



A Retrospective Study on The Patient's Preference on The Management of The Anterior Space by Orthodontic Therapy or Prosthodontic Management

Joshini Shanmugam¹, Remmiya Mary Varghese^{2*}, Suresh V³

¹Research Associate, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences(SIMATS),Chennai-77, India

Email: 151501047.sdc@saveetha.com

²Senior lecturer, Department of Orthodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences(SIMATS),Chennai-77, India

Email: remmiyav.sdc@saveetha.com

³Reader, Department of Prosthodontics, Saveetha dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences(SIMATS),Chennai-77, India

Email: suresh@saveetha.com

ABSTRACT

A diastema, or maxillary anterior spacing, is an esthetic problem that presents a higher prevalence in the maxilla than in the mandible and has a multifactorial etiology. The prevalence of midline diastema is high in the south indian population. Hence the treatment modality available for space closure are orthodontic treatment or veneers. When we come to know which treatment is preferred by the patients, more knowledge and awareness can be spread among dentists in India regarding closure of diastema as this case is encountered more often in clinical practice. Till date there is no existing studies on treatment options chosen for midline diastema closure from a patient's perspective. The aim of this study was to determine the patient preference on anterior space closure by orthodontic therapy or prosthodontic management. Case records of patients who visited the department of Orthodontics and Prosthodontics at Saveetha Dental College from June 2019 to March 2020 was reviewed. 239 patients who fulfilled the inclusion criteria were included in the study. The data was analysed through chi square. It was observed that 97% of the patients preferred orthodontic treatment and 3% of the patients preferred veneers. Within the limitations of this study, it was concluded that patients with midline diastema preferred orthodontic therapy than prosthodontic management

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* **Contact:** Remmiya Mary Varghese, Senior lecturer, Department of Orthodontics, Saveetha dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences(SIMATS),Chennai-77, India., Ph.no: +919500085771,

remmiyav.sdc@saveetha.com

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INTRODUCTION

The concept behind esthetics is all about beauty and smile[1]. In smile esthetics, presence of diastemas, can occur due to differences in tooth size[2]. Maxillary midline diastema is a common esthetic complaint of patients[3]. space greater than 0.5mm between the proximal surfaces of the two central incisors is called maxillary midline diastema[4]. Presence of spacing can be a normal growth characteristic during the primary and mixed dentition and usually closes when maxillary canines erupt[5]. However, for some individuals, diastema does not close[6]. It can be one of the most negative factors in self perceived dental appearance[7]. Treatment is mainly for esthetic and psychological reasons, rather than functional ones[8].The etiology causing spacing of maxillary anterior teeth is multifactorial in nature. It can be hereditary, acquired or functional, depending upon the conditions of individuals.

There are a variety of approaches for treatment of closing the midline diastema, which might vary according to various etiologies[9–11]. Good results of such treatment will depend upon the elimination of these factors[12].

Some of the approaches are orthodontic, prosthodontic and conservative approaches[13]. In this study, we are going to consider only orthodontic and prosthodontic approaches. Orthodontic approach is carried out by closing the diastema or redistributing the spaces for a posterior anatomization of the anterior teeth[14]. In cases where there is discrepancy of tooth size, orthodontic treatment alone is not enough for the success of the treatment.[15]. Hence, these diastemas should be closed by means of composite, or prosthetic crowns[16,17].

Another choice of treatment for closure of midline diastema includes laminate veneers(PLV) which are thin shells of ceramic which can be bonded to the labial surface of anterior teeth using bonding agents and dual cure cements.. This procedure is immensely conservative due to minimal amount of tooth preparation and also creates excellent esthetic results in just two appointments. These veneers take up the strength of enamel and become strong just like a natural tooth[18,19].Although they may be invasive and non economical, they are less time consuming as it could be done as a chair side procedure.Previously our team had conducted numerous clinical trials and in vitro studies [20–39] over the past 5 years. Now we are focusing on retrospective studies. Hence, the objective of this study is to evaluate patient preference on anterior space closure by orthodontic therapy or prosthodontic management.

