

Speech Variability in Different Hard Palate Morphologies: A Pilot Study

Anuj Shukla^{1*} Manish Kumar² Pratik Gupta³ Chetan Sharma⁴

¹Senior Lecturer, Department of Prosthodontics & Crown and Bridge, Institute of Dental Sciences, Bareilly, India.

²Senior Resident, Department of Dentistry, S P Medical College and Hospital, Bikaner, Rajasthan, India.

³Senior Lecturer, Department of Prosthodontics & Crown and Bridge, Institute of Dental Sciences, Bareilly, India.

⁴Senior Lecturer, Department of Prosthodontics & Crown and Bridge, NIMS Dental College and Hospital, Jaipur, Rajasthan, India.

ABSTRACT

Aim: To determine the speech variability in dentulous patients with different hard palate morphologies. To evaluate the pitch and intensity in the dentulous patients. To compare the pitch and intensity with the variable types of hard palate in dentulous subjects,

Materials and Method: The study was conducted in the department of Prosthodontics, Career post graduate institute of dental sciences and hospital, Lucknow. In this study, 24 dentulous subjects were taken randomly between age group of 25-40 yrs. Subjects were further divided into three groups of 8 each. Group 1: U shape palate, Group 2: V shape, Group 3: Shallow.

Result: Patient was asked to sit in a sound proof room and read certain words which were present on the chart with the help of a microphone. Analyze the intensity and pitch of the patients with the different types of palate. The obtained results were statistically analyzed. After analyzing the master chart, (table 1 and table 2) the U shaped palate had higher pitch and intensity than the shallow palate and V shaped palate. Out of 24 patients in group 1, 7 patients had shown higher pitch and intensity compared to other 8 patients in both other groups.

Conclusion: Within the limitations of this study, it is concluded that the U shaped palate had better pitch and intensity than the V shaped and shallow palate.

Keywords: Evidence, Implantology, Periodontal disease.

INTRODUCTION

The expression of or the ability to express thought and feelings by articulate sounds is called speech.¹ Speech has been recognized as an aid in selecting and checking the vertical dimension of occlusion, the height of the occlusal plane within the dimension, and the position of teeth in relation to the lips, tongue, and cheeks.²

Hard palate shape varies in three prominent ways:

- The height of the palatal dome,

- the position of the dome's apex in the oral cavity, and
- The angularity of the dome around the apex.

Differences in hard palate morphology can substantially affect speech, which is not explained exactly. So this study differentiates the phonetic value with the respect of hard palate contour.

MATERIAL AND METHODS

Materials used were Speech analysis software, A sound proof room, Lateral cephalogram,

Received: Feb. 11, 2016; Accepted: April. 7, 2016

*Correspondence Dr. Manish Kumar.

Department of Dentistry, S P Medical College and Hospital, Bikaner, Rajasthan, India.

Email: drmanishagarwalmds@gmail.com

Table 1: Pitch Value (Hz)

U SHAPED	V SHAPED	SHALLOW
213.88	174.23	153.25
173.56	182.45	133.25
205.78	163.17	148.65
210.56	167.44	143.12
207.75	169.74	139.31
202.25	167.64	140.12
207.98	164.23	137.58
V203.61	168.11	139.31

Table 2: Intensity Value (Hz)

U SHAPED	V SHAPED	SHALLOW
67.1	74.34	62.56
71.33	71.35	63.56
69.1	72.45	67.29
72.6	75.94	66.13
70.3	73.27	71.25
71.61	74.25	67.79
76.25	71.23	72.25
74.22	69.33	70.25

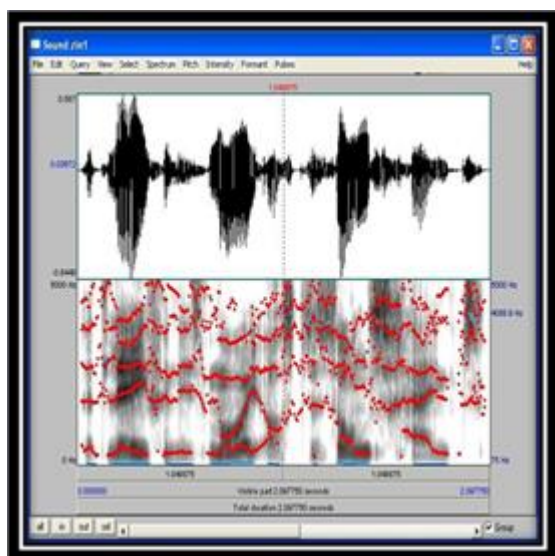


Fig 1: PRAAT.

