

THE HOARSE PATIENT

VOCAL FOLD DISEASES

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LEARNING OBJECTIVES

After reviewing this module, the student will have the ability to:

- Create a broad differential diagnosis for the hoarse patient
- Describe the most common causes and the most concerning etiologies of hoarseness
- Understand the workup and evaluation of the hoarse patient

CASE PRESENTATION

Ms. T is a 57 year old female smoker who presents to your clinic for follow up. You first saw this patient 3 weeks ago for complaint of several weeks of cough and hoarse voice. She had been previously seen at an urgent care clinic, where she was diagnosed with laryngitis and prescribed a course of oral antibiotics with minimal improvement. At that time, she had a raspy/coarse voice and nonproductive cough. She had no other symptoms or physical exam findings. At that visit, you prescribed a z-pack (Azithromycin) and are seeing her back in follow up today.

Today, patient reports that despite taking antibiotics as prescribed, she continues to have hoarseness and notes that it seems to be getting worse. She continues to cough, but now reports that she fatigues more easily than before while doing housework and often has to catch her breath after speaking for a few minutes.

On exam today, you notice some shotty lymph nodes on the left with a slight prominence of the upper cervical lymph nodes.

How should you treat this patient today?

QUESTION

What is the next best step in managing this patient's complaint?

- A. Repeat course of azithromycin
- B. Switch patient to Augmentin (Amoxicillin- clavulanate) x 14 days
- C. Start inhaled corticosteroids and beta-2 agonist
- D. Refer to Otolaryngology
- E. Order pulmonary function tests and chest x-ray

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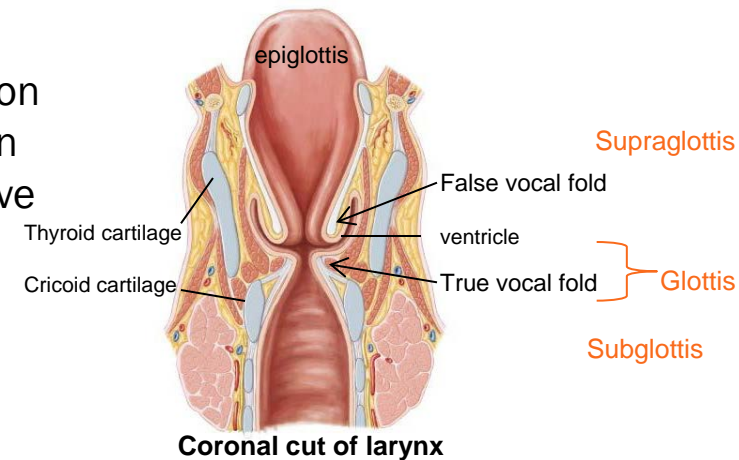
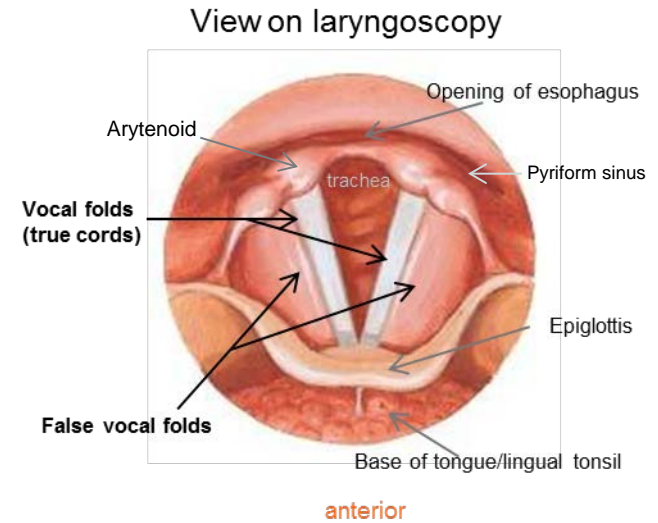
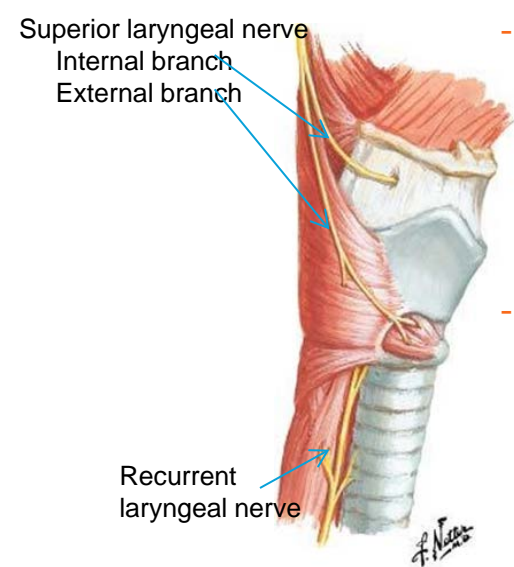
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In this patient with progressive hoarseness and now with some shortness of breath, with a risk factor of smoking, there should be a high index of suspicion for malignant process. She has already failed 2 courses of antibiotic therapy, so this is likely not infectious. While patient may have underlying lung pathology, especially with smoking history, COPD alone does not explain all of her symptoms, especially persistent, progressive hoarseness. This patient needs endoscopic exam of larynx to evaluate for a possible laryngeal mass.

