Lateral Throat Form measurement made easy using a customized gauge

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Abstract
Recording correct lateral throat form depth is a prerequisite in complete denture therapy. Correct extensions in this area help us achieve better stability and retention for a lower complete denture. Conventionally, Neil’s classification for lateral throat form is used to check the depth of lateral throat form which depends on the tactile sense of the operator. In this study an instrument was customized to record the actual depth of lateral throat form which is more accurate than the conventional arbitrary method.

Keywords:
Retention, Stability, Complete denture
**Introduction**

Optimal outcome of complete denture treatment depends on the successful integration of the prosthesis with the soft tissues, patient’s oral functions plus psychological acceptance of the dentures by the patient. These parameters require that patient’s perceive their dentures as stationary or well retained during function. In this regard in the field of prosthodontics, retention and stability are two major concerns for complete denture therapy especially in lower denture because of less surface area available.

Aged patients present with resorbed ridges and are a nightmare to the dentist in terms of achieving proper retention and stability. Recent advances like implant supported dentures have reduced this problem to an extent; however implants cannot be placed in all cases because of various reasons like presence of systemic diseases, poor bone support, cost factor etc. Thus, it is desirable to achieve adequate retention and stability from remaining surface area available and for this reason it is important to cover as much area as possible specially in case of lower dentures. Zarb-Bolender has also described the average available denture bearing area for an edentulous mandible is 14 cm², whereas for edentulous maxilla is 24 cm².

Thomas described three distinct spaces available on lingual side of edentulous ridge for extension of the denture base to get adequate retention in resorbed lower ridges. These three spaces were-1). Sublingual crescent space 2). Sublingual fossa 3). Retromylohyoid fossa.

The retromylohyoid fossa (fig 1) is below and behind the retromolar pad and it provides an excellent area for extending the denture for positive retention, especially when extensions into the sublingual crescent and the sublingual fossa cannot be made as in case of resorption. Neil also mentioned that the distal end of the alveolingual sulcus (i.e. Lateral Throat Form, fig 1) can be used to achieve more vertical height of dentures in this region. Neil classified Lateral Throat Form as Class1, Class2, and Class3; Class1 and Class2 being more common than class3.

Lower dentures are shallow in the mylohyoid region and turn towards the tongue and then curves back again towards ridges as we go more posteriorly. Thus in this distal end of the alveolingual sulcus we get more vertical height of the denture, which can give more horizontal support and retention due to increased surface area. However recording this area is always been inaccurate and is dependent on the clinician’s experience. This often results in under extension in this critical area. To overcome this problem, a specially designed instrument was fabricated at D.A.P.M.R.V.Dental College to measure the depth of lateral throat form. This measurement was then used to modify the primary impression tray in the area of interest to record the lateral throat form more accurately during subsequent impression procedures.

**Materials and methods:**

The Instrument was designed with a hollow ‘L’ shaped copper pipe with a flexible wire within it. This wire was freely movable inside the pipe and was extended on both side of the L shaped tube. Extension on one side would help in the measurement and on the
other side it would move on a metal scale which is attached to the copper pipe(fig 2), that would accurately give us the lateral throat form depth. A stopper was attached to the vertical arm which was positioned on the retromolar pad (fig 3). The stopper was made movable horizontally so that the same instrument could be used on either side. A scale was attached on the horizontal arm so that measurement can be made directly on the patients (fig 4). Mouth mirror is used to retract the tongue from the area of interest.

Patients were instructed to open their mouth and protrude their tongue so that it was ¼ inch ahead of the upper lip. Then the instrument is placed inside the patient’s mouth so that the stopper of the instrument rested on the middle third of the retromolar pad (fig 5). Then the flexible wire was pushed from outside till it touches the floor of the mouth. The length of wire pushed in the vertical arm was indicated on scale attached to it and was equal to length of wire coming out from vertical arm which in turn reflected the lateral throat form depth.

**Results**

This instrument was checked in two patients and it was found to be more accurate than the conventional arbitrary method because with this instrument we were able to measure the exact depth of the throat in millimetre. This instrument would also help classify lateral throat form based on the depth.

**Discussion**

Generally the lower dentures are under extended in distal end of the alveolingual sulcus because measuring the lateral throat form as described by Niel is an arbitrary method. Moreover there is no specific tool available to measure this area. The customised tool described in this report gives us the exact value of lateral throat form depth which will be helpful in making good preliminary impressions by selecting a proper stock tray (fig 6). A good preliminary cast will ensure that the custom tray is fabricated with proper extensions which will be reflected in the final denture (fig 7). This will help us achieve better retention and stability in mandibular dentures.

**Conclusions**

Instrument which was customized to measure lateral throat form depth gave consistent results when compared against conventional method.
Figure 3: Stopper attached to vertical arm of gauge

Figure 4: Measuring scale attached to horizontal arm of gauge

Figure 5: Instrument position in mouth, stopper resting on retromolar pad with end of flexible wire in contact with floor of the mouth.

Figure 6: Selection of stock tray using customized gauge

Figure 7: Throat form verification in denture using customized gauge, measuring scale showing the depth in millimeters.
References


