INTERCEPTIVE TREATMENT OF ANGLE CLASS III MALOCCLUSION THROUGH TEMPORARY PROSTHETIC REHABILITATION WITH FUNCTIONALLY GUIDED OVERLAY CROWNS

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Abstract
Background. Class III Angle malocclusion represents a major challenge in modern orthodontics due to its multifactorial etiology, clinical variability, and increased risk of relapse during the growth period. Early diagnosis and interceptive intervention are essential for guiding craniofacial development and reducing the complexity of subsequent treatment. Among the objectives of orthodontic treatment are the correction of anterior crossbite, elimination of functional dysfunctions, and creation of favorable conditions for harmonious development of the maxilla and mandible, thus contributing to the balanced formation of the stomatognathic system.
Objective of the study. To highlight the particularities of interceptive treatment of Class III Angle malocclusion using temporary prosthetic restoration in mixed dentition, employing functionally guided partial crowns.
Material and Methods. The study is based on a synthesis of the scientific literature and on clinical experience gained in the interceptive treatment of children with Class III malocclusion. The method consists of the use of acrylic overlay crowns that cover the occlusal surfaces, increase the vertical dimension of occlusion (VDO), eliminate occlusal interferences, and facilitate the "occlusal jump By rotating the occlusal plane and repositioning the mandible posteriorly and superiorly, favorable conditions are created for functional reorganization of the temporomandibular joint (TMJ) and harmonious jaw development. The method was applied to a 6-year-old patient in early mixed dentition diagnosed with mandibular prognathism and anterior crossbite. Cephalometric investigations confirmed a tendency toward skeletal Class III malocclusion. Treatment included professional cleaning, intraoral scanning, digital planning, and fabrication of functionally guided partial crowns using specialized software.
Results. After treatment, improvement of the facial profile, harmonization of facial thirds, and achievement of Class I molar and canine relationships with controlled overcorrection were observed. The method ensured occlusal stability and superior functional and esthetic comfort compared to conventional interceptive methods.
Conclusions. Interceptive treatment guided by overlay crowns represents an effective and minimally invasive alternative for early management of Class III malocclusion, promoting physiological adaptation of the stomatognathic system and harmonious craniofacial growth guidance.
Keywords: Class III malocclusion, interceptive treatment, temporary prosthetics.

Introduction

Skeletal Class III anomalies according to Angle represent one of the most complex challenges in modern orthodontics due to their multifactorial etiology, variability of clinical manifestations, and unpredictability of long-term treatment stability [1]. Etiologically, Class III malocclusion results from the interaction of genetic,

functional, and environmental factors. Genetically determined forms are usually associated with a more reserved prognosis, while functional and environmentally influenced forms may be related to tongue posture, parafunctional habits, and oral breathing [6,11].

The prevalence of Class III anomalies varies depending on the population. In European countries it is significantly lower than in Asian regions, ranging between 1.2% and 6.5%. According to data reported by associate professor V. Trifan, in the Republic of Moldova the prevalence is approximately 2.2%, with an increase of 0.7% in recent years [14,15].

Clinically, Class III malocclusion can be classified into dento-alveolar, skeletal, and functional forms, which is essential for diagnosis and prognosis. Early diagnosis, ideally during primary or mixed dentition, requires careful analysis of facial, occlusal, and cephalometric characteristics. It is known that the severity of Class III tends to increase during active growth, especially in adolescence [17,16].

Interceptive treatment aims to create a favorable environment for growth, correct negative overjet, stimulate maxillary growth, and control mandibular growth, while reducing compensatory mechanisms and the complexity of later treatment. Early intervention also has an important psychological impact by preventing the development of facial appearance-related complexes [9].

Objective of the study: To highlight the particularities of interceptive treatment of Angle Class III malocclusion using temporary overlay crowns.

Material and methods

The study is based both on a narrative synthesis of the specialized literature and on clinical experience gained from the application of interceptive treatments in children with Class III Angle malocclusions.

