

Need for Adjunct Orthodontics in Young Patients Reporting to the Dental Outpatient Department

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ABSTRACT

INTRODUCTION

Adjunct orthodontics is the tooth movement carried out to facilitate other dental procedures necessary to control the disease, restore function or enhance the appearance of the tooth and the surrounding tissues. It can facilitate treatment in necessary ways such as contemporary prosthodontics, rehabilitation of hypodontia as an adjunct therapy to periodontitis, surgical adjunctive procedure for accelerating any orthodontic treatment.

AIM

Aim of the present study was to assess and analyses the need for adjunct orthodontics in patients reporting to the dental outpatient department in a university setting.

MATERIALS AND METHOD

Data collection was done using a patient management system. It is a recording system of all the data related to the medical and dental history of the patients and the treatment done in Saveetha dental college. The inclusive criteria for the present study included distal tipping, mesial tipping, migration and supraeruption and the exclusive criteria included patients name, age and gender. The overall data was filtered and only the inclusive criteria mentioned above were finally taken for evaluation. The collected data is analyzed using SPSS IBM (*Chi square* test).

RESULTS AND CONCLUSION

In the present study, it was found that 7 % of the cases from the overall study population reported with supraeruption, 12 % reported with distal tipping, 16 % were found to be migration, 25 % of mesial tipping and 40 % of the cases were found to be with no individual tooth abnormalities. It can be concluded that there are limited studies based on adjunct therapies in orthodontics. Further studies are further needed to introduce better treatment modalities.

KEYWORDS

Adjunct orthodontics, Periodontal therapy, Surgically adjunct procedures, Prosthodontics rehabilitation, Innovative technology, Novel method

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INTRODUCTION

Orthodontic treatment is based on tooth movement, which is performed by the periodontal ligament which unites the tooth root and the alveolar bone. Force applied on the tooth produces stress on the periodontal ligament with areas of traction or stretching that induces bone resorption and formation that further result in tooth movement.¹ Therefore, for this process to occur efficiently a healthy periodontium is essential to avoid any compromise to the tooth supporting tissues.² Orthodontic treatment may contribute to the periodontal health, because they align the teeth and favour in balancing the occlusion.³ However, fixed appliances may increase the supragingival biofilm and deteriorate the periodontal health.⁴ Bacteria in the supragingival or the subgingival biofilm may affect the orthodontic treatment which should be controlled by adequate oral hygiene.⁵ Maintenance of periodontal health is essential to treat malocclusion and crowding in the dental arch. Orthodontic treatment produces root parallelism which adequately distributes occlusal forces and corrects any vertical bone defects.⁶ Adjunct orthodontics involves alignment of crowded anterior teeth, tooth uprighting, coronal positioning before any restorations, prosthesis after forced eruption, reduction of the inter proximal distance or any distance between the roots, fixed or removable appliances.⁷ Range of surgical and non - surgical techniques have received increasing attention in recent years to reduce the duration and course of the orthodontic treatment. Various techniques have been used however, in relation to the effectiveness of the procedures and possible adverse effects that are related. Interdisciplinary esthetics is a contemporary modality of treatment causing outcomes in the field of restorative dentistry. An adjunct approach to rehabilitation of congenitally missing anterior teeth with orthodontic intervention throws light on the integrated treatment modality.⁸ Adjunctive procedures carried out as part treatment plan include cases of hypodontia or any missing teeth, mesial migration of maxillary canines, maintaining adequate space, restoring the lip fullness, achieving stable and functional occlusion and restoring anterior esthetics. Incorporation of NiTi open coil springs was carried out to vitalize the canines bilaterally. Our team has extensive knowledge and research experience that has translate into high quality publications.⁹⁻²⁸ Aim of the present study was to assess and analyses the need for adjunct orthodontics in patients reporting to the dental outpatient department in a university setting.

