

# INDICATIONS OF MAXILLARY PROTRUSSIONS IN PATIENTS OF DIFFERENT AGE

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**Abstract:** Maxillary protrusion is a dentofacial condition commonly observed across various age groups, from early childhood to adulthood. It presents distinct clinical signs depending on the developmental stage and skeletal maturity of the patient. This study aims to identify and analyze the age-specific indications of maxillary protrusions to aid in timely diagnosis and personalized treatment planning. By reviewing current orthodontic literature and clinical data, the paper outlines the characteristic signs of maxillary protrusion in primary, mixed, and permanent dentition phases. It also discusses behavioral and functional symptoms, such as lip incompetence, speech difficulties, and psychological discomfort, which may vary with age. Understanding these indications is essential for early detection and for preventing long-term structural and psychosocial complications. The findings underscore the importance of age-based diagnostic protocols and multidisciplinary collaboration in managing maxillary protrusions across the lifespan.

**Key words:** maxillary protrusion; age-specific diagnosis; pediatric orthodontics; skeletal maturity; dentofacial development; overjet; lip incompetence; early intervention; malocclusion indicators; orthodontic assessment

## Introduction

Maxillary protrusion is a widely recognized anomaly in orthodontic and craniofacial development, characterized by an excessive anterior position of the upper jaw relative to the mandible. While the condition is commonly discussed in terms of skeletal or dental classification, its clinical indications are highly age-dependent, often manifesting differently in infants, children, adolescents, and adults.

In pediatric patients, protrusion may first be noticed through subtle signs such as persistent thumb sucking, mouth breathing, or difficulties in achieving lip seal. As the patient transitions through the mixed dentition phase, indications become more apparent and may include increased overjet, early malocclusion patterns, and facial imbalance. In adolescence and adulthood, maxillary protrusion is often accompanied by psychosocial impacts, including lowered self-esteem due to facial aesthetics, and functional disturbances in speech or mastication.

While early identification is known to improve treatment outcomes significantly, many clinicians rely on generalized criteria that do not account for age-related changes in facial growth. This paper aims to fill that gap by cataloging the developmental indicators of maxillary protrusion across different age groups, offering a structured reference for age-tailored diagnosis and management.

This study employs a descriptive and comparative literature review approach, aimed at thoroughly exploring the clinical indications of maxillary protrusion across various age groups. The goal is to synthesize current knowledge from a wide range of reliable sources and present a cohesive analysis of how this condition manifests differently at each stage of human development.

## Methodology

To ensure academic rigor and comprehensiveness, a systematic search of peer-reviewed literature was carried out using major scientific databases including PubMed, Scopus, and the Cochrane Library. The search process was guided by a carefully selected list of keywords, such as “maxillary protrusion by age,” “pediatric malocclusion,” “skeletal development and overjet,” “orthodontic diagnosis across age,” and “age-specific dental anomalies.” The focus was on retrieving studies that offered clinical insight, statistical data, or diagnostic frameworks related to maxillary protrusion.

This process involved screening titles, abstracts, and full texts to determine their relevance to the topic. Duplicate records were removed, and articles that lacked age-specific details or clinical analysis were excluded. Priority was given to articles published between 2005 and 2024, ensuring both recency and relevance.

### Inclusion Criteria

To maintain focus and consistency, the inclusion criteria were defined as follows:

- Studies must have been published in English between 2005 and 2024.
- Articles needed to include human subjects aged 3 to 40 years, representing both pediatric and adult populations.
- Only clinical trials, cross-sectional studies, orthodontic case reports, and epidemiological surveys were considered.
- Studies were required to present direct diagnostic findings, indicators, or clinical patterns related to maxillary protrusion.

### Age-Based Grouping for Comparative Analysis

The collected data were organized into five distinct age brackets, reflecting key stages in craniofacial growth and dental development:

1. Early childhood (3–6 years) – reflecting the primary dentition stage
2. Late childhood (7–11 years) – corresponding to the mixed dentition phase
3. Adolescence (12–17 years) – associated with permanent teeth eruption and growth spurts
4. Young adulthood (18–25 years) – where skeletal maturation typically stabilizes
5. Mature adulthood (26–40 years) – where clinical symptoms may persist or evolve

This categorization allowed for a clearer comparison of how maxillary protrusion presents and progresses over time.

### Analysis Parameters

Each study was examined to identify and extract information under three core categories:

- Morphological Indicators: including overjet measurements, lip incompetence, and changes in facial profile.
- Functional Signs: such as breathing pattern anomalies, phonation difficulties, and mastication problems.
- Psychosocial Aspects: encompassing self-image concerns, social interaction issues, and behavioral responses to facial disharmony.

