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## Case Report

# Customizing the palatal contour of a complete denture using a Palatogram in a case of partial glossectomy



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3) The sensory feedback mechanism for swallowing is also affected as there will either be a premature or an incomplete contact between the tongue and the palatal surface of an improperly fabricated denture.

The rapid adaptability of the tongue is the key to obtain optimum phonetics after insertion of an oral prosthesis. If the tongue is compromised due to natural or surgical reasons then it poses a greater challenge to the rehabilitation procedure performed by a Prosthodontist.<sup>4,5</sup>

## Case report

A 54-year-old male patient completely edentulous operated for carcinoma of the tongue, was referred to this hospital. The patient had undergone wide surgical excision (2 cm × 2 cm and 8 mm invasion) of the left lateral margin of tongue and floor of the mouth, 06 months ago. This was followed by a course of radiotherapy. On examination, the patient was using maxillary and mandibular complete dentures since 08 years and all along pursued singing as his hobby. Intraoral examination revealed ill-fitting dentures and marked alteration in speech following the surgery. Mouth opening was restricted to 32 mm in the anterior region and the tongue movements were restricted. After a thorough evaluation, a decision was made to fabricate conventional maxillary and mandibular complete dentures with reinforced heat cure polymethyl methacrylate resin. The palatal surface of the maxillary denture was to be customized using a Palatogram.

## Introduction

Our ability to speak is the result of a learned, habitual, neuromuscular process. Speech is a sophisticated, autonomous, unconscious activity. Its production involves neural, muscular, mechanical, aerodynamic, acoustic and auditory factors. Markedly slow and weak speech may result from a weakened physical condition and may indicate a need for complete medical examination. An improperly fabricated oral prosthesis may modify speech due to the following reasons<sup>1–3</sup>

- 1) Change in surface will affect articulation and resonance.
- 2) Increased thickness of the denture in the palatal area reduces tongue space and hampers its movement, thereby affecting articulation.

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Impressions were made using putty and wash formulations of addition silicon impression material (Panasil). Permanent denture bases were fabricated using reinforced heat cure polymethyl methacrylate denture base acrylic resin. The denture base was evaluated for retention and stability, followed by face bow transfer and jaw relation recording. Teeth were arranged on occlusal rims after which anterior and posterior trial insertions were done separately.

Phonetics was evaluated at this stage with both the trial dentures in the mouth. The teeth were rearranged to ensure unhindered movement of the tongue. The patient was made to read out sentences that simulated specific sounds (Table 1) and these were recorded by a digital audio–video recorder.

**Recording of speech using Palatogram:<sup>6</sup>**

It was observed that the tongue came in contact with the palate while producing palatolingual consonants such as s, t, d, n and l. Hence, these were repeated and assessed for proper pronunciation.

While the mandibular denture remained in the mouth, a thin layer of eugenol free zinc oxide impression material (Pulpdent corporation, USA) was applied on the palatal aspect of the maxillary denture base that was in contact with the patient’s tongue. When the initial setting of the paste began, the denture was inserted into the patient’s mouth. He was then guided to read out aloud the sentences as listed in Table 1, in a deliberate manner. When the material was seen to be completely set, the maxillary denture was removed. The surface of the material on the palatal surface of the denture was checked visually for uniform contact (Fig. 1). Areas where the denture base was exposed were trimmed using a fine carbide bur. The paste then was completely removed from the maxillary denture and was reapplied as described previously. The same procedure was repeated for all the sounds mentioned until proper phonation was achieved. The final assessment was made by making the patient to read out all the sentences in the presence of a neutral observer. The resultant Palatogram recording of the customized palatal surface ensured a uniformly thin layer of material (Fig. 2). The excess material extending over the tooth surface was removed. The denture bases were then waxed up, flaked and processed. The prosthesis was polished in a manner that ensured minimal alteration on the palatal aspect. The final prosthesis (Fig. 3) was inserted into the patient’s mouth and the speech once again recorded using a digital audio–video



**Fig. 1 – Intraoral view showing partial glossectomy.**

recorder. The patient was seen to be comfortable with this treatment (Figs. 3 and 4).

The patient was reviewed after five months. His speech was clear and he had since resumed his hobby of singing.

**Discussion**

- Vowels are voiced sounds wherein the vocal cords are activated by vibration. There is free emission of speech sounds through the mouth and require only subglottic pressure for specific sounds (a, e, i, o and u).
- Consonants are produced as a result of the air stream being impeded, diverted, or interrupted before it is released. p, g, m, b, s, t, r, and z are consonants. Plosive consonants such as p and t are produced when an overpressure of air has been built up by contact between soft palate and the pharyngeal wall and released in an



**Fig. 2 – Denture base with impression paste.**

**Table 1 – Sentence simulating specific sounds.**

Sentence	Sound
Chennai to Chandigarh	Ch
January and June	J
Shoe is shining	Sh
Zebra in the zoo	Z
Tomorrow is Tuesday	T
Eddy brought a Teddy	D
Nineteen ninety nine	N
Sixty six	S

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