MATERIALS AND METHODS

Sampling

Samples for the present study were collected from March 2020 to March 2021. The samples were collected from the patient management system. A total of 25,000 patients were screened out of which a total of 500 to 700 cases were collected. The inclusive criteria for the study involved migration, supraeruption, mesial tipping and distal tipping. Whereas the exclusive criteria involved the patients age, gender and name.

Data Collection

The data collected is further stored in excel sheets and transferred to SPSS IBM software for analysis. *Chi square test* was performed. The collected data was further analyzed and tabulated.

RESULTS

From the results of the present study it was found that about 100 % of the female population was involved in the study. A higher ratio was seen among the 28 years (patients visiting the dental care for any orthodontic diagnosis), followed by the 25 years old, 26 and 29 years old and finally the 30 years old individuals. Among the orthodontic diagnosis reported the most common were, mesial tipping among them, followed by migration, distal tipping and supraeruption.

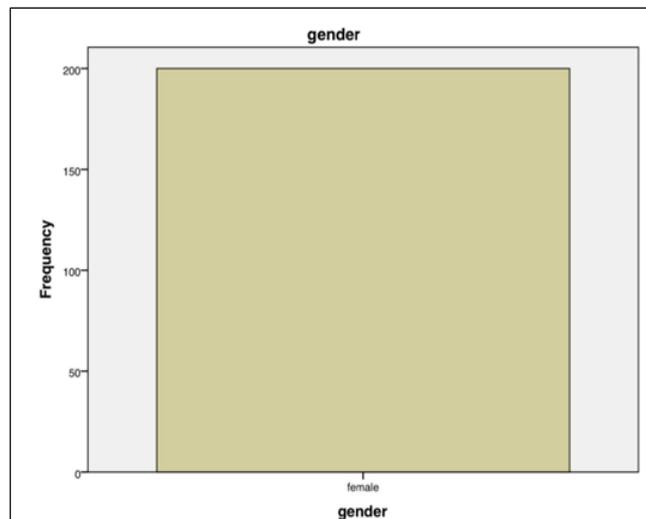


Figure 1. Bar Chart and Table Depicting the Gender Involved in the Present Study. In the Overall Study, it was seen that about 100 % were Female Population used in the Present Study.

| Gender | Percentage in present study |
|--------|-----------------------------|
| Female | 100 % |

Table 1. Depicting the Gender Involved in the Present Study. In the Overall Study, it was Seen that about 100 % were Female Population used in the Present Study.

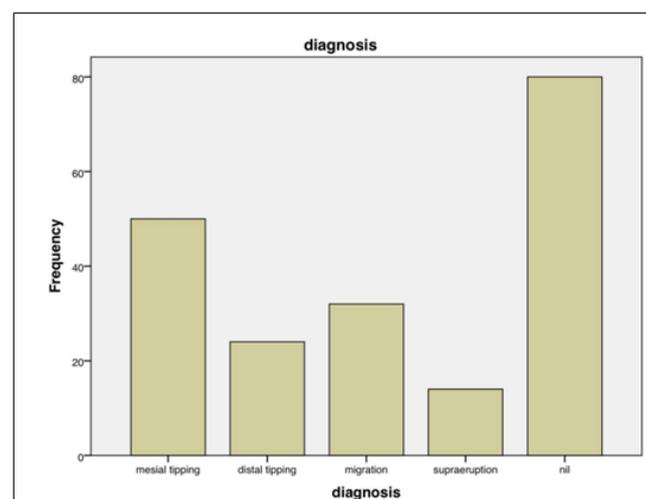


Figure 2. Bar Chart and Table Depicting Age Groups Involved in the Present Study it was Seen that 28 Years, Approximately 33% were Involved, 26 and 29 Years were about 15% and 25 Years Age Group were About 22% and 30 Years Age Group were Found to be About 14 %.

| Age groups | Percentage in present study |
|------------|-----------------------------|
| 25 years | 22 % |
| 26 years | 37 % |
| 28 years | 33.50 % |
| 29 years | 15.50 % |
| 30 years | 14 % |
| Total | 100 |

