ORIGINAL RESEARCH

Evaluation of Types of Treatment Plan for Patients with Class II Division 2 Malocclusion among Orthodontists in Puducherry and Tamil Nadu: A Questionnaire Study

Akash Ponnukumar[1], Arya Jayavarma[2], Lidhiya Alexander[3]

Received on: 01 November 2022; *Accepted on:* 16 November 2022; *Published on:* 15 December 2022

Abstract

Aim: The aim of this study was to evaluate the different treatment alternatives for class II division 2 malocclusion prevalent among the orthodontist in a questionnaire study.

Methodology: The study was conducted among the orthodontist practicing in Chennai and Puducherry regions. A self-reviewed questionnaire was distributed to 52 orthodontists and the completely filled survey questions were collected and assessed.

Results: Only an average of 27% of patients were having class II division 2 malocclusion with 69% of orthodontists considering the age of 12–15 years to be an optimal treatment period. Self-ligating bracket system was highly preferred for treatment care compared to the conventional bracket system.

Conclusion: A need for proper treatment plan, appliance selection, and appropriate biomechanics is needed for class II division 2 malocclusion.

Keywords: Class II division 2, Management, Prevalence, Survey.

Journal of Scientific Dentistry (2022): 10.5005/jp-journals-10083-1019

Introduction

Among the heterogeneous population in India, the most common malocclusion seen after crowding is class II malocclusion which attributes to about 14.6% of total population[1] and in Chennai alone, it is around 15.3% in primary occlusion.[2] Among class II, division 2 type malocclusion is considered to be one of a unique variety having deep bite, lingually inclined incisors, proclined maxillary lateral incisors deep curve of spee, deep mento labial sulcus, gummy smile, and irregular gingival margins.[3] The treatment of class II division 2 malocclusion is a great task due to its varied features and etiological factors.[4] The most common mode of treatment for class II starts with a functional appliance, fixed or removable, and aims at redirecting the growth of the upper jaw and accelerating the growth lower jaw in growing patients, camouflage *via* extraction in adults and *via* orthognathic surgeries in certain cases. However, the main problem in class II division 2 is that the extraction is inhibited for maximum cases and the use of functional appliances is restricted due to inadequate overjet. When it is opted to create the necessary space without extractions, an alternative to obtain the necessary space to correct the malocclusion must also be planned. Class II division 2 patients require a proper treatment plan as there is a need for esthetics and functions. The treatment objectives must include the chief complaint of the patient, and the mechanics plan should be individualized based on the specific treatment goals. In this study, we are going to evaluate the different treatment alternatives for Class II division 2 malocclusion prevalent among orthodontists in and around the Pondicherry and Chennai regions.

Aim and Objective

The main objectives of this study were as follows:

- To describe and evaluate treatment for class II division 2 malocclusions.
- To investigate which treatment alternatives are most often used by orthodontists.

Methodology

Information on different treatment possibilities for class II division 2 malocclusion were collected from the database PubMed. The study was conducted among 52 orthodontists in Tamil Nadu and Puducherry region by asking a questionnaire (see the format below) about class II: Two treatment alternatives.

Depending upon the previous study, sample estimation was done where a minimum sample size of 52 was considered using the following formula where the Alpha (α) = 0.05, estimated proportion (p) = 84% (0.84), estimation error (d) = 10% (0.1), and Z = 1.96.

$$n \geq \frac{Z^2_{1-\frac{\alpha}{2}} \times p(1-p)}{d^2}$$

[1–3]Department of Orthodontics, Indira Gandhi Institute of Dental Sciences, Puducherry, India

Corresponding Author: Akash Ponnukumar, Department of Orthodontics, Indira Gandhi Institute of Dental Sciences, Puducherry, India, Phone: +91 9962039962, email: akashponnukumar@gmail.com

How to cite this article: Ponnukumar A, Jayavarma A, Alexander L. Evaluation of Types of Treatment Plan for Patients with Class II Division 2 Malocclusion among Orthodontists in Puducherry and Tamil Nadu: A Questionnaire Study. J Sci Dent 2022;12(1):11–14.

Source of support: Nil

Conflict of interest: None

QUESTIONNAIRE

Name: _____

Gender: _____

Age: _____

IOS No. _____

QUESTIONS

1. **Do you work as a private practitioner or at an institution?**
   (a) Private Practitioner (b) Institution (c) Both
2. **What percentage of your patients are treated for angle class II division 2?**
3. **When do you think angles class II division 2 malocclusion should be treated?**
4. **What should determine the treatment needed for class II division 2? (Multiple answers can be given)**
   (a) Retroclined upper incisor (b) Decreased over jet
   (c) Deep bite (d) Other (specify)
5. **What type of appliance do you prefer to treat a class II division 2 malocclusion?**
   (a) Fixed appliance (b) Functional appliance
6. **If a functional appliance, then what type do you use?**
   (a) Removable (twin block/activator/bionator/frankel)
   (b) Fixed functional appliances(herbst/forsus/advansync 2)
7. **If no, why not?**
   (a) Compliance (b) Time effort
   (c) Fixed appliance is better (d) Other
8. **What is the main reason for your choice of treatment?**
   (a) Evidence based (b) Clinical experience (c) Compliance
9. **What type of treatment plan do you use to correct class II division 2?**
   (a) Conventional (b) Self-ligating

Private orthodontists as well as institutional practitioners were included in the survey. Among the 52, 16 orthodontists were private and the rest were associated with institutions. They were all telephoned in advance and were informed about the project and requested to participate. The results obtained were then reviewed and compared using a statistical package for social sciences (SPSS) software.

