UCSF School of Medicine

Closing the Gap: Unilateral Vocal Fold Paralysis

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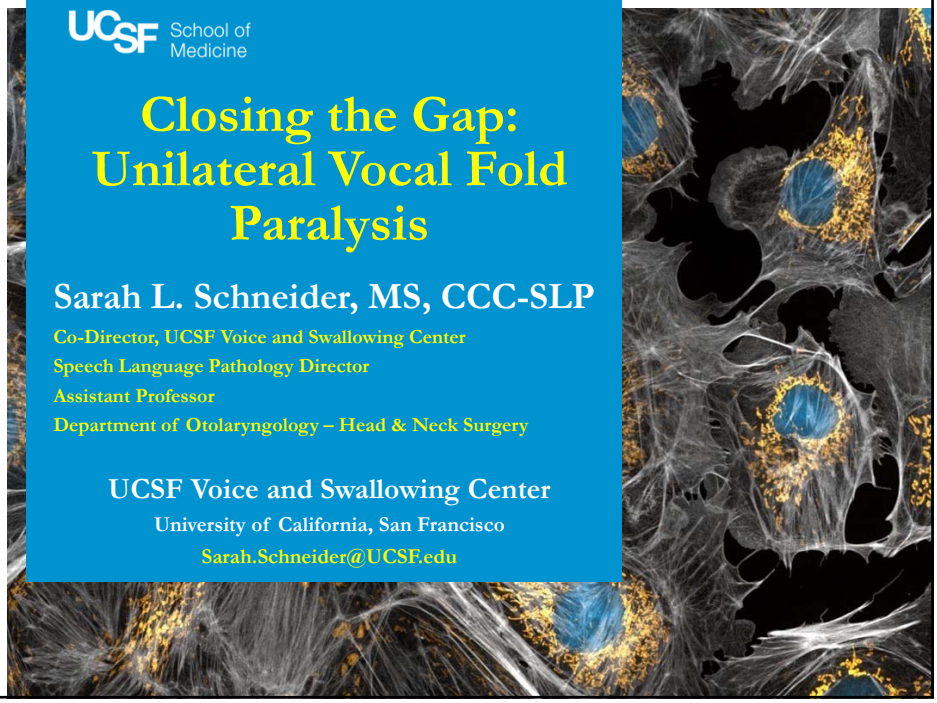


Disclosure

- None

Vocal Fold Motion Impairment

The SLP Perspective

Evaluation	Therapy Candidacy	Treatment
• Voice • Swallowing • Breathing	• When to refer for voice therapy	• Frequency • Duration • Therapy techniques

Glottic Insufficiency - Nomenclature

- **Vocal Fold Immobility/Hypomobility**
  - Absent/reduced movement due to unknown cause
- **Vocal Fold Paralysis/Paresis**
  - Absent/reduced movement due neurogenic etiology
- **Vocal fold Immobility/Hypomobility** related to the mechanical impairment of the cricoarytenoid joint
  - Includes posterior glottic scarring/stenosis
- **Vocal fold Immobility/Hypomobility** related to laryngeal malignant disease

Rosen et al 2016

Clinical Factors and Decision Making

- History
  - Medical history
  - Onset of symptoms
- Patient vs Clinician perception severity
- Complaints
- Laryngeal Examination
- Stimulability for behavioral change
- Readiness for change/motivation
- Patient and clinical expectations for recovery
- Candidacy for surgical intervention

Patient Intake/History

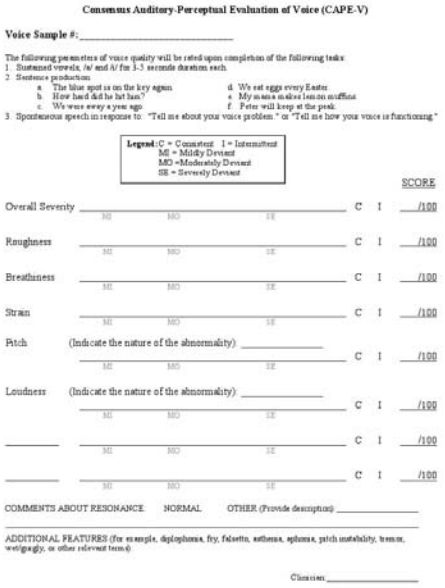
- Onset of Complaints – gradual, sudden
- Specific complaints
  - Voice
  - Swallowing
  - Breathing
- Vocal demand
- Medical/Surgical history
- Medications
- Relevant social history