MATERIALS AND METHODS

Study setting

This study is a university setting which was conducted in Saveetha dental College., predominantly. The patients who reported with anterior spacing were included for the study. Approval was obtained from the institutional ethical committee[IEC]. Ethical approval number-SDC/SIHEC/2020/DIASDATA/0619-0320. Two examiners were involved in the study.

Sampling

It is a retrospective study. Data was collected from June 1, 2019 to March 31, 2020. Totally 2000 plus case sheets were reviewed out of which 239 patients had undergone treatment for midline diastema from the Department of Prosthodontics and Department of Orthodontics, Saveetha Dental College and Hospitals. Cross verification of data for error is done by the presence of additional reviewers. Simple random sampling is done to minimise the sampling bias.

Data collection/Tabulation

Data of patients who had undergone anterior space management was collected from initial to last in chronological order. Data verification was done based on the age,gender, presence of anterior spacing, treatment chosen. Data was entered in the excel sheet in a methodical manner and was imported to SPSS. Incomplete or uncensored data was excluded from the study.

Analytics

The variable definition for this study was depending upon the age, gender, the type of treatments. The descriptive and inferential statistics was done. Frequency distributions were determined, and statistical analyses were performed using Pearson chi-square analysis, cross tabulation, and Pearson correlation. The results were shown by graphical illustrations. Any incomplete or missing data in this study was eliminated.

RESULTS AND DISCUSSION

From the results, the maximum number of patients with anterior spacing reported in 18-27years age group(75.31%; n=180) followed by 28-37 years (21.34%; n=51) and least in 38-47 years(3.35%; n=8)[figure 1]. Gender predilection shows that 56.07% males (blue) and 43.93% of females (green) have anterior spacing[figure 2].

According to the distribution of treatment chosen by patients for anterior space closure, it was seen that 97% chose orthodontic treatment and 3% chose prosthodontic management[figure 3]. In the distribution of treatment chosen according to age

group, it was observed that in the age group 18-27 years, 98.33 chose orthodontic therapy and 1.6% chose prosthodontic management; in the age group 28-37 years, 94.11% chose orthodontic therapy for anterior space closure and 5.8% chose prosthodontic management; in the age group 38-47, all the patients(100%; n=8) chose orthodontic therapy for anterior space closure[figure 4]. In the distribution of treatment chosen according to gender, out of 134 males, 97.76% chose orthodontic therapy and 2.23% chose prosthodontic management for anterior space closure. Out of 105 females, 97.14% chose orthodontic treatment and 2.85% chose prosthodontic management for anterior space closure. When comparing both the genders, orthodontic treatment was more commonly chosen than prosthodontic management by both males and females. p value=0.09>0.05 which is statistically non significant[figure 5].

The data for this retrospective study was based on south indian residents seeking treatment at Saveetha Dental College. Currently, there is no previous literature investigating the patient preference on treatment needs for anterior space closure. Since all the data available was included without a sorting process, no bias was accepted in the selection of patients.

Midline diastema can have multiple etiologies. Hence, the diagnosis of diastema must be based on a thorough medical/dental history, clinical and radiographic examination. Diastema based on tooth size discrepancy is most amenable to restorative and prosthodontic solutions. According to Viswambaram[40], even though orthodontic treatment is an option that is to be considered, most adults do not want to spend several years and multiple appointments to enhance their smiles. The current study disagrees with this statement as 97% of the patients with midline diastema have chosen orthodontic treatment over veneers. From this, it can be seen that not all the patients feel that orthodontic therapy is a burden.

The survival rate of laminate veneers is over 10years.[41,42]. Even though porcelain veneers had advantages like safe, highly esthetic, less work time, firm fit, long term success and large induration, they have their own limitations too. They cannot be done in cases where remaining enamel is inadequate which can lead to loss of retention. Large class IV defects cannot not be restored with veneers because of the large amount of unsupported porcelain and lack of tooth colour backing.

That does not mean that orthodontic therapy does not have any disadvantages. It has its own limitations too. Riedel[43] stated that orthodontically moved teeth tend to return to their original position. Few studies report that diastema

recurrence after orthodontic closure[44,45]. Shashua and Artun[46] evaluated the proportion of diastema recurrence and possible variables that may have contributed to this recurrence in a sample of 96 patients 4-9 years after the end of treatment. The mean space recurrence was 0.1mm in 49% of the patients in total. However, fixed retention is often cited as the only satisfactory method to promote stability at closure of previous anterior space[47,48].

