Benign lesions on vocal cords causing hoarseness

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I'm feeling a little hoarse.
Objectives

- Definition, anatomy, function
- Presenting signs, symptoms, physical exam, ancillary tests
- Causes of hoarseness
- Case Presentation
- Conclusion
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Hoarseness

- Considered a symptom of a disease.
- Definition:
  - Rough, abnormal harsh quality
  - Rough or noisy quality of voice
  - Perception of voice with breathy quality
  - Abnormal quality
When to pursue workup?

- “Any patient with hoarseness of two weeks duration or longer must undergo visualization of the vocal cords”
Anatomy - Cartilages
Anatomy - Muscles

- Foramen for superior laryngeal vessels and internal branch of superior laryngeal nerve
- Oblique and transverse arytenoid muscles
- Posterior cricoarytenoid muscle
- Vertical part
- Oblique part

- Right lateral view

- Posterior view

- Epiglottis
- Aryepiglottic fold
- Cuneiform tubercle
- Corniculate tubercle
- Aryepiglottic muscle
- Oblique arytenoid muscle
- Transverse arytenoid muscle
- Posterior cricoarytenoid muscle
- Cricoid cartilage
Anatomy - Muscles
ABductors

Action of posterior cricoarytenoid muscles
Abduction of vocal folds
ADuctors

Action of lateral cricoarytenoid muscles
Adduction of vocal folds

Action of transverse arytenoid muscle
Adduction of vocal folds
Tensors

**Action of cricothyroid muscles**
Lengthening (tension) of vocal folds

**Action of vocalis and thyroarytenoid muscles**
Shortening (relaxation) of vocal folds
Innervation

- Superior Laryngeal Nerve
  - Internal branch (sensory innervation)
  - External Branch (cricothyroid muscle)

- Recurrent Laryngeal Nerve
  - Sensory to subglottic area and motor innervation of remaining muscles.
At Rest

The vocal cords at rest, forming a V-shaped space (the glottis), divided into the vibratory (membranous) and nonvibratory (cartilaginous) portions.
The vocal cords are divided into anterior, mid, and posterior thirds. With regard to phonation, the vocal cords are divided into the upper vibratory lips (dotted line) and the lower vibratory lips (dashed lines).
Mucosal Wave
1. Squamous epithelium – stratified, nonkeratinizing
2. Superficial lamina propria – Loose fibrous matrix gelatinous consistency allows for mucosal wave
3. Intermediate Lamina propria – Elastin
4. Deep Lamina – Fibroblasts and collagen
5. Thyroarytenoid muscle complex – Thyroarytenoid and vocalis muscle
Body Cover Concept

- Body – muscle and ligament
- Cover – lamina propria and epithelium
Function

- Phonation
- Airway protection
- Swallowing
- Valsalva
- Fixation of chest
History and Physical

- **Character of Hoarseness** –
  - Onset & Duration
  - Time course
  - Periodicity (AM vs PM)

- **Contributing Factors** –
  - Recent URI, fever, sore throat
  - Cough, congestion, talkativeness
  - Abuse of voice, tobacco, alcohol
  - Medical problems – DM, GERD, Thyroid, neurologic diseases
  - Recent surgery or recent trauma
  - Psychologic stressors
Physical Exam

- Assess perceptual quality of voice
  - Frequency
  - Loudness
  - Nasality
  - Stridorous versus breathy
  - Harsh
  - Tremorous/strained
  - Arrest of phonation
  - Aphonic
Physical Exam

- Complete head and neck exam
  - Special attention to neck masses, thyroid masses
- Complete neurologic exam
- Indirect and direct laryngoscopy
  - Mirror exam
  - Nasopharyngoscopy
- Videostroboscopy (best examination)
- Laryngeal EMG
Ancillary Workup

Generally let history and physical guide additional studies:

Suspect Autoimmune:

  ANA, RA, ACEi, CRP, ESR, c-ANCA, p-ANCA

Suspect Thyroid problem:

  TSH, T3, free T4

Infection:

  FTA-ABS, CBC
Ancillary Workup

- Chest pathology - CXR
- CT scan: cancer, persistent or recurrent pain and hoarseness, trauma, FB
- Neurologic cause – MRI – multiple cranial neuropathies - evaluate skull base and brainstem
- Modified Barium swallow if dysphagia is also a complaint
What can go wrong?

- Mucosal/mechanical alterations
- Muscle weakness
- Nerve damage
- Neurologic disorders
Systemic

- Psychogenic
  - Functional Dysphagia

- Neurologic
  - Parkinson
  - GBS
  - Stroke
  - MS
  - Myasthenia Gravis

- Autoimmune
  - RA, SLE, Wegner’s, Sarcoid

- GERD/LPR
Infectious

- Viral laryngitis
- Papilloma
- TB
Idiopathic/iatrogenic

- Medications
- Post-intubation
  - Short term
  - Long term
- Post-Cardiac Surgery
- Post-Neck Surgery
Endocrine

