

Prevalence of High Frenal Attachment in Edentulous Patients: A Cross-Sectional Study

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Abstract

Frenum is considered as a normal anatomic structure in the oral cavity. However, it may exist intraorally as a thick broad fibrous attachment and/or become located near the crest of the residual ridge, thus interfering with proper denture border extension resulting in inferior denture stability, retention and overall patient satisfaction. The aim of this study was to assess the prevalence of high frenal attachment in edentulous patients. The present retrospective study was conducted among 355 edentulous patients reported to Saveetha Dental College and Hospitals, Chennai from June 2019 to March 2020. Data regarding the type of frenal attachment of the study participants was collected and the incidence was assessed. Frequency distribution and percentage and chi-square test were calculated. Among 355 edentulous patients, only 2 patients had high frenal attachment. The association between gender and high frenal attachment was not statistically significant. The present study showed that the prevalence of high frenal attachment in edentulous patients in the given population was less.

Keywords: Alveolar ridge; Completedenture; Edentulous; Frenum

Introduction

Patients and are still widely used. ^[1] However, these dentures are associated with various complications from which fractures are often encountered. ^[2]

Midline fractures appear to be one of the most common problems in maxillary complete dentures. Maxillary denture midline fracture has been related to deformation of the denture base during function, thereby resulting in a flexural fatigue failure. Clinical factors related to single denture failure include: (1) Improperly contoured mandibular occlusalplane, (2) High frenal attachments, (3) Occlusal scheme, (4) Occlusal forces, (5) The denture foundation, and (6) Denture base thickness. ^[3] Possible reasons for midline fractures include sharp frenal notches, midline diastema and palataltori. ^[4,5]

Frenum is a fold of mucous membrane consisting of highly vascularized connective tissue covered with epithelium. A normal frenulum attaches apically to the free gingival margin so as not to extract a pull on the zone of attached gingiva and usually terminates at the mucogingival junction.

However, its level may vary from the height of vestibule to the crest of the alveolar ridge and even to the lateral incisal papilla area in the anterior maxilla. ^[6,7]

The maxillary labial frenum is a potential complicating factor in both complete and partial denture construction. ^[8,9] A large frenum, particularly one that is broad based or attached near the crest of the ridge, can be an obstruction that may have to be eliminated prior to denture construction. ^[10] High frenum attachments result in a subsequent weak point and/or potential fracture line in the denture base. Maxillary labial and buccalfrenum attachments that closely approximate or attach to the edentulous ridge crest also interfere with a satisfactory retentive seal of the maxillary denture. ^[11,12] In many patients who have worn complete dentures for long periods of time, frena appear to have migrated to the crest, probably because of reduction in height of the residual ridge. ^[13] The denture notch that is required to accommodate the frenum is a cleavage point responsible for a large number of denture fractures. ^[14,15]

If the prominent frenulum is recognized during the stages of denture construction, a more satisfactory result will be possible if elimination of the frenum is done prior to impression procedures. ^[16,17] Several methods for frenum excision have been proposed. The aberrant frena can be treated by frenectomy or by frenotomy procedures. Frenectomy is the complete removal of the frenum, including

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its attachment to the underlying bone, while frenotomy is the incision and the relocation of the frenal attachment. [18]

Frenectomy can be accomplished either by the routine scalpel technique, electrosurgery or by using lasers. [19]

Since the conventional procedure of frenectomy was first proposed, a number of modifications of the various surgical techniques like the Miller's technique, V-Y plasty and Z-plasty have been developed to solve the problems which are caused by an abnormal labial frenum. [20,21]

Literature search reveals numerous studies assessing the impact of frenulum height on complete denture.

Previously our team has a rich experience in working on various research projects across multiple disciplines. [22-36]

Now the growing trend in this area motivated us to pursue this project.

However, studies assessing the prevalence of high frenal attachment in edentulous patients are lacking.

Therefore, this research was undertaken to assess the prevalence of high frenal attachment in edentulous patients.

Materials and Methods

The present retrospective study was conducted among outpatients reported to Saveetha dental college and hospitals, Chennai from June 2019 to March 2020.

A total of 355 edentulous patients were randomly selected as study participants. Data regarding the type of frenal attachment of the selected study participants was collected and the incidence was assessed.

The study protocol was approved by the Institutional ethical and review board, Saveetha dental college and hospitals, Chennai.

Results and Discussion

The collected data was then entered in Microsoft Excel spreadsheet and analysed using SPSS software (IBM SPSS Statistics, version 23).

Frequency distribution and percentage were calculated for data summarization and presentation. The study sample consisted of 355 edentulous patients (150 females and 205 males) [Figure 1].

The mean age of the study population was 61.02 ± 9.85 years. Among the study subjects, 2 patients had high frenal attachment in the given population [Figure 2].

The association between gender and high frenal attachment using Chi-square test was done and found to be not statistically significant with p value of 0.824 [Figure 3].

