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REVIEW ARTICLE

Speech Therapy with Obturator

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Abstract Rehabilitation of speech is tantamount to closure of defect in cases with velopharyngeal insufficiency. Often the importance of speech therapy is sidelined during the fabrication of obturators. Usually the speech part is taken up only at a later stage and is relegated entirely to a speech therapist without the active involvement of the prosthodontist. The article suggests a protocol for speech therapy in such cases to be done in unison with a prosthodontist.

Keywords Velopharyngeal insufficiency · Speech · Obturator

Introduction

Rehabilitation of velopharyngeal (VP) defects (congenital/acquired) does not end with the prosthodontic part as the patients will have continuing definite speech impairment [1]. Speech is the prime medium for communication and it defines the individuality and carves the personality of an individual. Speech defects mar the psyche and create social stigma. A functional obturator successfully re-creates the partition between the oral and nasal cavities but fails to restore articulation to near normal levels [2, 3]. Many a time this job is entirely relegated to a speech therapist only after the completion of the prosthesis. Since it's dealt as a separate entity the net outcome is never optimal leaving the patient with continuing speech deficits. A synchronized team effort between the prosthodontist and the speech therapist is the key to tackle this challenge. This article evaluates the problem and suggests a protocol for speech therapy in obturator cases to be done in tandem with a speech specialist.

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Speech Evaluation

Oral Examination

Phonation is closely interrelated to the site of the VP defect as the articulation varies with the location of the defect [4]. The address to the problem starts with a thorough oral examination and using a classification system to categorise the congenital/acquired defects accordingly. Here the VP incompetence and the nasal air emission are the major causes for speech defects. The evaluation of speech should start from here before the start of the prosthetic treatment.

Articulation Tests

When oral sounds are produced during speech, the VP valve closes directing both sound energy and air flow from the pharynx into the oral cavity. Because air flow and sound travel in a superior direction from the lungs to the oropharynx, the VP valve must close completely to prevent speech distortion.

Nasal Emission Test [5]

Nasal emission occurs when there is an attempt to build up intraoral air pressure for the production of consonants in the presence of a leak through the VP valve (or an oronasal

fistula). Nasal emission can be very soft or very loud based on the size of the opening. Large opening offer little resistance making the emissions less audible and vice versa, for small openings cause more speech distortion than those that are bigger. As it is released through the nasal side of the opening with significant pressure, bubbling of the nasal secretions happen distorting speech in the form of a 'nasal rustle' (nasal turbulence). This rustle can mask the sound of the consonant affecting both the intelligibility and quality of speech. Nasal emission in VP insufficiency occurs on all pressure sensitive sounds. The greater the emission, the weaker the oral consonants will be. Connected speech also becomes choppy and short as the speaker, to compensate the air volume lost after each breath, has to take more frequent breaths to replace the air needed for phonation and articulation.

The test is performed using a straw or a piece of tubing one end of which is placed at the entrance to the patient's nose and the other end at the examiner's ear. The patient is then asked to produce oral sounds like pa, ba, c, and da followed by words which has 'k' syllable. e.g. Cat, pocket, walk etc. With normal VP closure, no sound will be heard through the straw. If air is heard loudly through the straw during this it indicates nasal emission. This loss of air pressure through the nose makes the articulation weak in intensity and pressure. The same can be tested using finger under nostril or a paper piece/mirror held under the nostril.

Clarity of Speech [5]

Patient is asked to produce the following types of speech samples like:

1. Phrases and sentences loaded with pressure- sensitive phonemes

   Eg: she sells shells in the sea side
   Choose the cheese etc.

2. Counting from 60 to 69
3. Spontaneous speech, storytelling, narration etc.

The degree of clarity produced can be noted down on a scale of 1–6 (where 1 is for poor and 6 is for excellent)

Nasal Oral Resonance Test [6]

Similar to nasal emission test and is determined by listening to connected speech and also by checking audible nasal emissions. Tests are done with nares in occluded and unoccluded states. The speech is evaluated for hypernasality, hyponasality, or a mixture of both. This is done by asking the patient to produce speech samples like:

1. Prolonged single vowels and consonants

   Eg: papapa; pipipipi; sasasasa; sisisisi etc.

2. Repetition of nasal consonants like m, n, and ng (for checking hyponasality).

Overall Speech Intelligibility

This is assessed using familiar and unfamiliar listeners, apart from the clinician, and again can be graded on a scale of 1–6. Additional to these tests nasoendoscopy [7] and videofluorographic [8] tests can be done for a more detailed speech evaluation by assessing the motility of the velum and pharyngeal walls as well as their involvement in velopharyngeal closure.

A final diagnosis can be drawn following analysis of all these parameters. The Borel-Maisonny classification [9] can be used to score the quality of phonation on a scale of type 0–type 3 (Table 1).

Clinical Protocol

VP insufficiencies are conventionally treated using a palatal lift/bulb prosthesis [10]. Here an inactive plate with no soft palate portion is given initially for a period of 1–2 weeks prior to the addition of extensions to the posterior portion. Later Korrecta wax, supported by wire loop/

Table 1 Borel-Maisonny classification

Type 0	No phonation
Type 1	Excellent phonation, no nasal air emission
Type 1/2	Good phonation, intermittent nasal air emission, good intelligibility
Type 2	Phonation with continuous nasal emission
Type 2 b	Phonation with continuous nasal emission but good intelligibility and no social discomfort
Type 2 M	Phonation with continuous nasal emission, poor intelligibility
Type 2/3	Phonation with continuous nasal emission with compensatory articulation, poor intelligibility
Type 3	Continuous compensatory articulation, no intelligibility

acrylic, can be used for building the tail of the plate and, in conjunction with a speech therapist, speech analysis is done. Articulation tests as explained before are conducted with measured additions and subtractions to the wax extension until speech is improved without any nasal emissions. The same can be confirmed using nasoendoscopy/videofluorography to confirm the VP adequacy.

A final assessment of speech can be carried out now starting with the visual assessment to auditory-perception judgment to instrumental techniques. Patient perception and parent/listener perception should also be recorded as it gives an opportunity for the patients and his family to assess and appreciate the phonetic improvement. Once they are satisfied and the speech therapist okays it the wax part can be converted to acrylic, finished and polished. The same can be reconfirmed post-acrylization too.

Even though there can be a marked change in phonation from the former state still further modifications will be needed to bring the speech to near normal levels. Weekly recall sittings of duration 25–45 min are needed to evaluate and correct speech over time. During these sessions addition and/or subtraction in the VP area is done following the various speech tests. Repeat endoscopy/videography will help as an adjunct. Speech drills are important part of these sessions and the same should be reinforced at home too for improvement. Alternating oral and nasal sounds like 'ah n ah n' or 'ah n ah ma' can be taught for the task.

For the next 6 months frequent assessment of VP activity should be recorded and accordingly adequate modifications and lateral reductions of the bulb at a rate of 1–2 mm each time has to be carried out. Top, sides and posterior reductions are done for palatal lift prosthesis. This is continued until the speech becomes acceptable which is mostly achieved within 6 months.

Repeat speech evaluation at regular intervals needs numerous appointments to achieve optimal speech. Reinforce speech drills for hastened improvement.

Conclusion

Speech therapy in obturator cases demands a team approach comprising the patient, speech therapist, prosthodontist, and parents/relatives for an effective outcome and the absence of any one can scuttle the result. Obturators given for VP insufficiencies should be fabricated only in the presence of a speech specialist for the betterment of the patient.

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