ANATOMY

Innervation of larynx:

- Vagus Nerve (CN X)
 - Superior laryngeal nerve
 - Internal branch: sensation to supraglottis
 - External branch: motor innervation to cricothyroid muscle
 - Recurrent laryngeal nerve
 - Loops around subclavian artery on right/aorta on left and back up in neck in tracheoesophageal groove
 - Motor innervation of all intrinsic muscles of larynx (except cricothyroid)
 - Sensation to subglottis



DIFFERENTIAL DIAGNOSIS OF HOARSENESS

VITAMIN C mnemonic

- **V**ascular
 - Stroke involving brainstem/CN
 - Hemangioma of vocal fold
- **I**nfectious
 - Laryngitis (viral, bacterial, fungal)
- **T**raumatic
 - Laryngopharyngeal reflux
 - Smoking
 - Voice abuse/chronic cough
- **A**utoimmune/systemic diseases
 - SLE, RA, Wegener's, Sarcoidosis, pemphigoid – cause inflammation
 - Neurologic disorders
- **M**etabolic/Medications
 - Inhaled steroids
 - Endocrine abnormalities- DM, thyroid disease
- **I**diopathic/Iatrogenic
 - Radiation (XRT) changes
 - Recent procedure/surgery/intubation
- **N**eoplastic
 - Laryngeal/vocal fold mass
 - Neck mass causing compression on laryngeal nerve or laryngeal structures
- **C**ongenital : masses or anatomic abnormality
- **O**ther : benign lesions of Vocal folds (nodules, polyps, cysts)
 - Vocal fold paralysis/paresis

WORKUP OF HOARSE PATIENT

History of hoarseness

- Characterize onset, situation, duration, nature (fluctuating, progressive, stable, improving)
- **Associated symptoms**
 - Cough
 - Shortness of breath
 - Difficulty swallowing, aspiration of food or liquids, odynophagia
 - New neck masses
 - Ear pain
 - Throat pain
- **Voice use:**
 - Professional voice user? How much does patient talk throughout day?

WORKUP OF HOARSE PATIENT

Additional History

- **Tobacco & alcohol use**
 - Risk for malignancy
- **History of previous surgeries**
 - especially in head and neck region
- **Medical history**
 - History of cancer, skull base mass or mediastinal/thoracic mass
 - Neurologic, autoimmune/rheumatologic disorders
- **Family history**
- **Medications:**
 - Inhaled steroids, neurologic medications

