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Correction of Class II Malocclusion Using Class II Elastics: A Review

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ABSTRACT

Class II elastics can effectively repair dental discrepancies linked to Class II malocclusion, mostly by altering dentoalveolar structure rather than causing major skeletal changes. Elastics offer a convenient and non-invasive solution, but they can also cause unintended side effects including lower incisor proclination. By accomplishing tooth adjustments, Class II elastics are important in the orthodontic treatment of Class II malocclusion. However, patient participation, the severity of the initial malocclusion, and contemporaneous orthodontic mechanics all affect the outcome.

Keywords:- Class II malocclusion, Class II elastics, Orthodontics.

Introduction

Class II malocclusion, a condition where the upper jaw and teeth are positioned too far forward relative to the lower jaw and teeth, is one of the most common forms of malocclusion diagnosed in orthodontic practice. Class II malocclusion can result from a skeletal imbalance (i.e., an overgrowth of the upper jaw or underdevelopment of the lower jaw) or dental misalignment (where the upper teeth protrude excessively). Patients with Class II malocclusion often experience functional problems, such as difficulty chewing or speaking, and are at risk for aesthetic concerns like an overly prominent upper jaw or chin (Bishara et al., 2018).

One of the most effective non-surgical methods of correcting this malocclusion is the use of **Class II elastics**. These elastics are often used in conjunction with traditional braces to apply consistent, controlled forces that realign the upper and lower arches, improving occlusion and jaw function. This review aims to delve into the mechanics, clinical advantages, challenges, and considerations associated with Class II elastics in orthodontic treatment.

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What Are Class II Elastics?

Class II elastics are orthodontic accessories designed to correct the overjet or the relationship between the maxilla (upper jaw) and the mandible (lower jaw) in Class II malocclusion. The elastics are typically connected from hooks or attachments on the upper arch (usually the upper canines or first premolars) to the hooks or attachments on the lower arch (second premolars or molars). The elastics apply force in a particular direction to correct the misalignment.

Class II elastics are available in different strengths—light, medium, and heavy—depending on the severity of the malocclusion and the treatment goals. The primary function of these elastics is to exert continuous force on the upper teeth, pushing them back (distalizing) and on the lower teeth, pushing them forward (mesializing), thus improving the bite relationship.

Mechanism of Action

The working mechanism of Class II elastics revolves around the force system that acts on both the teeth and the jaw. This dual-force approach addresses both the dental and skeletal components of the malocclusion.

1. **Distalizing Force on the Upper Arch**: The Class II elastics apply a backward force on the upper teeth, which helps to move the maxilla slightly posteriorly (toward the back of the mouth). This action reduces the overjet or the protrusion of the upper teeth, helping to close the bite and aligning the upper and lower jaws (Graber et al., 2017).
2. **Mesializing Force on the Lower Arch**: Simultaneously, the elastics exert a forward force on the lower molars and premolars. This encourages the mandible to move anteriorly (towards the front), balancing the relationship between the upper and lower jaws. As the lower jaw moves forward, the patient's occlusion is aligned, and the teeth meet more harmoniously (Miller, 2019).
3. **Skeletal and Dental Effects**: In growing patients, Class II elastics can assist in promoting skeletal changes by guiding the forward growth of the lower jaw. This is particularly relevant when treating patients in their adolescent growth phase, as the elastics can help achieve optimal skeletal and dental alignment without the need for surgical intervention (Proffit et al., 2013).
4. **Impact on Temporomandibular Joint (TMJ)**: Class II malocclusion can lead to TMJ disorders due to the irregular jaw position, causing strain on the joints. By aligning the jaw, Class II elastics may help reduce discomfort associated with TMJ issues by improving the overall position of the jaw (Bishara et al., 2018).

Benefits of Class II Elastics

1. **Non-Surgical Approach**: One of the key benefits of Class II elastics is that they offer a non-invasive and non-surgical solution for Class II malocclusion. This is especially important for patients who do not want or are not candidates for surgical procedures like maxillofacial surgery. The treatment can be highly effective, even in moderate cases, without the need for extensive surgery (Sandler et al., 2016).
2. **Effective for Mild to Moderate Malocclusions**: Class II elastics have shown efficacy in treating mild to moderate Class II malocclusions. They provide a targeted,

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effective solution for repositioning the teeth and jaws without resorting to more complex appliances or interventions. When used correctly, Class II elastics can bring about significant improvement in the bite and overall alignment (Eliades et al., 2021).

