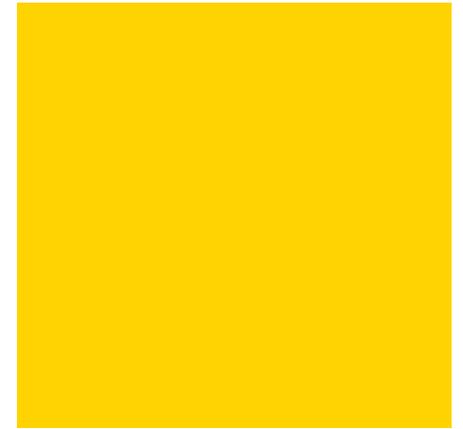


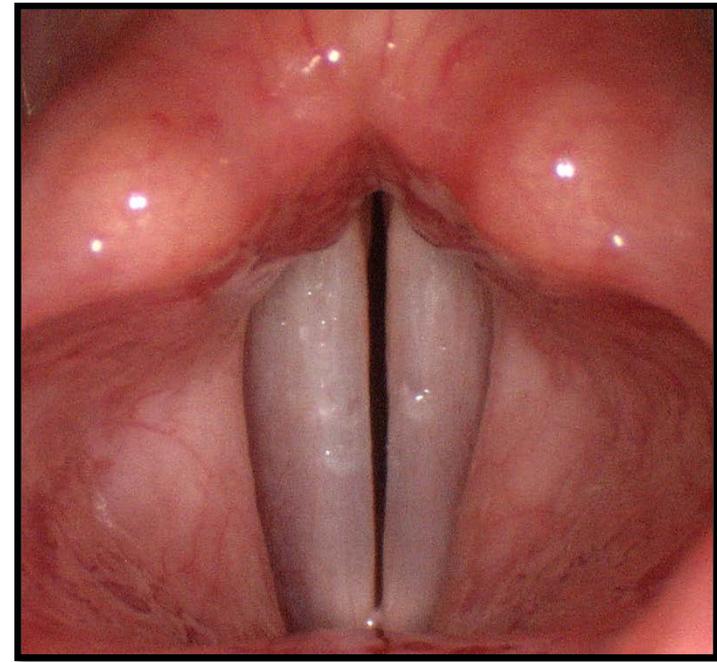


# BENIGN VOCAL CHORD LESIONS



Elena Rizzo Riera  
R1 ORL HUSE

# + Introduction



- Normal voice requires laryngeal function to be coordinated, efficient, and physiologically stable
- Benign lesions of the vocal folds can cause imbalances in this system



# HISTOLOGY

## ■ The Cover

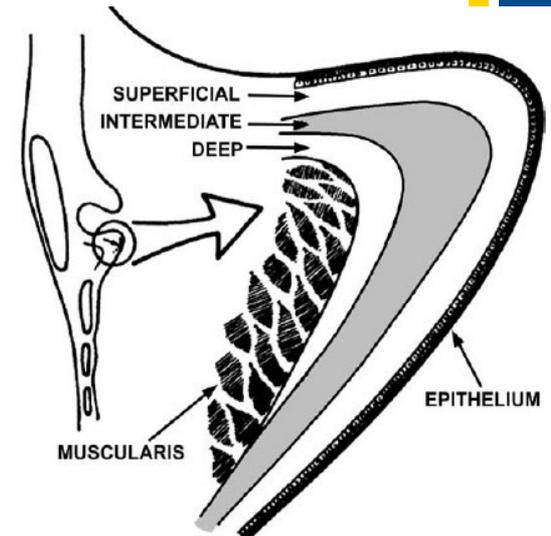
- Epithelium (mucosa)
- Basal lamina
- Superficial layer of lamina propria

## ■ The transition

- Intermediate layer of lamina propria
- Deep layer of lamina propria

## ■ The body

- Vocalis muscle (thyroarytenoid muscle)



# + HISTOLOGY

## COVER

### ■ Epithelium

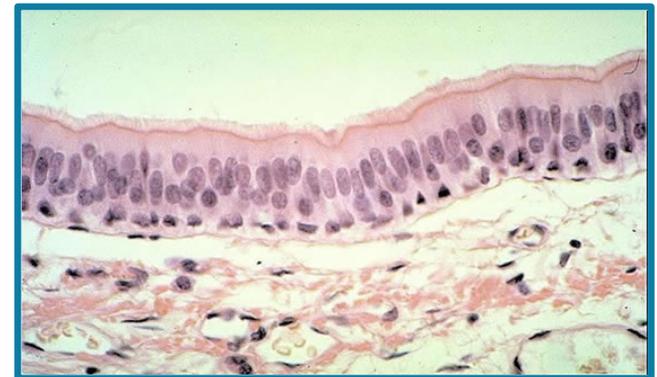
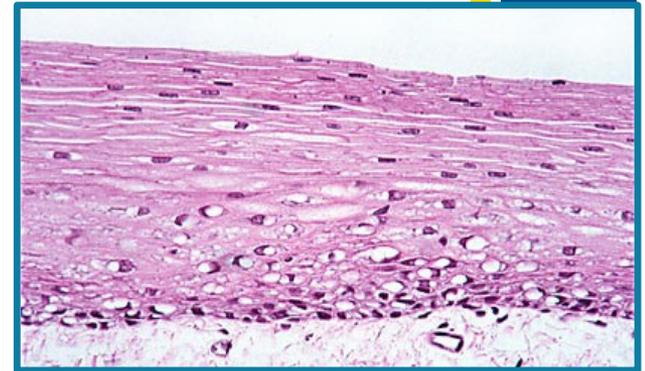
- Anterior glottis → stratified squamous
- Posterior glottis → pseudostratified ciliated

### ■ Basal lamina → physical support

- Lamina lucida
- Lamina densa

### ■ Superficial layer of lamina propria

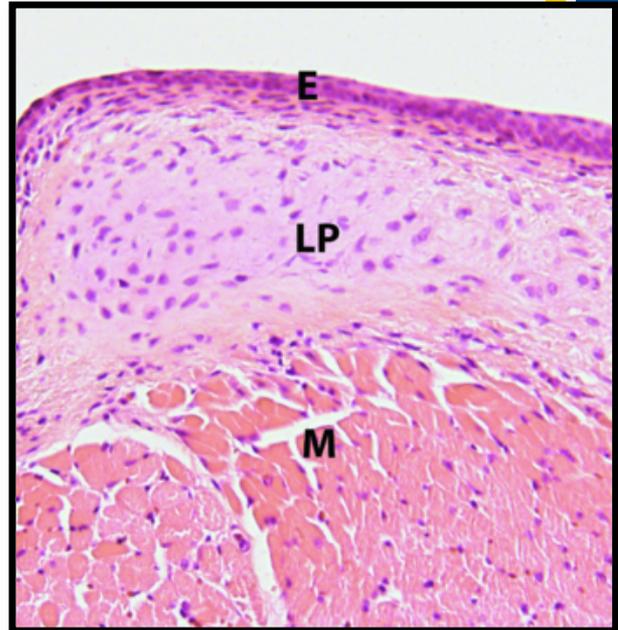
- Reinke's space (potential space) → Reinke's edema
- Fibrous components + extracellular matrix



