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ASSESSMENT OF FRENECTOMY PROCEDURES DONE USING CONVENTIONAL AND LASER TECHNIQUE

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Abstract

Aim*: The aim of the present study was to retrospectively analyse the prevalence of laser frenectomy and conventional frenectomy in patients undergoing frenectomy/ frenotomy procedures at Saveetha Dental college.*

Materials and Methods*: Retrospective data of 102 patients was obtained and segregated. The inclusion criteria included patients below 70 years of age who underwent frenectomy/frenotomy and visited between June 2019 to April 2020. Once the data was obtained it was statistically analyzed using SPSS by IBM version 20.*

Results*: As per the analysis of the variables considered in this retrospective study a total of 43.1% males and 56.9% females comprised the total study population of 102 patients who underwent frenectomy/frenotomy and visited between June 2019 to April 2020. The mean + or - the standard deviation = 29.27 + 12.7 years. Based on the arch 54.9% of the treatments were performed in the maxillary arch while only 45.1% were in the mandibular arch. Conventional frenectomy/frenotomy was performed more frequently than laser with a percentage of 75.5% against 24.5%.*

Conclusion: *Within the limits of the present study it is observed that Conventional Frenectomy is performed more often than laser, this brings into question the awareness regarding the same among practitioners.*

Key words: *Frenectomy, Frenotomy, Laser, Scalpel, Periodontitis*

Introduction

A Frenum is a fold of mucous membrane, usually with enclosed muscle fibers, that attaches the lips and cheeks to the alveolar mucosa and/or gingiva and underlying periosteum. A frenum becomes a problem if the attachment is too close to the marginal gingiva. Tension on the frenum may pull the gingival margin away from the tooth. This condition may be conducive to plaque accumulation and inhibit proper brushing of the teeth.[1], thus resulting in a cascade of inflammatory pathways causing destructive and degenerative periodontal disease.[2–5] and there are various recent treatment modalities towards the same[6].

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This will hence necessitate extensive regenerative and restorative procedures to regain the lost epithelial attachment and also improve the destroyed alveolar architecture.[7–11], which can be studied through various extra and intra cellular modulators. [12,13] Any abnormalities in the size and location of the frenum can cause functional and aesthetic disabilities which require surgical intervention to alleviate the problem.[14]. There are various systemic factors that can complicate the existing periodontal disease caused due to the abnormal frenal attachment that might also need to be addressed [15–17] The most common location for the development of frenum abnormalities are maxillary and mandibular central incisors,canine and premolar areas. Frenectomy is the complete removal of the frenum, including its attachment to the underlying bone. Frenotomy is a procedure in which the entire frenum is not removed but the attachments are left intact. One technique for removal of a frenum is the conventional approach, using scalpels and various periodontal incisions. Recently, to improve the effectiveness and efficiency of periodontal surgery, laser frenectomy has been performed.[1,18,19] Lasers, particularly Nd:YAG lasers, have been used for a wide range of dental applications,[20] including endodontics,[21] periodontics,[22]preventive dentistry,[23] and oral surgery.[24] Nd:YAG lasers also make possible minimally-invasive dentistry for certain soft tissue procedures (e.g., gingivectomy-gingivoplasty, frenectomy, as an adjunct to surgical and nonsurgical periodontal treatment, incisional and excisional biopsy, and various other oral surgical procedures).[25,26]

As an advantage, the Nd:YAG laser cannot be easily absorbed by hard tissues (such as cementum and dentine) and affects only soft tissues (such as the pocket epithelial lining) within the dosages that are recommended.There are various benefits and disadvantages that can be observed with both the types of frenectomy/Frenotomy. Individual perceptions of periodontal therapy are different. Evidence suggests that both males and females experience and report feeling pain differently.[27] The aim of the present study is to assess the Prevalence of both treatment modalities among patients who have been treated at Saveetha Dental College, Chennai, India.

Materials and Methods:

The present study involved a total of 102 patients that underwent frenectomy procedures. These included all treatment modalities of frenectomy or frenotomy. The study was performed in a university setting at Saveetha Dental College and Hospitals. Thus the data obtained from the patients is of the same geographic location and ethnicity. The ethical approval for collection of retrospective data from the dental patient management archives was obtained from the Institutional Ethics Board (SDC/SIHEC/2020/DIASDATA/0619-0320).