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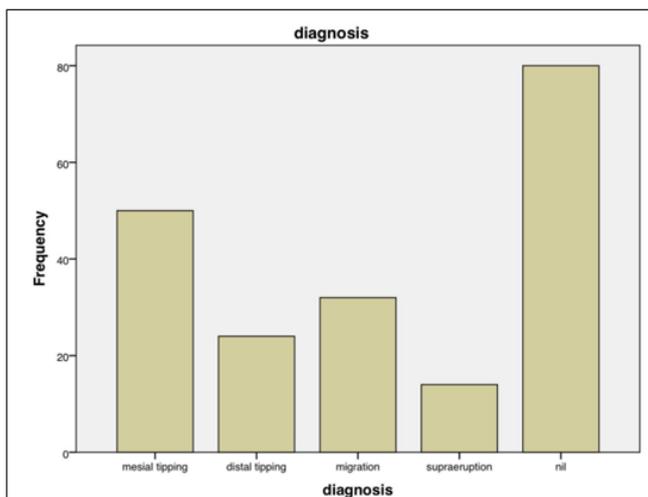


Figure 3. Bar chart and Table Depicting the Orthodontic Diagnosis Made from the Present Study Group. It was Found that 7 % of the Cases from the Overall Study Population reported with Supraeruption, 12 % Reported with Distal Tipping, 16 % were Found to be Migration, 25 % of Mesial Tipping and 40% of the Cases were Found to be with no Individual Tooth Abnormalities.

| Diagnosis | Percentage in present study |
|----------------|-----------------------------|
| mesial tipping | 25 % |
| distal tipping | 12 % |
| supraeruption | 7 % |
| migration | 16 % |
| nil | 40 % |
| total | 100 |

Table 3. Depicting the Orthodontic Diagnosis Made from the Present Study Group. It was Found that 7 % of the Cases from the Overall Study Population Reported with Supraeruption, 12 % Reported with Distal Tipping, 16 % were Found to be Migration, 25 % of Mesial Tipping and 40 % of the Cases were Found to be with no Individual Tooth Abnormalities.

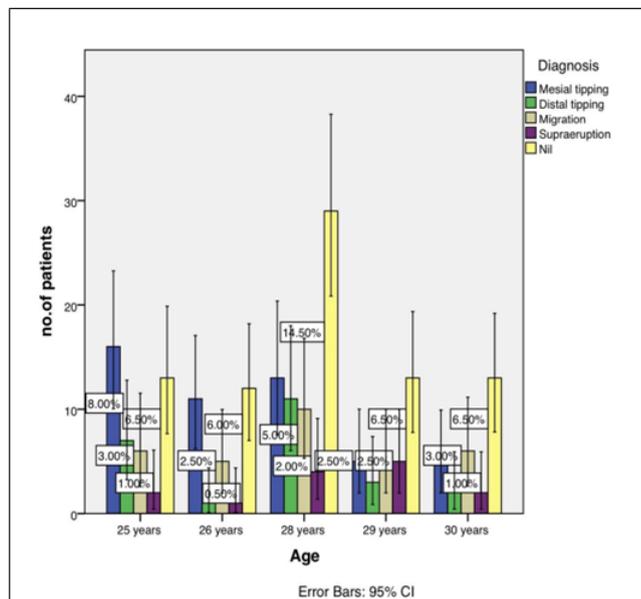


Figure 4. Error Graph Depicting the Comparison between the Age Groups and the Diagnosis Made in the Study Population.