- Hypothyroidism (laryngeal myxedema)
- Pubescence
Toxins/Trauma

- Voice Abuse
- Caustic ingestion
- Blunt and penetrating injury to neck
Tumor

- Benign -
  - Nodules
  - Cysts
  - Polyps
  - Varices
  - Granulomas
  - Papillomas
  - Laryngocele
  - Polypoid Corditis/ Reinke’s edema
  - Granular cell tumor
Tumor

- Malignant
  - Leukoplakia
  - Scca
- Nerve impingement from neck mass compression
  - Thyroid Cancer
- Paraganglioma of vagus
Benign Causes of Hoarseness
VC Nodules

- Occur from overuse/misuse
- Hard glottal attacks
- Occur @ the free edge of the ant & mid third of the vocal cord
VC Nodules

- 3 stages:
  - An inflammatory phase with increased vascularity and protein accumulation (SP involved early)
  - Localized swelling on the edge of the vocal cord that appears as grayish, translucent thickening
  - Replacement of thickening by fibrotic tissue
VC - Nodules

- Treatment:
  - Speech therapy
  - Surgery (secondarily and rare)
VC - Cyst

- Epithelial lining covering cyst
- Results from misuse or overuse
- May be retention cyst
- Found in the lamina propria, Reinke’s space
- May cause fibrosis to contralateral cord
VC - Cyst

Treatment:
- Medical - Modified voice use, vocal hygiene, 2 week steroid taper, Reflux
- Surgical - vocal cysts typically do not respond to conservative therapy
  - Goal is preservation of the mucosal cover with minimal disruption of underlying tissue
    - Lateral vs. medial flap
    - Triamcinolone acetate at the end
VC - Polyp

- Sessile or pedunculated
- Fibrotic, vascular or mixed
- Not uncommon to find contralateral prenodule
- Polyp less common contralateral
VC Polyp

- Treatment can be different based on type of polyp
  - Sessile – microflap and resect
  - Pedunculated – may retract, small flap and amputate
VC - Varices

- Vascular lesions or enlarged vessels on vibratory surface of cords
- Related to abuse, trauma, vocal use
VC - Varices

- Shearing stress along lateral fold near the termination and reversal point of the mucosal wave
- Hormones have been implicated
- Treatment:
  - Medical – D/c anticoag, reflux meds, voice rest
  - Surgery – PDL, KTP Laser, CO2 laser
VC - Granuloma

- Results from intubation trauma
- Habitual throat clearing, excessive glottal attacks, and reflux esophagitis
- Inflammation leads to granulation tissue covered by hyperplastic squamous.
VC - Granuloma

- Majority seen near arytenoids
- Treatment:
  - Speech therapy
  - Anti-reflux meds
  - Botox cricothyroid for severe pain
  - Surgery if lesion starts to obstruct, failed conservative management, or need tissue dx.
    - Tend to recur in ~ 70%
VC - Papilloma

- Benign non-keratinizing squamous cells
- Associated with HPV 6 & 11
- Speculated children become infected as they pass through birth canal (can occur with c-section)
- First born more likely to have RRP
VC - Papilloma

- **Treatment:**
  - **Surgical (goldstandard):** microsurgery, microdebrider, laser & photodynamic therapy
  - **Medical:** Cidofovir, interferon, indole-carbinol-3, acyclovir, gancyclovir, mitomycin
  - **Intralesional injection of cidofovir (controversial)**
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

Intralesional cidofovir

- 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.
Side effects

- Dysplasia (2.7%)—no difference found in comparison to placebo
- Rash
- Vocal fold atrophy and scarring
- Breast adenocarcinoma when given IV
Laryngoele

- 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
VC - Reinke's edema

- Polypoid degeneration
- 2ry to smoking, chronic irritation
VC – Reinke’s Edema

○ Treatment
  ● Smoking cessation (x6 months prior to surgery)
  ● Speech Therapy
  ● Antireflux medication
  ● Surgery
    ○ Epithelial microflap (lateral/Hirano flap) elevation with SLP contouring and reduction using either cold instruments, Microspot CO2 laser, or both
Granular cell tumor

- Benign entity arising from schwann cells
- Half of GCTs occur in H&N and 10% occur in larynx
- (Tongue most common site)
- Stain positive S-100 and vimentin
Granular cell tumor of larynx

- Average age is 37
- Treatment:
  - Endoscopic excision
  - Low recurrence rate 8-12%
  - For larger lesions an open approach can be attempted after failed endoscopic attempts
Normal Videostrobe

Click to play or repeat the video
Case Presentation

- 33 y/o female
- c/o hoarseness x 2-3 months
- Kindergarten teacher
- You notice during PE she frequently clears her throat
- Denies any past medical/surgical history and denies smoking or alcohol
Videostrobe

Click to play or repeat the video
Conclusions

- Hoarseness is a symptom of a disease which can be localized or systemic.
- Good working knowledge of anatomy helps elucidate diagnosis.
- Attempt to rule out carcinoma.
- Videostrobe – best to look at cords and function.
- Speech pathology – key to treating patient.


Kaypentax, Assessing Dysphonia. Interactive video textbook

Cummings Otolaryngology: Head and Neck Surgery

Head and Neck Surgery—Otolaryngology (Head & Neck Surgery)