# + HISTOLOGY

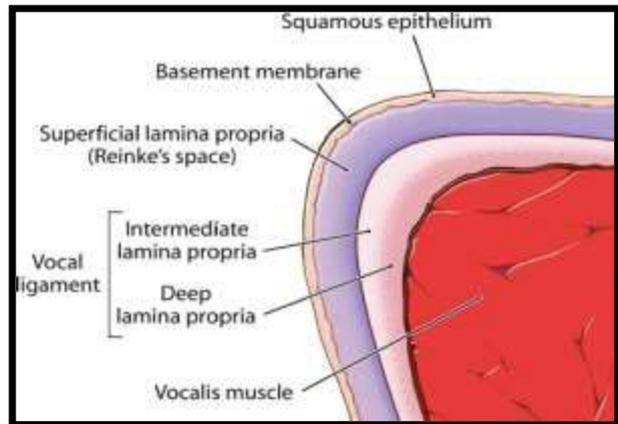
## TRANSITION

- Intermediate layer of the lamina propria
  - Elastic fibers
- Deep layer of the lamina propria
  - Collagenous fibers



## BODY

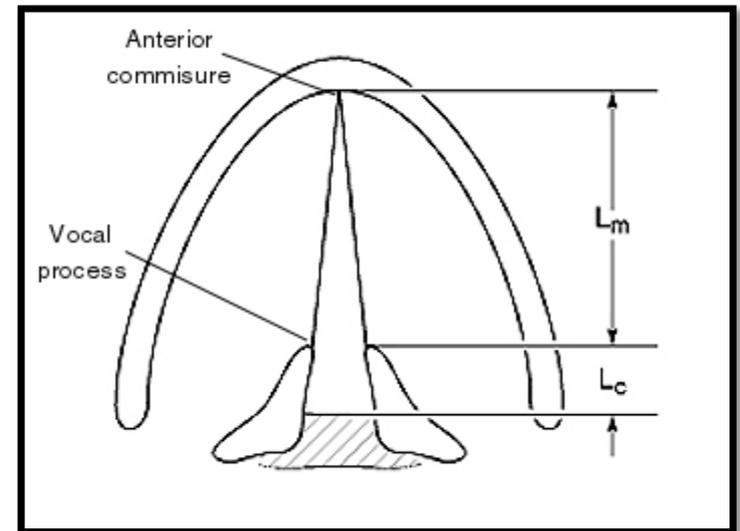
- The vocalis muscle



(medial portion of the thyroarytenoid muscle)

# + Anatomy

- Mucosa and vocal ligament extend over the vocal process
  - Cartilaginous (aphonatory)
    - Posterior one-third
  - Membranous (phonatory)
    - Anterior two-thirds
- Important anatomical feature
  - Most benign lesions affect the membranous portion





# BENIGN VOCAL CHORD LESIONS



## ■ NON-NEOPLASTIC

- Vocal nodules
- Vocal Polyp
- Vocal Cyst
- Reinke's edema
- Granuloma
- Leukoplakia
- Intracordal scars

## ■ NEOPLASTIC

- Papilloma

# + Benign Non-neoplastic vocal chord lesions

- Majority of vocal fold lesions

- **Causes**

- Vibratory injury

- Multifactorial

- *Extroverts, talkativeness*

- *Occupation*

- *Smoking, acid reflux, allergy and infection*

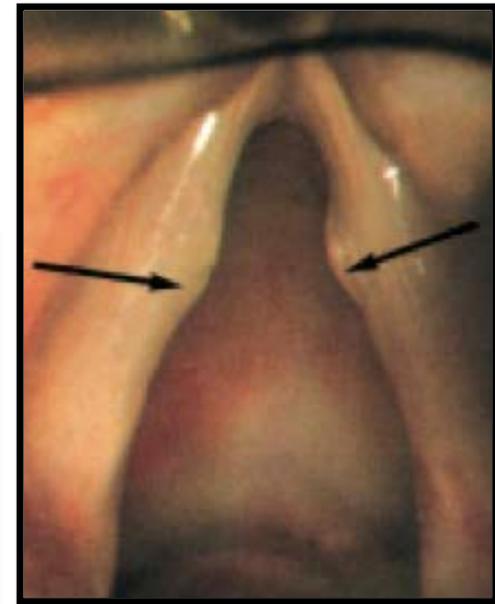
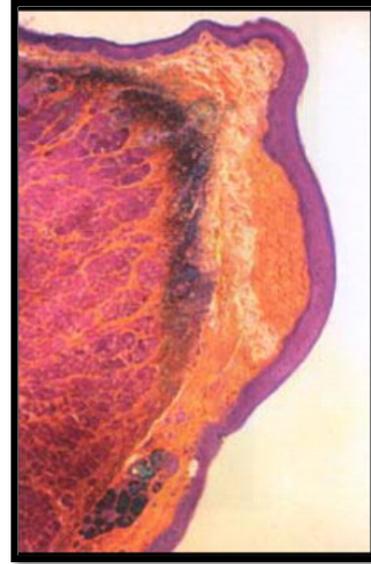
# + VOCAL CHORD NODULES

- Most common benign lesion of the v.c.

- Children and adult females

- Clinical presentation: hoarseness of variable duration, can have different degrees of breathiness and vocal breaks

- Risk factors: Voice misuse or abuse (professional singers, teachers, other occupations with high voice demands)



# + VOCAL CHORD NODULES

- BILATERAL

- Junction of the *anterior to middle membranous portion* of vocal fold (point of the maximal shearing and collision forces)

- Vary in size, symmetry, contour, and color.



- Pathological sequence

- Forceful or prolonged vibration at the membranous portion
  - Edema and congestion
- Long-term vocal abuse leads to hyalinization of the SLP

# + VOCAL CHORD NODULES

## ■ Videostroboscopy

- Hourglass appearance
- Relatively symmetrical mucosal wave

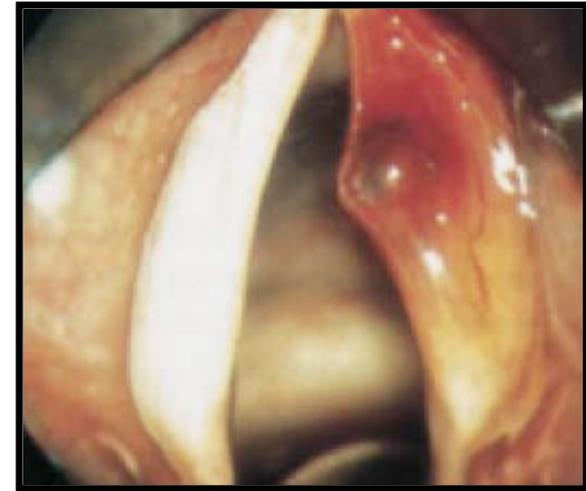
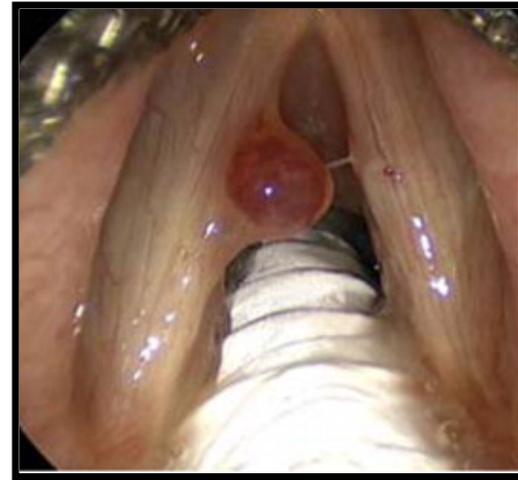
## ■ Management

