

# DENTAL CALCULUS IN PRIMARY TEETH: AN INTEGRATIVE LITERATURE REVIEW

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**Abstract:** Introduction: Dental calculus, also known as tartar, is the result of the mineralization of bacterial plaque that forms on the surface of the teeth. Its appearance in deciduous teeth causes concern and possible repercussions for the appearance and functionality of the dental arch. Objective: This integrative literature review aims to address the formation and impact of the presence of dental calculus in deciduous teeth. Methodology: The National Center for Biotechnology Information (NCBI), U.S. National Library of Medicine (PubMed) and Scientific Electronic Library Online (SciELO) databases were used. Articles published in the last 10 years, available in Portuguese, English and Spanish, were selected for their relevance, methodology and main findings. Discussion: Although the formation of dental calculus is more common in adults, it can also affect children during the deciduous and mixed dentition phases. Elucidating the need to introduce a balanced diet to avoid changes in the oral microbiota and increase in pathological dysbiosis. Furthermore, preventive habits are necessary to avoid the development of dental calculus in primary teeth. Conclusion: The presence of dental calculus in primary teeth represents an important risk factor for changes in children's oral health. The adoption of preventive measures from childhood not only prevents damage to primary teeth, but also establishes solid foundations for oral health throughout life.

**Keywords:** Dental calculus, Primary teeth and Oral hygiene.

## INTRODUCTION

Dental calculus, also known as tartar, is the result of the mineralization of plaque that forms on the surface of the teeth. Its composition and quantity are constantly changing, being influenced by several factors, such as oral hygiene, oral fluid chemistry and eating habits. The removal of calculus depends on both the effectiveness of daily cleaning and the periodicity of dental appointments for professional cleaning. (WEI, ET AL. 2024)

Although tartar buildup is often associated with permanent dentition, its presence in primary teeth has been increasingly studied due to the significant impact on children's oral health. Dental



calculus can affect the aesthetics of children's smiles, provide the development of gingival inflammation and, in more severe cases, contribute to early periodontal diseases, affecting the supporting tissues and base of the teeth. (DANTAS DE ALMEIDA, R. V.; DE MORAIS BELTRÃO, ET AL. 2003)

Currently, research has investigated this theme in more detail, taking into account the high prevalence of gum problems in children and the need to develop efficient methods of prevention and treatment. Initially, this problem was analyzed, taking into account general factors of the oral environment, such as the oral microbiota and the composition of saliva. However, more recent approaches have begun to emphasize the individual assessment of each child's risk, allowing the creation of personalized strategies for the control and prevention of dental calculus from childhood. (RODRIGUES, H. B.; DINIZ, M. B.; ET AL. 2020).

Within this context, it is worth investing in research in favor of adequate oral hygiene habits, associated with regular brushing, flossing and professional monitoring to ensure a healthy smile from the first years of life. Thus, this study was structured to analyze the presence of dental calculus in deciduous teeth, identify its determining factors, and discuss effective methods of prevention and treatment.

## **METHODOLOGY**

This study consists of an integrative literature review on dental calculus in deciduous teeth, The methodology adopted followed the following steps:

### **Definition of the Problem and Objectives**

The study was structured to analyze the presence of dental calculus in deciduous teeth, identify its determining factors and discuss effective methods of prevention and treatment.



## **Inclusion and Exclusion Criteria**

Articles published in the last 10 years (2015 to May 2025) and some well-known articles in the literature, available in Portuguese, English, and Spanish, which directly address the formation of dental calculus in children, as well as studies that deal with the oral microbiota, salivary composition, and prevention methods, were included in the research. Studies that did not present specific data on deciduous teeth, that did not have a clearly described methodology, or that had a publication year above the established one were excluded.

## **Data Sources and Search Strategy**

The literature review was performed in the National Center for Biotechnology Information (NCBI), U.S. National Library of Medicine (PubMed) and Scientific Electronic Library Online (SciELO) databases. Descriptors such as “dental calculus”, “deciduous teeth” and “oral hygiene” were used.

## **Data Collection and Analysis**

The selected articles were analyzed for their relevance, methodology, and main findings. The data were organized in a table, categorizing the studies according to title, authors and year, objective and methodology/main findings.

