ADVANCEMENTS IN ORTHODONTIC TREATMENTS

A Case Study on Correcting Occlusion

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INTRODUCTION

Advances in orthodontics in the last several years and in digital development have caused this area of dentistry to change radically and foster significant improvements across various practices. Due to the use of technology, orthodontic treatments have become safer and more predictable, reducing potential risks and enhancing outcomes. Computerized applications and clear aligner technologies have changed the way of correcting occlusion, favored in their predictability and comfort for the patient, which has led to a transformation in patient preference (Adel et al. 9954615).

In this document, I will discuss a clinical case that will be presented that used some of the latest innovations in clear aligner therapy. This case study is about a patient who presents with insomnia and discomfort in the temporomandibular joint (TMJ) and muscles of mastication, where occlusion becomes one of the treatment objectives to achieve a stable and nearly symptom-free position, long-term relief and comfort.

The patient, a 21-year-old male, had been experiencing insomnia and TMJ discomfort for the past year, which significantly affected his daily life. After a thorough examination, it was determined that his occlusion was a contributing factor to his symptoms, emphasizing the importance of addressing occlusion to improve overall quality of life. Traditional orthodontic treatment options were considered.

CASE STUDY

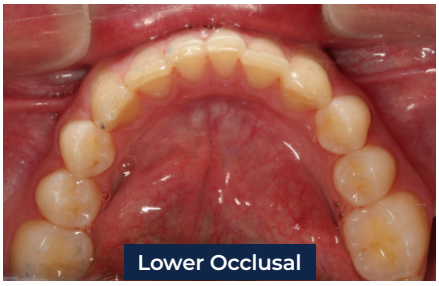
Patient with Insomnia and TMJ Discomfort

This case study highlights a less complex orthodontic treatment for a patient suffering from insomnia, episodic clenching, headache, cervical pain, and TMJ pain, all of which have been significantly impacting the patient's quality of life and daily functioning. It was decided to use NDX Aligners due to their effectiveness in addressing similar symptoms and their non-invasive nature. Thorough analysis revealed that both a deep overbite and a deep curve of spee were aggravating factors that contributed to the patient's condition. The main treatment goals included the reduction of the curve of spee and the upright positioning of mandibular molars (with slight extrusion) to improve the anterior/posterior relationship and ensure stabilization of occlusion. **The first set of photos are before treatment.**


Front Buccal


Left Buccal


Right Buccal


Lower Occlusal


Upper Occlusal

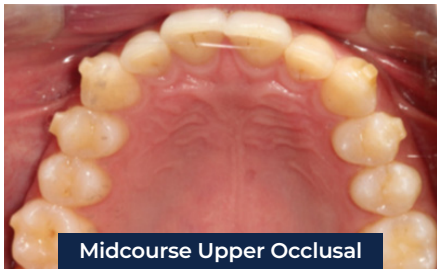
The second set of photos (with attachments) were taken at midtreatment, approximately seven months after the beginning of the treatments. The photos show the significant change in the vertical dimension of occlusion (VDO), a crucial parameter, with the refinement being implemented to decrease the curve of spee and secure the second molar occlusion. These photos exhibit a significant difference, showing the considerable change in occlusion.

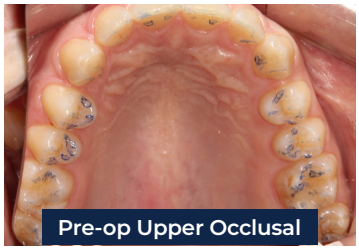

Midcourse Front Buccal

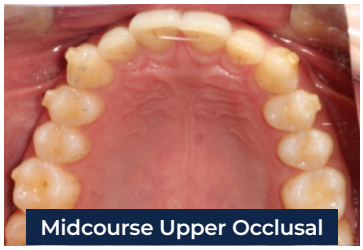

Midcourse Left Buccal

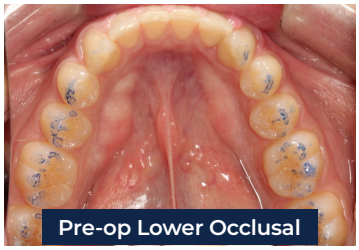

Midcourse Right Buccal


Midcourse Lower Occlusal


Midcourse Upper Occlusal


Pre-op Upper Occlusal


Midcourse Upper Occlusal


Pre-op Lower Occlusal


Midcourse Lower Occlusal


Pre-op Right Buccal


Midcourse Right Buccal


Pre-op Left Buccal


Midcourse Left Buccal

The third set of photos exhibits the before-treatment photos next to the midcourse treatment photos. The articulating paper shows a constricted envelope of function in the anterior and the lack of posterior support on the molars. It is observed that a patient presents with a deep overbite.

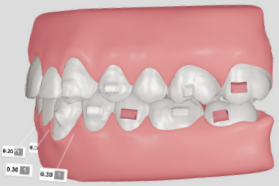
In the midcourse photos, you can see that we are starting to achieve an increase in the vertical dimension of occlusion by aligning the teeth and uprighting the mandibular posterior teeth and palatal arch expansion.

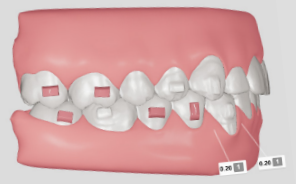
The patient reports that during his first series of aligner therapy with NDX Aligners he has had very little clenching/grinding. At this time, he no longer needs neuromodulators in his master and temporalis muscles.

This is a case study to discuss the theory that creating a more stable posterior occlusion on the molars and decreasing the constriction in the anteriors could then decrease the pressure on the TMJ discs and create a more relaxed position in repose.

Right now, the patient is still undergoing treatment. The NDX team and I agreed on a refinement treatment plan to improve the VDO and stabilize the occlusion further. These screenshots of the treatment plan will show the improvement in opening the VDO and the pursuit of stable occlusion.

Refinement Treatment Plan Design


Left Buccal


Right Buccal

At this time, the treatment with NDX Aligners is highly predictable and is leading to improved aesthetics and a resolution of the patient's symptoms. The comprehensive treatment not only straightened the dentition significantly but also, importantly, increased the vertical dimension of occlusion, which ultimately reduced clenching, thereby improving patient comfort and facilitating a more comfortable daily life. I am very pleased with the progress of the patient's symptoms and improvement in the current treatment plan provided by NDX Aligners.

CONCLUSION

Overall, the findings discussed in this case study demonstrate that modern orthodontic methods and technologies have improved the capacity to rectify malocclusion and increase patient comfort and satisfaction. The patient experienced the alleviation of TMJ pain and related issues due to an accurate occlusal adjustment. Together, these findings confirm the ability of modern orthodontic practices to achieve progress in functional and aesthetic conditions for patients, thereby contributing to more positive experiences. The rising technology promises more future improvements aimed not solely at the efficacy of orthodontic treatment but also at patient comfort. As technology continues to advance in the field of orthodontics, it has significantly improved the accuracy and effectiveness of clear aligner therapy. Computerized applications have allowed for precise planning and treatment, resulting in successful outcomes for patients.

To learn more about NDX Aligners, please visit nationaldentex.com/aligners.

References

Adel, S. et al. (2021) “Robotic applications in orthodontics: changing the face of contemporary clinical care,” BioMed research international, 2021(1), p. 9954615. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1155/2021/9954615.

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