

SPEECH REHABILITATION OF CLEFT PALATE CASES WITH SUPERIORLY PROJECTED DOME PROSTHESIS AND INTENSIVE SPEECH THERAPY

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Plastic surgery of cleft palate cases has made remarkable advance and many cases benefit from it. For many unknown factors, in spite of this advance in plastic surgery, there are several cases which do not acquire proper functional closure of the nasopharynx and the result is nasal speech with poor articulation and intelligibility. It is therefore necessary to evolve some other useful method of achieving the velopharyngeal closure. In this paper we have dealt at length with the usefulness of a 'custom-made' prosthetic device.

DETAILED REPORT OF WORK DONE WITH PARTICULAR EMPHASIS ON MATERIALS, METHODS AND RESULTS

1. Subjects

Post-operative cases of cleft of the palate and/or lip with short palate and hypernasal, unintelligible speech were accepted for this study. These cases were originally seen at Nair Dental College or at B. Y. L. Nair Charitable Hospital, Bombay-8. They were either unfit for further surgery or unwilling to go for it. All these cases were operated more than twice in past before their inclusion in this study.

Total No.

Fifty eight subjects were originally considered for this study but only forty two came for fitting of the SPD. From these 42 we were able to follow up on regular basis 26 cases as the rest did not turn up either to take the prosthesis or were not able to come for follow up due to distance.

Sex and Age

Out of these twenty six subjects there were ten male and sixteen females whose minimum age was six years and maximum twenty six years with mean age of 16.6 years—Table I.

B. Y. L. Nair Charitable Hospital, Bombay-8

TABLE 1: Sex age group and average age of patients

Age Group	Male	Female	Total
6 to 10 yrs.	4	5	9
11 to 15 yrs.	1	1	2
16 to 20 yrs.	1	6	7
21 to 25 yrs.	2	2	4
25 to 30 yrs.	2	2	4
Total	10	16	26
Average age	16.5	16.6	

Palatal Defects

Above subjects were operated for cleft of the lip and/or palate at different times Without much improvement in their speech performance. There were 4 cases of severely scarred palates, one had curtain palate, three had fistula of the palate (5mm to 12 mm in diameter), one had mental retardation of moderate degree with IQ 70—Table II. Remaining had short palate of not less than 5mm antero-posteriorly.

TABLE II

(a) Palatal anomalies.		(b) Dental problems.	
Short palate	18	Irregular Alignment	17
Scarred palate	4	Dental Carries	3
Fistula in palate	3	Poor Hygiene	5
Curtain palate	1	Collapsed Maxillary Arch	1
Total	26	Total	26

Hearing

Detailed audiometric assessment revealed six cases with conductive loss (23 per cent) in the range of average 30db to 60db.

Speech

It was observed that speech was partially intelligible with difficulty in twenty four cases (92.3 per cent) and not at all intelligible in two cases (7.7 per cent), as shown in table III. Speech errors of various nature are given in table IV.

TABLE III: Speech Intelligibility

Rating	Before fitting SPD Prosthesis	After fitting SPD Prosthesis
Good	0	12
Partly Unintelligible	0	7
Poor	24	5
Unintelligible	2	2
Total	26	26

TABLE IV: Nasality Ratings

Rating	Before fitting SPD Prosthesis	After fitting SPD Prosthesis
Nil	0	8
Mild	1	10
Moderate	20	7
Severe	5	1
Total	26	26

Nasality

Pre-prosthetic nasality as assessed by the judges revealed five cases (19.2 per cent) with severe, twenty cases (76.8 per cent) with moderate and only one (4 per cent) with mild nasality—Table-V.

TABLE V: Types of Speech Errors: (Before Fitting SPD Prosthesis).

Substitutions	7
Substitutions and Omissions	3
Substitutions and Distortions	6
Substitutions, Distortion and Omissions	10
Total	26

Dental Structure

Examination of dental structure showed seventeen cases (61.5 per cent) with irregular alignment, five cases (19.3 per cent) with poor dental hygiene, three cases (11.5 per cent) had carried and only one case (7.7 per cent) had collapsed maxillary arch.