Patient reported measures:
- Voice Handicap Index (VHI)-10
- Voice Related Quality of Life (VRQOL)
- Dyspnea Index (DI)
- Eating Assessment Tool (EAT)-10

Leder and Ross 2005

Perceptual Evaluation

- CAPE-V
  - Standard instructions
  - Standard tasks
- Common voice quality:
  - Breathiness
  - Asthenia
  - Diplophonia
  - May be worse at lower pitches



Consensus Auditory-Perceptual Evaluation of Voice (CAPE-V)

Voice Sample #:_____

The following parameters of voice quality will be rated upon completion of the following tasks:
1. Sustained vowels: /a/ and /i/ for 3-5 seconde duration each
2. Sentence production:
   a. The blue spot is on the key again.
   b. How hard did he hit him?
   c. We were away a year ago.
   d. We eat eggs every Easter.
   e. My mama makes lots of muffins.
   f. Peter will keep at the peak.
3. Spontaneous speech in response to: "Tell me about your voice problem." or "Tell me how your voice is functioning."

Legend: C = Consistent I = Intermittent
MI = Mildly Deviant
MO =Moderately Deviant
SE = Severely Deviant

			SCORE
Overall Severity	MI MO SE	C I	/100
Roughness	MI MO SE	C I	/100
Breathiness	MI MO SE	C I	/100
Strain	MI MO SE	C I	/100
Pitch	(Indicate the nature of the abnormality) _____ MI MO SE	C I	/100
Loudness	(Indicate the nature of the abnormality) _____ MI MO SE	C I	/100
_____	MI MO SE	C I	/100
_____	MI MO SE	C I	/100

COMMENTS ABOUT RESONANCE: NORMAL OTHER (Provide description) _____

ADDITIONAL FEATURES (for example, diplophonia, fry, falsetto, asthenia, aphonia, pitch instability, tremor, wet/gurgly, or other relevant terms):

Clinician:_____

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Assessing Peri-Laryngeal Tension

Peri-laryngeal Palpation

<u>Tension and Tenderness</u>

- Infrahyoid
- Sternocleidomastoid
- Suprahyoid
- Submental
- Lateral motion of the Larynx

*Assess at rest and during phonation

**Pressure to blanch the thumb nail on a firm surface

Acoustic and Aerodynamic Testing

- **Acoustic Measures –**
  - Jitter, shimmer, noise/ harmonic ratio
    - Time based acoustic measures unreliable with dysphonic voices
  - CSID and CPP speech –statistically significant improvement pre- and post treatment in this population (Gillespie et al 2014)

Acoustic and Aerodynamic Testing

- **Aerodynamic Measures**
  - Speech Aerodynamics. (Gillespie et al.)
    - Can be done with or without equipment
    - Duration of the first 4 sentences of the Rainbow passage and count number of breathes
    - With equipment - analyze average airflow

Stimulability and Self-awareness

Important for the success of behavioral intervention

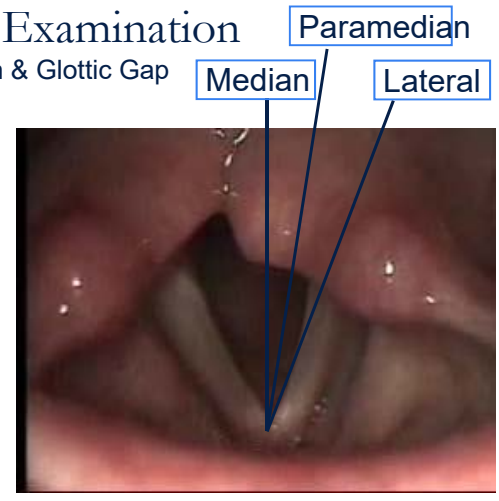
- Stimulability
  - Are they able to alter the sound or feel of the voice?
  - Can they follow vocal direction?
- Self-awareness
  - Is the patient aware of voice use patterns?
  - Can they identify changes in voice ease or quality?
    - With therapy and practice, can this skill develop?

