloma
  - Mesodermal lesions: (5 %): lipoma, myoma, haemangioma
- 95 %

# Reinke-oedema



- ❑ 30-50 yrs old heavy smokers, male/female: same
  - ❑ Deep frequency, husky, tired voice.
  - ❑ Connective tissue lamellas in Reinke space, and effusion.
  - ❑ Invasion with fibroblasts, fibrocytes, later hyperplastic changes, keratosis (atypia: never).
  - ❑ 80 %: bilateral, generally assymmetric.
  - ❑ Therapy: mind the free edge of the vocal cords, preserve the integrity of the vocal cord muscle!
-

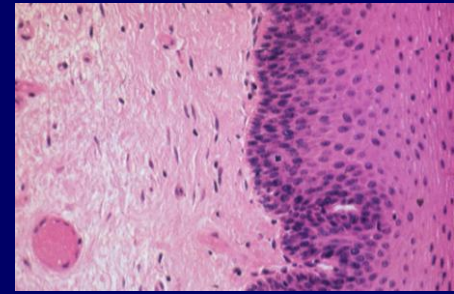
# Reinke space (Hirano's figure)



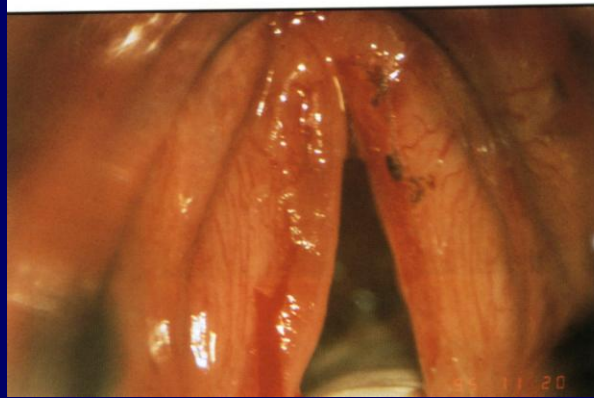
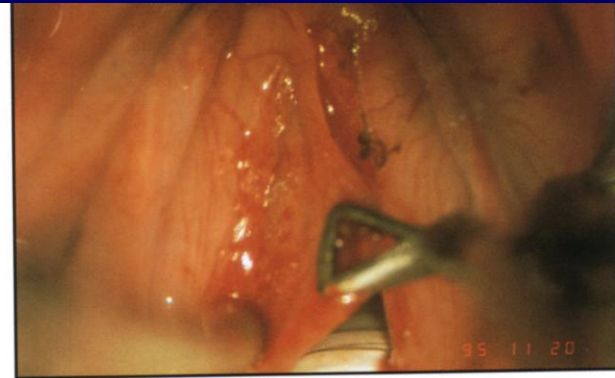
- a: under the basal membrane of the epithel
- A: above the vocal ligament (medial lam. propria)
- B: under the vocal ligament (deep lam. propria)
- C: thyroarytenoid muscle
- D: vocal ligament



# Reinke-oedema



# Reinke – oedema - surgery



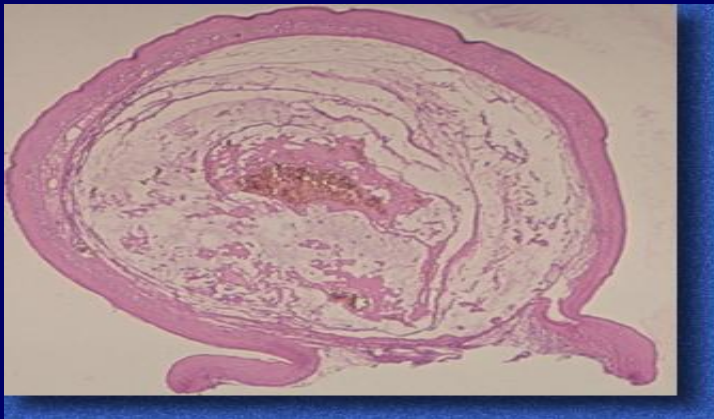
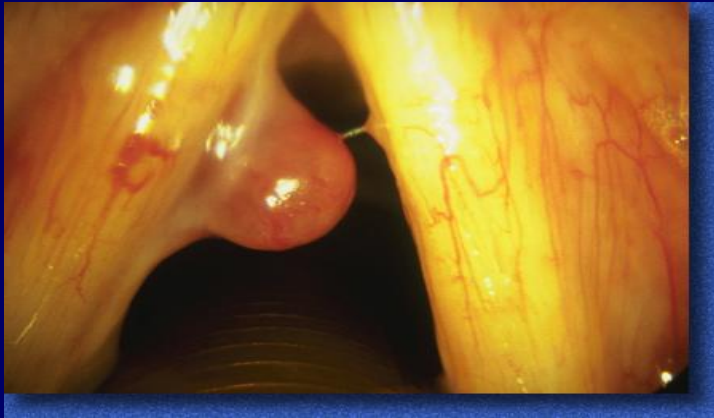
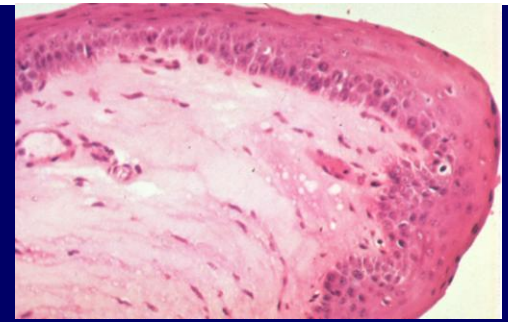
**Microflap  
technique**

# Vocal cord polyp



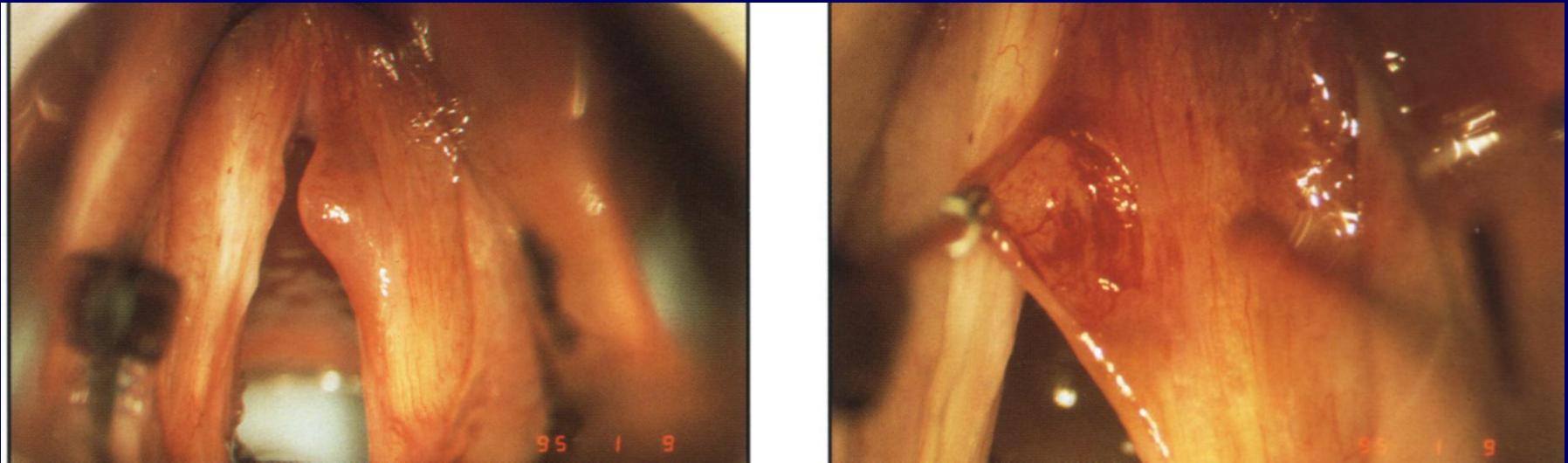
- ❑ Most frequent benign lesion, affects middle-aged males, generally smokers.
- ❑ Can follow acute infection, fonorauma.
- ❑ croaking, hoarsness.
- ❑ Pendular lesion, or a lesison with a wide base.
- ❑ Can be hyperplastic, however, atypic changes can never be detected.
- ❑ Therapy: laser or conventional phonosurgery