Among traditional early treatment methods are both intraoral appliances and devices from the field of dentofacial orthopedics, often used in combination to optimize therapeutic outcomes. Functional appliances such as the Frankel type III, Balters' Bionator, as well as rapid maxillary expansion associated with the Delaire facemask, have long been considered the "gold standard" in the orthodontic-orthopedic treatment of Class III malocclusion. [3, 5, 10, 13]

A therapeutic alternative consists of using two acrylic occlusal splints combined with Class III elastics and a chin cup. A modification of this technique involves combining the two acrylic splints with PowerScope-type systems adapted for Class III treatment, with the aim of stimulating maxillary advancement and controlling mandibular growth. However, proper adaptation of the splints remains a critical factor in achieving stable results. [7, 8]

Considering the limitations and disadvantages of the aforementioned methods, an interceptive approach based on guided orthodontics through temporary prosthetic restoration using acrylic overlay crowns has been proposed. The technique is used as interceptive treatment in skeletal Class II, deep bite, functional mandibular displacements, as well as in early or functional Class III Angle malocclusion.

In Class III cases, anterior premature contacts are frequently encountered, leading to anterior displacement of the mandible and muscular adaptation to this position. The proposed method involves physiological compensation of the malocclusion through three mechanisms: vertical compensation by increasing the vertical dimension of occlusion (VDO), compensation at the level of the temporomandibular joint (TMJ), and dentoalveolar compensation by correcting occlusal contacts.

The concept involves fabricating full-coverage crowns from biocompatible and aesthetic material, which increase the vertical dimension by covering occlusal surfaces, eliminating mandibular interferences and facilitating the "occlusal jump." Clockwise rotation of the occlusal plane occurs, resulting in posterior and superior displacement of the mandible, with modification of the vertical component. In this context, posterior facial height may decrease, while anterior facial height may remain constant or slightly increase due to the forward and downward displacement of the chin. This mechanism explains why the method predominantly affects the mandible. However, the technique does not directly stimulate the maxilla, which is why it is not

indicated in cases of severe maxillary retrognathia, where active maxillary treatment methods such as rapid maxillary expansion combined with a Delaire facemask are required. [2, 4, 12]

Mandibular repositioning is achieved by the dental technician through the creation of an occlusal surface that promotes mandibular retrusion. The idea consists in shaping the crown cusps so that, for each millimeter of sagittal discrepancy, 2 degrees of inclination are added to the active cusps of the maxillary teeth and 2 degrees are reduced from the inclination of the active cusps of the mandibular teeth. At the same time, the angles of the cusps modeled by the technician must not exceed the angle of the condylar path.

Mandibular repositioning occurs not only at the dental level but also at the level of the temporomandibular joint (TMJ), which undergoes changes and remodeling processes. For this reason, it is important that the patient has high growth potential so that articular changes can occur. Increasing the VDO leads to relaxation of the muscles and articular ligaments. At the joint level, the condyle moves from its reference position to a therapeutic position. In Class III patients, the condylar head is typically positioned anteriorly and inferiorly. During mandibular repositioning, this is considered the initial position (reference point). Following intervention, the therapeutic position is achieved by posterior rotation of the mandibular condyle within the glenoid fossa. Thus, the condyle attains a higher, more centralized or slightly distalized position in the articular fossa, eliminating anterior loading of the TMJ.

Considering the capacity for tissue restructuring and reorganization in a growing organism, these displacements are regarded as physiological and may further stimulate normal development of both the joint and the jaws. Therefore, compensatory mechanisms activated during therapy contribute to growth stimulation without overloading the stomatognathic system.

Precise modeling of the occlusal surface of the crowns, compared to splints or occlusal platforms, allows superior adaptation and a well-defined occlusal morphology, which guides controlled repositioning and stabilization of the new mandibular position. In skeletal Class III cases, controlled overcorrection toward a slight Class II dental relationship may be achieved in order to maintain long-term stability.

Clinical Case Description

The patient, a 6-year-old boy in mixed dentition, was diagnosed with mandibular prognathism. The main complaint was: “the upper front teeth are positioned behind the lower ones”.

Extraoral examination revealed increased lower facial height, lip strain during closure, and a slightly tense facial appearance. Anterior facial divergence and a slightly concave profile were observed. The nasolabial angle was straight to obtuse. The smile had an unaesthetic appearance with limited visibility of the maxillary teeth.

Figure 1. Extraoral appearance of the patient.

Intraoral examination revealed early mixed dentition, wear of primary incisors, partially erupted mandibular central incisors, and the presence of first permanent molars. Bilateral molar relationship corresponded to Angle Class III, with a 2 mm anterior crossbite.

Figure 2. Intraoral photographs of the patient.

Cephalometric analysis revealed: SNA = 85.2°; SNB = 84.8°; ANB = 0.4°; Wits = –3.2 mm.

