

## **Velopharyngeal insufficiency: Who does what? The surgeon and the speech**

### **pathologist: The broken circle unbroken**

Velopharyngeal insufficiency (VPI) is a challenge for every craniofacial team. Although the most common etiology of VPI is a cleft of the secondary palate, this disorder can also occur without a malformation of the vocal tract. Etiologies vary widely including adenoidectomy, neuromuscular disorders, deafness, craniofacial anomalies (other than cleft palate), surgery and/or radiation for oral and/or pharyngeal cancer, stroke and traumatic brain injury.

Regardless of etiology, VPI is conceptualized as a structural disorder. Thus, the most effective treatment is either surgical or prosthetic. Even in the absence of a palatal cleft or tissue loss, speech and Language Pathology (SLP) treatment can rarely restore velopharyngeal seal during speech. Most reports agree that speech pathology treatment can correct VPI in only about 1 percent of the cases. Even when VPI occurs in patients with compensatory articulation patterns, the correction of articulation placement can achieve a complete velopharyngeal closure during speech only in a few cases.

Surgical treatment of VPI provides the best results. The most common surgical procedures for correcting VPI are pharyngeal flap and sphincter pharyngoplasty and it has been reported that with either of these surgical techniques a successful outcome can be achieved in around 90% of the cases. However, it should be emphasized that surgical treatment of VPI should be customized individually in each case according to an adequate imaging assessment of velopharyngeal closure using videonasopharyngoscopy (VNP) and multiplanar videofluoroscopy (MPVF).

The rationale for relying on imaging procedures for assessing velopharyngeal closure during speech is that for the adequate articulation of phonemes requiring increased intraoral pressure (plosive and fricative sounds mostly) the lips have to be closed. Thus, intraoral examination of palatal movement during an attempt to articulate /a/ with a wide open oral cavity whether a tongue depressor is being used or not serves no purpose at all.

There may be VPI even if palatal movement is observed as “adequate” during intraoral examination. Conversely, adequate velopharyngeal closure can be achieved even if palatal movement during intraoral examination is considered minimal. Furthermore, it has been extensively reported that velopharyngeal movements during speech vary from individual to individual.

Non - pathological variations of anatomy and physiology of the same structures may be found in several regions including the vocal tract. Thus, it is absurd to pretend that the same surgical procedure can effectively correct VPI in all patients. The words of Anatole France should be kept in mind: “It is human nature to think wisely and act in an absurd fashion”.

The collaboration and effective communication exchange between the surgeon and the SLP clinician is essential for detecting and assessing the obligatory features of VPI: hypernasality and nasal emission as well as compensatory articulation patterns. Articulation placement has to be corrected through SLP intervention before imaging procedures.

In order to effectively plan the surgical procedure for restoring the function of the velopharyngeal valve it is necessary that the patient can repeat an appropriate speech sample with adequate articulation during the imaging studies.

Individually customizing the surgical technique is essential for effectively restoring velopharyngeal closure during speech. Surgeons who have learned how to interpret the imaging findings and modify the surgical technique accordingly achieve the most successful outcomes.

SLP intervention should continue after the surgical procedure in order to carry over adequate articulation placement into conversational speech. In some cases SLP intervention has to help the patient to redirect the pulses of acoustic energy, known as voice sources coming from the inferior vocal tract into the oral cavity instead of the nasal passages.

Although only the surgeon and the SLP clinician working in concert can perform an accurate diagnosis and treatment of VPI, the circular communication between these professionals is usually not smoothly continuous. They seem to use different terms. They seem not to be in synchrony, not in the same channel.

Most surgeons do not have a full grasp on phonology and articulation placement, manner and voicing and most SLP clinicians do not have a full understanding of the intricate surgical anatomy of the vocal tract.

It is necessary to put aside any differences and work together with the aim of providing the best possible care to each and every patient with VPI.

The SLP clinician who has the knowledge about phonology and articulation has to be open to share these important data with the surgeon. By the same token, the surgeon who knows the surgical anatomy and how to safely handle the tissues during the surgical procedures in order to preserve the blood flow and at the same time improving their function has to discuss these aspects with the SLP clinician. Both professionals working together can customize the surgical treatment for each case.

Surgical correcting of velopharyngeal closure can be helpful for providing SLP treatment on articulation placement but by itself cannot restore adequate articulation placement when there are compensatory patterns. Conversely, SLP treatment cannot restore velopharyngeal closure without repairing abnormal anatomy. The famed and renowned surgeon and professor Fernando Ortiz – Monasterio commonly used an analogy to explain the role of the surgeon for repairing a cleft palate: “A violin without strings cannot be played. It is the job of the surgeon to put the strings on the instrument”. As usual, *Don* Fernando was absolutely right but following his own analogy, it is also the job of the SLP clinician to teach how to play the violin.

There is no better example of how interdisciplinary communication is the only possible pathway for providing effective treatment than the collaboration between the SLP clinician and the surgeon. The broken circle must be unbroken.

The words used to describe how the recently deceased illustrious Mexican Scientist Doctor Rene Drucker conceptualized research should be remembered: “Research must be uncomfortable, irreverent and heretic”. The surgeon and the SLP clinician must learn to work together at the same level without any dogma or any pretense of superiority, sharing responsibility and keeping always in mind that the ultimate goal is a successful outcome which cannot be considered until all aspects of oral communication: language, voice, resonance, speech and fluency are completely normal.

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