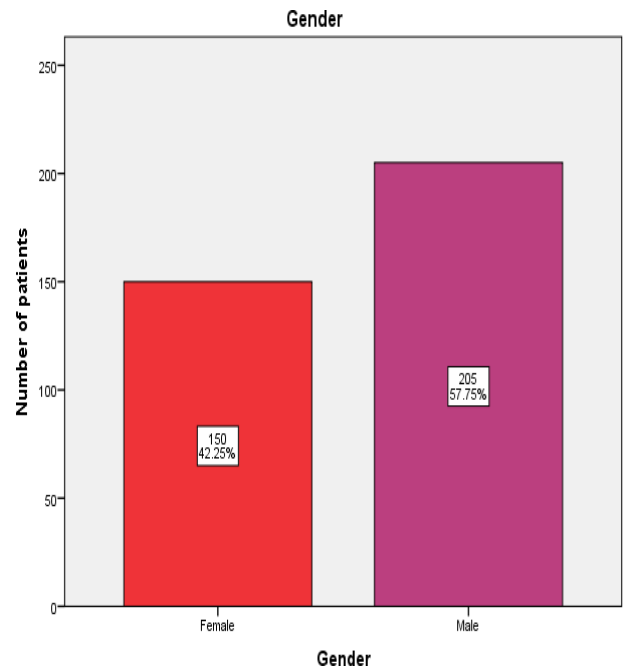


Figure 1: Bar chart showing distribution of gender among study population. X-axis represents gender and Y-axis represents the number of patients. Among 355 edentulous patients, 150 were females and 205 were males.

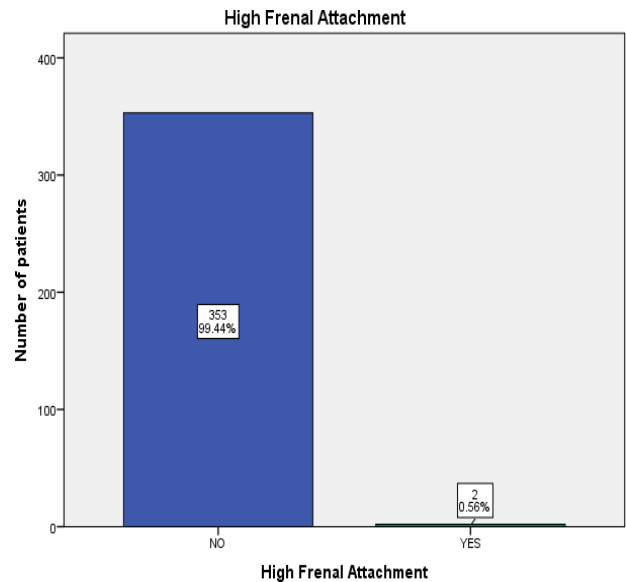


Figure 2: Bar chart showing distribution of high frenal attachment among study population. X-axis represents presence or absence of high frenal attachment and Y-axis represents the number of patients. Among 355 edentulous patients, 2 patients had high frenal attachment and 353 patients did not present with high frenal attachment.

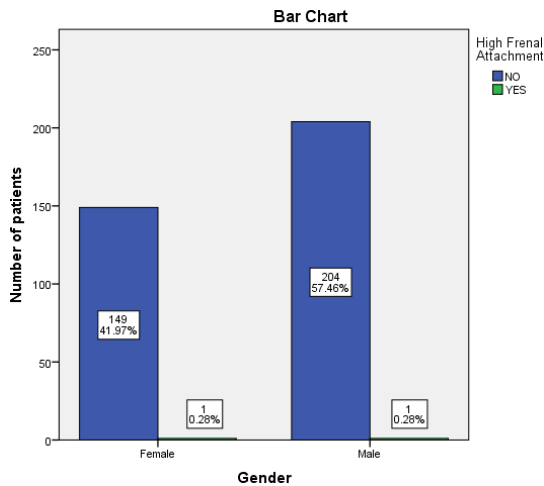


Figure 3: Bar chart showing association between gender and high frenal attachment. X-axis represents gender and Y-axis represents the number of patients. Green denotes presence of high frenal attachment and blue denotes absence of high frenal attachment. Among 150 females, 1 patient had high frenal attachment and among 205 males, 1 patient had high frenal attachment. In both the gender, high frenal attachment was present in one patient. Association between gender and high frenal attachment was not statistically significant with the p value of .824 (Chi-square test)

The present retrospective study assessed the prevalence of high frenal attachment in edentulous patients.

Cilingir et al. [37] assessed the impact of frenulum height on strains in maxillary denture bases and suggested that the stress on the anterior midline of the maxillary complete denture increased with a higher labial frenulum. Al Jabbari [38] suggested that an adequate patient satisfaction with conventional complete dentures can be significantly increased after frenectomy. Also, Axinn recommended that where an unfavorable frenum is present, the technique of frenectomy plus free graft is perceived as an efficient, predictable procedure to improve the prognosis of a complete or partial denture. [39-42]

To the best of our knowledge, this is the first study to assess the incidence of high frenal attachment in edentulous patients.

Khursheed et al. assessed the prevalence of high frenal attachment in the Kurdish young population and found out that majority of the individuals had gingival and mucosal type frenal attachment. Also, Jindal investigated the variations in frenal morphology in the diverse population of Himachal Pradesh. The authors suggested that the normal frenum was most common. Our findings are in accordance with previous studies as the incidence of high frenal attachment is less. [43]

However, the findings cannot be generalized because of limited sample size and geographic limitation.

The number of patients who require complete dentures will continue to increase as a result of the increasing proportion of

the adult population older than 55 years. Patient satisfaction with complete denture is related to the quality of life. [44] Hence, proper intraoral examination is needed to rule out unfavorable conditions which require preprosthetic surgery prior to the treatment. Our institution is passionate about high quality evidence based research and has excelled in various fields. [42-48] We hope this study adds to this rich legacy. [45-48]

Therefore, extensive research is needed in this field to find the variations in frenal morphology and attachment in edentulous patients.

Conclusion

Within the limitation of the present study, it was concluded that only 2 patients out of 355 edentulous patients presented with high frenal attachment. Therefore, the prevalence of high frenal attachment in edentulous patients was less in the given population.

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