WORKUP OF HOARSE PATIENT

- **Review of Systems:** Full ROS necessary
 - Pay special attention to:
 - Constitutional symptoms (fever/chills/weight loss), otalgia/referred pain, vision changes, MSK and neurologic complaints (weakness, tremor), rashes or dermatologic complaints (autoimmune symptoms)
- **Physical Exam**
 - Full Head & Neck exam (see “Approach to Head & Neck Patient” module)
 - Pay special attention to complete oral cavity/oropharynx exam, ear exam, and neck exam
 - Flexible fiberoptic laryngoscopy is essential:
 - Evaluate entire upper aerodigestive tract for masses, ulcerations, lesions, asymmetry
 - Pay close attention to vocal cord mobility: note any asymmetry, masses or abnormalities of vocal fold movement

If patient has complaint of ear pain but normal ear exam, heightened concern for malignancy

LARYNGOSCOPY

Flexible fiberoptic transnasal scope

- Provides endoscopic view for careful examination of upper aerodigestive tract from nose down to larynx
- Allows examination of vocal folds to assess for lesions and evaluate vocal fold mobility and global laryngeal function
- **Videostroboscopy**
 - Using strobe lighting and microphone to pick up sound, vibration of vocal folds can be synched to the sound that is produced to give a representative view of how the vocal folds are moving
 - Vocal fold wave visualized as vocal folds vibrate
 - Allows finer assessment of vocal fold mobility at the level of the vocal folds themselves



FINDINGS ON LARYNGOSCOPY

- **Vocal fold masses**
 - Neoplastic: Vocal fold (glottic) cancer
 - Often appear exophytic, papular, invading
 - Can extend across midline, obstruct airway, or limit vocal fold mobility
 - Often have submucosal extension so may be larger/deep to surface than initially appear
 - Benign: nodules, polyps, cysts, granuloma, papilloma, leukoplakia
 - Usually well-circumscribed vocal fold lesions that do not usually obstruct airway
 - Can interfere with proper vocal fold closure or vibratory pattern
 - May develop reactive lesion on contralateral vocal fold

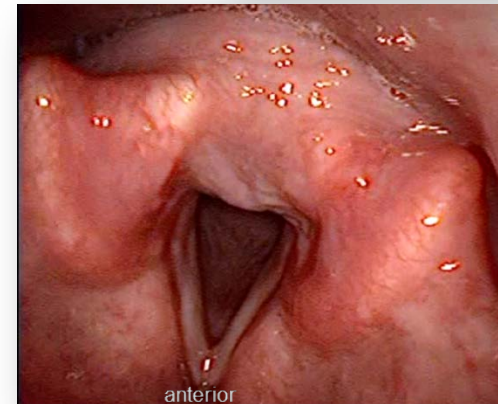
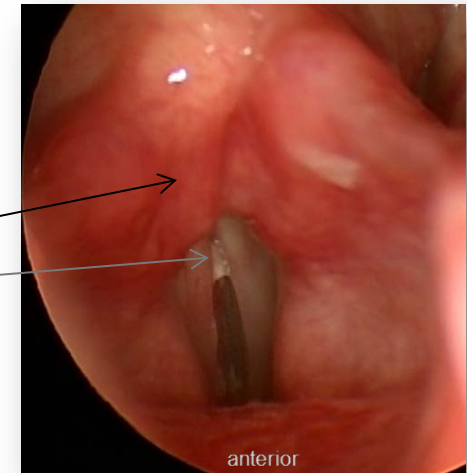


Right vocal fold granuloma (acquired after intubation trauma)

FINDINGS ON LARYNGOSCOPY

- **Laryngopharyngeal reflux (LPR) changes**
 - Interarytenoid edema, erythema of mucosa, thick mucous, pachydermia (cobblestone, thickened mucosa)
- **Vocal fold paresis or paralysis**
 - Paralyzed vocal fold often in lateral position, causing vocal folds not to be able to touch during phonation
- **Contracture patterns of supraglottic musculature**
 - Anterior-posterior, lateral, or circumferential contraction
 - Supraglottic contraction and false vocal folds often obscure view of true vocal folds