- Voice therapy (*6 months*)
  - Primary treatment
  - Optimize laryngeal environment
  - Phonotraumatic behaviors, guidelines for voice use, optimizing hydration
- Medical
  - Reflux, smoking
- Surgical (infrequent)



# + VOCAL POLYPS

- Unilateral lesions
  - Broad based or pedunculated
- Often in males
- Red, white, or translucent lesions at **anterior/middle third** along the free edge
- **Causes:** Vocal abuse or anticoagulant use
- Two **types**
  - Hemorrhagic – abrupt onset – extreme vocal effort
  - Nonhemorrhagic (pseudocyst) – outpouchings of inflamed SLP



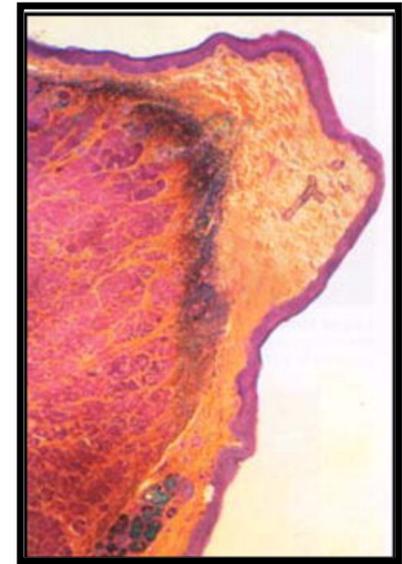
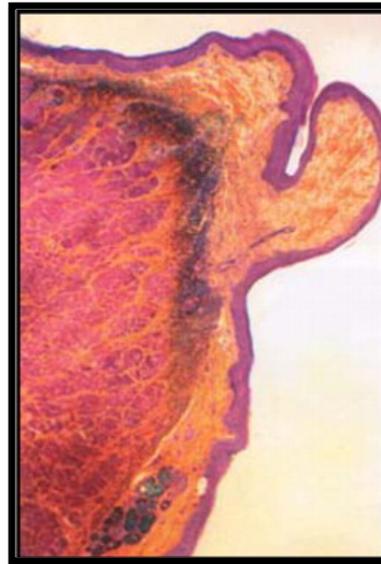
# + VOCAL POLYPS

## ■ Pathophysiology

- Shearing forces
- Capillary rupture and focal accumulation of blood or hematoma
- Inflammatory cells infiltrate
- New matrix

## ■ Videostroboscopy

- Usually have intact mucosal waves
- Phase asymmetry with impaired glottic closure
- Fatigue, voice breaks, decreased vocal power.

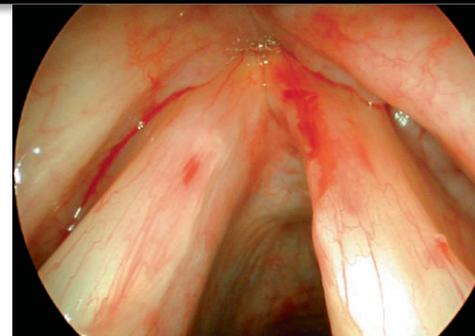


# + VOCAL POLYPS

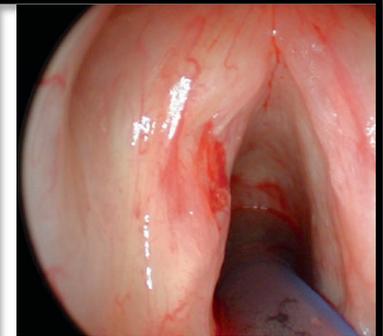
- Management based on polyp size
  - Conservative management for small polyps

## ■ Management

- Medical
  - Discontinue anticoagulants
  - Reflux treatment
- Voice therapy
  - Small polyps
- Surgical



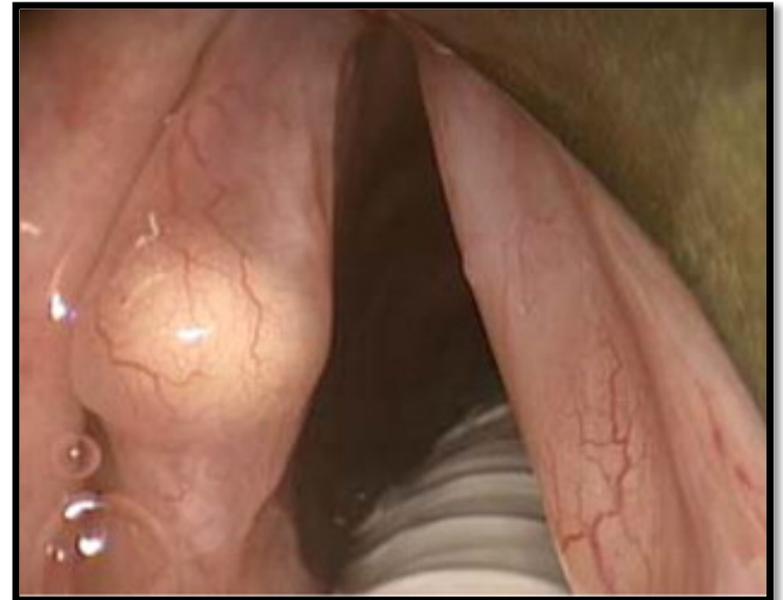
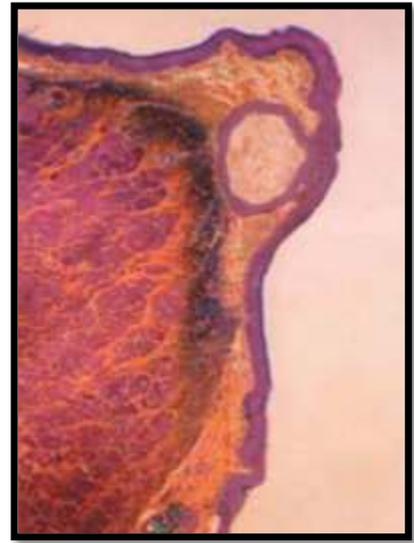
**Fig. 3.6.4** (a) Right vocal cord polyp a few millimeters behind the anterior commissure. (b) After excision. Mucosa was preserved as much as possible and anterior commissure was not touched



**Fig. 3.6.5** (a-c) Vocal cord polyps are usually single lesions which can occur anywhere on the vocal cord. The treatment is microlaryngoscopic removal of the polyps