Results

The orthodontist answered that 25–28% of the patients they encountered were presented with a class II division 2 malocclusion, 68–70% of practitioners said that the best treatment time for this malocclusion should be around 12–15 years of age while 18–20% said it was around 9–11 years, 10% said above 15 years while rest said below 9 years (Fig. 1). A total of 44% of orthodontists said that ratiocination of the upper incisors was considered as one of the determining factors for their treatment plan followed by deep bite which was attributed to 28%, decreased overjet 23%, and the rest

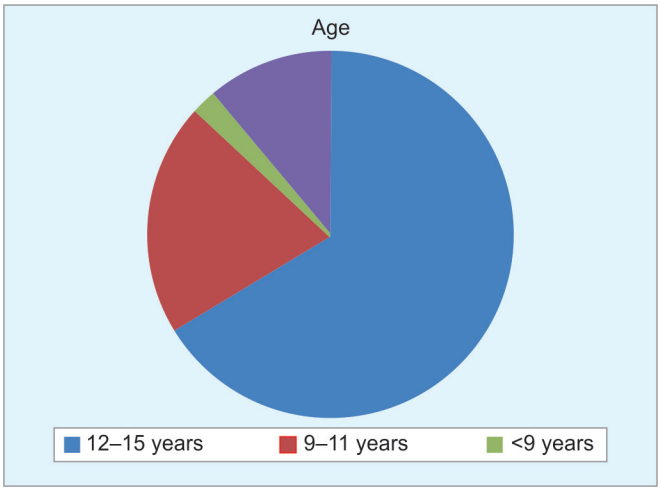

Fig. 1: Age group preferred for orthodontic treatment for class II division 2 malocclusion

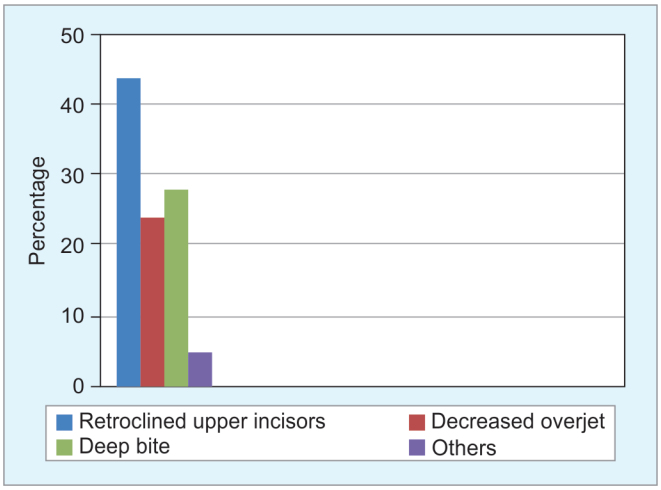

Fig. 2: Order of the clinical features which determines need for the treatment

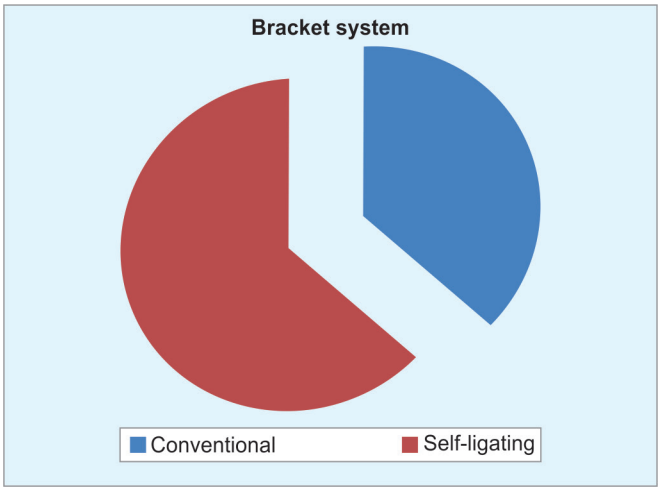

Fig. 3: System of bracket used

5% attributing it to other features (Fig. 2). More than 64% of the orthodontist preferred self-ligating bracket system for treatment (Fig. 3).