LPR changes:
Interarytenoid edema
and erythema
Thick endolaryngeal
mucous



Arytenoid
edema,
pachydermia

MANAGEMENT BASED ON LARYNGOSCOPY

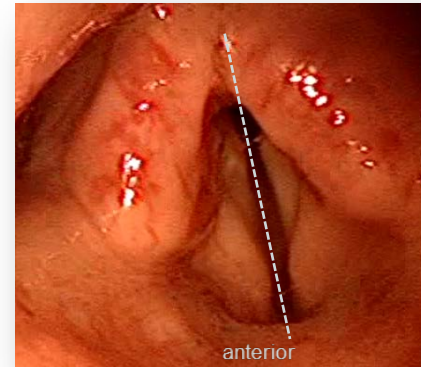
- **Vocal fold masses**
 - Neoplastic- vocal fold mass that often projects into airway
 - Panendoscopy (direct microlaryngoscopy, bronchoscopy, rigid esophagoscopy) with biopsies for definitive diagnosis
 - Often squamous cell carcinoma or precursor
 - Patient may require tracheostomy to relieve upper airway obstruction (can be temporary, depending on staging and treatment)
 - Benign: nodules, polyps, cysts, granuloma, papilloma
 - Videostroboscopy is necessary to further characterize lesions and assess for intervention
 - Surgical intervention- endoscopic/microlaryngeal procedures; debridement for RRP papilloma lesions
 - Treatment often includes voice therapy



Laser excision of papillomatous lesions from vocal fold in a patient with Recurrent Respiratory Papillomatosis (RRP). RRP is due to HPV virus infection of upper aerodigestive tract with papillomatous lesions

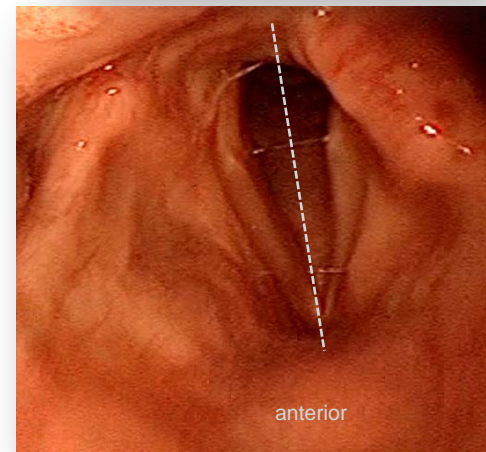
MANAGEMENT BASED ON LARYNGOSCOPY

- **Vocal fold paresis or paralysis**
 - Correlate with patient history. If unclear etiology, idiopathic VF paralysis often requires CT scans (neck + chest) or EMG testing of nerve function
 - Often requires surgical intervention for management of symptoms (treatment of voice, aspiration)
 - Endoscopic procedures – injection of vocal folds to add bulk and reposition affected vocal fold to more midline position
 - Open procedure – Medialization of vocal fold by placement of implant from external approach



Left vocal fold paresis

Vocal folds at rest



Vocal folds upon inspiration:
Right vocal fold abducts to open airway but left vocal fold remains in essentially the same position as previous image

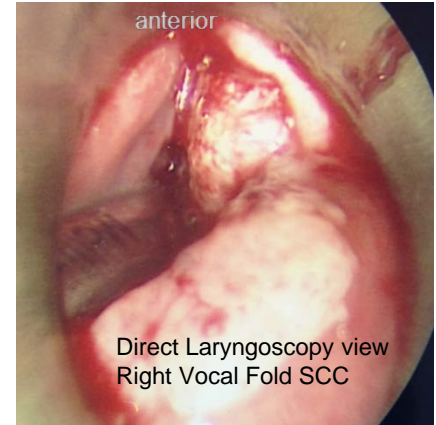
MANAGEMENT BASED ON LARYNGOSCOPY

- **Laryngopharyngeal reflux (LPR)**
 - Lifestyle modifications:
 - Avoid trigger foods (spicy, acidic, caffeine), do not eat close to bedtime, elevate head of bed
 - Prescribe proton pump inhibitor (PPI)- Nexium 40mg once to twice daily
- **Hypercontraction of supraglottic musculature (muscle tension)**
 - Voice therapy primary treatment
 - Patient may also benefit from botox injections to affected musculature