The patients were explained about 2 major drawbacks as a summary- in veneers, a part of the enamel will be reduced, which is irreplaceable and in orthodontics, long term treatment, discomfort and pain. The patients in our study were fully aware of the available treatment options and understood the risks and benefits of treatment before finally deciding on their choice of treatment.[49,50] This may partly explain why the orthodontic treatment was chosen over veneers was highly significant.

Hasan [51] has reported that the treatment option of veneer is not chosen widely by the dentists in India. This can be another reason why veneers were not very widely chosen as a treatment option in the present study as the dentist might have not stressed about the esthetic pros of laminate veneers.

The present study has some limitations that might have affected the results of this study. For example, the data collection period could have been longer. Different population could have been taken for comparison.

The current study shows that despite its drawbacks, orthodontic therapy is widely chosen as a treatment option than laminate/ceramic veneers by the patients in South India. Patients chose orthodontic therapy over prosthodontic management based on various parameters like the cost, treatment period and their attitude towards the tooth reduction involved. These findings can be used as a reference to spread awareness among dentists in India on various treatment modalities of anterior space closure and patient's perspective about it.

CONCLUSION

Within the limitations of this study, it can be concluded that after a clear explanation of the pros and cons of both the treatment approaches, 97% of the selected population chose orthodontic therapy and 3% preferred veneers.

AUTHORS CONTRIBUTION

First author, Joshini Shanmugam performed the data collection by reviewing patient details, filtering required data, analysing and interpreting statistics and contributed to manuscript writing.

Second author, Dr. Remmiya Mary Varghese contributed to the conception of study title, study design, analyse the collected data, statistics and interpretation and also critically revised the manuscript.

Third author, Dr.Suresh V participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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CONFLICT OF INTEREST

The authors have declared that there is no potential conflict of interests

FUNDING

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Ethical Clearance

It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number-SDC/SIHEC/2020/DIASDATA/0619-0320)

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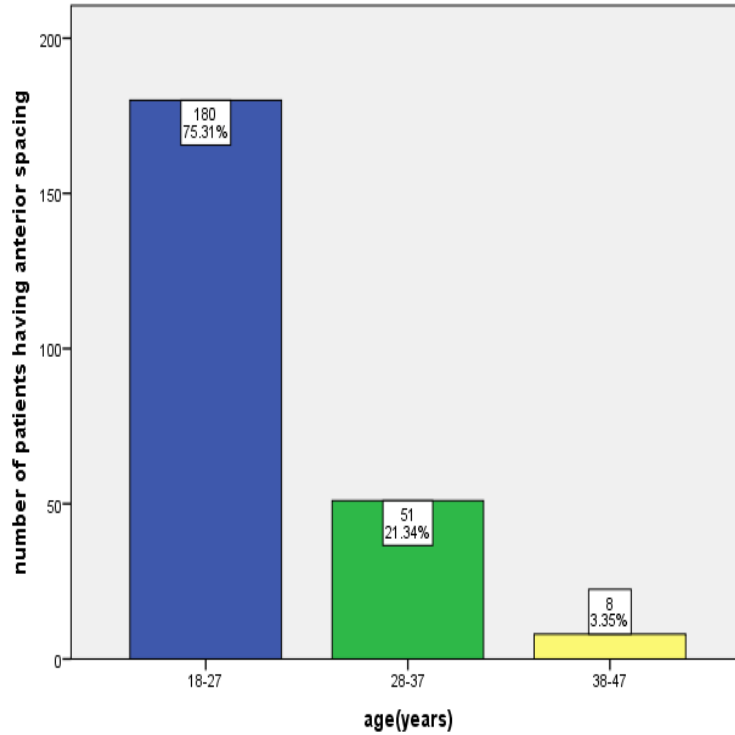


Figure 1: Bar graph represents the distribution of anterior spacing according to age group. X-axis represents age and Y-axis represents the number of patients with anterior spacing. It shows that the maximum number of patients reported in 18-27 years age group (blue) followed by 28-37 years (green) and least in 38-47 years (yellow).