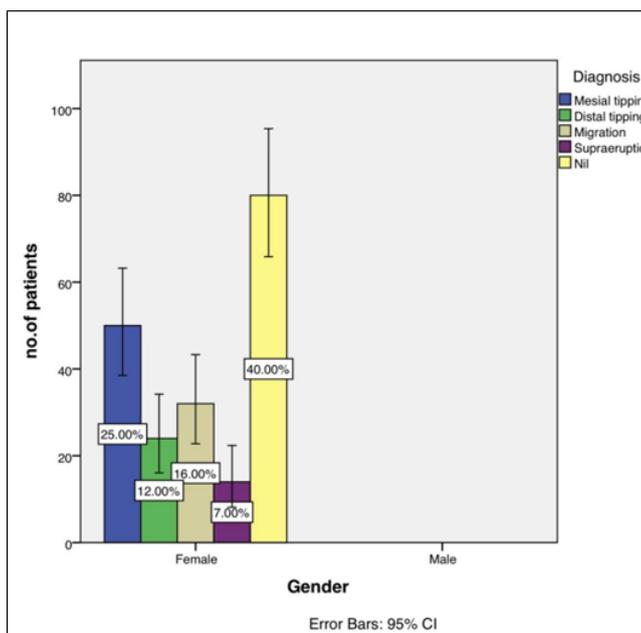


Figure 5. Error Graph Depicting the Comparison between the Gender and the Diagnosis Made in the Group of Study Population.

DISCUSSION

Adjunct procedures to prosthetic rehabilitation in treating cases of hypodontia or missing teeth depend on factors such as degree of edentulous span, alignment of teeth and the amount of space, type of space and the skeletal relation. In previous studies, it was seen that migrations of about 23.9 % was due to any carious defect or any early extraction of the deciduous molars. Tipped and rotated teeth were the most among other dental anomalies. Tipped teeth were found to be about 30 % in the previous studies, whereas rotated teeth were found to be about 45 %. Tipped teeth were mostly seen in the posterior region and were frequently associated with early extraction of the deciduous molars. On the other hand, rotated teeth were seen frequently both in the anterior and posterior teeth and were known to be associated with crowding of teeth. Crowding was the most common dental

anomaly and was recorded about 52.1 % of the population. It was reported a lesser percentage of mild crowding, and 17 % were seen with moderate to severe crowding. Occlusal development was negatively influenced due to mesial migration of the permanent molars (25 %) which in turn causes deviation and rotation of teeth. Previous studies reported most of the supernumerary teeth were found to be mesiodens (1.8 %) and others were paramolars and distomolars. And were commonly seen in the lower arch. Infraocclusion of the first and the second molars were found to be 2 % prevalent among the mixed dentition.²⁹ And 0.3 % of permanent molars in the previous researches were found to be in infraocclusion. Different modalities of prosthetic rehabilitation ranges from restoring esthetics with removable dentures to making implant supported prosthesis. Formulating a treatment plan depends on various factors such as tooth size relationship, severity of malocclusion size and the esthetics of canines. Adjunct orthodontic techniques such as distalization of canine to a region to create adequate space and bone volume for the placement of dental implants have been routinely advocated by various authors.³⁰ Osseointegrated implants can be a diversity treatment option to restore the esthetics with splinting of the prosthesis. The need for any orthodontic treatment has been presented in the literature by means of different indices. The range of the malocclusion trait may reflect the need and the demand for any orthodontic treatment depending on the individual cases. As the need for orthodontic treatment is different among every individual, there are several levels of orthodontic treatment based on socio - economic status and or other ethnic differences. Any orthodontic treatment should be understood as a relative concept and not expressed as a single figure. Prevention and early orthodontic treatment are still being controversial when it comes to cost effectiveness, functional and psycho local benefits. Studies even reported that early diagnosis and treatment of caries and other dental anomalies helps in correcting malocclusion of about 45% - 70 % of the cases. Treatment options in restoring anterior esthetics range from space regaining or closures using adjunct therapies in orthodontics and restoring arch esthetics with fixed tooth supported or implant supported prosthesis. Orthodontic treatment of adults with periodontal disease should be conducted in association with other specialties to achieve good results. Crowding or any rotation may complicate the oral hygiene of the patients, thereby increasing the risk of periodontal disease.³¹ Extraction of first premolar and canines moved distally into the extraction space, incisor alignment facilitated brushing. Thus adjunct therapy in the field of orthodontics helps facilitate and improve periodontal health in many individuals.

