Unilateral Laryngeal Paralysis or Vocal Cord Paralysis

redirect to: Management of Specific Voice Disorders

see also: Vocal Fold Paralysis (Vocal Cord Paralysis) Etiologies

Vocal Cord Paralysis Evaluation and Etiology

Type I Thyroplasty (Gore-tex) case examples (includes sample op note for thyroplasty)

Immobile Vocal Cord After Intubation

Injection Laryngoplasty for Vocal Fold Paralysis and Glottic Incompetence

Case example Thyroplasty with arytenoid adduction under General Anesthesia

Complication from Arytenoid Adduction Combined with Medialization Laryngoplasty (Gore-tex thyroplasty)

Vocal Cord Paralysis Complication with thyroplasty

Laryngeal EMG (Electromyography) Anatomy and Video

Reinnervation for Laryngeal Paralysis;

Cymetra Injection to Paralyzed Vocal Cord In the Clinic Technical Points for Percutaneous Injection

Transoral injection laryngoplasty with videostroboscopy

see also: Recurrent laryngeal nerve injury anatomic considerations

and Bilateral Vocal Cord Paralysis

Presenting signs and Symptoms

1. Airway
   a. Unilateral laryngeal paralysis compromises the capacity of the glottic aperture to enlarge in a normal fashion during inspiration (see Beatty and Hoffman 1999)
      i. Most patients do not detect impaired inspiration due to this change
      ii. Many patients will complain of shortness of breath related to loss of air during attempted phonation
      iii. Airway compromise may occur if the unilateral paralysis is accompanied by other pathologic processes such as polypoid changes to the vocal cord or decreased abduction of the contralateral vocal cord.
   b. Bilateral vocal cord paralysis may cause stridor if the vocal cords are in a median or paramedian position

2. Swallowing
   a. Unilateral recurrent laryngeal nerve paralysis in isolation and in an otherwise healthy patient often is unattended by swallowing problems. When swallowing problems occur in this scenario, they occur most commonly during ingestion of thin liquids (causing coughing due to aspiration)
   b. Swallowing problems in the presence of a new onset laryngeal paralysis are very common due to:
      i. Combined neurologic deficits - including loss of sensation (superior laryngeal nerve paralysis); loss of ipsilateral pharyngeal muscle innervation (broader vagal paralysis); loss of hypoglossal/glossopharyngeal function.
      ii. Associated comorbidities: weakness, poor cough (lung function), advanced age

3. Dysphonia (hoarseness)
   a. Unilateral vocal cord paralysis may cause ‘glottic incompetence’ if the paralyzed vocal cord is laterally positioned and lacks sufficient tone to provide a buttress against which the normal mobile vocal cord can oppose.
      i. A breathy dysphonia will usually occur with glottic incompetence.
      ii. Adaptive measures by the patient may cause a presentation similar to muscle tension dysphonia as compensation with a supraglottic squeezing mechanism may dominate the clinical picture
iii. Often complain of rough and breathy voice
iv. Voice fatiguable
b. Bilateral vocal cord paralysis may result in a normal or near normal voice if
the vocal cords are positioned near the midline. Stridor commonly occurs in this
situation.

History

1. Trauma
   a. often surgical
   b. can be related to laryngeal trauma from intubation--->important to solicit
      intubation history
2. Infectious
   a. History viral infection at the onset of voicing difficulties
3. Neurologic
   a. Wallenberg syndrome
4. Neoplastic
   a. thyroid, lung, esophageal, skull base tumors (benign and malignant),
      mediastinal lesions
5. Idiopathic (see Sulica 2008)
6. Ortner's syndrome "cardio-vocal syndrome"
   a. Important to evaluate history of cardiopulmonary status - 'idiopathic vocal
      cord paralysis' may actually reflect Ortner's syndrome
   b. Classically: atrial enlargement causing traction on the left RLN issues (Ortner
      1897)
   c. However: "Vocal cord paralysis appears to be caused by compression of
      the left recurrent laryngeal nerve between the enlarged hypertensive
      pulmonary artery, the aorta, and the ligamentum arteriosum and not by
      dilatation of the left atrium, as some observers have thought." (Clinical
      Cardiology 2010)
7. Collett-Sicard Syndrome  (click on link for info)

