

# GBMC Stroboscopy Rounds

October 12, 2007

# Case Presentation

- JC: 65 y/o retired plumber
- CC: Hoarseness
- HPI: Admitted to a local hospital on May 30 for severe pneumonia. Intubated in ICU for 10 days, total hospital stay = 32 days. Abrupt onset of dysphonia after extubation. No change in voice quality over subsequent months, difficulty using telephone. Evaluation by physician (OHNS) → told cords were moving and sent to voice therapy but did not follow through. No dysphagia, pain, aspiration, or GERD.

# Case presentation cont.

- PMH: DM, Hep C, renal failure requiring dialysis, arthritis
- SH: Non-smoker, non-drinker
- Meds: Metoprolol, propranolol, Vitamins for renal failure

# Case presentation cont.

- PE: NAD, voice extremely hoarse
  - Quiet, breathy, poor pitch and volume modulation. Strained quality.
- CN intact
- Oropharynx clear, missing teeth (secondary to interferon treatment), no masses or lesions.
- Neck flat, trachea midline.

# Exam Summary

- Flexible Laryngoscopic exam / Strobe:
  - Normal nasopharynx, BOT, epiglottis, pyriform sinuses
  - VC normal in appearance with full abduction – no granulomas, nodules, webs, or stenosis.
  - Phonation: Severe medial and AP compression of ventricular folds. Arytenoids move normally, unable to assess TVC during phonation, ? posterior gap

# □ Muscle Tension Dysphonia □

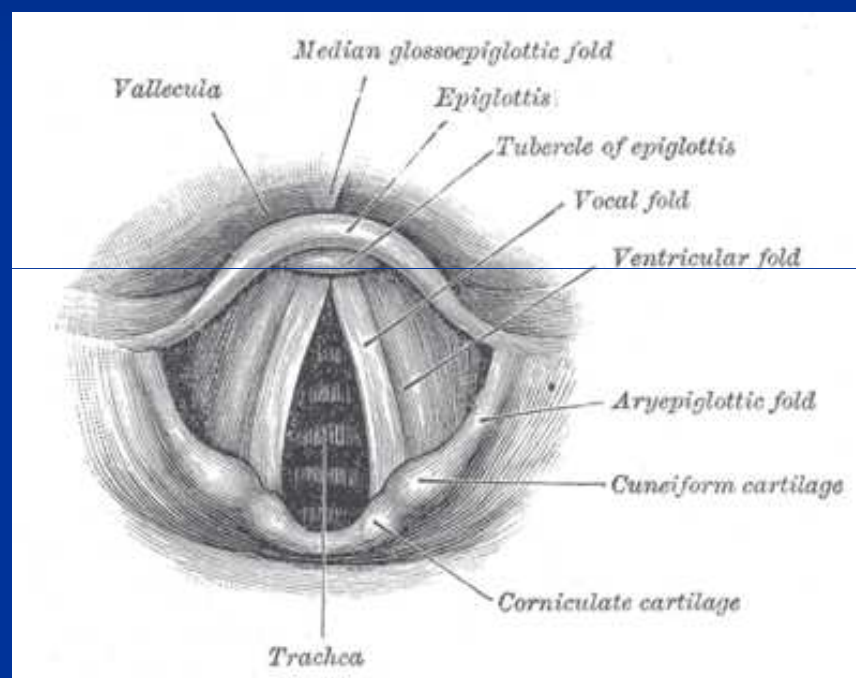
- otherwise known as ... hyperfunctional dysphonia, muscle misuse dysphonia, hyperkinetic dysphonia, musculoskeletal tension dysphonia, mechanical voice disorder, functional hypertensive dysphonia, laryngeal tension-fatigue syndrome, or laryngeal isometric dysphonia.
- Functional dysphonia
  - ie) impairment of voice production in absence of structural or neurogenic disease of larynx

# Ventricular Dysphonia

- Dysphonia plica ventricularis
- After Sataloff - “phonation using false vocal fold vibration rather than true vocal vibration, most commonly associated with severe muscular tension and occasionally may be an appropriate compensation for profound true vocal fold dysfunction.”

# Ventricular Dysphonia Described

- Ventricular folds (false cords)
  - Physiologic movement with arytenoid cartilages but should not approximate midline during normal voice production. Motor innervation by thyroarytenoid branch of anterior division of recurrent laryngeal nerve
  - Voice – low-pitched, hoarse, rattling, restricted vocal range, voice breaks, and voice fatigue





# Etiology / Classification

1. Substitute voice resulting from severe TVC disease or glottal incompetence ie) hemilaryngectomy, unilateral paralysis
  2. Habitual / voice abuse
  3. Psychoemotional / stress-induced
  4. Cerebral or cerebellar signaling dysfunction
- Does repetitive motion cause muscular hypertrophy, functional change, and even a new system of innervation?