# + VOCAL CHORD CYST

- Unilateral but can be bilateral
- Women > men.
- Sac like structure within the lamina propria, yellow or white in color, distinct and defined border
- Two subtypes
  - **Epidermoid +++**
    - Stratified squamous epithelium
  - **Mucous retention**
    - Cylindrical epithelium



# + VOCAL CHORD CYST

Symptoms: vocal strain,  
diplophonia

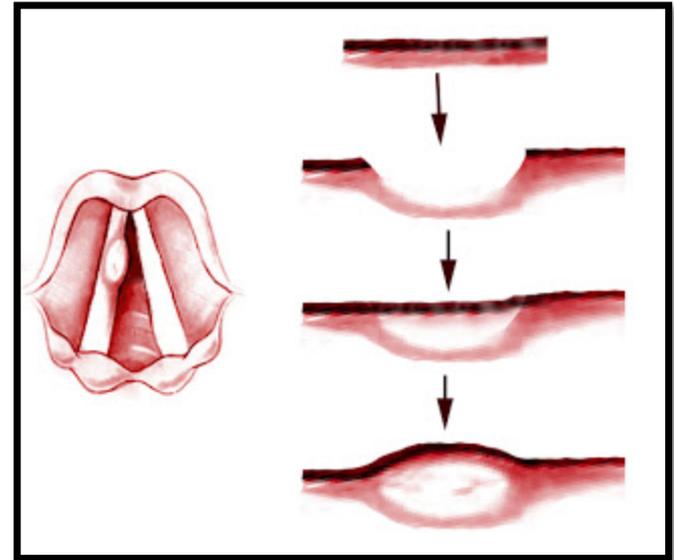
## ■ PATHOGENESIS

### ■ Epidermoid vocal chord cyst

- Epithelial cells buried congenitally
- Healing mucosa – vocal abuse

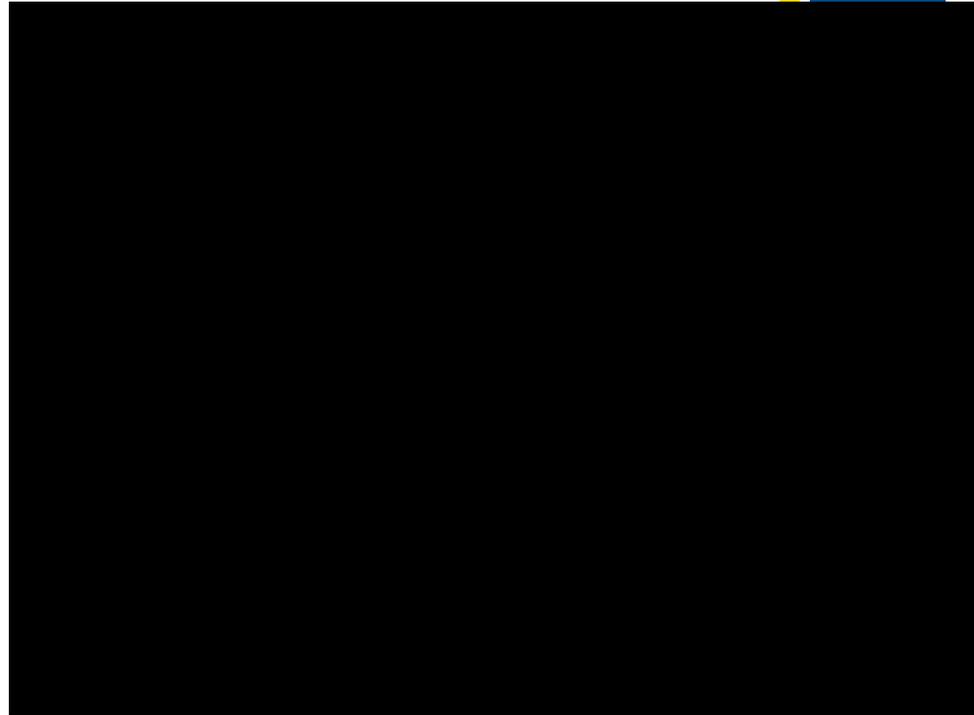
### ■ Mucous retention cyst

- Obstruction of a glandular duct ----> Upper respiratory infection, voice overuse and acid reflux.



# + VOCAL CHORD CYST

- Videostroboscopy
  - Asymmetrical mucosal wave
  - Decreased on side of lesion
  - Glottic closure depends on the size of the cyst
- Management
  - **Surgical – mainstay of treatment**
  - Supportive measures (hydration, reflux)
  - Voice therapy
    - Limited role
    - Epidermoid type



# + REACTIVE LESIONS

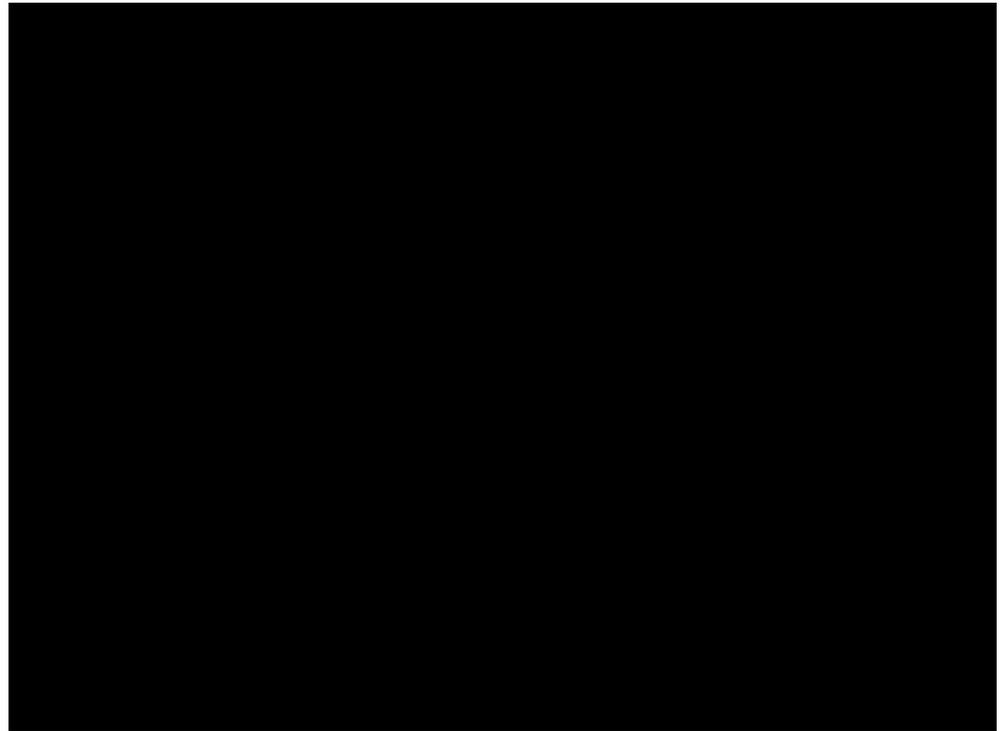
- Response to unilateral vocal chord lesion



- Reactive callus with vocal chord hyperplasia
- Can be confused with vocal nodules

