

Orthodontic Management Approaches of Class II Malocclusions

Anas Qahtan Hamdi

College of Dentistry, Tikrit University, Iraq

Abstract

Class II malocclusion represents an important concern in orthodontic practice, accounting for approximately 25–33% of malocclusions encountered in orthodontic treatment. The aim of this work was revisiting and summarizing treatment modalities for class II malocclusion.

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Email: anaqahntan@tu.edu.iq

Introduction

Dental occlusion refers to the way teeth contact and function against one another. Nevertheless, occlusion encompasses more than the static relationship between the dental arches; it includes the morphology and inclination of the teeth, the activity of the muscles, the craniofacial skeletal components, the temporomandibular joints, and the dynamic movements of the mandible, all of which depend on precise neuromuscular coordination [1,2].

Malocclusion is generally defined as a deviation from the accepted range of normal dental occlusion [3]. Its development may be influenced by hereditary or genetically determined factors [4]; however, in many individuals, malocclusion results from the combined effects of genetic predisposition and environmental influences [5]. Despite extensive research, the multifactorial etiology of malocclusion remains complex, and several aspects of its development are yet to be fully understood.

Class II malocclusion represents an important concern in orthodontic practice, accounting for approximately 25–33% of malocclusions encountered in orthodontic treatment [6]. In contrast, discrepancy between the upper and lower dentitions. This dental discrepancy may occur independently or in association with an underlying skeletal imbalance [6].

Literature Review

Ideal Occlusion

Although it is a theoretical idea based on tooth anatomy and is seldom, if ever, observed in nature, it offers a benchmark for evaluating all other occlusions [3].

A normal occlusion is one that meets both functional and cosmetic standards, yet each tooth has a few small abnormalities [7].

Incisor Classification

The following is how the British Standards Institute classified incisor relationships:

- Class I: The lower incisor edges lay directly underneath or occlude with the upper central incisors' cingulum plateau, which is the center portion of the palatal surface.
- Class II: There are two types of Class II malocclusion, with the lower incisor margins located posterior to the upper incisors' cingulum plateau:
 - o Division 1: The upper central incisors have a greater overjet and are proclined or of average inclination.
 - o Division 2: The overjet is typically normal in size but may be larger; the upper central incisors are retroclined (less than 105° to the maxillary plane) [10]:
- Class III: The upper cingulum plateau is situated in front of the lower incisor borders.
- Class III: The overjet may be diminished or inverted, and the lower incisor margins are

located anterior to the upper incisors' cingulum plateau.

Class II Malocclusion

Since class II malocclusions account for 25–33% of the cases that professional orthodontists treat, they are of interest to them. The quantity of development in people with adequate occlusion and skeletal relationships, producing attractive profile. The maxillary and mandibular dentitions have an anteroposterior discrepancy [6].

Classification of Class II Malocclusions

It is characterized by a distal positioning, exceeding approximately half the mesiodistal width of the cusp. Malocclusion position of the maxillary central incisors classified into:

- an enlarged overjet, a moderately small maxillary arch, and an overbite that ranges from a deep to an open bite (Figure 1).

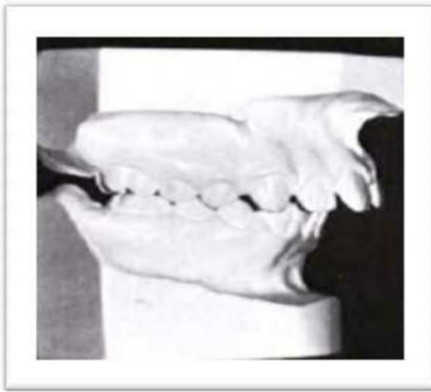


Figure 1. Proclined maxillary central incisors.

Diagnosis

Class I is defined when the mandible is two to three millimeters behind the maxilla. Class II is defined when the maxilla and mandible are retruded. Class III is defined when the mandible protrudes in relation to the maxilla [16].

Looking toward the horizon or a far-off object while standing or sitting upright—but not lounging in a dentist chair.

When the head is in this posture, observe the connection between two lines: one that extends downward to the chin and another that drops from the bridge of the nose to the base of the top lip [17]. requires the patient to be positioned in the head position, which is the physiologic natural head posture. An angle between them denotes either profile concavity (upper jaw behind chin) or profile convexity (upper jaw prominent in relation to chin). Therefore, Class II is indicated by a convex shape, whereas a Class III is indicated by a concave profile [17].

Diagnostic Records

It is crucial to keep in mind that the records are an addition to, not a substitute for, the clinical examination, which is the primary source of information for clinical diagnosis [17].

Radiographic Examination

When skeletal abnormalities or when anteroposterior movement of the incisors is necessary, a lateral cephalometric radiograph is recommended [11].

The front teeth are regarded as proline if the angle is fewer than the mean of 130° or more acute [12].

Treatment of Class II

Treatment of non-skeletal during the early mixed dentition should only be treated if gaps between them, are unsightly, or provide a risk of traumatic damage [15].

This problem is frequently the result of prolonged thumb sucking in children without skeletal abnormalities. It is advisable to break the thumb habit before moving your teeth [17].

Treatment of children's skeletal issues during the mixed dentition, the headgear can be

utilized. However, to install the most functional equipment, the incisors' location and connection must be acceptable [20]. Method of action and objectives of headgear treatment to change the pattern of bone apposition at these locations, a helmet meant for growth modification is made to provide a sufficient retention [21].

While the main goal of posterior and superior extraoral orthopedic forces is to prevent the maxilla's anterior and inferior growth, they also prevent the maxillary posterior teeth's mesial and occlusal eruption [19].

The primary objective of headgear therapy is to limit or redirect development of the continued mandibular growth, thereby providing an opportunity for the mandible to achieve a more favorable anteroposterior relationship with the maxilla [18]. The term *headgear* generally refers to an orthodontic appliance designed to apply push in a posterior direction to the maxillary complex. It typically comprises a metal framework supported externally by a connected intraorally to an appliance secured to the maxillary teeth [18].

The facebow represents the most widely used type of headgear. It consists of a heavy-gauge wire assembly formed by an outer bow, which provides the extraoral connection, and an inner bow that engages tubes positioned on the bands. Depending on the treatment requirements, the facebow may be incorporated into either a fixed or removable maxillary orthodontic appliance [20].

Treatment depends mainly on the patient's age, growth potential. In growing patients, early treatment may be used to correct unfavorable skeletal and dental relationships [21]. Headgear and other extraoral items can be utilized to regulate maxillary development and enhance the anteroposterior relationship [11]. Orthodontic appliances can be utilized to enhance incisor position in situations when protruding maxillary incisors are the primary cause of increased overjet. Fixed orthodontic appliances using extraction or non-extraction techniques may be used in the permanent dentition [22].

For older teens and adults with mild-to-moderate skeletal Class II abnormalities, dental camouflage may be an option. When necessary, the extraction of the upper first premolar may create room for the maxillary front teeth to retreat [19]. The molar and canine connections can also be enhanced with class II interarch elastics. To accomplish proper skeletal and face correction in severe skeletal Class II instances in adults, orthognathic surgery in addition to orthodontic therapy may be necessary [23].

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