Discussion

The treatment modalities for class II division 2 malocclusion vary according to age and the skeletal counterpart of the malocclusion. Since there are many modalities for the treatment a need arises to determine the most common and effective method among all and there is no better way to decide other than to study the prevalent existing procedures and these formed the basis for this study. A questionnaire survey was used as they are effective when the respondents are experienced in the topic and there was a requisite for a definite purpose for the objective from the clear findings from the available resources.[5] Did a similar study as they surveyed and investigated the best treatment plan for class II division 1 malocclusion in the Stockholm and Uppsala area by sending a questionnaire to 50 orthodontists in that area and they concluded no fixed standard treatment is there for the malocclusion, several factors such as patient's age, compliance, other malocclusion has to be considered while planning. Among the survey conducted, less than 30% of the patient they encountered had class II division 2 type of malocclusion and the majority of the malocclusion would like to be treated within 12–15 years mainly in the permanent dentition period while around 20% of orthodontist said that they would treat it in late mixed dentition stage around 9–11 years of age. The objective reason for early treatment was to establish proper anterior occlusion and provide proper space for canines and to avoid crowding.[6] Similarly the main concern in treating early is to maintain the occlusion for a longer period of time to prevent mandibular forward rotation and deep bite formation.[7]

With respect to the use of functional/orthopedic appliances and fixed treatment, many orthodontists preferred to use of fixed over the function as the freedom of play was considered to be high in fixed which may contradict few studies as Basavaraddi et al.[8] described the application of fixed functional appliance in the treatment of an adult female having class II division 2 malocclusion with ratiocination of upper incisors and they demonstrated that fixed functional appliance can act as a better "noncompliant corrector". In another study done by Atik et al.[9] a case of Class II division 2 mandibular retrusion, severe deep bite, and concave profile was treated using forces and they concluded that Fixed functional application with appropriate treatment time can result in prominent changes in the facial profile and dentition, and the outcomes can be maintained at the long-term follow-up periods. The use of extraction was also suggested by some practitioners but it involved the risk of spacing in the long run in the maxilla[9] Finally, the self-ligating system was highly preferred compared to conventional by the practitioners as the copper nickel titanium (CuNiTi) wire used along with the self-ligating brackets increases the arch length.[10]

Conclusion

With the data, we acquired from our study we came to the conclusion that majority of the orthodontist prefer treating class II division 2 case by non-extraction method mainly during the permanent dentition period, and initially concentrate on correcting the ratiocination of upper anteriors as it further paves for the mandibular growth mainly by using the self-ligating system to increase the treatment efficacy and usage of functional appliance depends upon the underlying skeletal pattern. Hence, class II division 2 malocclusion requires a meticulous and effective treatment plan for correction to achieve an ideal occlusion and form.

Orcid

Akash Ponnukuma https://orcid.org/0000-0002-0661-0622

References

1. Chitra P, Negi G, Thushar BK, Verma S. Treatment outcomes in the sagittal and vertical dimensions with the AdvanSync2 class II corrector: A case series. J Contemp Orthod 2018;2(3):14–26. Corpus ID: 220598503.
2. Radha Krishna G, Saritha V, Suryaprakash VN. A study to determine the prevalence of malocclusion in primary dentition in suburban population in Chennai. Orthod Cyber J 2013;5:1–19. PMID: 30397375.
3. Uribe F and Nanda R. Treatment of class II, division 2 malocclusion in adults: Biomechanical considerations. J Clinic Orthodont 2003;37(11):599–606. PMID: 14652423.
4. Graber TM, Rakosi T, Petrovic AG. Dentofacial Orthopaedics with Functional Appliances. St. Louis: CV Mosby Co, 1997, pp. 346–352.

5. Roopa S, Rani MS. Questionnaire designing for a survey. J Ind Orthod Soc 2012;46(4):37–41. DOI: 10.5005/jp-journals-10021-1104.
6. Nishimura M, Sannohe M, Nagasaka H, Igarashi K, Sugawara J. Nonextraction treatment with temporary skeletal anchorage devices to correct a Class II Division 2 malocclusion with excessive gingival display. Am J Orthodont Dentofac Orthoped 2014;145(1):85–94. DOI: 10.1016/j.ajodo.2012.06.022.
7. Nielsen IL. Class II, division 2 malocclusion: What the clinician should know about treatment of this malocclusion (part II). Taiwan J Orthodont 2021;33(2):1. DOI: 10.38209/2708-2636.1099.
8. Basavaraddi S, Gandedkar NH, Belludi A, Patil A. Correction of an adult class II division 2 individual using fixed functional appliance: A noncompliance approach. Contemp Clin Dent 2016;7(1):82–86. DOI: 10.4103/0976-237X.177114.
9. Atik E, Kocadereli I. Treatment of class II division 2 malocclusion using the forsus fatigue resistance device and 5-year follow-up. Case reports in dentistry 2016. DOI: 10.1155/2016/3168312.
10. Zreaqat M, Hassan R. Self-ligating brackets: An overview. In: Naretto S, editor, Principles in Contemporary Orthodontics, InTechOpen, 2011.