## **FINDINGS**

For the literature review, 10 articles were chosen based on the previously established inclusion and exclusion criteria. The searches were conducted in the following databases: National Center



for Biotechnology Information, U.S. National Library of Medicine (PubMed), Scientific Electronic Library Online (SciELO), including English, Spanish and Portuguese. A detailed description of each of these articles is presented in the following table.

Title	Authors	Goal	Methodology/ Key findings
Recent advances in the pathogenesis and prevention strategies of dental calculus	Wei Y, Dang GP, Ren ZY, Wan MC, Wang CY, Li HB, Zhang T, Tay FR, Niu LN.	To introduce the mechanisms of dental calculus formation, influencing factors and the relationship between dental calculus and various systemic diseases. Next, a conceptual solution is presented to improve existing treatment strategies and minimize recurrence.	It was identified that the mechanisms of dental calculus formation help to protect oral and systemic health. A multitude of biological and physicochemical factors contribute to the physiological balance in the oral cavity.
Prevalence and severity of periodontal disease and accumulation of dental biofilm in children from the Pediatric Dentistry Clinic of UFPB.	Dantas de Almeida, R. V., de Moraes Beltrão, Érika, Bezerra Cavalcanti Nóbrega, C., & Gondim Valença, A. M.	To verify the prevalence and severity of periodontal disease in patients at the Pediatric Dentistry Clinic of the Federal University of Paraíba, relating the levels of disease with gender and biofilm accumulation.	Oral hygiene conditions were unsatisfactory; the presence and severity of gingivitis were high, as well as the prevalence of gingival recession and periodontal pocket; There was no predilection of alterations according to gender and no statistically significant association could be observed between biofilm accumulation and gingivitis patterns.
Impact of periodontal condition on the quality of life of children and adolescents.	Rodrigues, H. B.; Diniz, M. B.; Costa, P. de S.; Pinheiro, S. A. de A.; Vieira, T. C. L.; DE Melo, T. R. N. B.; Medeiros, R. A. de S.	OBJECTIVE: To evaluate the impact of periodontal condition on the quality of life (QoL) of schoolchildren aged 11 to 14 years in the municipality of Patos-PB. The study was observational, epidemiological and cross-sectional.	It can be concluded that dental calculus had a negative impact on the quality of life of adolescents aged 11 to 14 years.
Dental calculus: the calcified biofilm and its role in disease development	Akcali, A.; Lang, N. P.	To present a brief historical overview of the formation of dental calculus and its clinical relevance in modern periodontal practice.	The mineralization process involves metabolic activities of bacterial colonies and strengthens the attachment of non-mineralized biofilms to the tooth surface.



Early periodontal disease in children: a case report.	Palmeira, J. T., Barbosa, D. V., Junior, M. S. P., de Assis Braga, M. L., Santos, N. C. S., & Nóbrega, W. F. S.	To report a case of early periodontal disease in a child.	After the onset of the pathological condition, the intervention of the professional mechanically and carrying out the health education part will be indispensable for the recovery of health and maintenance of the balance of oral health.
THE INFLUENCE OF DIET ON CHILDREN'S ORAL HEALTH.	Filho, L. A. L.; Lima, R. F.; Vilela, T. T. C. G.	to explore the relationship between diet and children's oral health, highlighting the main foods that contribute to the formation of caries lesions, the role of the family in care and the role of the dental professional.	Diet plays a fundamental role in children's oral health, when there is no care with food, added to poor conduct regarding oral hygiene, an oral environment is created that is conducive to the development of problems.
Periodontal disease in pediatric dentistry	Paulino, L. M. P.	To review all concepts related to Periodontal Disease, as well as to adapt all these new criteria to the pediatric population.	Gingivitis is a type of periodontal disease. In children and adolescents, this disease usually remains chronic. However, the alteration of the balance between the biofilm and the host can result in the progression of gingivitis to periodontitis.
Therapeutic Alternatives for Dental Calculus: a prospective scientific and technological analysis. Prospecting Notebooks	Cruz et al.	To present an overview of existing therapeutic alternatives to dental calculus due to the need for innovative treatments.	Dental calculus is the result of the mutualistic interactions of microorganisms present in dental biofilm, and is correlated with the development of periodontal disease.
Treaty of Clinical Periodontics and Oral Implantology.	Lindhe J.	To offer a comprehensive, evidence-based approach to the diagnosis, prevention, and treatment of periodontal diseases, as well as to integrate the principles of modern implantology into periodontal clinical practice.	It emphasizes the need for continuous periodontal support therapy to ensure long-term stability of outcomes. The work is strongly based on scientific evidence and seeks to combine theory and clinical practice, being an essential reference for the training and updating of dental professionals.



