Laryngeal Endoscopy (Rigid, Flexible, and Stroboscopy)

Visualization of the larynx can be performed via several different methods. Special tools are required for laryngeal evaluation.

Mirror laryngoscopy (1)

- While the patient's tongue is protruded, a mirror is placed in the posterior oropharynx with gentle pressure on the soft palate while light is reflected caudally into the larynx.
- Mirror laryngoscopy can be challenging for both the examiner and the patient, has limited magnification, and may require topical anesthesia.
- Mirror laryngoscopy provides the most accurate color representation of laryngeal and pharyngeal tissue because there is no light or digital distortion.

Flexible laryngoscopy (2)

- A flexible laryngoscope is placed into the nasal cavity, through the naso- and oropharynx and positioned cephalad to the larynx for a full laryngeal assessment.
- Nasal anesthesia (lidocaine) and/or nasal decongestants (oxymetazoline/phenylephrine) may be applied to the nose for the purpose of improving patient comfort and tolerance
- Supplemental procedures such as dynamic voice assessment (comprehensive laryngeal movement evaluation), functional endoscopic evaluation of swallowing (+/- sensory testing), and other laryngeal procedures (ex. injections, laser surgery, biopsies) can be performed during flexible laryngoscopy.
- Flexible laryngoscopy is ideal for evaluating vocal fold weakness, real-time/unencumbered evaluation of task-specific abnormalities (ex. my voice is problematic when I do this), and assessing the intensity of glottal attack.

Rigid Laryngoscopy (3)

- Rigid laryngoscopy is performed by placing a rigid 70- or 90-degree telescope into the oropharynx during tongue protrusion.
- Sometimes, oropharyngeal and/or tongue application of anesthesia (ex. lidocaine, cetacaine) can be helpful for patient tolerance. Rarely, patient anatomy or intolerance will prohibit this examination.
- Rigid laryngoscopy provides a clear, magnified view of the larynx, but can distort some aspects of laryngeal biomechanics (muscle tension, glottic gap, laryngeal movement) because of the positioning required for the examination and voice exam generally limited to "e" vowel phonation.

- Rigid laryngoscopy under general anesthesia may be necessary for patients who are unable to tolerate office endoscopy, require procedures such as biopsy or tissue removal and for the assessment of lesions that require manipulation of the vocal folds, such as sulcus vocalis and mucosal bridges.

Videostroboscopy (3, 4)

- The addition of stroboscopy to laryngeal visualization allows for the detailed analysis of vocal fold vibration and closure. It is the most useful examination for evaluation of the mucosal cover layer of the leading edge of the vocal fold.
- Because vocal fold vibration occurs far too fast for visualization with the unaided eye under natural light, stroboscopy is performed to either slow or freeze the image for analysis.
- A microphone is placed near the patient that detects the vibrating frequency of the vocal folds. Based on this frequency, the bulb is flashed either at the same frequency or just slower than the glottic cycle, allowing for the image to appear frozen, or in slow motion respectively.
- Videostroboscopy examination protocol should include evaluation at modal pitch (at a comfortable intensity), low pitch (at soft and loud intensities), and high pitch (at soft intensity) for comprehensive evaluation.
- Characteristics evaluated during videostroboscopy include, but are not limited to, fundamental frequency, symmetry of movement, periodicity, glottic closure, amplitude of vibration, mucosal wave, and the presence of adynamic segments. These are compared with expected norms and previous stroboscopic examinations.
- The videostroboscopic examination is recorded and reviewed by the provider with the patient to provide documentation of the patient's progress and comparison with previous examinations.

REFERENCES

1. Best SRA, Akst LM. Visualizing the Larynx. In: Sataloff's Comprehensive Textbook of Otolaryngology: Head & Neck Surgery. 1st Edition. Jaypee 2016.
2. Koufman JA. Evaluation of Laryngeal Biomechanics by Fiberoptic Laryngoscopy. In: Diagnosis and Treatment of Voice Disorders. 3rd Edition. Plural 2006.
3. Sataloff RT. Chapter 20 – Physical Examination. In: Care of the Professional Voice: The Science and Art of Clinical Care. 3rd Edition. Volume 1. Plural 2005.
4. Rosen CA, Simpson CB. Chapter 3 – Videostroboscopy and Dynamic Voice Evaluation with Flexible Laryngoscopy. In: Operative Techniques in Laryngology. Springer, 2008.