# Vocal cord polyp





# Phonosurgery of the vocal cord polyp - hidrodissection

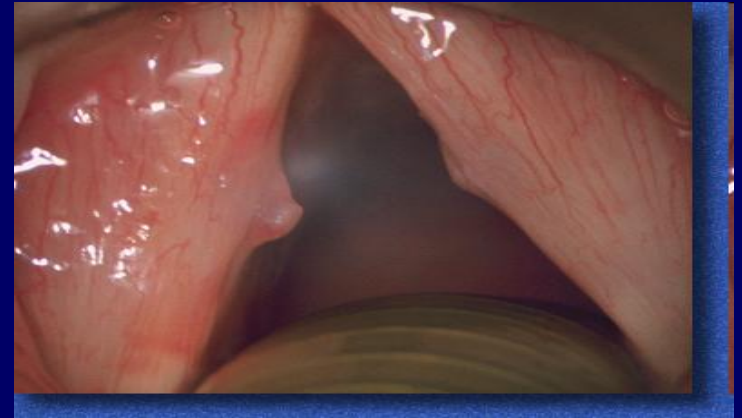
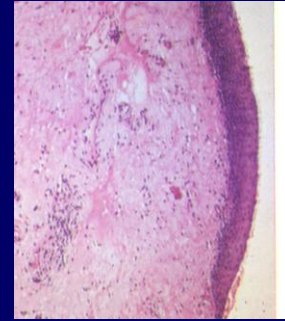


# Singers' nodule

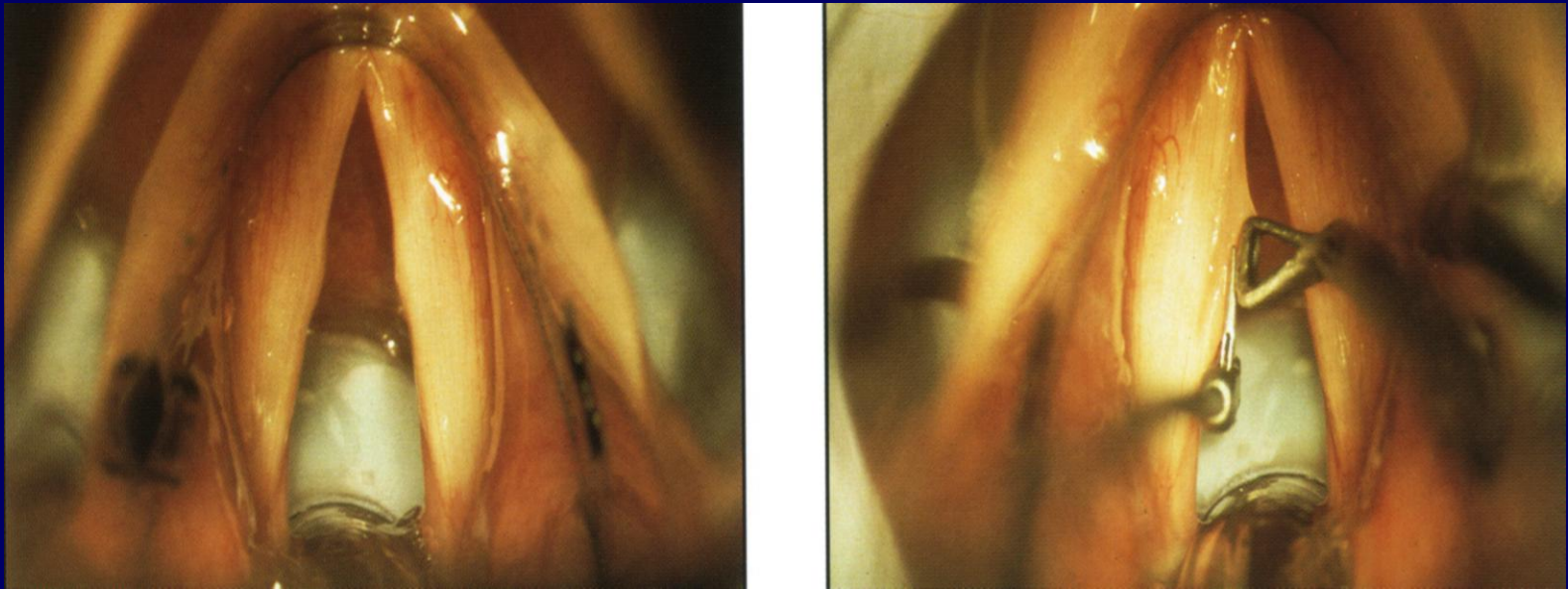


- ❑ Mostly the younger generation is affected, location: anterior-middle third.
- ❑ Forced voice, gradually increasing hoarseness
- ❑ Whitish-greenish, sometimes yellow.
- ❑ Sometimes „kissing nodules”.
- ❑ Reinke-space oedema, hyalin content, fibrin deposits, vascular changes, hyperkeratotic lesion.
- ❑ Therapy: phoniatry or phonosurgery.

# Singers' nodule



# Removal of singers' nodule - hidrodissection



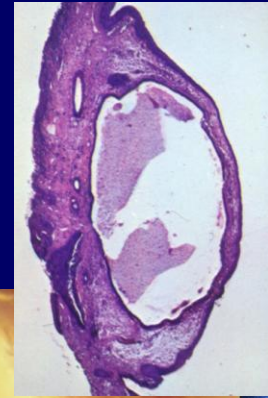
# Laryngeal cyst



- ❑ Can be **congenital**: covered by thick mucous mb.,
- ❑ In the supraglottic region it can be 1-2 cm in diameter.
- ❑ Mostly not congenital **acquired**: small, superficial, reason: blocked openings of the small salivary glands,
- ❑ Can occur on the surface of the false vocal cord, aryepiglottic fold.
- ❑ Frequently no symptoms, can cause foreign body feeling.
- ❑ Can be located on the surface of the middle third: smooth, covered by thin epithel, contains liquid, bluish-greyish transparency.
- ❑ Therapy: laser or conventional phonosurgery, marsupilation.



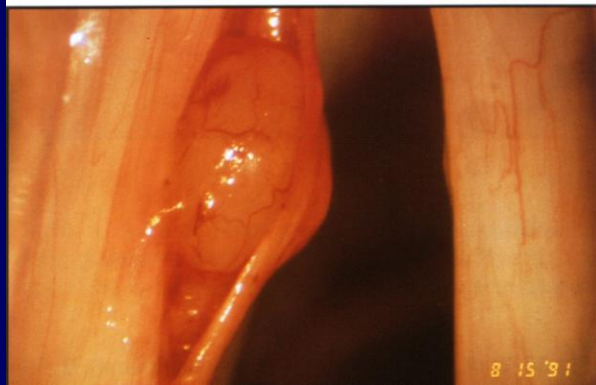
# Vocal cord cyst



**Stroboscopy !**



# Removal of vocal cord cyst – hidrodissection technique

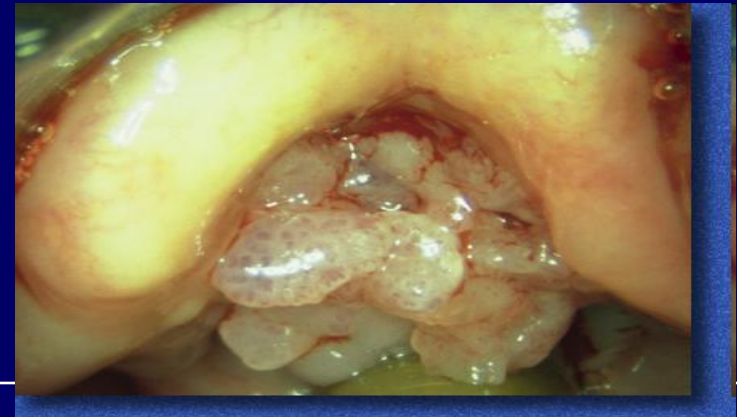
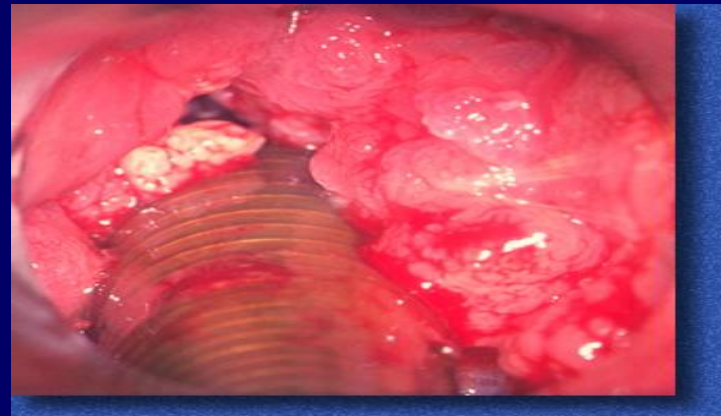
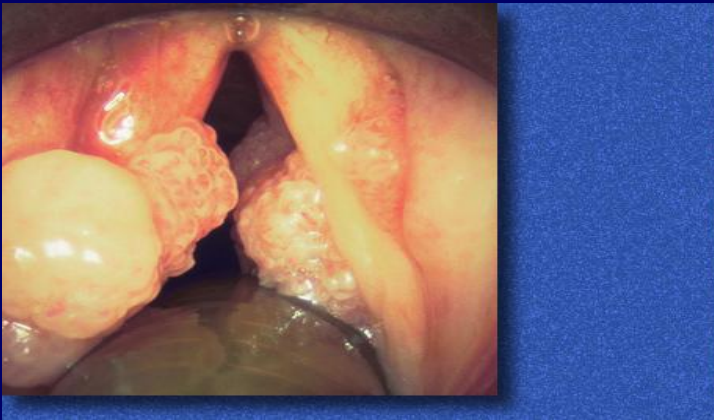
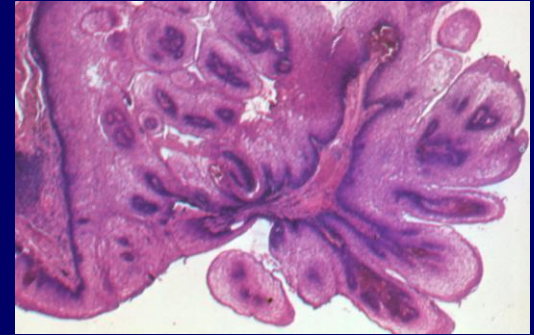