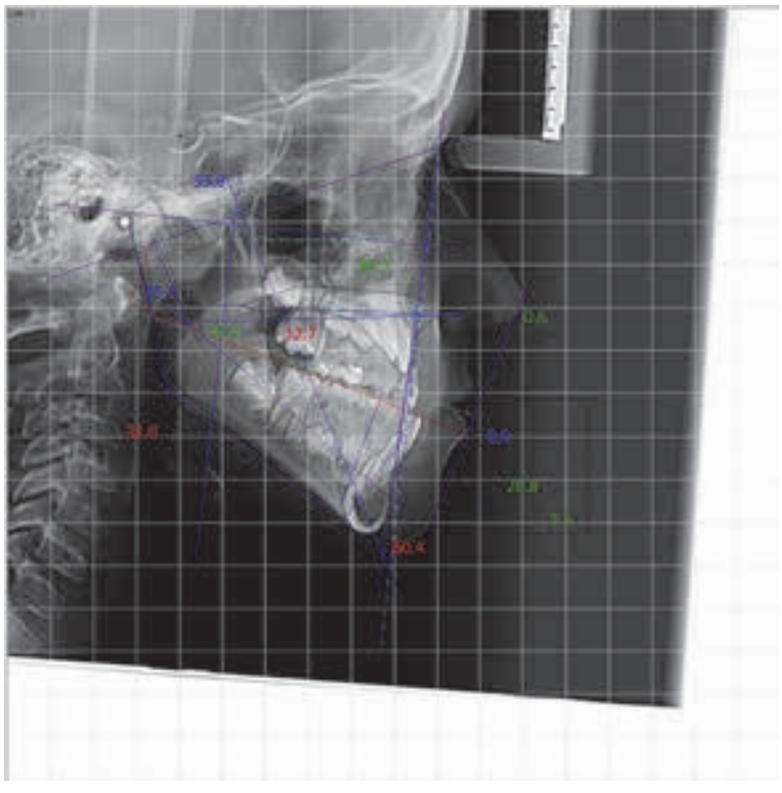

Figure 3. Patient's cephalometric X-ray.

Steiner Cephalometric Analysis

	Norm	Value	Trend
S-N-A Angle	80.5 °	85.2	2+**
S-N-B Angle	79.2 °	84.8	2+**
A-N-B Angle	1.3 °	0.4	
S-N-D Angle	76.0 °	81.2	2+**
Upper 1 to N A Distance	4.0 mm		
Upper 1 N A Angle	22.0 °		
Lower 1 to NB	4.0 mm	3.5	
Lower 1 N B Angle	25.0 °	28.1	
Pogonion to N B Distance	3.0 mm	−0.5	3−***
Holdaway Difference	3.3 mm	4.0	
Interincisal Angle	132.8 °		
Occlusal Plane to SN	12.2 °	18.3	2+**
S-N to Gonion-Gnathion Angle	31.6 °	35.2	1+*

Figure 4. Cephalometric analysis of the patient's lateral cephalogram according to Steiner.

These values indicated anterior positioning of both jaws relative to the cranial base, with a slight skeletal tendency toward Class III.

Treatment objectives included correction of anterior crossbite, elimination of functional mandibular deviation, removal of occlusal interferences, and creation of favorable conditions for harmonious maxillary growth.

Treatment protocol included professional hygiene, photographic documentation, and intraoral 3D scanning. Digital models were mounted in a virtual articulator, and overlay crowns were designed using Exocad software and subsequently cemented in the oral cavity.

Figure 5. Acrylic crowns on the model.

Immediately after cementation, dental disocclusion with a 4 mm vertical open bite and a Class I molar relationship was observed, creating the conditions necessary for an "occlusal jump" and posterior mandibular repositioning.

Figure 6. Intraoral photos immediately after placement of the crowns.

Figure 7. Facial appearance of the patient immediately after crown placement.

The patient and her parents were instructed on maintaining proper oral hygiene and were monitored at two-month intervals.

Results and discussions

At follow-up evaluations, significant facial changes were observed, including progressive harmonization of the profile, transition from a concave to a slightly convex profile, increased fullness of the middle facial third, and improvement in the appearance of the lower third. Intraorally, a neutral molar and canine relationship was achieved, with slight overcorrection, and the upper incisors acquired an appropriate

vestibular inclination. The achieved overcorrection was intentional, in order to compensate for potential relapse tendencies associated with the growth process. Follow-up visits were scheduled until occlusal stability was obtained.