Radiographic marker (lead foil), Microphone, Reading chart. The study was conducted in the department of Prosthodontics, Career post graduate institute of dental sciences and hospital, Lucknow. In this study, 24 dentulous subjects were taken randomly between age group of 25-40 yrs.

Subjects were further divided into three groups of 8 each.

Group 1: U shape palate

Group 2: V shape

Group 3: Shallow

Inclusion Criteria followed for selection of the subjects:-

1. Co-operative patients.
2. Patients without any maxillofacial defect.
3. Patients without any intraoral abnormalities.
4. Dentulous patients without any neuro-muscular disorders.

Exclusion criteria followed for selection of the subjects:-

1. Un co-operative patients.
2. Patients with maxillofacial defects.
3. Patients with any type of neuro-muscular disorders
4. Illiterate patients

Lateral Cephalogram was taken under the ideal guidelines, and palatal depth was determined. The patient's head was centered in the cephalostat with the superior borders of the external auditory meatus resting on the upper parts of the two ear rods. The lowest point on the inferior bony border of the left orbit, indicated by the orbital marker, was at the level of the upper parts of the ear rods. The focus film distance was set at 5 feet (152.4 cm) and the subject film distance could be measured to calculate image magnification.

How to demarcate palatal depth

Reference points in the lateral cephalogram are Incisive papilla, Posterior nasal spine, Draw a straight line through incisive papillae to the posterior nasal spine and a perpendicular line is drawn on it to the vertex of the palate and Length of the perpendicular line was measured.

Recording of speech & analysis-

Patient was asked to sit in a sound proof room and read certain words which were present on the chart with the help of a microphone.

RESULTS

Analyze the intensity and pitch of the patients with the different types of palate. The obtained results were statistically analyzed. After analyzing the master chart, the U shaped palate had higher pitch and intensity than the shallow palate and V shaped palate.

- Out of 24 patients in group 1, 7 patients had shown higher pitch and intensity compared to other 8 patients in both other groups.
- 1 patient had shown lower intensity and pitch in group 1.

DISCUSSION

Speech is the act of expressing or describing thoughts, feelings, or perceptions by the articulation of words.³ PRAAT is a very flexible tool to do speech analysis. It offers a wide range of standard and non-standard procedures, including spectrographic analysis and articulatory synthesis.⁴ It reduced the manual error during analysis of speech. Lateral cephalogram was used for this study is a routine diagnostic radiographic method, which is more convenient, economical and less time consuming compared to other methods for measuring the palatal depth.⁵ Posterior nasal spine & incisive papillae were taken as reference points for the study because these are static cephalometric points.⁶ The result of this study is proved that speech quality is better in normal U shaped palate.

CONCLUSION

Within the limitations of this study, it is concluded that the U shaped palate had better pitch

and intensity than the V shaped and shallow palate. So, this study can be a boon for cleft lip and palate patients, as we can help these patients to improve their function and esthetics.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Haitas GP, Wolfaardt JF, Carr L. Speech defects in prosthetic dentistry. Part I -The mechanism of speech production. J Dent Assoc S Afr 1985; 40:381-6.
2. Bankson NW, Byrne MC. The relationship between missing teeth and selected consonant sounds. J Speech Hear Disord 1962; 27:341-8.
3. Bond EK, Lawson WA. Speech and its relation to dentistry. Speech and speech defects. Dent Pract Dent Rec 1968; 19:75-82.
4. Tobey EA, Finger IM. Active versus passive adaptation: an acoustic study of vowels produced with and without dentures. J Prosthet Dent 1983; 49:314-20.
5. Palmer JM. Analysis of speech in prosthodontic practice. J Prosthet Dent 1974; 31:605-14.
6. Meyer M Silverman .The speaking method in measuring vertical dimension; J prosthet dent 1953;3:193-199.