# + REACTIVE LESIONS

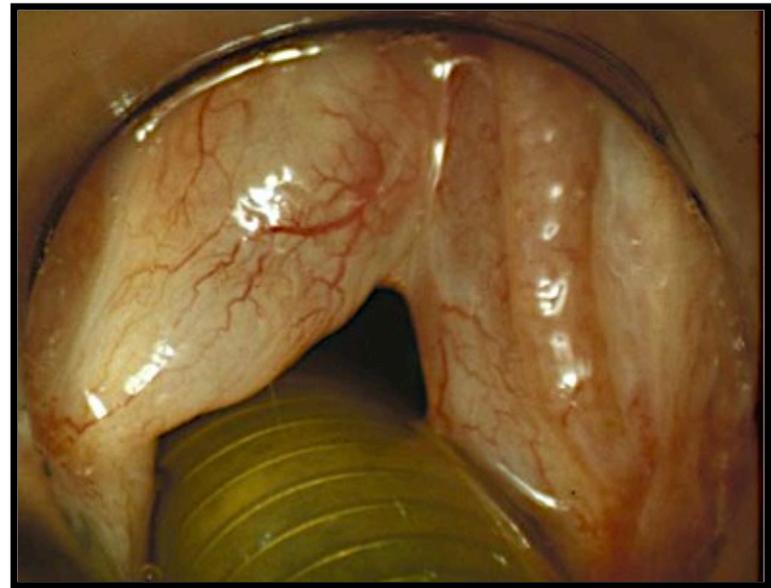
- Videostroboscopy
  - Hourglass appearance
  - *Wave asymmetry unlike vocal nodules*
- Management
  - Treat primary lesion
  - Conservative management





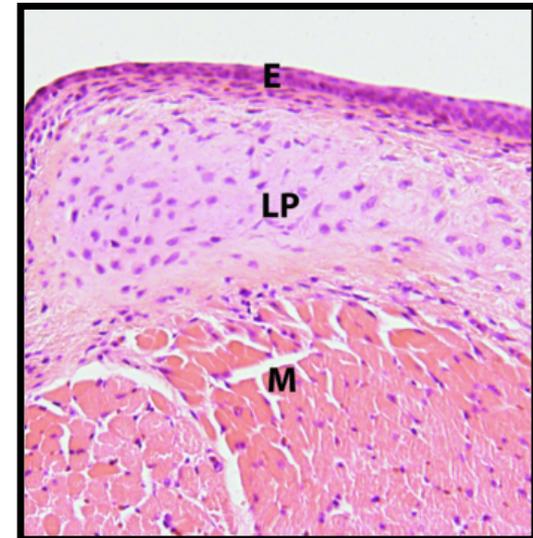
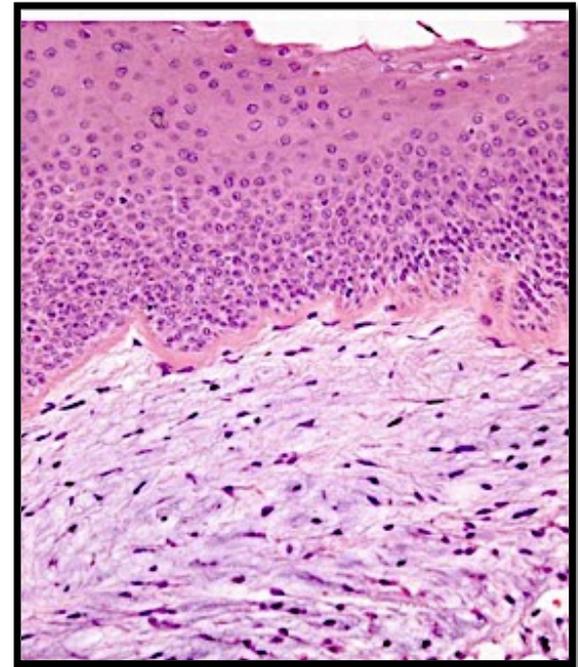
# REINKE'S EDEMA

- Polypoid corditis, Reinke's edema or smoker's polyps
  - Bilateral diffuse polyposis
- Causes: Chronic irritant exposure
- RF: middle aged, talkative women with a long-term history of smoking
- Clinical presentation:
  - Lower pitch (masculine range)
- Fibroscopy: Outpouchings of the membranous vocal chord
  - Water balloon appearance



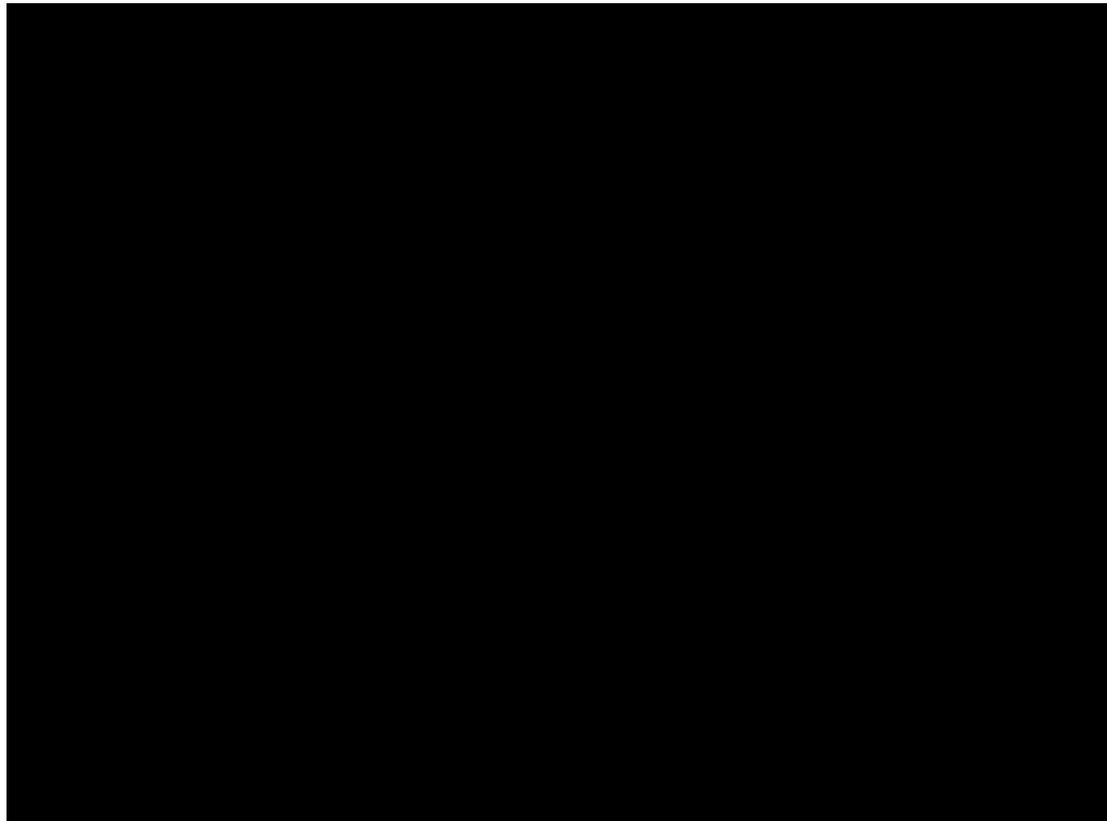
# + REINKE'S EDEMA

- Excessive accumulation of edema
- Alterations in the walls of blood vessels
- Thickening of the epithelial basement membrane
- Connective tissue proliferation--->irreversible lesion