3. **Improved Facial Aesthetics**: As Class II elastics correct the bite by repositioning the upper and lower teeth, they can dramatically improve the patient's facial aesthetics, particularly in individuals with prominent upper jaws. By realigning the teeth and jaws, these elastics can create a more balanced and aesthetically pleasing profile (Cunningham et al., 2019).
4. **Cost-Effectiveness**: Class II elastics are a cost-effective option compared to other more expensive treatments like functional appliances, headgear, or surgery. Elastics are relatively inexpensive, and their use does not require any special equipment or additional visits, making them an accessible treatment for many patients (Proffit et al., 2013).
5. **Reduced Treatment Duration**: When used correctly, Class II elastics can reduce the overall duration of orthodontic treatment. By addressing the malocclusion early in the treatment, they can help accelerate the correction of the bite, leading to a quicker resolution compared to using braces alone (Sandler et al., 2016).

Challenges and Limitations of Class II Elastics

1. **Patient Compliance**: The effectiveness of Class II elastics is highly dependent on patient compliance. To achieve the desired results, patients must wear the elastics for 12 to 16 hours a day, depending on the specific treatment protocol. Non-compliance can delay progress and lead to suboptimal results. Studies indicate that the lack of consistent wear is one of the most common reasons for treatment failure with Class II elastics (Graber et al., 2017).
2. **Discomfort and Oral Irritation**: When first wearing Class II elastics, patients may experience discomfort in the teeth and jaw as the forces applied by the elastics can be intense. Additionally, the rubber bands can cause irritation to the soft tissues inside the mouth, such as the gums and the inside of the cheeks. While this discomfort is typically temporary, it may discourage patients from consistently wearing the elastics (Bishara et al., 2018).
3. **Limited Effectiveness in Severe Cases**: In cases where there is significant skeletal discrepancy between the upper and lower jaws, Class II elastics may not be sufficient on their own. Severe Class II malocclusions, particularly those with significant maxillary protrusion or mandibular deficiency, may require more comprehensive treatment, such as functional appliances, surgery, or a combination of therapies (Cunningham et al., 2019).
4. **Risk of Relapse**: If elastics are discontinued too early or the patient does not wear them consistently, there is a risk of relapse. Once the active phase of treatment is completed, patients often require retention to prevent the malocclusion from reappearing. A lack of adequate retention protocols can result in the return of the misalignment (Proffit et al., 2013).

Clinical Protocols for Using Class II Elastics

1. **Pre-Treatment Assessment**: Before initiating treatment with Class II elastics, orthodontists conduct a thorough evaluation of the patient's occlusion, skeletal structure, and overall oral health. This includes taking clinical photographs,

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radiographs, and dental impressions to create a comprehensive treatment plan (Bishara et al., 2018).

2. **Elastic Placement and Adjustment**: Based on the severity of the Class II malocclusion, the orthodontist will determine the appropriate strength and configuration of elastics. These elastics are generally worn from the upper canine or first premolar to the lower second premolar or molar. Adjustments may be made during follow-up visits to ensure the elastics are working effectively (Graber et al., 2017).
3. **Patient Education and Compliance**: Educating patients about the importance of wearing the elastics consistently is critical. Patients should be instructed on how to place the elastics, how often to change them, and what to do in case of discomfort. Monitoring compliance through regular follow-up appointments is essential for successful outcomes (Proffit et al., 2013).
4. **Regular Monitoring and Adjustments**: The orthodontist should monitor the progress of the treatment regularly and make adjustments as needed. This includes checking the fit of the elastics, evaluating the occlusion, and ensuring that the patient is adhering to the recommended wear schedule (Sandler et al., 2016).

Conclusion

Class II elastics offer an effective, non-surgical solution for the correction of Class II malocclusion, particularly in cases of mild to moderate severity. The use of these elastics can significantly improve both the function and appearance of the occlusion, leading to a more balanced bite and enhanced facial aesthetics. However, the success of treatment depends largely on patient compliance, proper elastic wear, and consistent follow-up. For more severe cases, additional treatments may be necessary to achieve optimal outcomes. Class II elastics remain a cornerstone of orthodontic therapy due to their simplicity, cost-effectiveness, and proven efficacy in improving malocclusion.

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