The period of the study was between June 2019 to April 2020. Once the data was collected the same was verified by using photographs by two external reviewers who were blinded on the hypothesis from the present study. This was done to eliminate the chances of sampling bias. Before the commencement of the study a clear well defined inclusion criteria was defined. The inclusion criteria are as follows, Patients should have visited Saveetha Dental College during the study period. Patient has been treated by a resident of Saveetha Dental College, either an undergraduate or postgraduate student. Patients should have undergone frenectomy or frenotomy procedure using conventional method or by using laser. Patients should have been below 70 years of age.

Out of the study population that was chosen for the study there was no segregation process, as this would result in sampling bias. The data segregation was done according to various parameters such as speciality of clinic in which patient was treated, age of the patient, gender of the patient etc.

The data that was then tabulated and reviewed by an external reviewer and screened for internal validity of the study. The data was then exported to SPSS Software by IBM Version 20 for Statistical Analysis. Descriptive statistics was performed followed by Correlation tests to see any kind of correlation or association between the different variables taken in the present study.

Results:

As per the analysis of the variables considered in this retrospective study a total of 43.1% males and 56.9% females comprised the total study population of 102 participants. The mean + or - the standard deviation = 29.27 + 12.7 years. Based on the arch 54.9% of the treatments was performed in the maxillary arch while only 45.1%

were in the mandibular arch. Conventional frenectomy/frenotomy was performed more frequently than laser with a percentage of 75.5% against 24.5% (Figure 1).

42.1% of the total procedures were performed between the age group 21-30 years, scalpel used more than laser. Females were noticed to have undergone more number of frenectomy/frenotomy procedures than males, but conventional was most commonly used in both genders. Conventional frenectomy/frenotomy was performed more in number in the Maxillary arch than the mandibular (laser was more frequent). There was no statistically significant association seen between the variables of this study (Figure 2-3).