# Juvenile papilloma

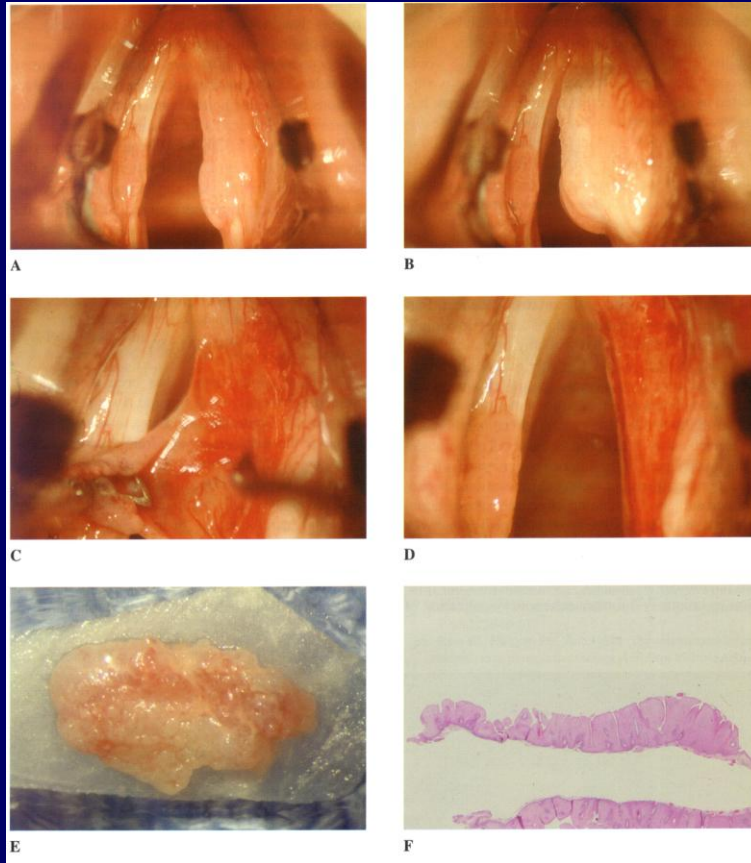


- ❑ Most frequent benign laryngeal tumor of the pediatric age group.
- ❑ Uneven surface, greyish, pinkish, redish color, coliflouwer-like papillary changes.
- ❑ Viral origin : HPV 6 és 11.
- ❑ Multiplex, can occur anywhere in side the larynx.
- ❑ If untreated: the surface becomes bullosus.
- ❑ Recidiv papilloma: uneven red surface
- ❑ Deeper layers of the mucous membrane can be affected.
- ❑ Stongly vascularised, prone to bleeding.
- ❑ Frequent reoccurance (sleeping virus, microinjuries).
- ❑ Therapy: laser, isoprinosine (inhalation can be a risk !)

# Juvenile papilloma



# Removal of laryngeal papilloma - hidrodissection





## Intralesional cidofovir

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- Cidofovir is a cytosine nucleotide analog
- Inhibits cytomegalovirus DNA polymerase
- Potential antiviral activity against :
  - herpes viruses, EBV, CMV, HSV, and varicella zoster, as well as HPV and adenovirus.

# Intralesional Cidofovir

---

- Small cohort of 10 patients
- 7 obtained complete remission
- Remaining 3 had notable improvement
- Complete remission defined as disease free and no recurrence after 6 months
- Average patient received 8.8 doses at 1 month intervals
- In aggressive cases, results were less favorable

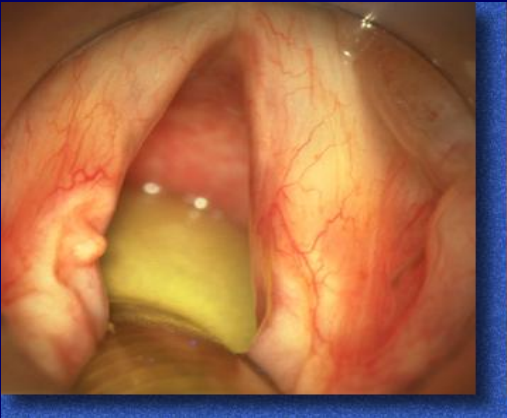


# Granulomas of the larynx



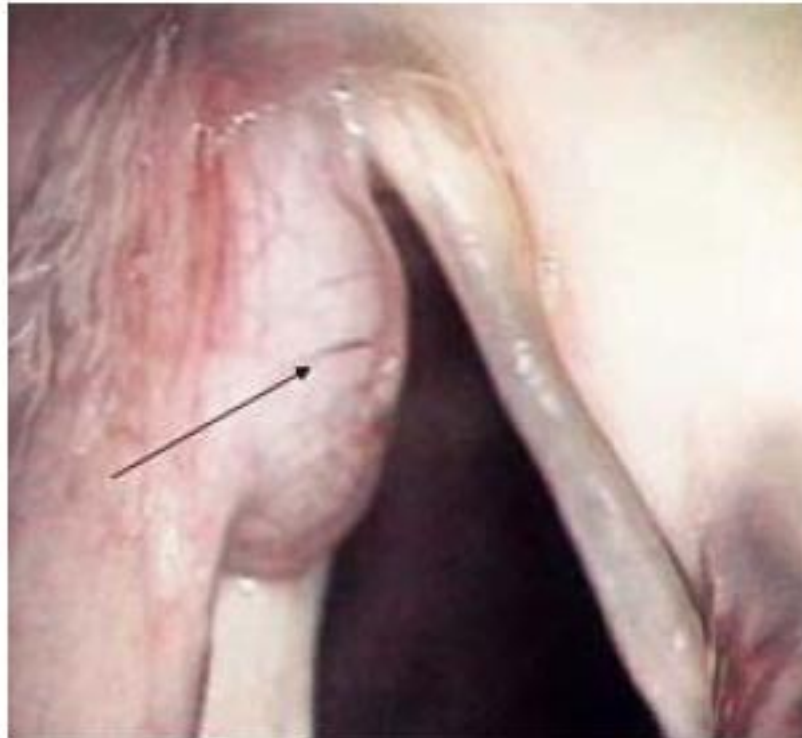
- ❑ Contact form, and postintubation form.
- ❑ Occurs at the posterior thirds of the vocal cords, close to the arytenoids.
- ❑ Reason: stress, trauma, spastic dysphonia.
- ❑ Dyspepsy, reflux as etiologic factors.
- ❑ Uni-or bilateral, tired voice, feeling of strangulation, can be followed by huskiness, laryngeal pain.
- ❑ Spontaneous regression can occur (rare), laser vaporisation is very effective (CO<sub>2</sub>, KTP laser).