2. Speech Testing Methods: Each case was assessed as follows:

- (a) Articulation test was done and defective sounds in any position in a word were noted. The test consisted of common words in the vocabulary of the language spoken by the subjects covering all the consonants and vowels in the initial, medial and final positions. Passages adequately representing the phonemes in the respective languages and in their natural frequencies were selected to be used with the subjects. Tests were given prior to fixing the SPD and every three months after SPD was fixed and case taken for therapy.
- (b) Tape recording was done for every case before and after therapy—with and without SPD.
- (c) Palatography was done wherever possible. It was done with a view to assess the AP distance between soft palate and posterior pharyngeal wall while saying m, n, n, and mouth closed and palate in normal resting position.

This was repeated after SPD was fitted to check its contours and alignment with the nasopharynx and palatal plane.
- (d) A panel of judges evaluated the nasality and intelligibility of speech from the recorded samples. The panel comprised of a speech therapist, a linguist and a psychologist. All of them were explained the procedure of evaluation. For this evaluation a *Four Point* rating scales (severe, moderate, mild and nil) was used. Intelligibility was assessed as *Poor, Partly Unintelligible, Fairly Intelligible and Intelligible*.
- (e) Detailed audiometric assessment was done to rule out any hearing impairment. This was done in a sound treated room by a qualified audiologist.
- (f) Intensive speech therapy was given to each case after SPD was fitted. Re-evaluation was done after every three months and results noted. Those cases who were irregular were sent letters at regular intervals of one week.

Results

Final assessment of 26 cases who were fitted with SPD and given intensive speech therapy gave encouraging indications about the usefulness of the SPD prosthesis when designed to suit each case according to his/her palatal abnormality.

It was observed that poor closure laterally contributed to hyphenasality and poor speech intelligibility. Escape of air through nasal passage contributed towards poor learning of velar, alveolar stops and plosives and fricative sounds. In most of the cases we had to rebuild lateral surfaces with green stick material on the prosthesis until we felt improvement in intraoral pressure on blowing cheeks. Little nasal escape was still noticed on mirror clouding test but this was also observed in normal individual and hence not considered significant when not of continuous nature. Since X-ray palatography could not show the lateral relationship, we had to depend on the above method of greenstick material and the mirror clouding test.

Hyphenasality was reduced and was occasional but insignificant in eight cases, mild in ten and moderate to severe in eight cases. Last category of eight cases were most irregular in attendance and poorly motivated. This included the patients with mental retardation. Thus more than two thirds of the cases (69.3 per cent) had shown appreciable change in nasality while less than one third (30.7 per cent) did not respond to our satisfaction. Poor motivation of the patients and their guardians is responsible in three cases. Maximum efforts were made to educate and counsel them. For other three cases attendance to clinic was not possible due to household work or job. One case was mentally retarded.

Speech intelligibility improved significantly in nineteen cases (73.1 per cent) while remaining seven (22.9 per cent) did not reach satisfactory level. If we break up nineteen cases twelve had already good intelligibility and seven had occasional errors which did not contribute to any unintelligibility. Prior to SPD fitting and speech therapy, 92.4 per cent had partial unintelligibility.

In two cases SPD was removed within three months as they learned to speak well without it.

Summary of Results

1. SPD type of prostheses have proved most effective to minimize nasality and improve the intelligibility of speech in cases with postoperative velopharyngeal incompetence.
2. Multiple surgical failures result in a very deficient palate and in such cases prosthesis is the treatment of choice.
3. Periodic dental and prosthetic examinations in addition to speech therapy have to be done for successful rehabilitation of the patient.
4. SPD prostheses could be used pre-operatively to form correct habits of speech so that post-operatively speech rehabilitation would be more effective. Separate studies on this aspects should be carried out.

Acknowledgements

Indian Council of Medical Research for their Research Grant for the Project.

Dean, T.N. Medical College & B.Y.L. Nair Charitable Hospital, Bombay, for his permission to use Clinical records of the patients.

Dean, Nair Dental College, Bombay for providing facilities to prepare SPD.

Dept. of Otolaryngology, B.Y.L. Nair Hospital for all the clinical assistance and guidance.