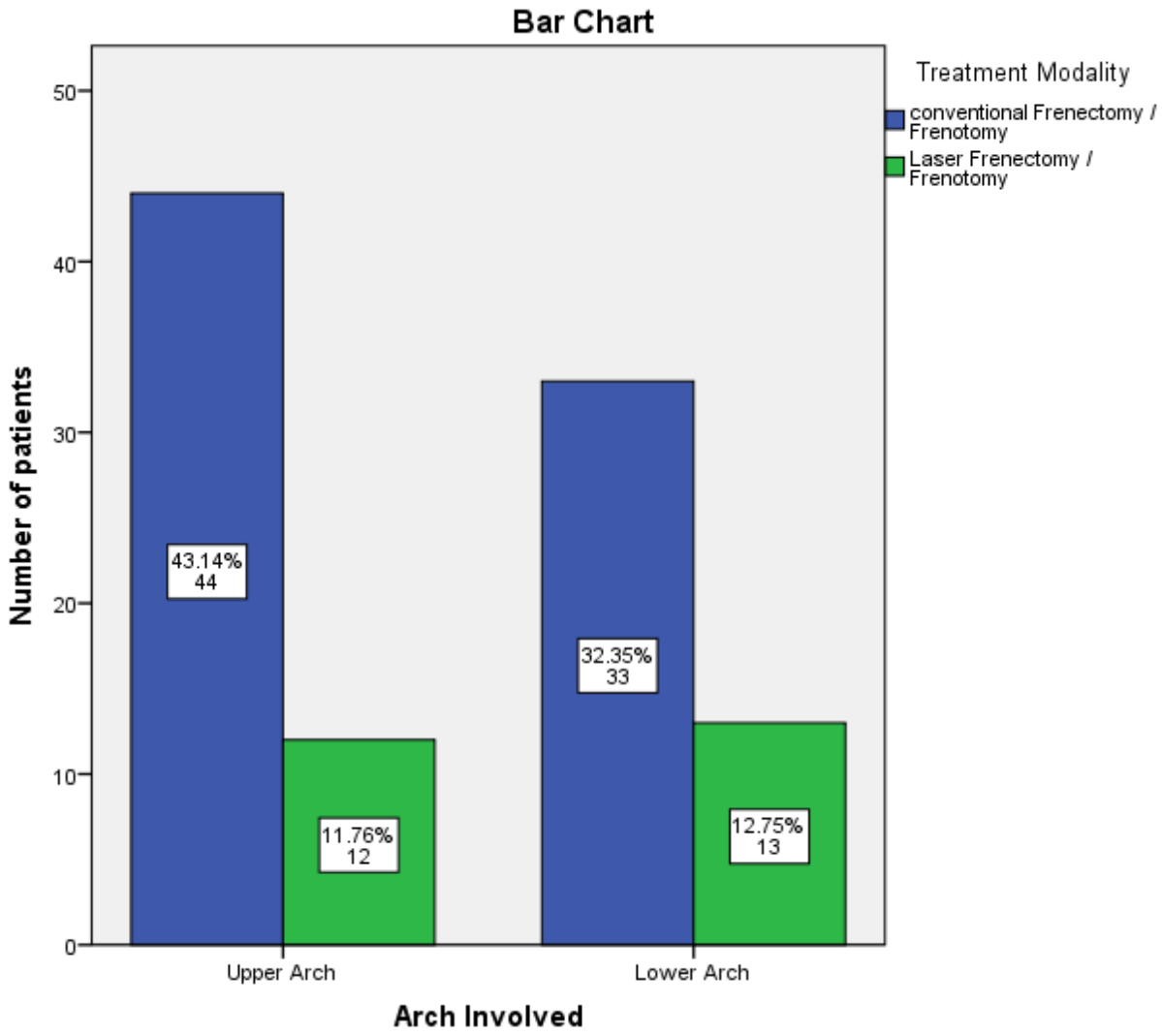

Figure 1: Bar Graph shows association between the technique used for frenectomy/frenotomy and the arch in which it is performed. X axis denotes the arch and Y axis denotes the number of patients. Blue colour represents the frenectomy/frenotomy performed using conventional method and green colour represents those done using laser. Conventional Frenectomy is performed more commonly than Laser frenectomy. Laser frenectomy is performed more commonly in lower arch than upper arch. However there is no statistical significance between the variables using Chi Square Test (Value=0.637,df=1,p=0.4)