# Contact granuloma of the larynx



# Laryngocele

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- Saccular disorder
- Can be internal, external or combined
- Caused by increased transglottic pressure
- Must r/o scca



# Laryngocele

---

- Potential complications
  - Laryngopyocele
  - Aspiration
  - Obstruction
- Management is surgical
  - Primary endoscopic marsupialization
  - External approach

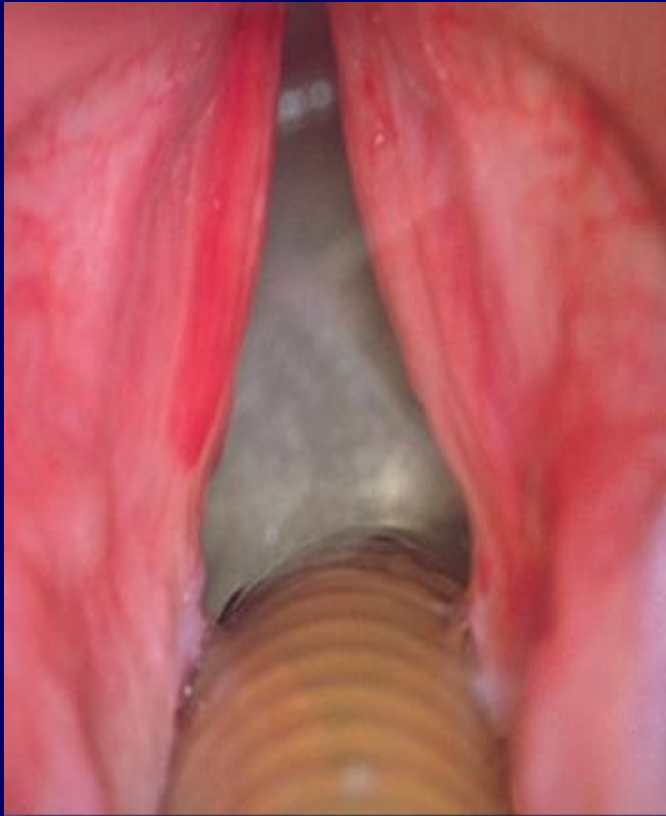
# Chronic hyperplastic laryngitis

- ❑ Repeated, permanent noxa! , Mechanical irritation (permanent plegm, laryngeal irritation, sinusitis, smog, dust, gas, alcohol, chronic bronchitis)
- ❑ Pressed, tired, husky voice.
- ❑ Metaplastic, hyperplastic, subepithelial vascularisation, cellular infiltration, keratotic changes, stratum basale: unaged epithel.
- ❑ Kleinsasser : premalignant lesion can be the consequence
- ❑ Therapy: prevention, avoidance, phoniatri, A-vitamin.





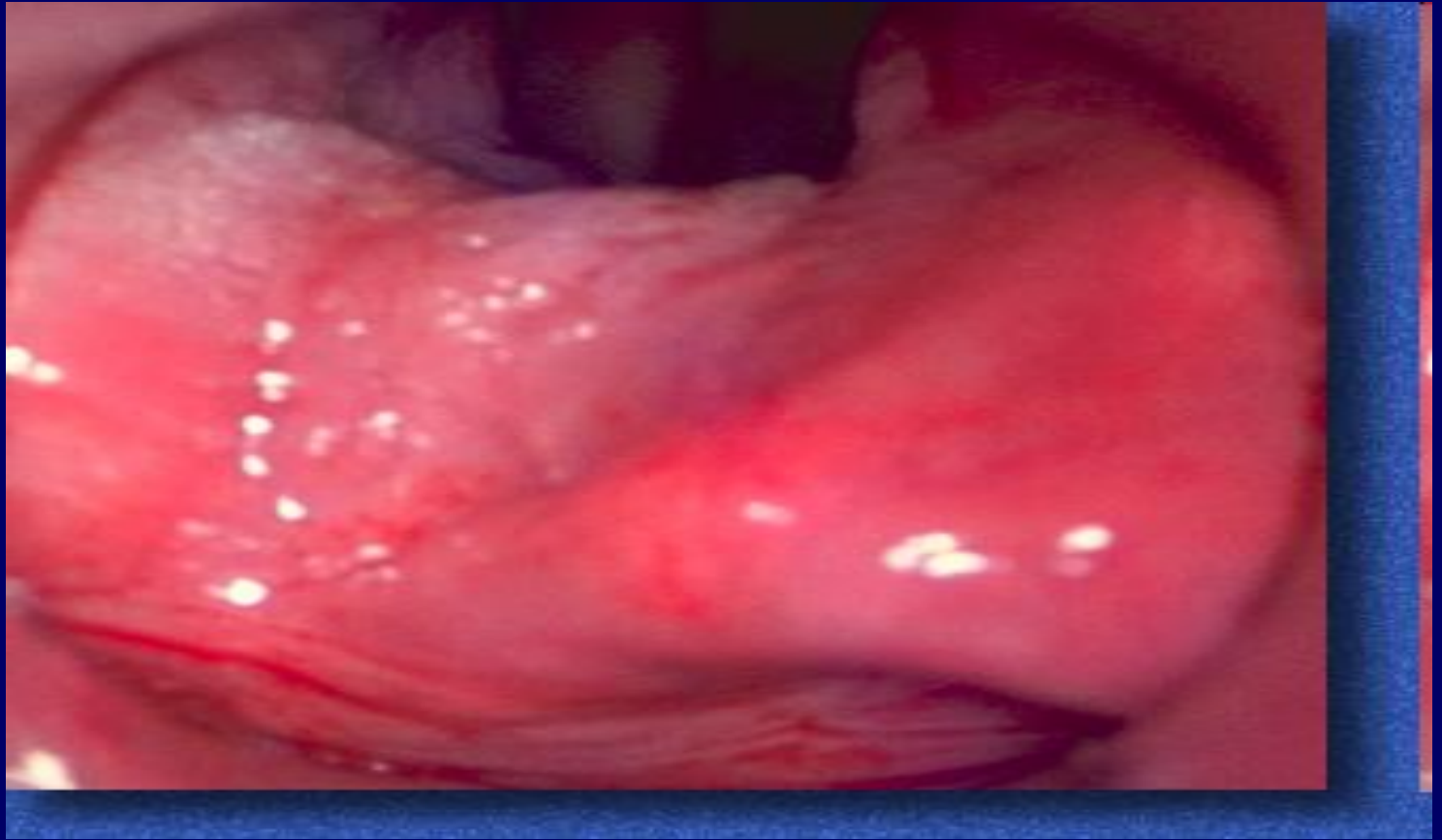
# Acute laryngitis and acute epiglottitis with small abscesses



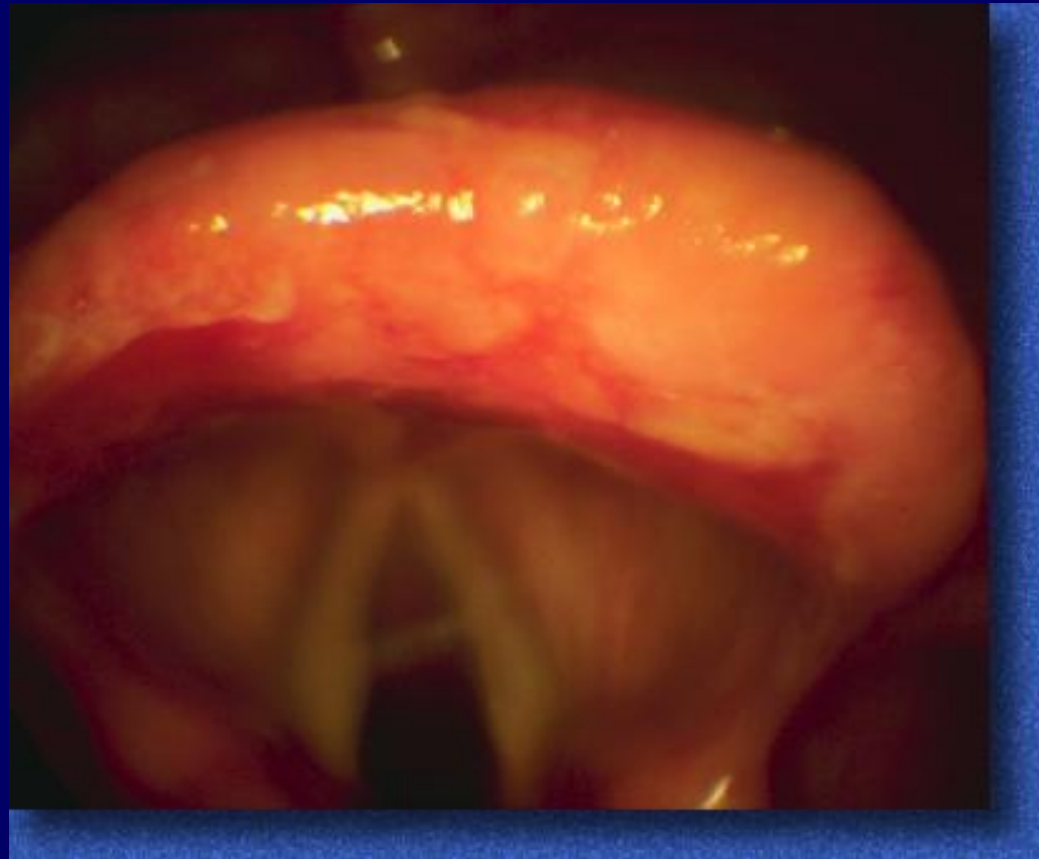
**Unilateral laryngeal redness: cave TB !**



