



ASSESSMENT OF RELATIONSHIP OF THE LINGUAL FRENUM TO THE MANDIBULAR INTER CANINE LINE: A LANDMARK FOR STABILITY

Orthodontology

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ABSTRACT

CLINICAL IMPLICATION: The purpose of this study is to record the relationship of anterior attachment of lingual frenum and intercanine line of mandibular canine in dentulous subjects and then suggest it as guideline for stability and positioning of canine in lower anterior region. **INTRODUCTION:** In the maxilla, incisive papilla is considered as a stable anatomical landmark and can be used for antero-posterior and vertical positioning of maxillary central incisors. Lingual frenum seems to be a stable landmark which can be accurately recorded in function and so can be used for proper positioning of mandibular anterior teeth. **METHODS:** 300 dentulous subjects (150 male and 150 female) were chosen based on predecided inclusion criteria. The relationship between the anterosuperior attachment of the lingual frenum and mandibular intercanine line was measured on the casts which were made by instructing tongue elevation while impressions and then the values were statistically analyzed. **RESULTS:** Antero-posterior relationship of the inter-canine line positions in relation to antero-superior most point on the lingual frenum in 300 dentulous subjects. Out of 150 male, 124 (82.66%) subjects showed anterior relation to the antero-superior most point of the lingual frenum, 20 (13.33%) subjects showed line at the same level, while 6 (4%) subject showed posterior relation. Similarly in 150 female subjects 131 (87.33%) showed anterior relation; whereas 19 (12.33%) subjects showed line at the same level. **CONCLUSION:** In majority of subjects showed mandibular inter-canine line positioned anteriorly to the antero-superior most point on mandibular lingual frenum; and males and females corresponds to each other. Hence it clearly shows that antero-posterior relationship of mandibular canine line with lingual frenum may also be used as reliable landmark at the time for orthodontic treatment.

KEYWORDS

lingual frenum; mandibular inter-canine line

INTRODUCTION

Paynel had quoted "Set the teeth where they grew", suggests the placement of artificial teeth in position similar to that of natural teeth. This enhances phonetics, denture stability, esthetic and physiologic support for the lips, cheek and tongue.

In the maxilla, incisive papilla is considered as a stable anatomical landmark and can be used for anteroposterior and vertical positioning of maxillary central incisors.

The restoration of natural and pleasing lip support is one of the prime requisites of an esthetic smile. Researchers 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 support². Hence, the knowledge of natural tooth position is a valuable starting point in establishing anterior tooth position for most of the complete denture patients.

The proper positioning of anterior teeth is essential in determination of vertical dimension, esthetics, and phonetics and last but not the least incisal guidance³.

Cade R.E⁴ and Max Sackstein⁵ 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 Bissas⁶. 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. To establish

such a landmark in mandible the following study will be conducted with reference to mandibular lingual frenum.

MATERIALS AND METHODS

The study will be set up in VSPM's DCRC, Nagpur. 300 dentulous subjects (150 male and 150 female) were chosen from untreated adults of Nagpur population aged between 18 to 48 years of age and having angle class I malocclusion visiting the Department Of Orthodontics And Dentofacial Orthopaedics and the subjects were included in the study as per the inclusion and exclusion criteria.

INCLUSION CRITERION

1. No previous history of orthodontic treatment
2. No pathology affecting the mandibular dentition, tongue, surface texture and shape of teeth.
3. Subjects with Angle's class I molar relation were selected.

EXCLUSION CRITERION

1. Edentulous spaces, history of trauma,
2. Significant cuspal wear
3. Extensive restorations or prosthetics
4. Anterior crossbites
5. Lower Anterior crowding

METHODOLOGY

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 and under extended flanges were extended with impression compound, 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.

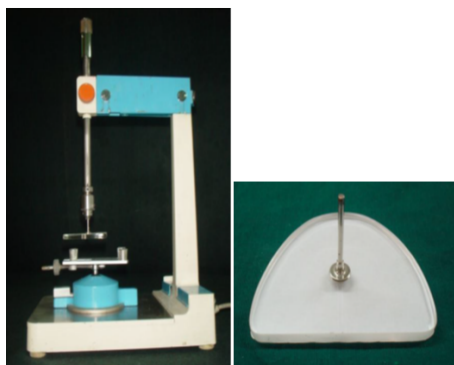


Fig a. Paralleling of cast on Ney's Surveyor; fig b. cast paralleling device

Three tray insertion trials were performed before making the impression so as to train the subjects to correctly record the lingual frenum.

The casts were made by pouring the irreversible hydrocolloid impressions with the Type III dental stone(orthokol).

The occlusal plane of all the casts was made parallel to the horizontal plane using a cast paralleling device (fig. b) on Ney's dental surveyor (fig. a). After occlusal plane orientation, the surveying arm with analyzing rod was lowered until the tip of the analyzing rod contacted the anterior attachment of the lingual frenum and marked the point (fig. c). Then the observations were made by using the transparent cast paralleling device as a guiding inter canine line on the cast.



Fig.c. marking of anterosuperior portion of lingual frenum

RESULTS

The study conducted on 300 subjects of which 150 were males and 150 were females. All the subjects in age group of 18-48 years chosen based on predecided inclusion criteria to determine and assess the position of mandibular intercanine line in relation to the antero-superior point of lingual frenum were determined for each subject. Antero-posterior relationship between antero-superior most point on the lingual frenum and inter-canine line in 300 subjects were recorded and compared. The mean and standard deviations were calculated for statistical analysis of all groups. Statistical analysis was carried out using appropriate tests and statistical software (SPSS software version 17.00). The data was interpreted at a confidence interval of 95% and the level of significance was $p < 0.05$.

Out of 300 dentulous subjects; 255(85%) showed anterior relation of inter canine line to the antero-superior most point of the lingual frenum, 39(13%) subjects showed line at the same level and only 6(2%) showed posterior relation(fig. d). Out of 150 male, 124 (82.66%) subjects showed anterior relation of inter canine line to the antero-superior most point of the lingual frenum, 20(13.33%) subjects showed line at the same level, while 6(4%) subject showed posterior relation(fig. e). Similarly in 150 female subjects 131 (87.33%) showed anterior relation to the antero-superior most point of the lingual frenum; whereas 19(12.33%) subjects showed line at the same level(fig. g) while none of the females showed posterior relation with the line.

CONCLUSION

The study was conducted to determine the reliability of lingual frenum

as a definitive landmark in post orthodontic treatment stability. Majority of subjects showed mandibular inter-canine line positioned anteriorly to the antero-superior most point on mandibular lingual frenum and also the antero-posterior relationship between intercanine line and antero-superior most point on the lingual frenum in males and females corresponds to each other. Hence it clearly shows that antero-posterior relationship of mandibular canine line with lingual frenum may also be used as reliable landmark at the time for orthodontic treatment.

However, to arrive at a definitive conclusion, long term study is required with larger sample size. If the results of these studies are found to be in agreement with the present study, this can be used as blanket therapy for the profession and can be a boon to both patients and the society at large.

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