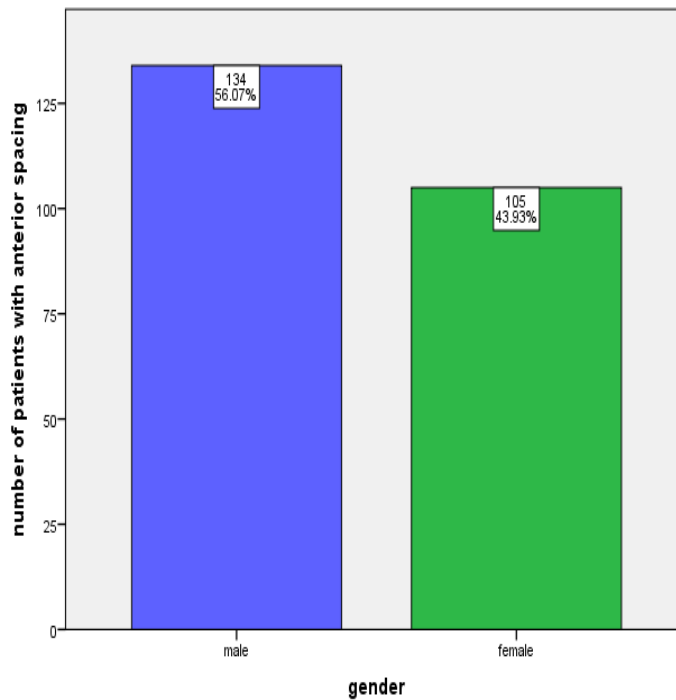


Figure 2: Bar graph represents the distribution of anterior spacing according to gender. X-axis represents gender and Y-axis represents the number of patients with anterior spacing. It shows that 56.07% males (blue) and 43.93% of females (green) have anterior spacing.

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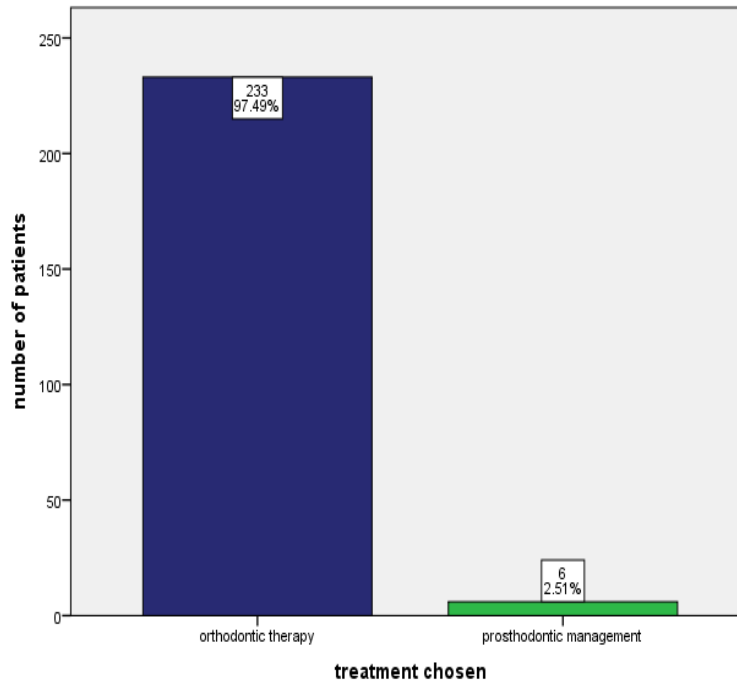


Figure 3: Bar graph depicts the distribution of treatment chosen by patients for anterior space closure. The blue bar represents orthodontic therapy and the green bar represents patients prosthodontic management. It shows that 97% of patients chose orthodontic treatment (blue) and 3% chose prosthodontic management (green). Hence orthodontic treatment was the most common treatment chosen by patients with anterior spacing.