Evaluation

1. Clinical Exam
   a. Cranial nerves
      i. CN XI, XII (Accessory and Hypoglossal) evaluate for higher vagal
         lesions
      ii. Superior Laryngeal Nerve (SLN)---> assess by touching supraglottic
         larynx with flexible fiberoptic laryngoscope
   b. Fiberoptic video laryngoscopy
      i. consider other alternatives for vocal cord immobility
         1. posterior glottic scarring
         2. cricoarytenoid arthritis
2. Laboratory analysis
3. Radiographic Analysis see: Head and Neck CT Protocols
   a. CXR in almost all patients with unexplained paralysis unless other more
      advanced imaging (CT/MRI/PET) has been or will be done.
   b. CT/MRI if idiopathic unilateral paralysis is not resolved in 2-3 months or
      immediately if clinical history or signs warrant

Differential Diagnosis

1. Vocal Cord Paralysis - lack of neurologic input to the larynx (intracranial, vagal, RLN)
2. Arytenoid Fixation
   a. Crico-arytenoid arthritis
   b. Arytenoid subluxation v dislocation
      i. Controversy persists about the appropriate way to discriminate
         impaired vocal cord mobility associated with paresis/paralysis from
         dislocation/subluxation
      ii. Three-dimensional CT imaging has been touted as useful in
discriminating between paralysis and subluxation/dislocation (ref
      Hiramatsu 2010)
3. Vocal fold fixation from tumor

Treatment
1. Voice Therapy
   a. controversial as to timing (some suggest a trial before surgical intervention; we more commonly advocate after surgery such as injection or medialization is done)
   b. generally used as adjunct to surgery
   c. evaluation by speech pathologist is useful initially to document degree of voice disorder and address abnormalities used in compensation to related abnormality
      i. can also employ speech pathology services to improve swallow function
         1. head rotation towards paralyzed side to direct food to innervated side
         2. head flexion to diminish laryngeal exposure
         3. modifying size and food consistency
         4. multiple swallow
         5. coughing and clearing throat
         6. breath holding
   2. Injection laryngoplasty
      a. see: "Injection Laryngoplasty for Vocal Fold Paralysis and Glottic Incompetence"
   3. Medialization laryngoplasty
      a. see: "Medialization Laryngoplasty- Type I Thyroplasty with ePTFE (Gore-Tex)"
   4. Arytenoid Adduction
      a. see: "Arytenoid Adduction Combined with Medialization Laryngoplasty through Type I Gore Tex Thyroplasty"
   5. Reinnervation
      a. see: "Reinnervation for Laryngeal Paralysis"
   6. Other

Management philosophy

see Friedman 2010 - controversy about recommended initial timing and type of intervention continues with our approach emphasizing efforts to include an educated patient and family in the decision-making

Difficulties in communicating information in an understandable fashion is highlighted by study by Balakrishnan et al (2016) who subjected four individuals with different educational backgrounds to PAMET (patient education materials evaluation tool) to on-line patient education materials (PEM) addressing vocal cord paralysis. The reading level of 29 PEMs ranged from grades 9 through 17 with understandability ranging from 29% to 82%. As a result, we work to go through our "Iowa Protocols" with patients to demonstrate images and videos to enhance their understanding of vocal cord paralysis and management options.

References


Hoffman H, McCulloch T, Vitoria L. Laryngeal Paralysis. General and Pediatric Otolaryngology. Pg 446-452


Sulica L. the natural history of idiopathic unilateral vocal fold paralysis: evidence and problems. Laryngoscope 2008;118:1303-1307