CONCLUSION

In the present study, it was found that 7 % of the cases from the overall study population reported with supraeruption, 12 % reported with distal tipping, 16 % were found to be migration, 25 % of mesial tipping and 40 % of the cases were found to be with no individual tooth abnormalities. It can be concluded that there is limited research concerning the effect of adjunct therapy in the field of orthodontics and further studies has to be carried out to improve the treatment plan and for the better treatment outcomes.

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CONFLICTS OF INTEREST

The authors declare that there were no conflicts of interest in the present study.

REFERENCES

1. Tanaka O, Cuoghi O, Tondelli P, et al. Effect of different types of force on the amount of tooth movement hyaline areas and root resorption in rats. *Eur J Gen Dent* 2018; 7(03):66-71. [Google Scholar]
2. Haas FC (1963). An evaporating film calorimetry enthalpy probe. Defence Technical Information Center. [GoogleScholar]
3. Bollen C. Peri-Implantitis: A New Disease. *J Dent Health Oral Disord Ther* 2014;1(3):76-77. [Cross Ref]
4. Watanabe E, Nascimento AP, Guerreiro-Tanomaru JM et al. Antiseptic mouthwashes: *in vitro* antibacterial activity. *Acta Odontol Latinoam* 2015;28(2):180-184. [Cross Ref][Google Scholar][Indexed]
5. Shah HV, Boyd SA, Sandy JR, et al. Aesthetic labial orthodontic appliances – an update. *Orthodo Update* 2011;4:70–77. [Cross Ref][Google Scholar]
6. Bosio J, Del Santo M, Jacob H. Odontologia digital contemporane - scanners intraorais digital. *Orthod Sci and Pract* 2017;355–362.[Google Scholar]
7. Tunes U. Periodontia. *J Public Health Dent* 1970;5(17):1-14 [Google Scholar]
8. R KV, Krishnamurthy VR, Halesha BR, et al. multiple anomalies of thyroid gland: a case report. *J Evol Med Dent Sci* 2014;14694–14697. [Cross Ref][Google Scholar][Indexed]
9. Felicita AS. Orthodontic extrusion of Ellis Class VIII fracture of maxillary lateral incisor - The slingshot method. *Saudi Dent J* 2018;30(3):265–269. [Cross Ref][Google Scholar][Indexed]
10. Chandrasekar R, Chandrasekhar S, Sundari KKS, et al. Development and validation of a formula for objective assessment of cervical vertebral bone age. *Prog Orthod* 2020;21(1):38. [Cross Ref][Google Scholar][Indexed]
11. Arvind PTR, Jain RK. Skeletally anchored forus fatigue resistant device for correction of Class II malocclusions-A systematic review and meta-analysis. *Orthod Craniofac Res* 2021;24(1):52–61. [Cross Ref][Google Scholar][Indexed]
12. Khan A, Verpoort F, Asiri AM (2021). Metal-Organic Frameworks for Chemical Reactions: From Organic Transformations to Energy Applications. Elsevier, Jeddah, Saudi Arabia.1-485.[Cross Ref][Google Scholar]
13. Alam MK, Alfawzan AA, Haque S, et al. Sagittal Jaw Relationship of Different Types of Cleft and Non-cleft Individuals. *Front Pediatr* 2021;5(9):651951. [Cross Ref][Google Scholar][Indexed]
14. Marya A, Venugopal A. The Use of Technology in the Management of Orthodontic Treatment-Related Pain. *Pain Res Manag* 2021;9:5512031. [CrossRef][GoogleScholar][Indexed]
15. Adel S, Zaher A, El Harouni N, et al. Robotic Applications

in Orthodontics: Changing the Face of Contemporary Clinical Care. *Biomed Res Int* 2021;16:9954615. [Cross Ref][Google Scholar][Indexed]

