Treatment of Cleft Related Speech Disorders

Orofacial Clefting: An Overview

Types of Clefting

- Cleft lip +/- Cleft palate
- Primary vs Secondary
- Unilateral vs Bilateral

Types of Clefting continued

- Cleft palate only
- Submucous cleft palate

Patient Population

- Pierre Robin sequence
- 22q11.2 Deletion Syndrome
- Van der Woude
- Treacher Collins
- Stickler
- Apert, Crouzon, Pfeiffer
- Craniofacial Microsomia
Team Care: An Overview

The Craniofacial Team

- “The principal role of the interdisciplinary team is to provide integrated case management to assure quality and continuity of patient care and longitudinal follow-up.”

- Pediatricians, plastic surgeons, otolaryngologists, social workers, nursing, speech-language pathology, maxillofacial surgery, orthodontists, dentists, genetics...

- “Care should be coordinated by the team but should be provided at the local level whenever possible.”

Parameters for the Evaluation and Treatment of Patients with Cleft Lip/Palate or Other Craniofacial Anomalies. American Cleft Palate-Craniofacial Association. Cleft Palate-Craniofacial Journal 1993; 30 (Suppl 1).

Collaboration is Key

- Always contact the team SLP with questions
- Send note/request notes
- Ask questions!
- You see the patient more than the team!

- Craniofacial: 206-987-2208
- Fax New Appointment Request Form (NARF): 206-985-3121 or 866-985-3121

Timeline of Care

- Primary lip repair & rhinoplasty
- Palatoplasty & PE tubes
- Alveolar bone grafting
- Orthodontics
- Orthognathic surgery

Normal VP Function

- Complete closure of VP port required for pressure consonants: [p, b, t, d, k, g, s, z, f, v, ʃ, ʒ, ʧ, ʤ, θ, ð] (all stops, fricatives, and affricates)
  - Onset of phonation → Nasal or vowel adjacent to nasal

- Variable VP closure for vowels, dependent on phonetic context and vowel type
  - Higher for high vowels, lower for low vowels

- Consistently open for nasal consonants [m, n, ŋ]


Velopharyngeal Dysfunction

There’s more to VPI than meets the eye...
Normal VP function

Velopharyngeal Dysfunction

Velopharyngeal Insufficiency

- Inability to achieve velopharyngeal closure due to structural deficit
- Clefting, tumor resection, post-adenoidectomy, palatopharyngeal disproportion
- Can only be treated by changing the structure
  - Surgery
    - Furlow palatoplasty, sphincter pharyngoplasty, pharyngeal flap, pharyngeal wall augmentation
  - Prosthetics
    - Pharyngeal bulb obturator

Velopharyngeal Incompetence

- Deficit in timing, planning, or execution of velopharyngeal closure due to neuromuscular etiology
- Motor Execution: Dysarthria
- Motor Planning/Programming: Apraxia
- Complex to manage
  - Speech therapy
    - Maximize other speech subsystems
  - Prosthetics
    - Palatal Lift
  - Surgery
    - Pharyngeal flap, sphincter pharyngoplasty
**Velopharyngeal Mislearning**

- *Learned* patterns that compensate for inability to control airflow at the level of the VP port
- Can co-exist with normal VP function or with VPI
- Treated with speech therapy
  - Does not improve with surgery!
- “Valve” airflow at or posterior to VP port

**Differential Diagnosis**

**Evaluation**

- **Resonance**
  - Any change in shape of the vocal tract can impact resonance
  - Hyper vs Hypo-nasality
  - Quick check: Flutter testing

- **Airflow control**
  - VP??
  - Fistula?
  - Mislearning?

- **Articulation**
  - Developmental
  - Obligatory
  - Compensatory Misarticulations
  - “Motor-speechy”
  - Quick check: Nasal occlusion

**Types of Evaluation**

- **Perceptual Evaluation**
  - Evaluation using your ears and eyes
  - Describe VPD Characteristics
  - Articulation testing
  - Resonance evaluation
  - Determine appropriateness for instrumentation

- **Instrumental Evaluation**
  - Completed after perceptual
  - Nasopharyngoscopy
  - Videofluoroscopy
  - Surgical planning tool

**The Importance of Correctly Articulated Speech Sounds for Evaluation of Velopharyngeal Function**

- *Sissy sees the sky*
  - Glottal stop replacement of /s/ results in large VP gap
  - Productions with cues from SLP
  - Complete velopharyngeal closure
Speech Therapy for VPD

What to do, when?

- Therapy CAN NOT…
  - eliminate VPI
  - improve hypernasality
  - reduce passive nasal air emission
  - strengthen the palate

- Therapy CAN…
  - Establish repertoire of correctly articulated pressure consonants
  - Eliminate mislearning for better understanding of relative contribution of VPI to overall intelligibility/acceptability
  - *Preserve* articulation until child is developmentally appropriate for instrumental evaluation
  - Be dynamic: Diagnostic therapy!