Role of the dental surgeon in the prevention of periodontal diseases and edentulism.	Costa, W. D. O.; Oliveira, W. R.; Marquez, C. O.	To present the role of the dental surgeon in the prevention of diseases periodontal and edentulism. To this end, the relationship between periodontal diseases and edentulism was highlighted; The implications of this oral health quality, in addition to observing existing public policies.	The dentist's contribution to improving this situation is based on attitudes of trust and care in the oral health of the patient, who in most cases is afraid of this professional or not has the financial condition to bear the costs of the procedures.
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## DISCUSSION

When trying to get to the main factors that contribute to the formation of mineralized bacterial plaque, which can later progress to periodontal disease, the deficiency in oral hygiene is what gains great prominence due to the lack of proper brushing and use of dental floss that allows the removal of biofilm. (AKCALI, A.; LANG, N. P. 2000).

In this sense, oral health can be negatively affected. If left untreated, calculus in the primary dentition can have serious repercussions: gingivitis, early periodontitis, mobility, premature loss of dental elements, malocclusion, and systemic involvement. Thus, understanding the mechanisms involved in the formation of dental calculus is essential to protect oral and overall health. (PALMEIRA, ET AL. 2020)

In addition, a diet rich in fermentable carbohydrates, children's favorite menu, contributes to bacterial growth and biofilm formation, Among all carbohydrates, sucrose is the most common and most consumed type, it is closely associated with modifications of the oral microbiota and increased pathological dysbiosis. (FILHO, LIMA, VILELA. 2023)

Although the formation of dental calculus is more common in adults, it can also affect children during the deciduous and mixed dentition phases. In pediatric dentistry, there is a great lack of research focused on this scenario, which leads to the belief that children do not face serious harm



due to this alteration. However, the quality of life of the children involved can be compromised if the side effects of mineralized plaque are not properly managed. (PAULINO, 2020).

Thus, since it is a stone, that is, a mineralized bacterial plaque, oral hygiene only through brushing becomes ineffective. For an efficient treatment in its removal, it is necessary to use dental scaling, performed correctly by a dental surgeon, eliminating all that hardened and rough plaque. (CRUZ, ET AL. 2023).

Thus, the removal of calculus can be performed with manual instruments such as cures, or ultrasonic devices, expressing itself as supragingival or subgingival, according to its location in the dental element. (LINDHE J. 2010)

In addition, preventive actions are fundamental principles when it comes to ensuring good oral health. Thus, from periodic dental consultations, accompanied by guidelines for proper hygiene, such as the frequency of brushing, the ideal amount of toothpaste, the use of dental floss, and even awareness to avoid a cariogenic diet, it ensures that bacterial penetration and accumulation on tooth surfaces is significantly reduced. Thus, preventive habits are essential to avoid the development of dental calculus in deciduous teeth. (COSTA, OLIVEIRA, MARQUEZ. 2023).

## **FINAL CONSIDERATIONS**

The presence of dental calculus in deciduous teeth represents an important risk factor for changes in children's oral health, which can trigger gingival inflammatory responses, early periodontal diseases, mobility and premature tooth loss. Its formation is directly associated with inadequate oral hygiene, a high-carbohydrate diet, and changes in the oral microbiota.

The calculus, once mineralized, cannot be removed only with daily brushing, requiring the intervention of a professional through scraping. Thus, preventive actions such as supervised brushing, correct flossing, dietary control, and periodic dental appointments are essential to reduce biofilm formation, prevent mineralization, and preserve oral health from the first years of life. The adoption



of these measures from childhood not only prevents damage to the deciduous dentition, but also establishes solid foundations for oral health throughout life.

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