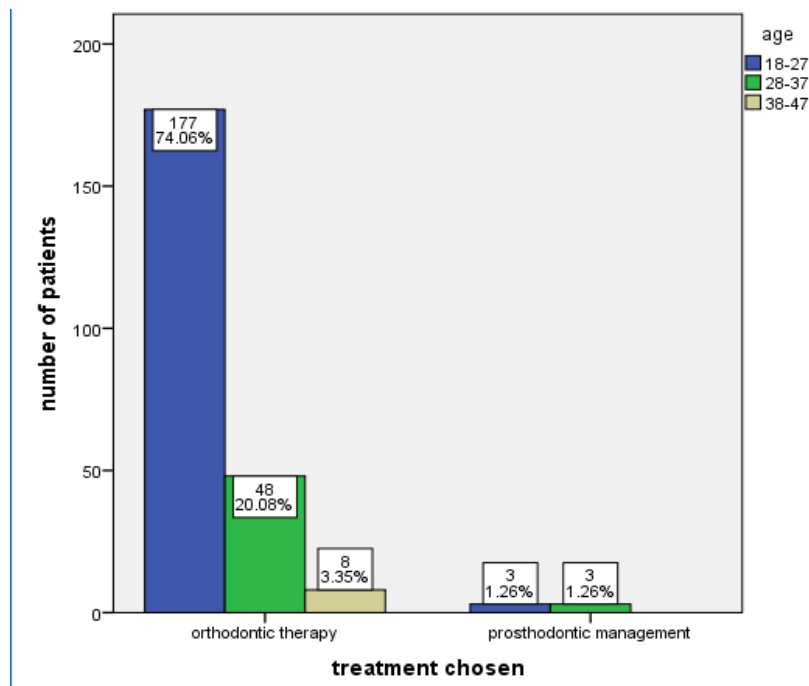


Figure 4: Bar graph depicts the distribution of treatment chosen by patients for anterior space closure according to age group. Majority of the patients in the age group of 18-27 years (Blue) chose orthodontic therapy followed by the patients in 28-37 years (green) and 38-47 years (yellow) over prosthodontic management. It shows that orthodontic treatment was most commonly chosen over prosthodontic management for anterior space correction in all the age groups where p value = 0.02 (< 0.05), Hence statistically significant.

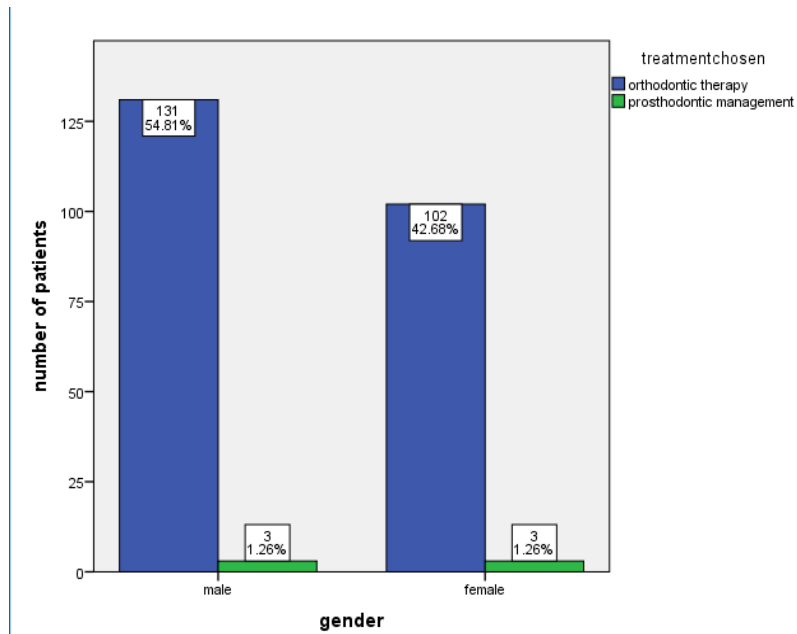


Figure 5: Bar Graph depicts distribution of treatment chosen by patients for anterior space closure according to gender. Out of 134 male patients, majority of them chose orthodontic therapy(blue) over prosthodontic management (green) for anterior space closure. Out of 105 female patients, majority of them chose orthodontic treatment over prosthodontic management for anterior space closure. When comparing both the genders, orthodontic treatment was more commonly chosen than prosthodontic management by both males and females. p value=0.09(>0.05)which is statistically not significant.