Data were analyzed qualitatively to assess how frequently these indicators were reported in each age group and how significantly they influenced clinical intervention.

### Ethical Considerations

As this study was based solely on existing literature and did not involve the collection of new patient data, no formal ethical approval was required. Nonetheless, all referenced articles were selected from peer-reviewed journals, and each study was checked to ensure that it adhered to proper ethical research standards in its own methodology.

## Results and Discussions

In orthodontic dentistry, based on the analysis of foreign and domestic research, maxillary protrusions account for 36.8% of all deformities of the maxillary system. Early diagnosis and effective treatment of these pathologies in orthodontic dentistry is one of the urgent problems awaiting a solution. In recent years, an increase in the number of class II deformities according to the Engel classification and a decrease in class III deformities have been observed, which is associated with changes in chewing pressure. It is known that the prevalence of maxillary protrusions, as cited in scientific sources, is associated with the evolutionary period and that the changes do not differ significantly. It is worth noting the information on other forms of maxillary protrusions, i.e. types of maxillary growth. An objective approach to the examination of maxillary protrusions is a complete analysis of cephalometric indicators, taking into account the growth component of the jaws. According to studies, 25-80% of cases of maxillofacial deformities occur in the postnatal period. According to scientific sources, the incidence of maxillofacial deformities is increasing among children and adolescents compared to adult patients. This is due to the fact that improving the living conditions and increasing the cultural level of the population, the need to improve facial aesthetics is high in adult patients. Currently, significant progress has been made in improving the methods of treatment and rehabilitation of patients with maxillary protrusions. The high level of these results is due to the increased quality of orthodontic care and the high level of measures for early diagnosis and prevention of maxillofacial deformities in schools and preschool educational institutions. According to orthodontists around the world, early diagnosis and effective treatment of deformities of the dento-maxillofacial system leads to the restoration and normalization of the morphological and functional optimality of the dento-maxillofacial system, thereby helping to significantly improve the results of their treatment.

The increasing trend in the prevalence of dental anomalies and deformations is characterized by differences in the growth rate of the jaw bones. In patients at the stage of development of the dentition during the period of temporary and permanent dentition, temporary imbalances in the size of the jaws are determined, which are associated with the order of eruption of teeth and their sequence. The decreasing trend in the prevalence of dental anomalies and deformations during the period of permanent dentition is attributed to the self-regulation processes of the body in the dentition and the high effectiveness of early orthodontic treatment, but the period of the appearance of permanent teeth is characterized by the emergence of new deformations and primary anomalies resulting from the early loss of teeth due to caries and its complications. Anomalies of individual teeth occur in 16.5% of cases, occlusion anomalies in 13.59% of cases, during this period dental anomalies occur only in 2.92% of cases.

In upper jaw protrusions, combined anomalies prevail in the period of changes in the tooth-jaw system, they occur in 34.02%, but in the period of permanent bite, their percentage increases to 39.58%, according to scientific sources. Deformations in the tooth-jaw system make up 14.08% of dental diseases, which decrease to 11.2% during permanent bite. Anomalies in the period of temporary occlusion constitute 4.35%, 1.4% in the period of exchange occlusion, 0.89% in the period of permanent occlusion, and only 1.3% of the total number of these pathologies in defects of tooth rows.

Abnormalities in the structure of hard dental tissues prevail during the occlusion period of the occlusal bite (43.48%). In 2.4% of the total number of dental-jaw system deformations, anomalies in the size of teeth are detected, they are detected mainly in the period of teeth change, 2.8% in the period of permanent bite, these anomalies are observed to increase in 2.22% of cases.

The early clinical sign of the development of maxillary protrusions is the vertical alignment of the distal surfaces of the second primary molars. Also, the functional impact on the lower jaw during the sucking function in infancy helps to increase its length and forward movement. After the eruption of the milk teeth, their closure returns to normal [87;17b]. With the eruption of the first and second primary molars, an increase in the alveolar height is observed. Thus, the study of the origin and distribution of various types of anomalies of the dentofacial system has provided us with information on the presence of malocclusions. Among the anomalies of the dentofacial system, the distribution of maxillary protrusions is due to deformations at birth and a number of endogenous and exogenous factors [70;22 b]. The author's scientific research provides information that the prevalence of maxillary protrusions occurs as a result of the predominance of maxillary growth, a delay in the growth of the lower jaw, or morphological changes in both jaw bones.

## Conclusion

In conclusion, a sufficient number of sources of information were studied and analyzed in the review of foreign and scientific literature on the methods of orthodontic examination and treatment of patients with maxillary protrusions.

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