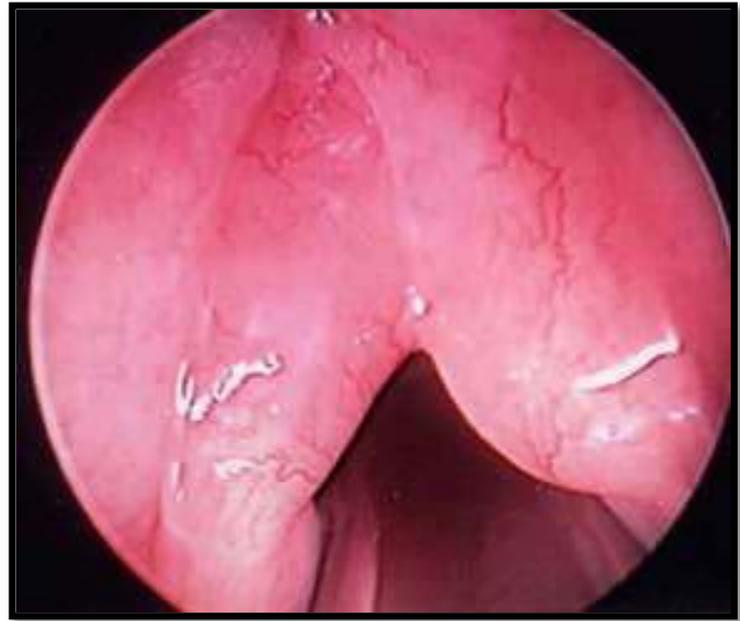


# + REINKE'S EDEMA

- Videostroboscopy
  - Decreased mucosal wave
  - Phase asymmetry due to ball-valving and asymmetric edema



# + REINKE'S EDEMA



## ■ Management

- Medical - **SMOKING CESSATION**
- Voice therapy
  - May help introduce optimal vocal behavior
  - ***Reduce size of the polyp and improve vocal functioning***
- Surgery necessary when the voice remains unacceptable to the patient
- **Risk of malignance:** 1.7% patients with potentially malignant lesions (atypical hyperplasia, and IEN I and II)

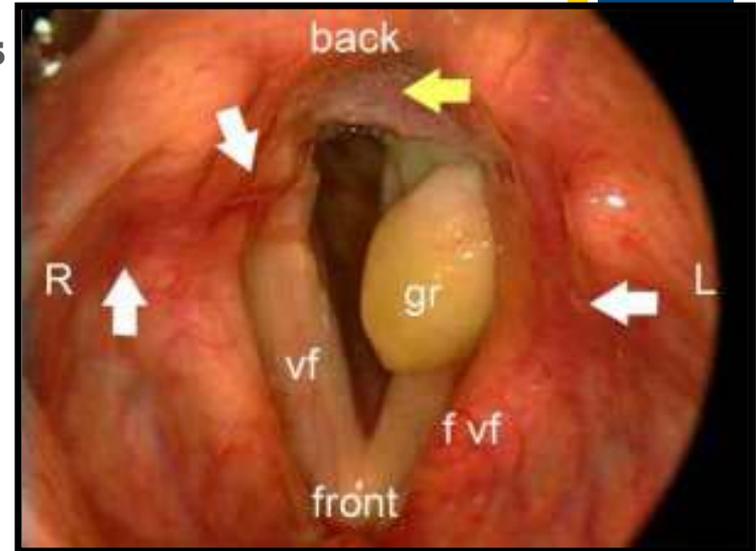
# + VOCAL GRANULOMA

- Primarily in men
- Posterior one-third or **cartilaginous glottis**

- Clinical presentation: Speech may be normal

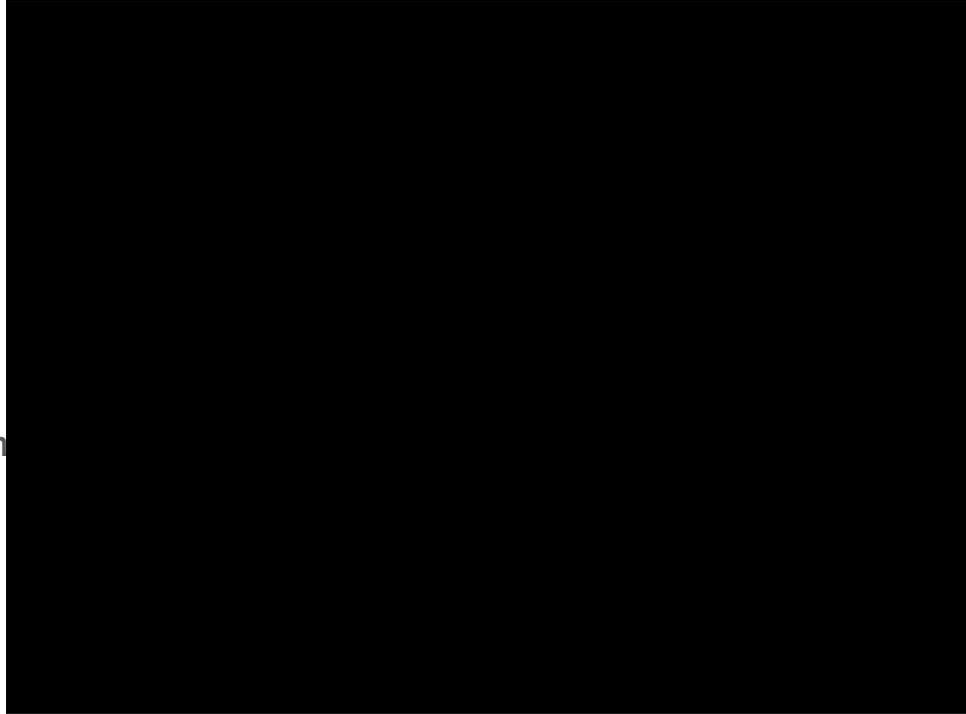
- Causes: Vocal chord trauma
  - Associated with acid reflux, chronic cough, throat clearing and intubation

- Pathophysiology
  - Traumatic areas → ulceration → granuloma.



# + VOCAL GRANULOMA

- Videostroboscopy
  - **Mucosal wave present**
  - Location in cartilaginous posterior vocal chord
  - Large lesions can affect closure
- **Management**
  - Treat underlying cause of irritation
  - Medical
    - Anti-reflux regimen
      - Spontaneously resolve over 3-6 months
  - Voice therapy
  - Surgical
    - Recurrence is common
    - Reserved for lesions
      - Enlarging
      - Affecting the voice
      - Suspicion for malignancy



# + CAPILLARY ECTASIA

## ■ RF: Female singers

- Clinical presentation: Hoarseness after short periods of singing



## ■ NSF: Abnormal dilation of capillaries, can also present as clusters

## ■ Pathophysiology

- Vibratory microtrauma lead to capillary angiogenesis in the superficial lamina propria.

