Vocal Cord Paresis: Background and Case Reports

The Greater Baltimore Medical Center,
The Johns Hopkins Voice Center at GBMC
Stroboscopy Grand Rounds
Definitions:

- **Paralysis**: No movement
- **Paresis**: Hypomobility
- **Synkinesis**: Aberrant regrowth of the laryngeal nerves.
Anatomy/Nerves:

- **Recurrent Laryngeal Nerves**: Different Course...
  - Right - Loops behind R subclavian artery (nonreccurrent possible)
  - Left - Passes inferoposteriorly to aortic arch
Anatomy/Nerves:

- **Superior laryngeal nerve**: Travels inferiorly, medial to carotid artery. Splits into 2 branches at hyoid. Internal SLN penetrates thyrohyoid membrane with laryngeal a., external division provides motor innervation to cricothyroid m.

- **Note**: Find external SLN 1 cm superior to superior pole of thyroid.
Internal b. SLN

External b. SLN
Anatomy/Muscles:

- RLN Innervates 4 muscles
- Adductors: Thyroarytenoid, lateral cricoarytenoid
- Abductor: Posterior cricoarytenoid
- Interarytenoid m-adduction and closure of posterior glottis
Occurrence:

- Highly variable depending on cause:
- Iatrogenic - seen in thyroid surgery
- Idiopathic: unknown
- Large number likely unidentified
Causes:

- Many causes: iatrogenic, idiopathic, trauma, neurologic ds (MS, ALS, MG, Guillain-Barre, Parkinson ds), local tumor infiltration (thyroid cancer, LN spread, Pancoast tumor), infection (Lyme), collagen-vascular ds, CVA, CNS tumors
Presentation:

• **VC Paresis**: VC hypomobility due to neurologic injury

• **Presents as**: dysphonia, loss of upper register of voice, hoarseness, breathiness, choking, decreased vocal stamina
Sunderland Classification:

- First thru Fifth Degrees of Injury
- First usually with complete recovery, fifth with more permanent changes
Synkinesis:

- Crumley Classification System:
  - I-normal voice/airway
  - II-spastic VC that twitches w/o control
  - III-tonic adduction of VC, compromised airway
  - IV-tonic abduction of VC, breathy voice and risk of aspiration
Evaluation:

- History
- Physical Exam-mirror exam, laryngoscopy, videostroboscopy
- EMG
EMG:

- Stimulate cells to produce action potential
- Innervation ratio (of motor unit)
- Electrodes placed
- Measure muscle fiber action potential
- Inserted into CT, PCA/LCA, Vocalis, TA
- Insertion, rest, min contract, max contract
EMG:

- Mild-decrease in recruitment 1-30%
- Moderate 31-60%
- Severe 61-99%
- Paralysis-No observable recruitment
EMG:

- Abnormal Findings:
  - increased insertional activity: myopathic and neurogenic
  - repetitive discharges: neuropathic process
Treatment

- Voice therapy
- VC injection
- Thyroplasty medialization
- Laryngeal pacing (FES)
Case 1: female vf paresis & presbylarynges

- 69 yo female
- R VC paresis and presbylarynges
- Multiple injections (saline, radiesse gel, and calcium hydroxyapatite)
Case 1 Video: female vf paresis & presbylarynges

CLICK HERE for video
Case 2: female, right tvf paresis

- 56 yo female
- R VC paresis
- Also w/ supraglottic hyperfunction and phonotraumatic nodules
Case 2 Video: female, right tvf paresis

CLICK HERE for video
Case 2 Video: female, right tvf paresis

CLICK HERE for video
Case 2 Video: female, right tvf paresis, injection radiesse

CLICK HERE for video
Case 3: male, left tvf paresis

- 54 yo male
- L VC paresis
- *Transcervical injection augmentation
Case 3 Video: male, left tvf paresis

CLICK HERE for video
Case 4: female, right tvf paresis & presbylarynges

- 83 yo female
- R VC paresis and presbylarynes
- Previous bilateral Radiesse gel injections
Case 4 Video: female, right tvf paresis & presbylarynges
The END

Questions: call 443-849-8451
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