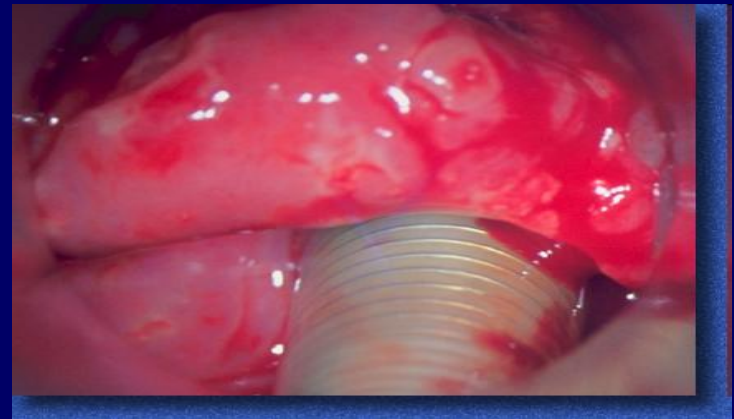
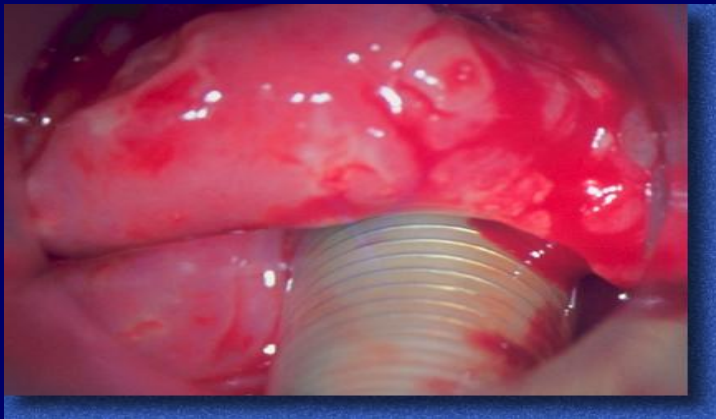
# Pachydermy in the inter-arytenoid region



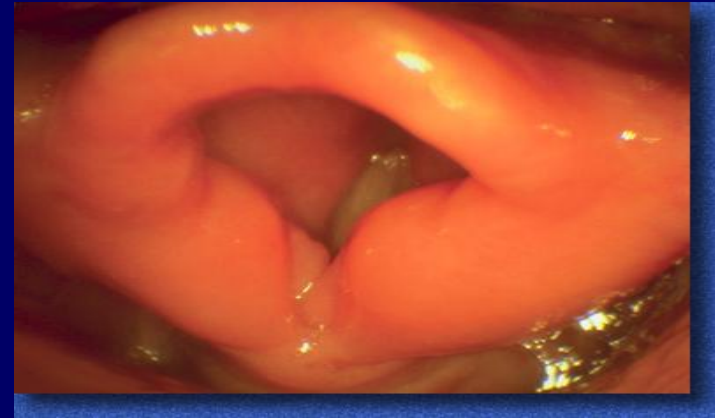
# Pemphigus of the epiglottis



# Larangeal TB (tuberculosis)



# Sarcoid of the larynx



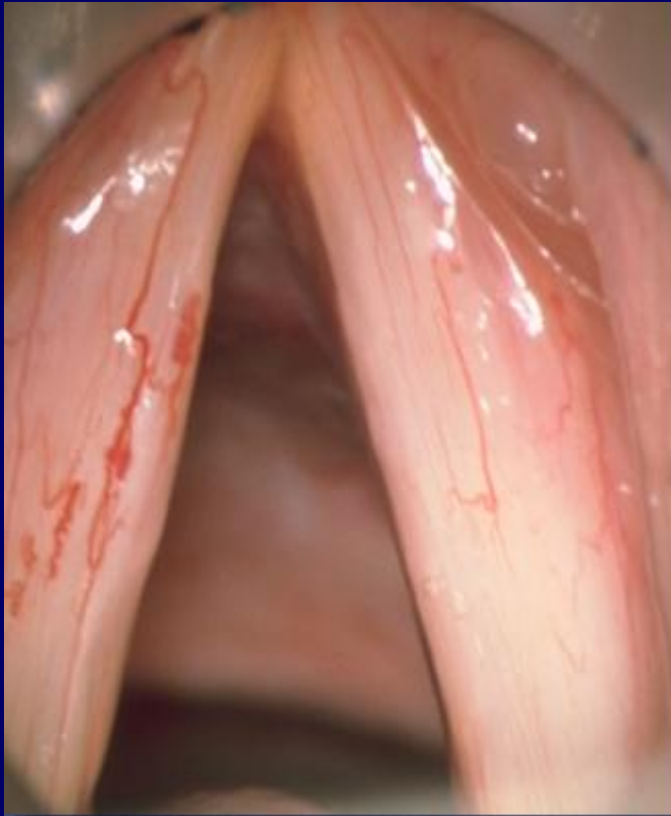
# Erythroplakia

- ❑ Superficial, non-inflammatory red spot.
- ❑ Mostly in the oral cavity, occasionally on the vocal cords.
- ❑ Red, because no parakeratotic or hyperkeratotic changes.
- ❑ Vascularised connective tissue (papillas) under the surface of the epithel
- ❑ Frequently occurs with dasplastic changes or with cc. in situ.
- ❑ Therapy: excision, change in life style

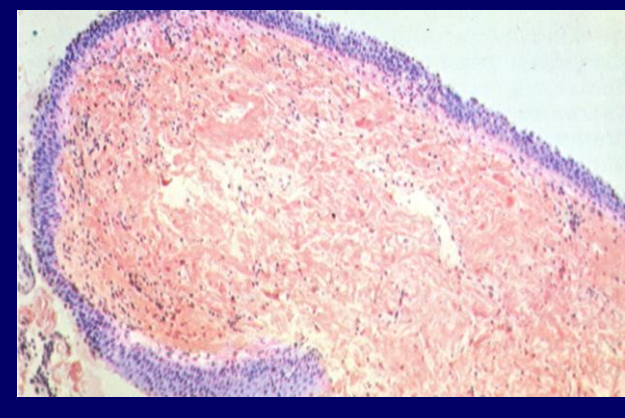
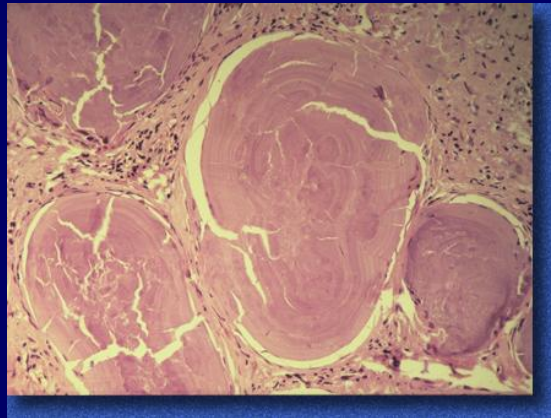




# Enlarged veins on the vocal cord



# Amiloid accumulated in the larynx



Lipid accumulated in the larynx  
and pharynx (gége,garat)