Laryngopharyngeal Reflux

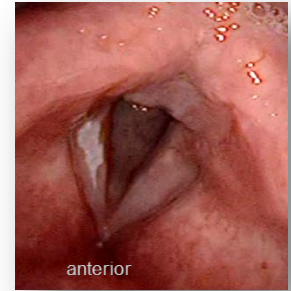
LARYNGEAL CANCER



- **Epidemiology**
 - More common in males compared to females (almost 4:1)
 - Risk factors: Tobacco, alcohol use, HPV, LPR, prior head and neck squamous cell carcinoma
- **Features**
 - Typically due to invasive squamous cell carcinoma (SCC)
 - Glottic SCC most common, however lesions can at the level of the vocal fold (glottic), supraglottic, or have infraglottic extension
 - Patients often present with progressive hoarseness, shortness of breath that can progress to respiratory distress
 - Lymphadenopathy or neck masses
- **Diagnosis**
 - Direct (micro)laryngoscopy, tracheobronchoscopy, esophagoscopy (panendo) for complete exam of all surfaces and biopsies
 - CT neck/chest for evidence of lymph node involvement/metastasis

LARYNGEAL CANCER

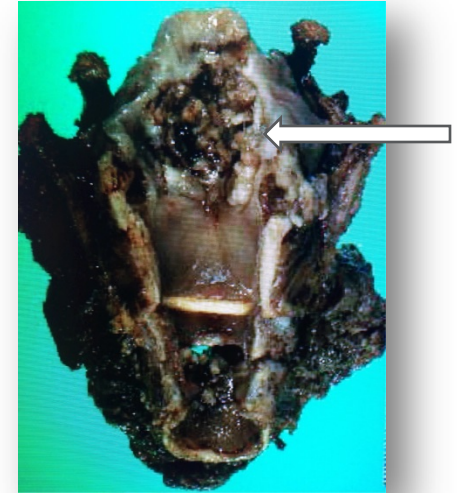
- **Staging**
 - Premalignant lesions- Leuko/erythroplakia, dysplasia, Carcinoma In Situ
 - Staging (I-IV) determined by TNM classification:
 - T- tumor size; N- nodal involvement; M- evidence of metastasis
- **Treatment options**
 - Erythroplakia, dysplasia, CIS can be treated with excision, laser ablation, surveillance
 - Early stage (I - II) : treated with single modality therapy
 - Surgery: Laryngectomy (partial or total)
 - Radiation
 - Late stage (III- IV) : treated with combined therapy
 - Primary surgery with postop radiation or postop chemotherapy
 - Primary radiation or chemotherapy followed by surgical salvage
 - Laryngeal conservation: radiation + chemotherapy or partial laryngectomy
 - Treatment must also take into account individual patient factors/functional status



Right vocal fold
leukoplakia

LARYNGECTOMY

- Removal of entire larynx from epiglottis to upper trachea
 - Superior portion of trachea sutured to opening of neck to establish airway
 - Complete separation of the respiratory and digestive tracts
 - Patients initially cannot phonate after surgery, however with motivated therapy in conjunction with Speech Language Pathology, patients can learn to produce intelligible speech
 - Tracheoesophageal puncture with prosthesis placement : valve to allow air in through from trachea to esophagus to allow air to pass up through esophagus for esophageal speech
 - Vibration of muscles allows for esophageal and buccal speech
 - Electrolarynx : allows oral movement to produce sound



Laryngectomy specimen
Epiglottis down to superior portion
of trachea. Tumor can be seen
invading the vocal folds and
supraglottis

TAKE HOME POINTS

- Persistent progressive hoarseness has a broad differential diagnosis, including malignancy, which should always be considered, especially in patients with known risk factors
- Hoarseness often requires evaluation by an otolaryngologist, for laryngoscopy as well as to address voice/vocal fold disorders

RESOURCES

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