16. Sivakumar A, Nalabothu P, Thanh HN, et al. A Comparison of Craniofacial Characteristics between Two Different Adult Populations with Class II Malocclusion-A Cross-Sectional Retrospective Study. *Biology* 2021;10(5)1-9. [Cross Ref][Google Scholar][Indexed]

17. Venugopal A, Vaid N, Bowman SJ. Outstanding, yet redundant? After all, you may be another Choluteca Bridge. *Semin Orthod* 2021;27(1):53–56. [Cross Ref][Google Scholar]

18. Gopalakrishnan U, Felicita AS, Mahendra L, et al. Assessing the Potential Association Between Microbes and Corrosion of Intra-Oral Metallic Alloy-Based Dental Appliances Through a Systematic Review of the Literature. *Front Bioeng Biotechnol* 2021;9:154. [Cross Ref][Google Scholar][Indexed]

19. Venugopal A, Vaid N, Bowman SJ. The quagmire of collegiality vs competitiveness. *Am J Orthod Dentofacial Orthop* 2021;159(5):553–555. [CrossRef][Google Scholar][Indexed]

20. Marya A, Karobari MI, Selvaraj S, et al. Risk Perception of SARS-CoV-2 Infection and Implementation of Various Protective Measures by Dentists Across Various Countries. *Int J Environ Res Public Health* 2021;18(11):5836-5848 [Cross Ref][Google Scholar][Indexed]

21. Ramesh A, Varghese S, Jayakumar ND, et al. Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients – A case-control study. *J Periodontol* 2018;89(10):1241–1248. [CrossRef][Google Scholar][Indexed]

22. Arumugam P, George R, Jayaseelan VP. Aberrations of m6A regulators are associated with tumorigenesis and metastasis in head and neck squamous cell carcinoma. *Arch Oral Biol* 2021;122:105030. [CrossRef][GoogleScholar][Indexed]

23. Joseph B, Prasanth CS. Is photodynamic therapy a viable antiviral weapon against covid-19 in dentistry? *Oral Surg Oral Med Oral Pathol Oral Radiol* 2021;132(1):118–119. [Cross Ref][Google Scholar][Indexed]

24. Ezhilarasan D, Apoorva VS, Ashok Vardhan N. Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells. *J Oral Pathol Med* 2019;48(2):115–121. [Cross Ref][Google Scholar][Indexed]

25. Duraisamy R, Krishnan CS, Ramasubramanian H, et al. Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Unoriginal Abutments. *Implant Dent* 2019;28(3):289–295. [Cross Ref][Google Scholar][Indexed]

26. Gothandam K, Ganesan VS, Ayyasamy T, et al. Antioxidant potential of theaflavin ameliorates the activities of key enzymes of glucose metabolism in high fat diet and streptozotocin induced diabetic rats. *Redox Rep* 2019;24(1):41–50. [Cross Ref][Google Scholar][Indexed]

27. Ezhilarasan D. Hepatotoxic potentials of methotrexate: Understanding the possible toxicological molecular mechanisms. *Toxicology* 2021;30:458:152840. [Cross Ref][Google Scholar][Indexed]

28. Preethi KA, Auxilia Preethi K, Sekar D. Dietary microRNAs: Current status and perspective in food science. *J Food Biochem* 2021. [Cross Ref][Google Scholar][Indexed]

29. Mandelaris GA, Huang I, Relle R, et al. Surgically Facilitated Orthodontic Therapy (SFOT): Diagnosis and Indications in Interdisciplinary Dentofacial Therapy Involving Tooth Movement. *Clin Adv Periodontics* 2020;10(4):204–212. [Cross Ref][Google Scholar][Indexed]

30. Kokich VG, Kokich VO. Congenitally missing mandibular second premolars: Clinical options. *Am J Orthod Dentofacial Orthop* 2006;437–444. [Cross Ref][Google Scholar][Indexed]

31. Kokich V. Early Management of Congenitally Missing Teeth. *Semin Orthod* 2005;11:146–151. [Cross Ref][Google Scholar]