The obtained results support the effectiveness of the method, which, compared to other classical approaches, provides the patient with increased comfort both functionally and aesthetically. The method ensures stability by creating a well-defined occlusal morphology and, due to the maintenance of these overlay-type crowns in the oral cavity until the physiological replacement of primary teeth, may contribute to reducing the risk of relapse, which is frequently encountered during active growth in patients with Class III Angle malocclusion.

Conclusions

Interceptive orthodontic treatment guided by the use of functionally guided partial crowns represents an effective alternative to classical methods for the treatment of Class III Angle malocclusions, offering higher precision while respecting the physiological limits of the human body's adaptability. Slow and controlled guidance stimulates the harmonious restructuring of the components of the stomatognathic system, indirectly influencing the direction and expression of craniofacial growth.

The method is less invasive compared to other interceptive treatment approaches and integrates more easily into the patient's daily routine. Furthermore, it is entirely controlled by the dentist, which represents a major advantage, providing a higher degree of predictability and efficiency, especially in the early stages of craniofacial development.

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PATOLOGIA PARODONTALĂ LA FETE CU DEREGLĂRI HORMONALE ÎN PERIOADA PUBERTARĂ

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Introducere. Statutul funcțional al organismului în pubertate influențează semnificativ sănătatea parodontală. Factorii sistemici, în special dezechilibrele hormonale, joacă un rol esențial în inițierea și progresia acestora în perioada pubertară. Hormonii sexuali (estradiol, progesteron) și prolactina modulează metabolismul gingival și răspunsul imun local, iar fluctuațiile lor cresc susceptibilitatea inflamatorie a țesuturilor parodontale.
Scopul lucrării. Analiza particularităților patologiei parodontale la fete în vârsta pubertară cu maladii ginecologice și cu dereglări hormonale.
Material și metode. Cercetarea dată reprezintă un studiu clinic controlat, efectuat în cadrul catedrei de stomatologie pediatrică „Ion Lupan”. În 2025 au fost selectați 38 de pacienți din secția de Ginecologie infantilă a IMSP „Institutul Mamei și Copilului”. Subiecții au fost repartizați în două loturi: lotul A – cu maladii ginecologice, modificări hormonale și semne clinice de boală parodontală; lotul B – fără semne clinice de boală parodontală.
Metodele de cercetare utilizate: bibliografică, statistică, documentară, clinică, paraclinică.
Rezultate. Prevalența patologiei parodontale la copii a constituit 65,79%. Gingivită cronică catarală a fost stabilită la 88% din paciente, din care generalizată la 60%, iar cea localizată - la 28%. Gingivita cronică hipertrofică generalizată a fost depistată la 12% paciente. Formele moderate ale gingivitelor au fost diagnosticate cel mai frecvent - la 56% pacienți, fiind urmate de cele ușoare - la 36% și severe - la 8%. Frecvența cariei dentare, al anomaliilor dento-maxilare s-au dovedit a fi factori deosebiț de importanți în etiologia, patogenia și evoluția clinică a proceselor inflamatorii a parodonțiului.
Concluzii. Studiul a evidențiat o corelație între patologia parodonțiului marginal și fluctuațiile hormonale, cu implicarea predominantă a progesteronului. Tratamentul patologiei parodontale la paciente în funcție de maladiile ginecologice infantile cu dezechilibru hormonal necesită o abordare complexă, ceea ce presupune în primul rând echilibrarea statutului hormonal, tratamentul patologiei ginecologice, înlăturarea factorilor locali cauzali, tratamentul local antiinflamator, orthodontic ș.a.
Cuvinte-cheie: patologie parodontală; fete cu dereglări hormonale; perioada pubertară.

Introducere

Hormonii, cum ar fi estradiolul, prolactina și progesteronul, condiționează starea metabolică gingivală și răspunsul imun local (9). Fluctuația acestora poate duce la o vulnerabilitate inflamatorie a țesuturilor de susținere dentare. Într-o măsură mai mare, maladiile sistemice, ca de exemplu tulburările hormonale, pot spori acest proces, întocmind un teren favorabil expansiunii patologiei parodontale. În această circumstanță, perceperea corelației dintre patologia ginecologică și dezechilibrul hormonal devine primordial pentru