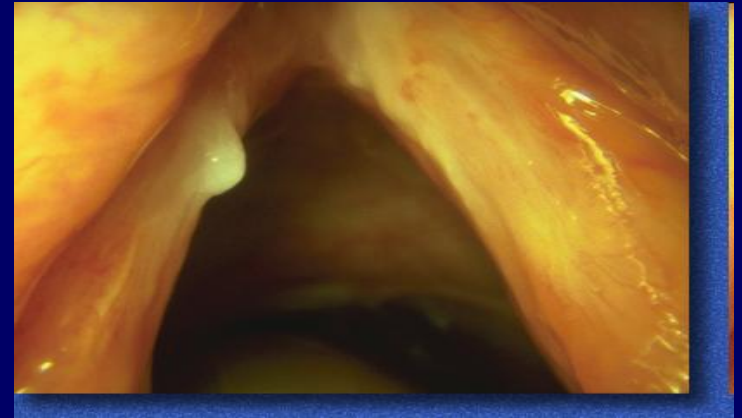
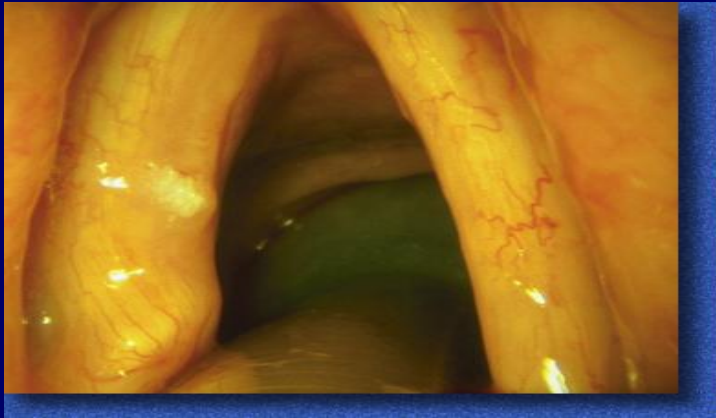


# Hyperplastic false vocal cords



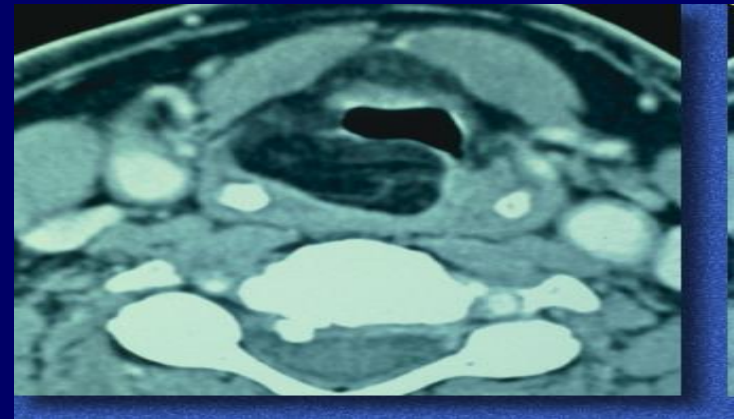
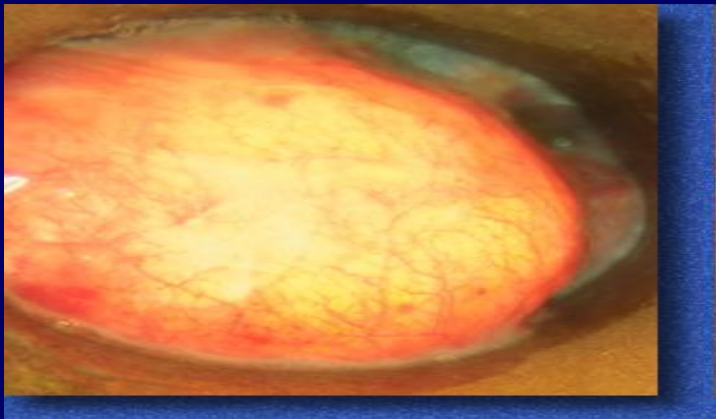
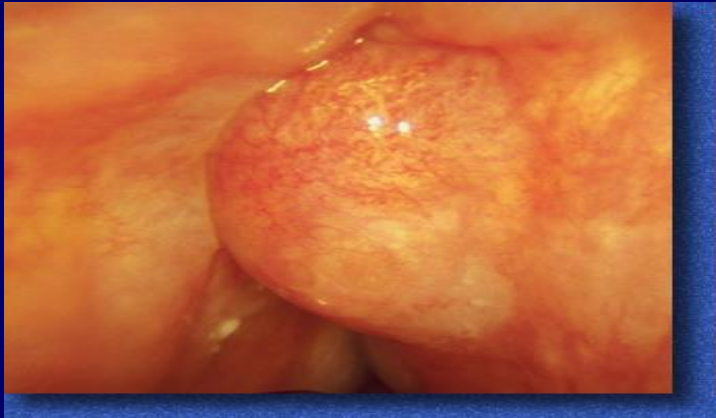


# Benign keratotic lesion of the larynx



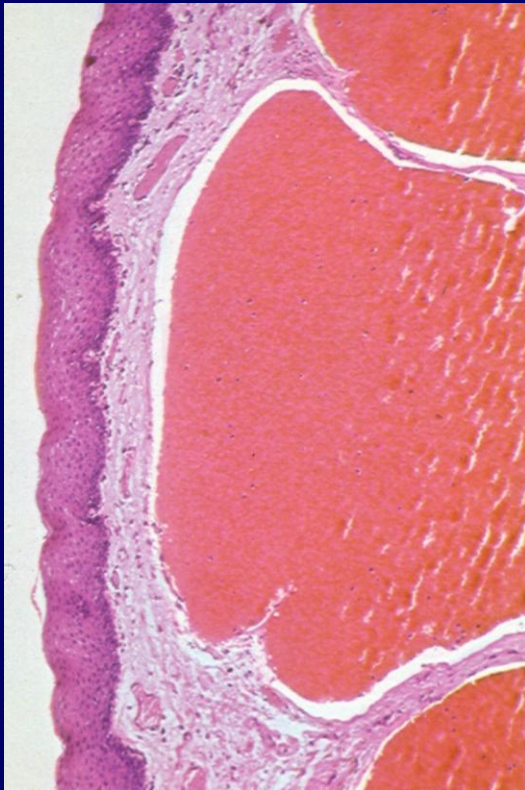


# Lipoma in the larynx



**Supraglottic region frequently affected!**

# Haemangioma in the larynx



**False vocal cord, postcricoid region.**

1. Angioleiomyoma
2. Rhabdomyosarcoma
- 3-4. Leiomyosarcoma

1.



2.



3.



4.