### Predisposes to:

- Increased vulnerability to mucosal swelling
- Vocal fold hemorrhage
- Hemorrhagic polyp formation



# + CAPILLARY ECTASIA

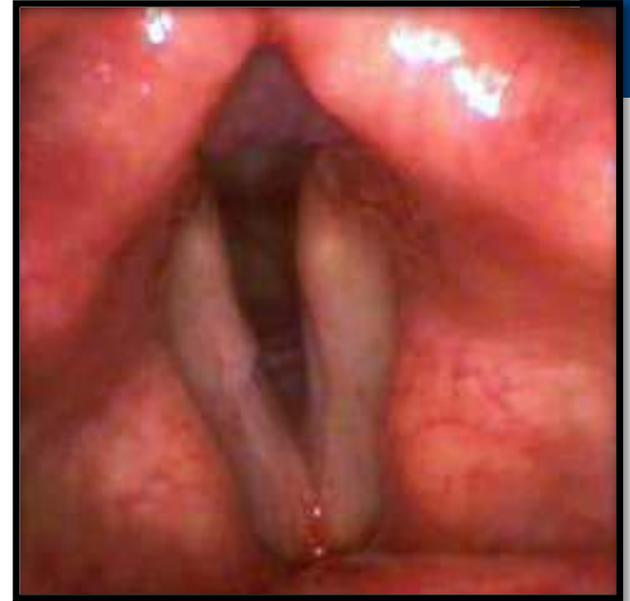


- Management
  - Medical
    - Discontinue anticoagulants
    - Acid reflux
  - Voice therapy – behavioral changes for voice abusers
- Surgical
  - Patients who fail conservative management
  - Spot coagulation is an excellent option
    - CO2 laser - scarring
    - KTP (532nm) laser
      - Angiolytic
      - Selectively ablate vessels



# INTRACORDAL SCARRING

- CP: Aphonia to relatively normal speaking voice
- NSF: Scarred, stiff vocal fold cover
- Causes:
  - Inflammation, vocal trauma, vocal chord hemorrhage
    - Scarring of the SLP or Reinke's space
  - Surgery involving lamina propria and repeated epithelial procedure
- Pathophysiology
  - Scarring adheres the mucosa to the underlying vocal ligament, disrupting the ability of the mucosa to oscillate freely

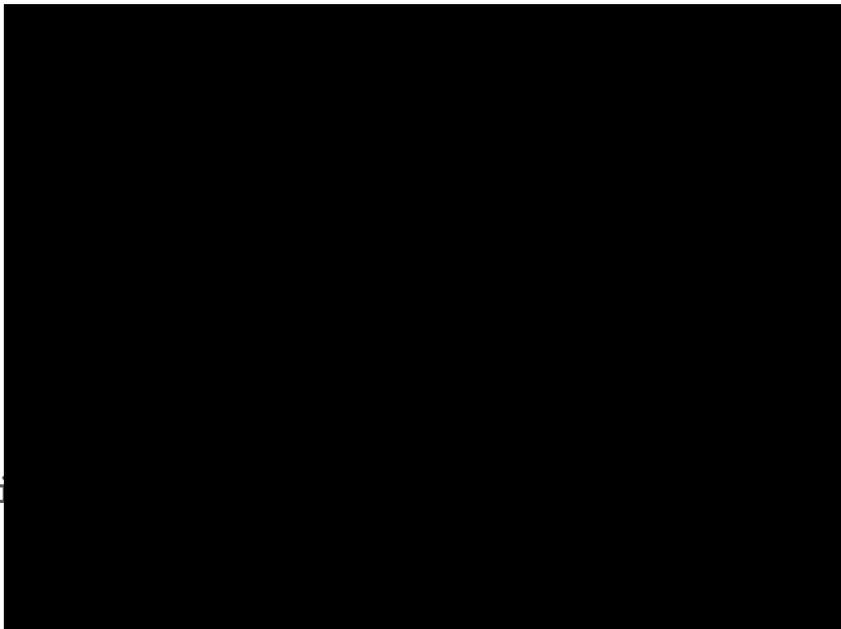




# INTRACORDAL SCARRING

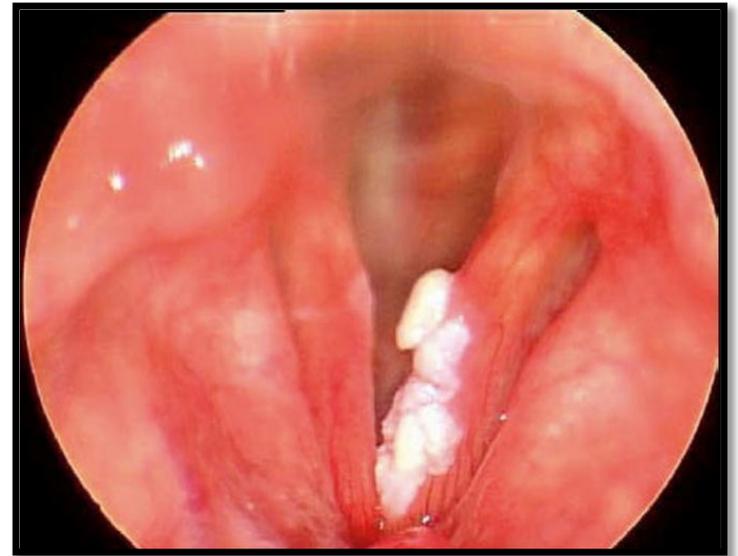


- Videostroboscopy
  - Markedly *reduced or absent mucosal wave* usually asymmetric
  - Often effects closure phase
  
- Management
  - Medical
    - General medical issues that affect voice should be optimized
  - Voice therapy
    - Voice building approach
      - Strengthen the muscles involved in phonation
  - Surgical
    - *Incision with elevation of mucosa above scar with early voice therapy*
- Prevention
  - Precise surgical technique
  - Early treatment of vocal trauma



