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Orthodontic Management of Class II Malocclusion: Diagnosis, Treatment Options, and Clinical Considerations

Dra. Arlety Acosta Muy

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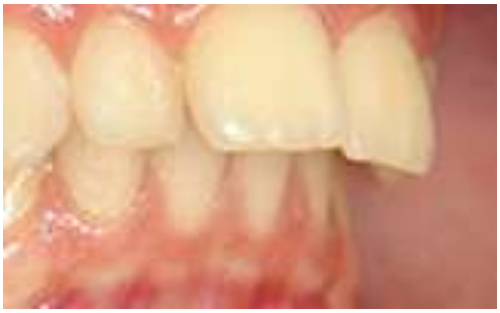
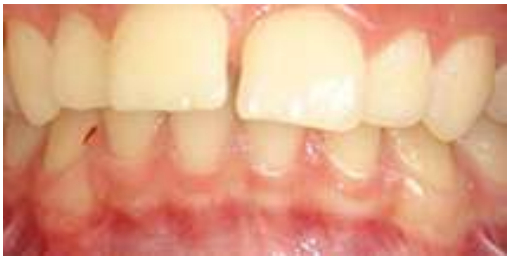
ABSTRACT
Class II malocclusion is one of the most common orthodontic problems, characterized by a discrepancy in the sagittal relationship between the maxilla and mandible. Its etiology may involve skeletal, dental, or soft-tissue components. Successful treatment requires a comprehensive diagnosis, proper case selection, and intervention at an appropriate growth stage. This article reviews the classification, diagnostic tools, and evidence-based treatment modalities—including growth modification appliances, extraction vs. non-extraction strategies, and orthodontic-surgical approaches—for patients with Class II malocclusion.





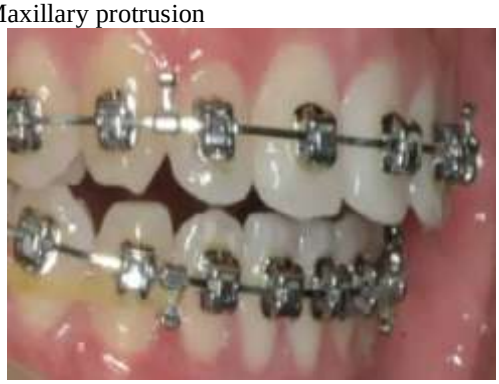
I. INTRODUCTION

Class II malocclusion affects approximately 15–20% of orthodontic patients worldwide. It is defined by an anteroposterior relationship where the mandible is positioned posteriorly relative to the maxilla or where the maxilla is positioned too far anteriorly. This condition can present as:
-Skeletal Class II
-Dental Class II
-Combination of skeletal and dental factors
-Understanding whether the etiology is skeletal or dental is essential for choosing the correct treatment plan. Growth modification appliances are primarily effective during adolescence, whereas adults may require camouflage orthodontics or orthognathic surgery.

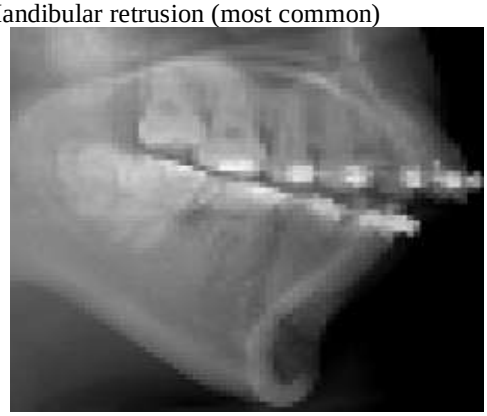
II. ETIOLOGY OF CLASS II MALOCCLUSION

2.1 Skeletal Factors

-Maxillary protrusion



-Mandibular retrusion (most common)



-Vertical growth pattern leading to clockwise mandibular rotation

2.2 Dental Factors

-Proclined maxillary incisors
-Retroclined mandibular incisors
-Molar relationship discrepancy due to premature tooth loss or drifting

2.3 Soft Tissue / Habits

-Mouth breathing

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-Improper tongue posture

III. DIAGNOSIS

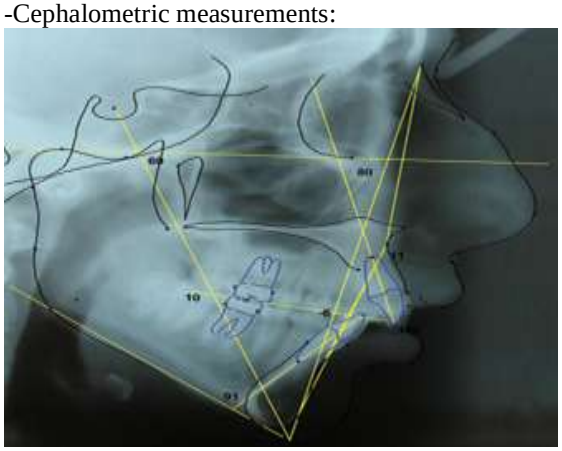
-Accurate diagnosis requires:

