Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jobcr

Original Article

Relationship of the lingual frenum to the mandibular central incisors

Swati Gupta [a,*], Sanchit Garg [b], Amrit Tandan [c], Ravi Dwivedi [c], Narendra Kumar Gupta [c], Garima Agarwal [c]

[a] Professor, Department of Prosthodontics, Babu Banarasi Das College of Dental Sciences, Babu Banarasi Das University, Faizabad Road, Lucknow, India
[b] Consultant, Private Clinic, Faizabad Road, Lucknow, India
[c] Babu Banarasi Das College of Dental Sciences, Babu Banarasi Das University, Faizabad Road, Lucknow, India

ARTICLE INFO

Article history:
Received 21 August 2014
Accepted 30 December 2014
Available online 4 February 2015

Keywords:
Lingual frenum
Mandibular central incisors
Edentulous
Complete denture

ABSTRACT

Clinical implication: The purpose of this study is to record the vertical distance between anterior attachment of lingual frenum and incisal edge of mandibular central incisors in dentulous subjects and then determine the mean vertical distance and to suggest guidelines for positioning of mandibular central incisors in complete dentures.

Method: In this study, 150 dentulous subjects (75 males and 75 females) were chosen based on predecided inclusion criteria. A mandibular cast was obtained from irreversible hydrocolloid impression in modified stock trays for each subject. All subjects were instructed to elevate the tongue while the impressions were made. The vertical distance between the anterior attachment of the lingual frenum and incisal edges of mandibular central incisors was measured on the casts and then the values were statistically analyzed.

Result: The distance between anterior attachment of lingual frenum (AALF) mesioincisal edge of mandibular central incisor (CI) in male, female and total (male + female) subjects was measured. In males it ranged from 7.3 to 8.9 mm with mean (±SD) 8.29 ± 0.36 mm while in females it ranged from 7.1 to 9.0 mm with mean (±SD) 8.21 ± 0.38 mm.

Conclusion: It is believed that the application of this anatomic relation can provide a reliable point for arranging and checking the position of the mandibular central incisors for complete dentures in patients with class I ridge relationship.

1. Introduction

The restoration of natural and pleasing lip support is one of the prime requisites of an esthetic denture. Researchers[1,2] have propagated the placement of artificial teeth in the same natural position from which they came, with reference to lips, cheeks and tongue so as to have a pleasing lip support. Hence, the knowledge of natural tooth position is a valuable starting point in establishing anterior tooth position for most

* *Corresponding author*. Tel.: +91 9839025605.
E-mail address: drswatigupta30@gmail.com (S. Gupta).
http://dx.doi.org/10.1016/j.jobcr.2014.12.006

of the complete denture patients.[3] The proper positioning of anterior teeth is essential in determination of vertical dimension, esthetics, and phonetics and last but not the least incisal guidance.

Cade R.E[4] and Max Sackstein[5] through their respective studies have shown that mandibular anterior teeth are displayed to a greater extent than the maxillary anterior teeth in various facial expressions as a person ages. But most literature related to positioning of artificial anterior teeth, emphasizes more on the positions of maxillary teeth and little information is available regarding the positioning of mandibular anterior teeth.

In the mandibular arch, lingual frenum seems to be a stable landmark which can be accurately recorded in function as proposed by Majid Bissasu.[6] This anatomical landmark can be used for proper positioning of mandibular anterior teeth in their original position and to establish the level of lower occlusal plane in complete denture patients'. The working hypothesis formulated is that the vertical distance between anterior attachment of lingual frenum and incisal edge of mandibular central incisors in dentulous subjects is almost same. The null hypothesis was that there is no correlation between the two. Hence, the purpose of this study is to record the vertical distance between lingual frenum and incisal edge of mandibular central incisors and determine the mean vertical distance along with standard deviation. The clinical relevance of this study lies in its application to complete denture construction. The dentist and laboratory technician can use the results of this study as guidelines in fabrication of mandibular occlusal rims and also for setting of mandibular anterior teeth.

2. Material and method

The present study was conducted in the Postgraduate Department of Prosthodontics, Babu Banarasi Das College of Dental Sciences, Lucknow. The study involved 150 dentulous dental undergraduates including 75 males and 75 females between the age group of 18–25 years. One mandibular cast was prepared for each subject. Subjects were selected based on the following inclusion criteria: Minimal incisal wear on mandibular central incisors, no previous history of orthodontic treatment, no pathology affecting the mandibular dentition, tongue, surface texture and shape of teeth, subjects with Angle's class I molar relation were selected. Prior written informed consent was taken from all the subjects.

Autoclaved perforated mandibular stock tray covering all anatomical landmarks including second molar were selected. Trays were adjusted for each patient, so that the lingual flange of the tray was approximately 2–3 mm short of the movable tissues of the floor of the mouth. Overextended lingual flanges were shortened (Fig. 1) and under extended flanges were extended with impression compound (Fig. 2), if required. The subjects were instructed to elevate the tongue and moisten the upper lip with the tip of the tongue, while the impressions were made. Three tray insertion trials were performed before making the impression so as to train the subjects to correctly record the lingual frenum. Impression trays were held in place by placing the index fingers in first molar and second premolar

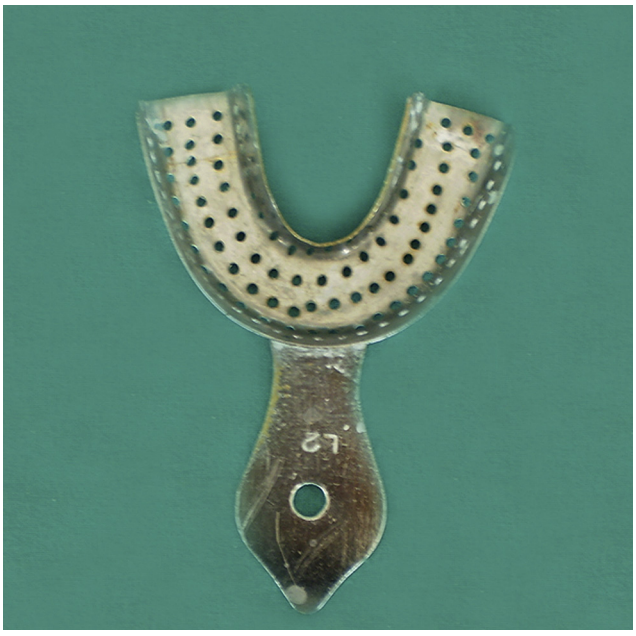

Fig. 1 – Overextended lingual flange of the impression tray trimmed.

regions bilaterally, to prevent the movement of the trays during impression making. The irreversible hydrocolloid impression material (Mectron, India) was mixed according to the manufacturer's instructions. The casts were made by pouring the impressions with the Type III dental stone (Pankaj enterprises, India).

Point markings were made on the dentulous cast by using sharp carbon marker, one in the mesioincisal angle of central incisors; second point was marked on the anterior attachment of the lingual frenum. In casts, where the mesioincisal angle of both the mandibular central incisors was not at the same occlusal plane, point marking was done on the higher mesioincisal angle. The occlusal plane of all the casts was made parallel to the horizontal plane using a cast paralleling device (Fig. 3) on Ney's dental surveyor (M.A dental company,

Fig. 2 – Underextended lingual flange modified using impression compound.