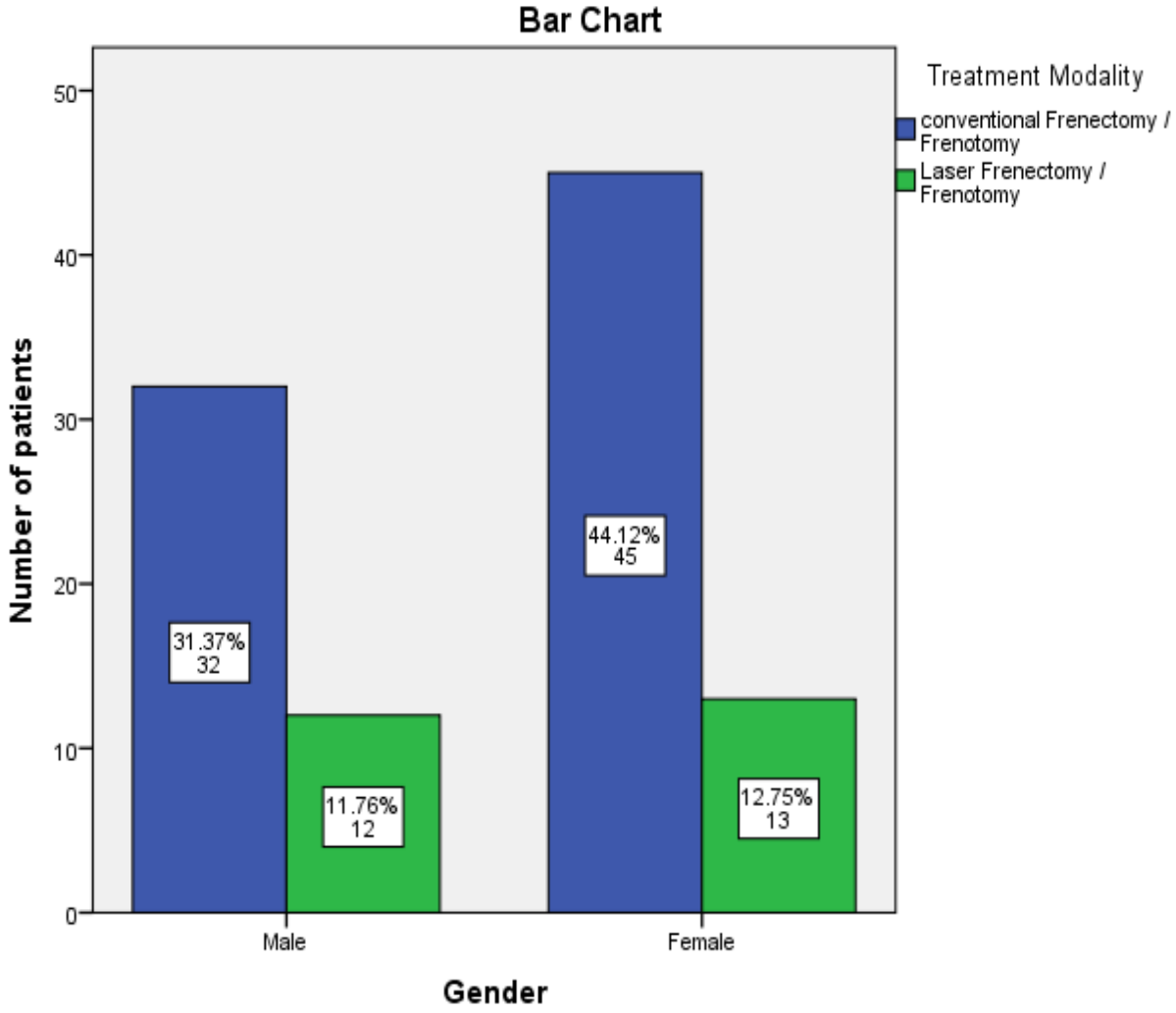

Figure 2: Bar Graph shows association between the technique for frenectomy/frenotomy and gender of the patient. X-axis represents the gender of the patient and Y-axis represents the number of patients. Conventional Frenectomy/Frenotomy is represented in blue colour and laser Frenectomy/Frenotomy is represented in green colour. Conventional frenectomy is performed most commonly in females. However there is no statistical significance between the variables using Chi Square Test (Value=0.319 , df=1, p=0.5)