# + LEUKOPLAKIA

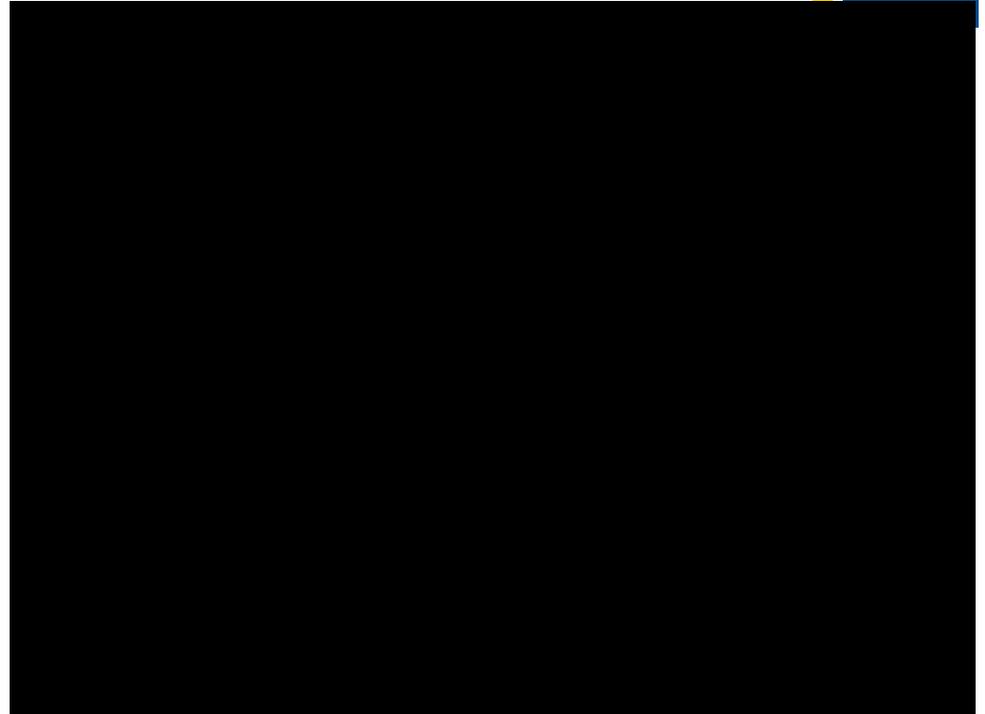
- White hyperkeratotic plaque which represents a change in the epithelium
  - 10.2 per 100,000 (Males)
  - 2.1 per 100,000 (Females)
- Pathophysiology unknown
  - Chronic irritation – smoking
- 3 stages
  - **No dysplasia -> mild to moderate dysplasia -> severe dysplasia**
- **8-14% chance of malignant transformation**





# LEUKOPLAKIA

- Videostroboscopy
  - Normal to sluggish mucosal wave
  - Can vary in severity but a mucosal wave should be present
- Management
  - Surgical
  - Tissue diagnosis is necessary to rule out malignancy
  - Excision or laser



# + VOCAL CHORD PAPILLOMA – Neoplastic lesion

- Most common benign neoplasm (84%)

- Prevalence Rate

- 4.3 per 100,000 children
- 1.8 per 100,000 adults



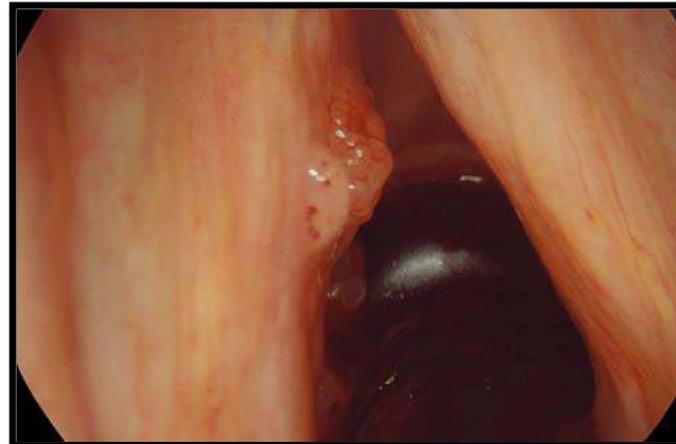
- **HPV (strains 6 and 11 most common)**

- Type 11 associated with more aggressive disease

- **HPV types 16 and 18 higher risk of malignant transformation**

# + VOCAL CHORD PAPILLOMA

- Two types
  - **Juvenile:** More aggressive and bulky, exuberant tissues resembling “clusters of grapes”. Recurrent
  - **Adult-onset:** More localized, usually less aggressive, less exophytic with a velvety appearance and little projection from the surface of the vocal chord.

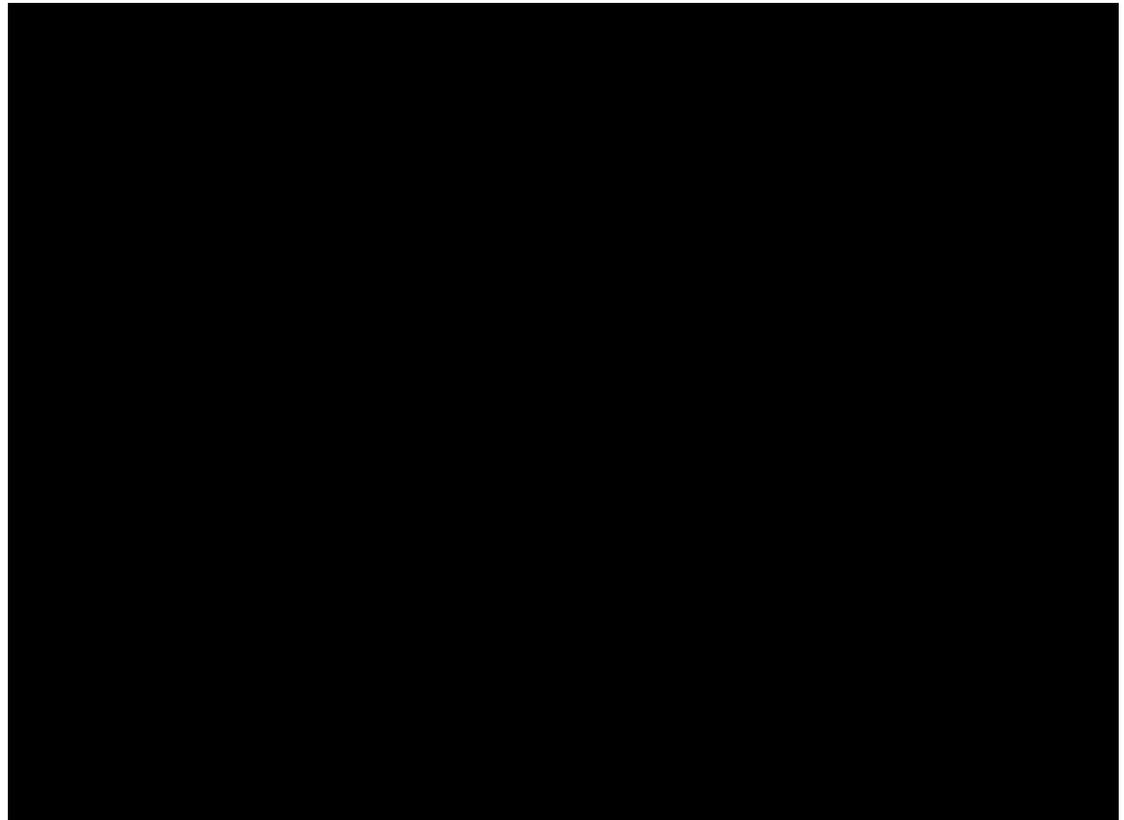




# VOCAL CHORD PAPILLOMA



- Videostroboscopy
  - Mass effect with decreased mucosal wave
  
- Management
  - Surgery
    - CO2 laser
      - Most widely accepted
      - Risk – scarring
    - Pulse Dye and KTP
    - Microdebrider
      - Bulky lesions
  - Adjuvant treatment
    - Interferon
    - Cidofovir (antiviral)
    - Bevacizumab
  - Vaccine (Gardasil)
    - Incidence of RRP
    - Herd immunity





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