Goals of Therapy

- Establish airflow direction, pressure build-up, and correct oral placement
- Maximize intra-oral air pressure build-up during speech
- Teach new motor patterns to replace atypical, and compensatory misarticulation errors

General Concepts

- Maintain manner of production while sacrificing place
  - Fricatives remain fricatives, stops remain stops
- Place of articulation generally shifts posteriorly
  - “backed” productions
- Most common errors:
  - Glottal stops & fricatives
  - Pharyngeal stops & fricatives
  - Posterior & anterior nasal fricative

Where do I begin?

- Airflow awareness
- Most visible sounds
- Most anterior sounds
- Most stimulable sounds
- Throw the developmental timeline out the window!
- Explicit teaching
- Call the team SLP!

Principles of Motor Learning

- Give new sounds a new name!
- High number of trials: drill drill drill
- Practice distribution: it takes time
- Variation: sounds in different contexts
- Random schedule: target multiple sounds per session
- Motor learning is task specific: Better speech involves speaking!
  - Sucking
  - Blowing
  - Whistles/flutes
  - Vibrating, massaging, stretching

Lof, Gregory L; Ruscello, Dennis. Don't Blow this Therapy Session! SIG 5 Perspectives on Speech Science and Orofacial Disorders October 2013, Vol.23, 38-48. doi:10.1044/ssod23.2.38

Airflow Control

• NOT non-speech oral motor exercise
• NOT intended to strengthen the palate
• Teaching concept of airflow control
• Visualization of oral airflow
• Quickly shaped into speech sounds

Glottal Stops /ʔ/ & Fricatives /h/

• Place of artic: Glottis
• Glottal stops → oral stops
• Glottal fricatives → oral fricatives
• Can also be co-articulated
  • Don’t just focus on place of artic

Glottal: Therapy Techniques

• Auditory discrimination & Airflow control
  • “coughing place” or “talking place”
  • Diagrams!

• Whispered speech
  • “Feel” for voicing
  • Make it fun-motor

• Shaping
  • /m/ → /b/
  • /n/ → /d/ 
  • /ng/ → /g/

Making Speech Fun!

• Visualize the airflow
  • Tissues, feathers, pom poms…
  • Tactile and visual cueing

• Shaping from non-speech
  • Puff cheeks then release
  • Use /h/ to facilitate & “catch” air
Pharyngeal Stops, Fricatives & Affricates

- Place of artic: Base of tongue to posterior pharyngeal wall
- Voiced or voiceless
- Stops: stops \[\text{I, ɾ}\]
- Fricatives: fricatives [s, ʃ]
- Affricates: affricates [ʢ, ʡ]

Pharyngeal: Therapy Techniques

- Auditory discrimination & Airflow control
  - "coughing place" or "talking place"
  - Diagrams!
- Move the tongue anterior
  - "Think" /t, d/ while holding tongue down with tongue depressor
  - Use /θ/ to shape /s, sh/
- Shaping
  - Nasal occlusion with /ŋ/’
  - Start with velar fricative then “stop”

VP Mislearning: Nasal Fricatives

- Place of artic: VP port
  - /s, z, ʃ/
  - Co-occur with VPI or normal mechanism
    - If phoneme-specific, resonance and all other pressure consonants WNL
    - Can be co-articulated: focus on air!
    - Do not respond to surgery

Nasal: Therapy Techniques

- Auditory discrimination & Airflow control
  - "Nose air" vs “mouth air”
  - Diagrams!
- Biofeedback
  - See-scape
  - Oral-nasal listener
- Nasal occlusion
  - Inhibits active nasal air emission
  - Gradually fade
- Shaping
  - “Long T” method
- Visual and Tactile Cues
  - Feel your air!
  - Catch your air!
- Stage the approach
  - Oral->nasal
  - Dentalized, lateralized…take it
  - Fine tune placement later
Goal Writing

- **Long term goal:** Frank will eliminate use of compensatory-misarticulation patterns and develop correct oral articulatory placement with orally directed airflow.
- **Short term goal:** Frank will use the bilabial place of articulation and orally directed airflow when producing /b, p/ in consonant-vowel (CV), VC, and CVC word shapes with 100% accuracy in each of two consecutive sessions. Visual, verbal, and tactile cues will be used as needed.
- X Frank will decrease hypernasality of vowels in 80% of opportunities.

Case Study

**Putting it all together**

The Power of Speech Therapy

Other Helpful Resources

- American Speech and Hearing Association
  - www.ASHA.org
  - Yearly conference, publications, online resources
- ASHA Special Interest Group 5
  - Craniofacial and Velopharyngeal Disorders
  - Access to publications, webinars, chats, and a very active list-serve
- American Cleft Palate-Craniofacial Association
  - www.acpa-cpf.org
  - Yearly conference, publications, online resources, list-serve
- The Clinician’s Guide to Treating Cleft Palate Speech (2016)
  - Peterson-Falzone, Trost-Cardamone, Karnell, Hardin-Jones

References


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Thank you!

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Questions?