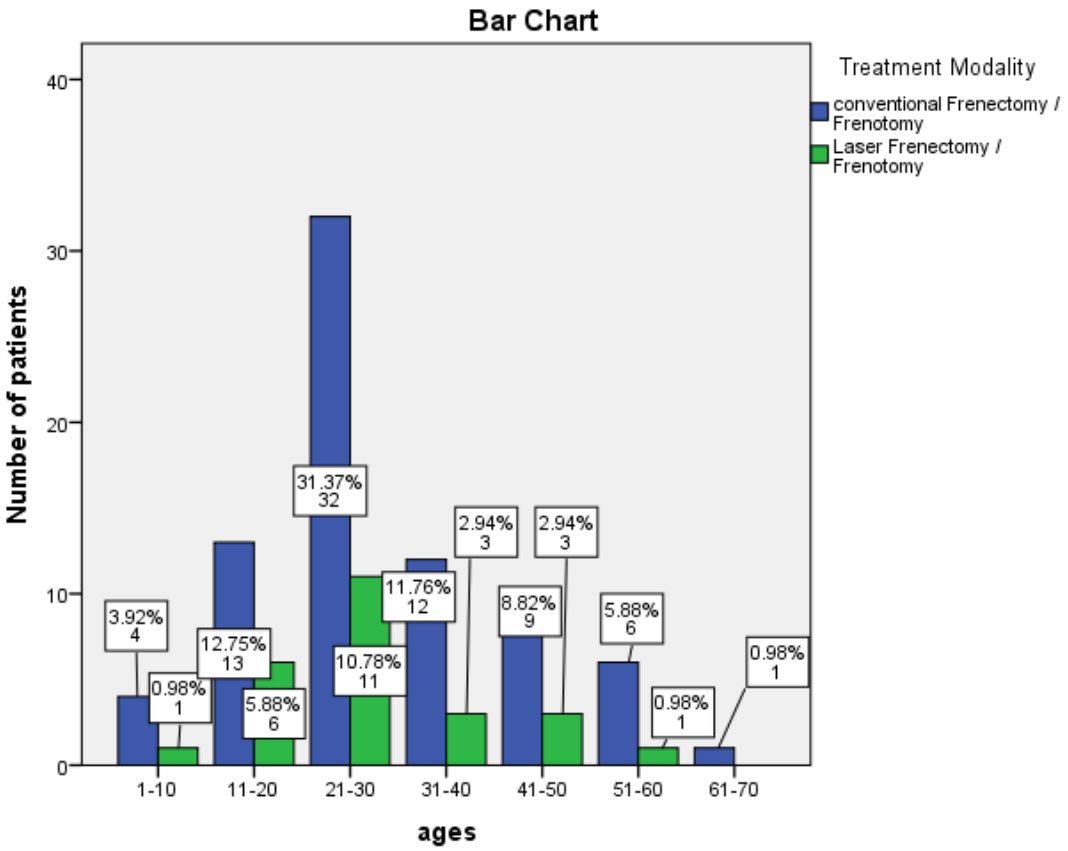

Figure 3: Bar graph shows association between the technique used for frenectomy/frenotomy and age of the patient, where the X-axis represents the age of patient and the Y-axis represents the number of patients. The blue colour represents conventional frenectomy/frenotomy and green colour represents laser frenectomy/frenotomy. The most common age group for both the frenectomy/frenotomy techniques is 21-30 years age group. Laser frenectomy/frenotomy was least performed in 51-60 years age group and was not performed in the age group of 61-70 years. Conventional frenectomy performed was least in the 61-70 years age group. However there is no statistical significance between the variables using Chi Square Test (Value=1.481, df=6, p=0.9)

Discussion:

Abnormalities in the size and location of frenum lead to the development and persistence of midline diastema, gingival recession, and speech problems. Such conditions require complete excision of the frenum attachment to the underlying alveolar process. Conventional frenectomy using surgical scalpel is the most commonly used method for frenectomy. Scalpel-assisted frenectomies are associated with postoperative pain and discomfort. This procedure also requires sutures which may lead to greater complications when sutures come in contact with the food. Soft tissue laser is a viable alternative to scalpel for such surgeries because laser treatment does not require sutures in most cases, reduction in surgical time, less postsurgical pain and discomfort leading to increased patient acceptance.[28]

In the present study of the total study population there was an increased number of females that reported for the procedure than males, this is indicative of an increased occurrence of high frenal attachment in females than in males. In a study conducted by Haytac et al [29] where the two procedures were compared, there was an increased Prevalence of females. This can be attributed to the geographical variation as well as increased demand for esthetic concerns among females than males. When both the arches were considered, the procedure

was performed more for maxillary frenum than for Mandibular frenum. This can also be attributed to the greater occurrence of a high frenal attachment in the upper arch. A study in Kenya by Kaimenyi et al [30]also concurred with similar results. In the present study it was observed that conventional frenectomy was performed more commonly than laser frenectomy. This can be attributed to inadequate knowledge on the usage of laser as well as non availability of lasers in the particular location for the procedure. However in developed countries there is more usage of laser therapy as reported by Calisir et al [31]. Thus further awareness programmes are to be carried out to ensure better treatment outcomes. When individual arches are considered conventional frenectomy was performed more in the upper arch, whereas laser frenectomy was performed more in the lower arch, this can be attributed to the recent trend of the usage of laser frenotomy for the treatment of lower lingual frenum. When age groups are considered it is observed that conventional is performed more in a younger population, this is again linked to the occurrence of high frenal attachment in the particular population as well as esthetic concerns. There was no statistically significant correlation that could be derived between the various variables, further studies with a larger sample size should be carried out to prove the same.

The limitations of the present study include that it is geographically isolated, ethically similar and various other factors such as reason for reporting have not been assessed. Future studies are to be carried out in a multi centered fashion to bring about unison in treatment modalities.

Conclusion:

Within the limits of the present study it is observed that Conventional Frenectomy is performed more often than laser. This brings into question the awareness regarding the same among practitioners. Further studies are to be carried out to formulate a concrete clinical practice guideline to help the community.

Author Contributions:

Aniruddh Menon carried out the retrospective study, planning the study design, collection and analysis of data and drafted the manuscript. Nashra Kareem and Jayanth Kumar Vadivel aided in conception of the topic, supervision and appraisal of the manuscript.

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Conflict Of Interest:

No conflict of Interest.

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