3.1 Clinical Examination

-Facial profile (convexity)
-Overjet measurement
-Lip competence
-Gingival display

3.2 Radiographic Analysis

-Cephalometric measurements:



-SNA, SNB, ANB
-Wits appraisal
-Growth pattern (FMA, SN-MP)

3.3 Dental Casts / Digital Scans

-Arch length analysis
-Molar and canine relationship
-Symmetry evaluation

3.4 Photographic Records

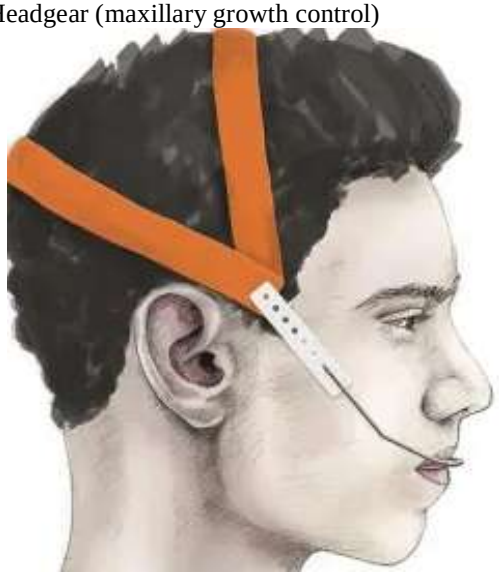
-Smile analysis
-Profile changes

IV. TREATMENT APPROACHES

4.1 Growth Modification (Ideal for 10–14 years old)

-Used when patient is still growing.
-Common Appliances

-Herbst appliance
-Twin Block appliance
-Functional appliances (e.g., Bionator)
-Headgear (maxillary growth control)



Objective: Correct skeletal discrepancy by stimulating mandibular growth or restricting maxillary growth.

4.2 Orthodontic Camouflage (Teenagers & Adults)

-Used when skeletal discrepancy is mild to moderate.
-Strategies
-Class II elastics
-Distalization of upper molars (Pendulum, Miniscrew-supported devices)
-Non-extraction vs. extraction:
-Upper premolar extractions for severe overjet
-Lower premolar extractions only in selected cases
-5.3 Surgical-Orthodontic Treatment (Adults with Severe Skeletal Class II)

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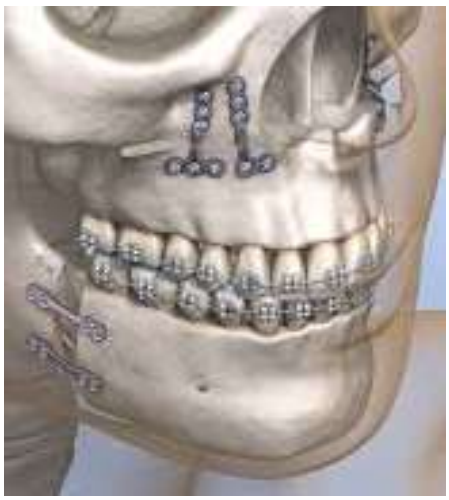


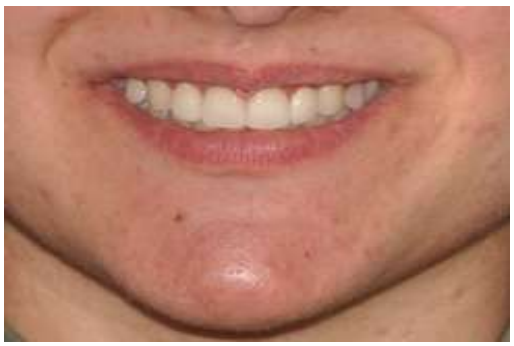
Indicated when:
-ANB > 6°
-Mandibular retrusion severe
-Soft tissue imbalance (deep mentolabial fold, lip incompetence)

Procedures
-Mandibular advancement (BSSO)
-Bimaxillary surgery in complex cases
-Expected outcome: Improved function, occlusion, and facial esthetics.

V. CLINICAL CONSIDERATIONS

5.1 Age
-Growing patients → orthopedic correction possible
-Adults → camouflage or surgery

5.2 Soft-Tissue Profile
-Orthodontic treatment should respect:
-Lip support
-Smile dynamics
-Chin projection



5.3 Skeletal vs Dental Contribution
-Correct classification determines treatment success.

VI. DISCUSSION

-Class II malocclusion is multifactorial, and treatment must be tailored based on age, growth potential, and severity. Functional appliances remain the gold standard for growing patients, offering significant skeletal and dental improvements. In adults, elastics and distalization can produce good results but cannot fully correct severe skeletal discrepancies, where orthognathic surgery becomes necessary. Advances such as miniscrew anchorage have improved control and efficiency during treatment.

VII. CONCLUSIONS

-Class II malocclusion requires a comprehensive diagnostic approach that incorporates skeletal, dental, and soft-tissue analyses. Treatment options vary from growth modification in children to orthodontic camouflage and surgical intervention in adults. Individualized treatment planning is essential to achieve functional occlusion, facial harmony, and long-term stability.

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