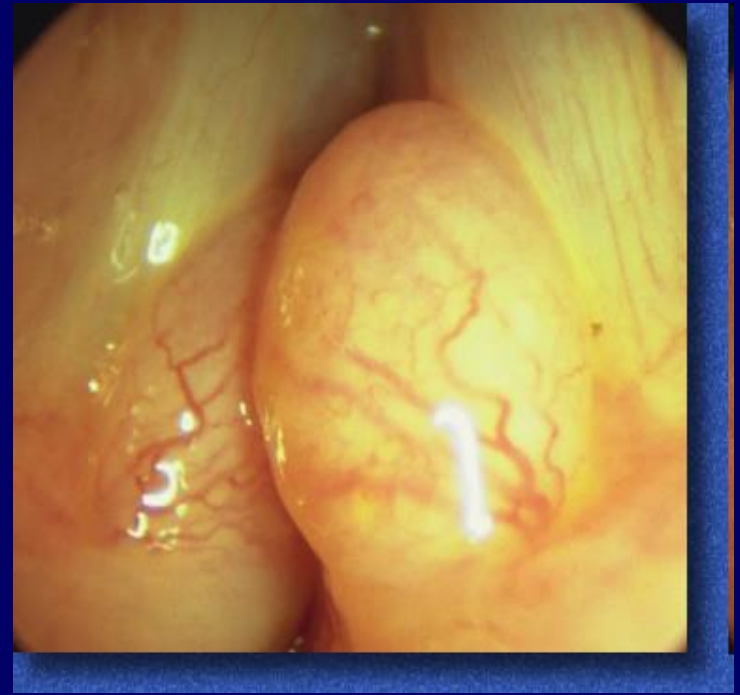
# Schwannoma



**Pedunculated, generally close to the ary region!**

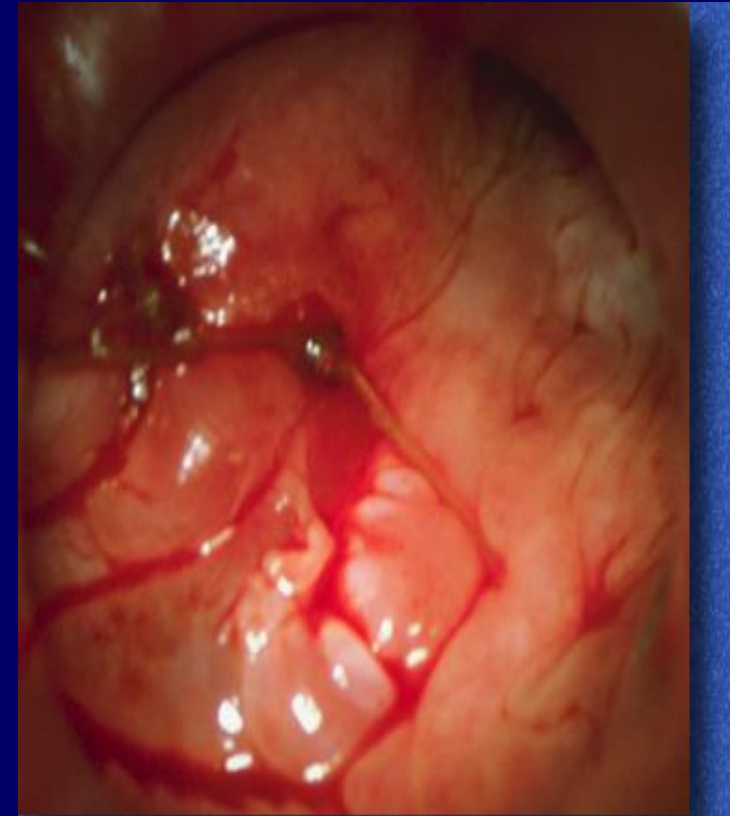


# Neurofibroma



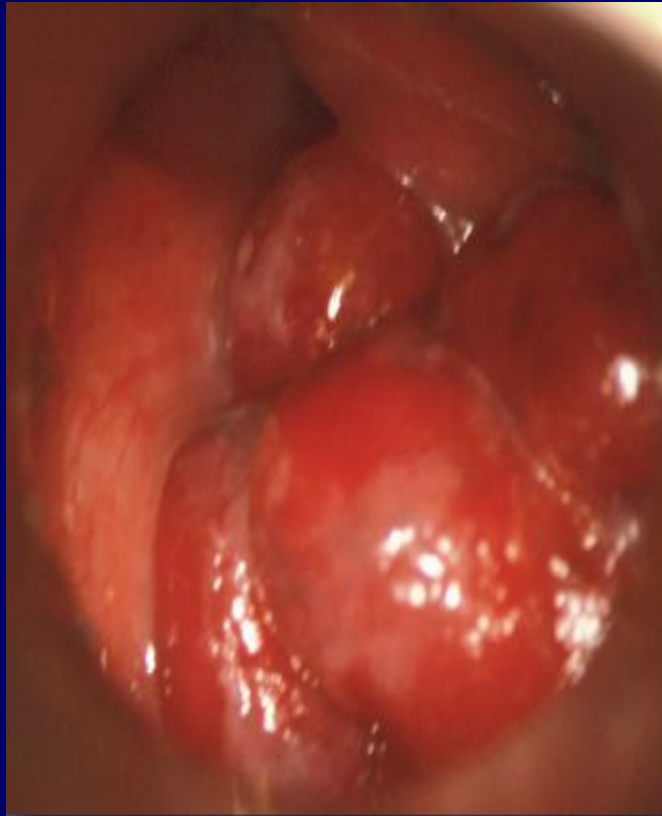


# Paraganglioma (non- chromaffin cell)



**Origin: supraglotticus region!**

# Carcinoid (metastatic)



**Ary region frequently affected!**

# Granular cell tumour



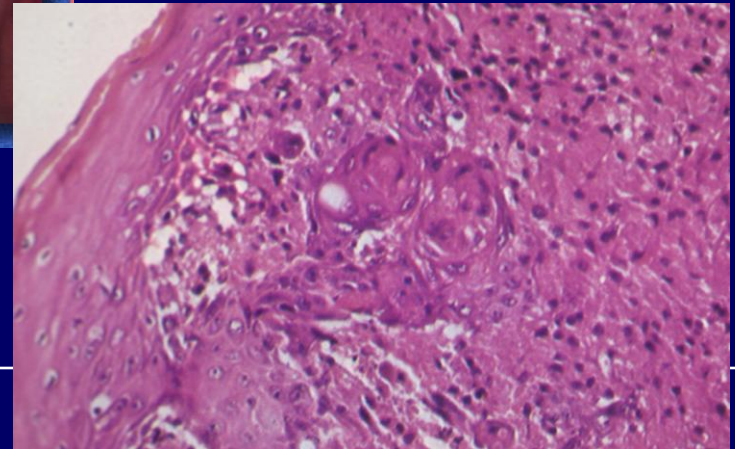
**Above age 40, males !**

**Diff.dg. : carcinoma.**

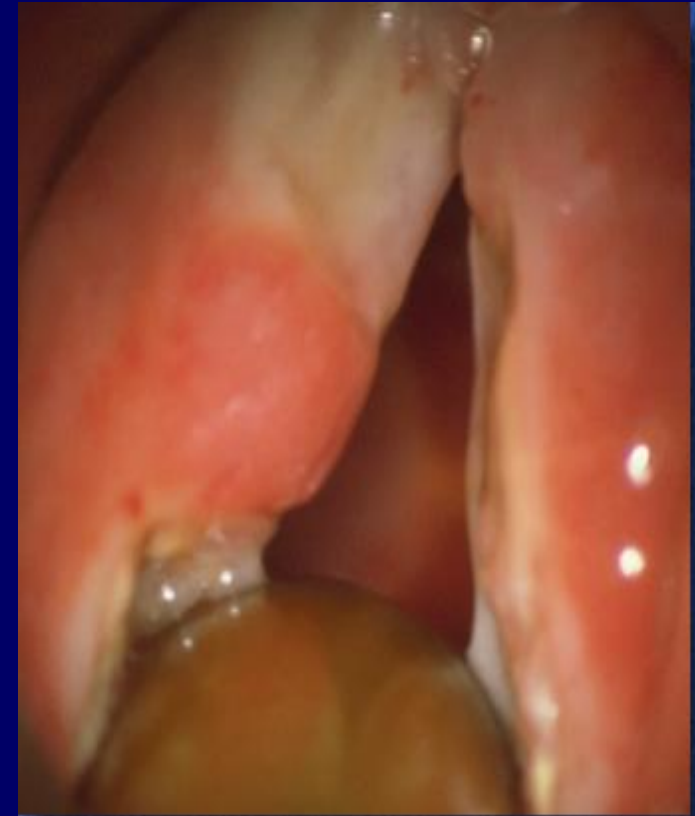
**Fibrin deposits and muscle in the stroma.**