# Etiology cont.

- 40 pt series: 22/40 compensating for glottal inadequacy
  - 10 – iatrogenic
  - 7 – intubation
  - 5 – VC paralysis
  - 5 – irritant exposure
  - 3 – vocal abuse
  - 3 – spastic dysphonia
  - 2 – respiratory disease

# Stroboscopy Findings

- Characterized by A-P shortening, medial compression (FVC)
  - Behrman et al.: 40 control, 40 nonorganic dysphonia:
    - No significant difference in medial compression
    - Significant difference A-P but considerable overlap in groups
  - Stager et al: 3 groups: control, nodules, hyperfunctioning
    - FVC compression: 45%, 68%, 80% (1,2 < 3)
    - A-P compression: 74%, 78%, 92% (1,2 < 3)
    - Therefore not a precursor for nodule development
  - Stager et al: Supraglottic activity in normal adults:
    - Present during glottal stops
    - Males > Females
    - FVC during initiation of female speech

# Treatment

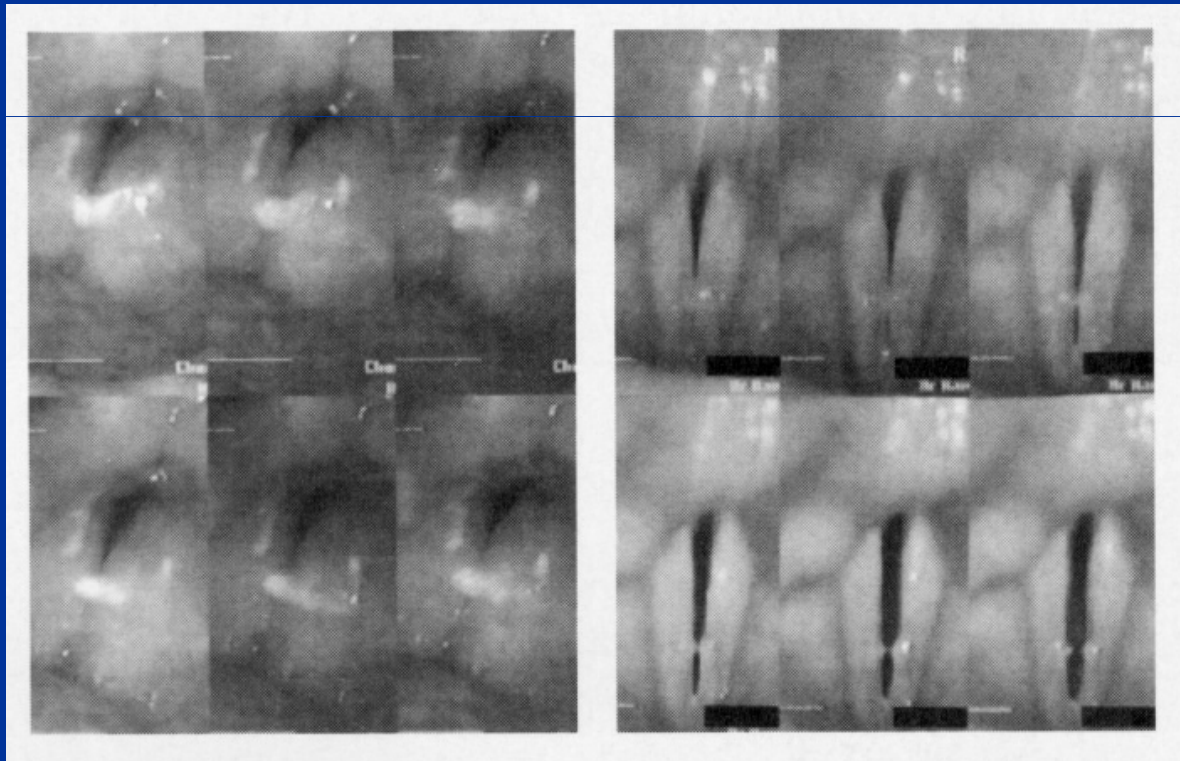
- Major therapy division between inadequate and adequate glottic closure
- Inadequate Closure
  - Training of ventricular phonation to improve voice quality
  - Thyroplasty

# Treatment cont.

- Adequate Glottic Closure
  - Voice therapy
    - Inhalation phonation – “pitch match” with exhalation
      - Retraining
      - Natural abduction of FVC
    - Digital manipulation of larynx – neck is elevated during ventricular phonation
    - Biofeedback
    - Fiberoptic feedback
  - Psychotherapy
    - CBT

# Treatment cont.

- Injections
  - Botox
    - 7 pt series – 5/7 achieved normal voice



# Treatment cont.

- Surgery
  - Excision of FVC
    - Reserved for patients refractory to voice therapy
    - Irreversible ventricular hypertrophy and normal TVC function
  - Kosokovic (1973) – Laser excision of FVC
    - 26/35 had prompt resolution of dysphonia

# Back to JC

- What is the possible cause of his ventricular dysphonia?
  - Underlying TVC dysfunction does not appear likely
  - Stress?
  - Nasri et al: Ventricular dysphonia after 12 day intubation – hypothesized that high cuff position compressed medial thyroarytenoid nerve fibers (TVC) leaving lateral fibers intact (FVC)