Gillespie & Gartner-Schmidt, 2016, Dejonckere & Lebacq, 2001, Bonilha & Dawson, 2012

Laryngeal Examination

Position & Glottic Gap

- Vocal Fold Position
  - Median – at midline
  - Paramedian – away from midline
  - Lateral - furthest away from midline
- Resultant Glottal Gap
  - Small, moderate, large
  - Height mismatch?



Laryngeal Examination – Jostle sign

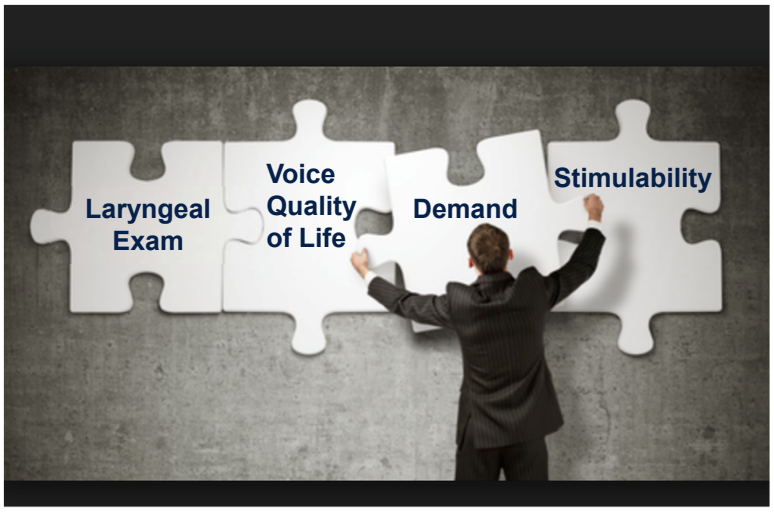
Why is this important to the SLP???

- Passive movement of the arytenoid of the affected side due to contact from the other arytenoid (Sataloff 1987)
- The weak side cannot maintain resistance to pressure during adduction
- **Implications** – difficulty increasing intensity!

Candidate for Voice Therapy??

Candidacy for Voice Therapy

Putting together the pieces of the puzzle



Treatment

- **Physiologic Approach informed by voice science and motor learning!**
- **Goals of treatment**
  - Maximize voice use in the presence of the current glottic configuration
- **Guide expectations:**
  - Type of injury
  - Time from injury
  - Vocal fold position and Gap
  - Current voice use patterns/vocal demands
  - Stimulability for change

Efficacy of Voice Therapy

- Handful of studies that show improvement in various outcomes post-therapy
- Therapy techniques are inconsistently described
  - No efficacy data for specific techniques
- Single-group treatment designs
  - Nerve regeneration was not accounted for

Heuer et al 1997, D'Alatri et al 2008, Schindler et al 2008 Mattioli et al 2011

Frequency and Duration of Voice Therapy

- **Frequency of therapy**
  - 4 sessions over 8 weeks
- **Duration of therapy**
  - Assess progress at each session
  - Discontinue if not progressing
  - Continue if trajectory for improvement
- **Therapy drop out**
  - Tends to be at ~4 sessions (Hapner et al)

Frequency and Duration of Practice

- Independent practice is crucial to success in voice therapy
- Little evidence to guide what practice should be

Therapy Techniques

- Semi-occluded Vocal Tract (SOVT) (Titze 2006)
- Resonant Voice Therapy (Verdolini)
- Stretch and Flow Therapy (Stone and Casteel)
- Vocal Function Exercises (Stemple 1993)
- Conversational Training Therapy (CTT) (Gartner-Schmidt et al 2016)
- Push/Pull Exercises???

Conclusions

- Comprehensive evaluation is necessary to guide therapeutic recommendations and ongoing decision making
- While efficacy data for types of therapy is missing, there is evidence that voice therapy is beneficial in the management of vocal fold immobility and hypomobility
- Considerations:
  - Timing and type of injury
  - Glottic gap
  - Voice use patterns and vocal demand
  - Stimulability for change assessed by SLP

Our Team!

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