**Origin: posterior third of the vocal cords !**

**Granulated cytoplasm  
non-capsulated.**



# Granuloma of the larynx with malignant transformation



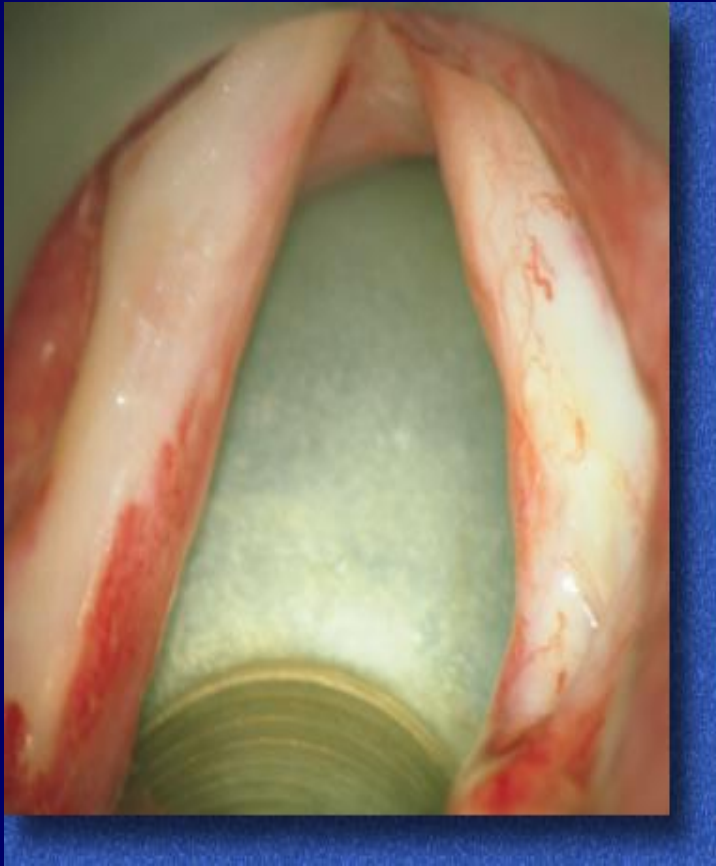


# Postirradiation: mucositis

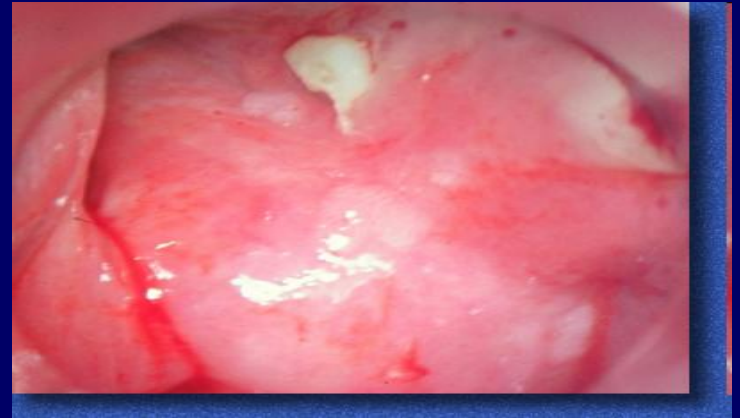
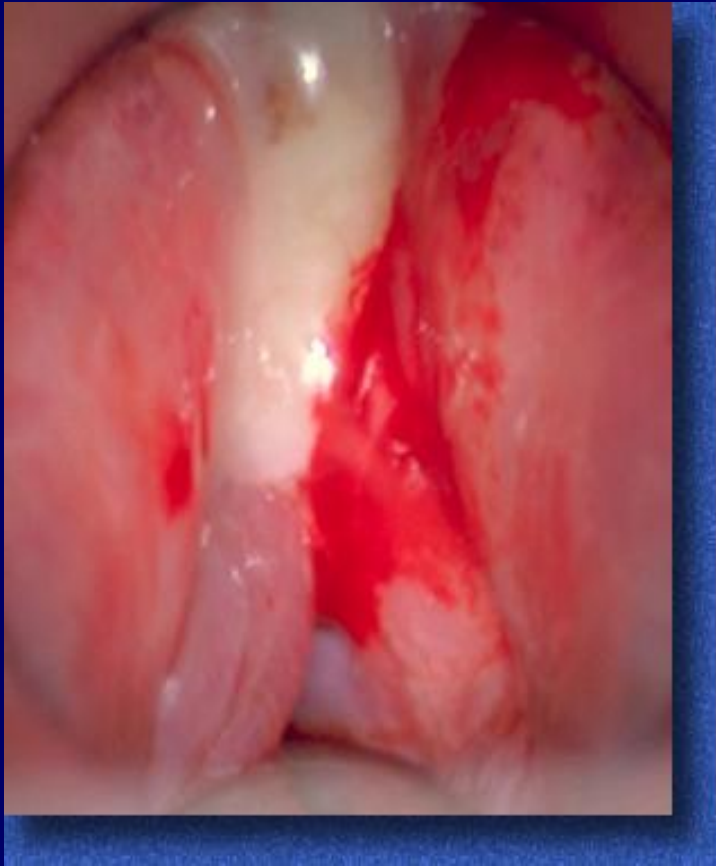




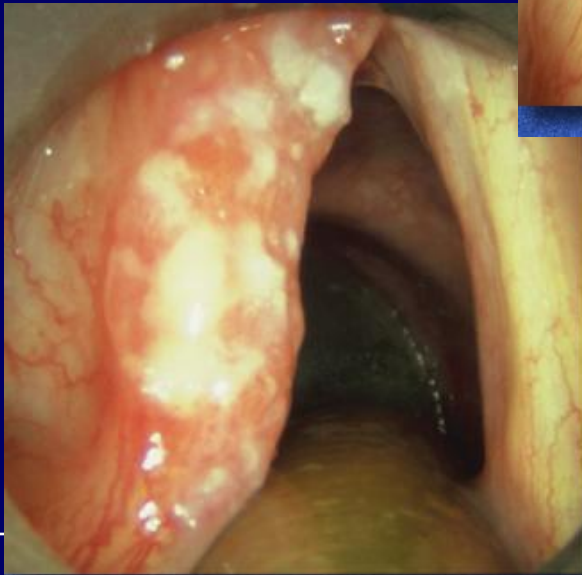
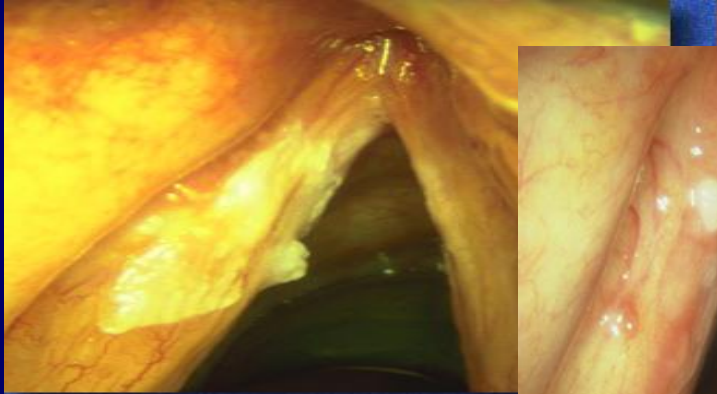
# Postirradiation: atrophy



# Postirradiation: necrosis



# Carcinoma in situ





## *Chemoprevention I.*

- ❑ Sporn, 1976: definition of chemoprevention: administration of natural or syntetic materials/drugs from the view point of prevention.
- ❑ Slaughter, 1953: „field cancerisation” , generations of similar, malignant abnormal cell clones, located under the mucous membrane, separated from each other by normal mucous membrane.
- ❑ In situ cc. can also appears with several locations.



## *Chemoprevention II.*

- ❑ vitamin A analoges (onkogének gátlása)
- ❑ vitamin E (antioxidant effect)
- ❑ Selen ( improves cellular immune response)

**The role of chemoprevention and non-smoking life-style should not be underestimated ! They can decrease the number of primary tumours**





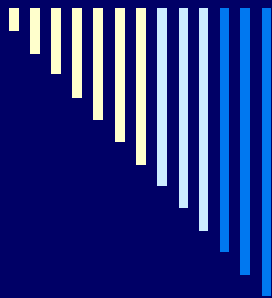
## *Kemoprevention III.*

### Directions of the research activity in the future:

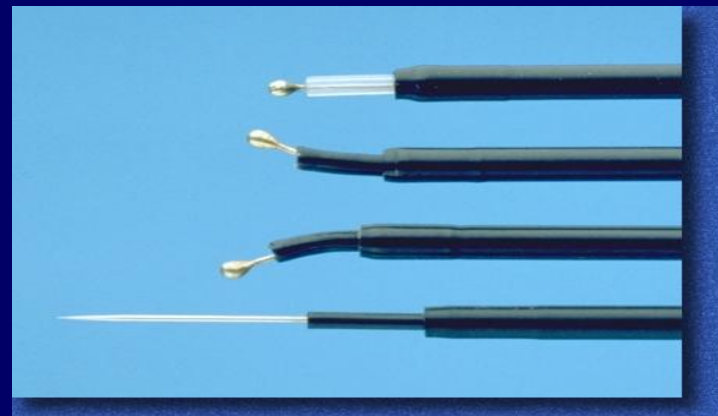
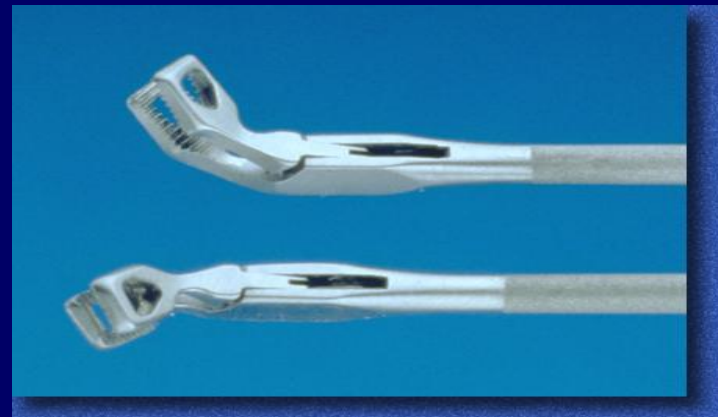
- ❑ **Gátlás** of enzymatic activity of H-ras with *farnesyl transzferáz* blockers.
- ❑ **Gátlás of** EGFR (epidermal growth factor receptor) a *gefitinib* with tyrosine kinase inhibitor)
- ❑ Blocking of COX-2 (*indomethacin*)

# Documentation





# Instrumentation



*Thanks for your attention !*



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