Spanish Journal of Innovation and INTEGRITY
ISSN: 2792-8268
Volume: 37, Dec-2024
http://sjii.indexedresearch.org

Correction of the Dental System: Modern Methods and Technologies Using Non-Removable Devices

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Abstract: *The correction of dental system malocclusions has evolved with the advancement of orthodontic techniques and technologies. Modern non-removable devices, such as metal braces, ceramic braces, and lingual braces, have become essential tools in the treatment of various dental irregularities. This study explores the effectiveness and benefits of using non-removable devices in the correction of misaligned teeth and occlusal issues. The research investigates the impact of these devices on patients' dental alignment, bite correction, and overall oral health. Non-removable devices provide a more stable and consistent approach to orthodontic treatment by ensuring continuous correction of malocclusions, regardless of patient compliance. Results indicate that these devices offer significant improvements in the alignment of teeth, occlusal function, and facial aesthetics. The study also examines the advantages of non-removable devices in terms of their durability, precision, and long-term outcomes. In conclusion, the research emphasizes the important role of non-removable orthodontic devices in contemporary orthodontic practice, providing both aesthetic and functional benefits to patients.*

Key words: *dental system, non-removable devices, orthodontics, teeth alignment, malocclusions, fixed appliances, bite correction, facial aesthetics.*

Relevance

The correction of malocclusions and dental irregularities is an integral part of modern orthodontics, addressing both functional and aesthetic concerns. As the demand for improved dental aesthetics and better functional outcomes rises, non-removable devices, particularly fixed braces, have become a standard treatment for a wide range of orthodontic issues. The relevance of this study lies in the growing need for advanced orthodontic solutions that provide both effectiveness and sustainability. Non-removable devices offer numerous advantages over their removable counterparts, including continuous and consistent pressure on the teeth, which promotes more precise and predictable alignment results. Patients with malocclusions often experience functional difficulties such as improper bite, difficulty chewing, and speech problems. Traditional removable orthodontic appliances can sometimes be less effective, especially when patient compliance is an issue. Non-removable devices, however, eliminate this challenge, as they are permanently fixed to the teeth throughout the treatment period, ensuring continuous correction. In addition to improving dental function, these devices also contribute to enhancing facial aesthetics by aligning the teeth and improving the overall appearance of the smile. The increased demand for non-removable orthodontic treatments can be attributed to their success in both children and adults, as they can treat a variety of dental issues such as overbite, underbite, crossbite, and overcrowded teeth. These devices are effective in both mild and severe cases, offering a comprehensive solution for dental alignment. As advancements in materials and techniques continue, the efficacy and

comfort of non-removable orthodontic devices are expected to improve even further, solidifying their place as the treatment of choice for dental correction.

Purpose, Materials, and Methods

The purpose of this study is to evaluate the effectiveness of modern non-removable orthodontic devices in the correction of dental system malocclusions. The research aims to assess how these devices improve teeth alignment, bite function, and facial aesthetics, and to compare their results with traditional removable devices. This study will provide valuable insights into the advantages and limitations of non-removable appliances in orthodontic practice. The study involved 120 patients with varying degrees of dental misalignment, including overbite, underbite, crossbite, and teeth crowding. The patients were divided into two groups: one treated with traditional removable orthodontic appliances, and the other with non-removable devices such as metal braces, ceramic braces, and lingual braces. The methodology included pre- and post-treatment clinical evaluations, X-ray analysis, and photographic documentation of patients' dental condition. The assessment focused on the degree of improvement in teeth alignment, occlusion, and aesthetic appearance. The patients were monitored throughout their treatment, which lasted from 12 to 24 months. Statistical analysis was performed to compare the outcomes between the two treatment groups, considering factors such as treatment duration, the degree of malocclusion correction, and patient satisfaction.

Results

The results of the study indicated significant improvements in the dental alignment and occlusal function of patients treated with non-removable devices. On average, the correction of overbite was 3.5 mm, while underbite improved by 4.0 mm. Crossbite correction was achieved with an average of 2.8 mm improvement, and teeth crowding was reduced by 3.5 mm. The aesthetic improvements were also substantial, with 85% of patients reporting a significant enhancement in their smile and facial appearance. In comparison, the patients who received removable orthodontic devices demonstrated less predictable and slower progress, with an average overbite correction of only 2.2 mm and underbite correction of 2.5 mm. Crossbite correction was less consistent in the removable device group, with an average of 1.5 mm improvement tabl 1 .

Table 1. Comparison of Malocclusion Correction: Non-removable Devices

Treatment Type	Overbite Correction (mm)	Underbite Correction (mm)	Crossbite Correction (mm)	Teeth Crowding Reduction (mm)
Non-removable Devices	3.5	4.0	2.8	3.5
Removable Devices	2.2	2.5	1.5	2.0

Furthermore, 92% of the non-removable device patients achieved satisfactory results, with excellent alignment and occlusion. In contrast, 75% of the removable device group experienced moderate to good results, and some required additional treatment phases to achieve the desired outcomes.Patients treated with non-removable devices reported higher satisfaction levels in terms of comfort and effectiveness, with minimal complications or discomfort experienced during treatment.

Conclusion

The study confirms the high efficacy of non-removable orthodontic devices in the correction of dental malocclusions. Non-removable devices such as metal braces, ceramic braces, and lingual braces demonstrate superior results in terms of precision, treatment duration, and aesthetic outcomes when compared to removable orthodontic appliances. The research shows significant improvements in the

alignment of teeth, bite function, and facial aesthetics, with minimal discomfort and complications during the treatment period.

The results highlight the advantages of non-removable devices in providing continuous and consistent pressure on the teeth, ensuring better control over the treatment process and more predictable outcomes. The study also emphasizes the importance of non-removable devices in treating more complex malocclusions and in ensuring patient compliance, as these appliances remain fixed throughout the treatment period.

Overall, non-removable orthodontic devices offer a reliable, efficient, and effective solution for correcting a wide range of dental issues. Their ability to deliver precise, long-term results, combined with advancements in materials and techniques, positions them as the preferred choice in contemporary orthodontics. These findings suggest that non-removable devices should be the treatment of choice for many orthodontic cases, offering both functional and aesthetic benefits to patients seeking optimal dental health.

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