

DENTAL CALCULUS AND CLEANING

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**Annotation.** Dental calculus, commonly referred to as tartar, is a hardened deposit that forms on the teeth due to the accumulation and mineralization of dental plaque. This condition is one of the most frequent oral health problems and affects both children and adults worldwide. Dental calculus can appear above the gum line (supragingival) or below the gum line (subgingival), and it often leads to inflammation of the gums, periodontal disease, bad breath, and tooth decay if left untreated. Its formation is influenced by multiple factors, including oral hygiene habits, diet, saliva composition, genetic predisposition, and lifestyle.

Regular oral hygiene practices, such as proper brushing and flossing, play a significant role in preventing the accumulation of plaque and the subsequent formation of dental calculus. However, once calculus has hardened, it cannot be removed by brushing alone and requires professional dental cleaning, such as scaling and polishing, performed by a dentist or dental hygienist. The removal of dental calculus is essential not only for maintaining oral health but also for preventing systemic health problems, as periodontal disease has been linked to cardiovascular conditions, diabetes, and other chronic diseases.

Scientific studies have shown that the frequency of dental calculus increases with age, and individuals with inadequate oral hygiene are at higher risk. Diet also contributes to calculus formation; foods high in sugars and starches promote plaque accumulation, which eventually mineralizes into tartar. Moreover, tobacco use and certain medical conditions can accelerate the development of dental calculus. Preventive measures, including routine dental check-ups, professional cleanings, and patient education about oral hygiene, are crucial in controlling tartar buildup and promoting long-term dental health.



In conclusion, dental calculus is a common but preventable oral health issue. Maintaining proper oral hygiene, avoiding risk factors, and seeking regular professional dental care are key strategies in preventing and managing tartar formation. Awareness of the causes and consequences of dental calculus can help individuals maintain a healthy oral environment, prevent periodontal disease, and support overall systemic health.

**Keywords:** dental calculus, tartar, oral hygiene, dental cleaning, periodontal health, plaque, prevention

## Introduction

Dental calculus, commonly known as tartar, is a widespread oral health issue that affects people of all ages. It forms when dental plaque—a soft, sticky film of bacteria and food debris—hardens on the teeth due to mineral deposition from saliva. Calculus can develop both above the gum line (supragingival) and below the gum line (subgingival), and its presence is strongly associated with the development of periodontal diseases, gum inflammation, bad breath, and tooth decay. Maintaining oral health requires not only proper daily hygiene but also awareness of the factors contributing to tartar formation.

The formation of dental calculus is influenced by multiple factors, including oral hygiene habits, diet, genetics, saliva composition, and lifestyle choices. Poor brushing and flossing techniques allow plaque to accumulate, which eventually mineralizes into tartar that cannot be removed by regular brushing alone. Certain foods, especially those rich in sugars and starches, contribute to plaque formation, while tobacco use and some systemic conditions can accelerate calculus buildup. Understanding these contributing factors is essential for both prevention and effective treatment.

Regular dental care plays a crucial role in controlling dental calculus. Professional cleaning, such as scaling and polishing, removes hardened tartar that cannot be addressed by home care alone. Such interventions not only restore oral hygiene but also prevent further complications, including periodontal disease, tooth mobility, and systemic health issues, such as cardiovascular problems and diabetes, which have been linked to poor oral health. In addition, patient education about effective oral hygiene practices, including correct brushing and flossing techniques, is vital for long-term prevention.

The prevalence of dental calculus increases with age, and individuals who neglect regular dental check-ups are at higher risk of developing severe oral health problems. Early detection and removal of tartar help maintain the health of teeth and gums, improve oral aesthetics, and enhance overall well-being. Furthermore, understanding the role of preventive strategies emphasizes the importance of routine dental visits and professional care in maintaining oral health.

In conclusion, dental calculus is a preventable but common oral health problem. Awareness of its causes, combined with proper hygiene practices and professional care, is essential for maintaining a healthy mouth and preventing serious dental and systemic complications. This paper aims to explore the causes of dental calculus, methods of prevention, and the importance of professional dental cleaning in promoting optimal oral health.

## Discussion



Dental calculus, or tartar, is a complex oral health issue influenced by multiple interrelated factors. Scientific research indicates that its formation is not solely the result of poor oral hygiene, but also depends on genetic predisposition, diet, lifestyle, and systemic health conditions. Supragingival calculus, which forms above the gum line, is often associated with visible plaque accumulation and can be detected during routine dental examinations. Subgingival calculus, developing below the gum line, poses a greater risk as it is closely linked to periodontal disease and may lead to gum recession, bone loss, and eventual tooth mobility if untreated.

Genetic factors play a significant role in the susceptibility to dental calculus. Studies have shown that variations in saliva composition, tooth morphology, and jaw alignment inherited from parents can influence how quickly plaque mineralizes into tartar. Individuals with naturally higher calcium and phosphate levels in their saliva may experience faster tartar formation. Therefore, genetic predisposition should be considered when designing preventive strategies.

Lifestyle habits are another critical factor. Inadequate brushing and flossing, frequent consumption of sugary or starchy foods, and tobacco use accelerate plaque accumulation, increasing the likelihood of calculus formation. Early intervention and education on proper oral hygiene techniques, including brushing at least twice daily, flossing, and using antiseptic mouth rinses, significantly reduce the risk of tartar buildup. Regular professional dental cleaning remains essential, as hardened calculus cannot be removed by home care alone.

The presence of dental calculus is also linked to broader health implications. Periodontal disease associated with tartar accumulation has been correlated with cardiovascular disease, diabetes, and systemic inflammation. These findings highlight the importance of timely removal of dental calculus and comprehensive oral care as part of overall health maintenance.

Preventive strategies must therefore combine patient education, routine dental visits, and individualized oral hygiene practices. Dental professionals should focus not only on removing existing tartar but also on guiding patients to modify behaviors that contribute to plaque formation. By understanding the causes, risk factors, and health consequences of dental calculus, both patients and clinicians can work together to maintain optimal oral health.

In conclusion, dental calculus is a multifactorial problem requiring a comprehensive approach. Awareness, prevention, and professional cleaning are key to controlling tartar formation and minimizing associated oral and systemic health risks.

## Literature Analysis

Dental calculus has been widely studied in both clinical and academic literature, emphasizing its causes, prevention, and treatment methods. According to Proffit and Fields (2018), dental calculus forms when dental plaque mineralizes due to the presence of calcium and phosphate in saliva. The accumulation of tartar is influenced not only by oral hygiene but also by genetic predisposition, diet, and lifestyle factors. Their research highlights that supragingival calculus is often visible and easier to remove, while subgingival calculus is more challenging to detect and treat, increasing the risk of periodontal disease.

Studies published in the *Journal of Clinical Orthodontics* and *American Journal of Orthodontics and Dentofacial Orthopedics* demonstrate the correlation between dental calculus and systemic health. These studies report that patients with higher tartar accumulation are more susceptible to gum inflammation, periodontal disease, and systemic complications such as cardiovascular



issues and diabetes. The authors emphasize the importance of professional dental cleaning, including scaling and polishing, as a preventive and therapeutic measure.

The World Health Organization (2021) also stresses the global prevalence of dental calculus and highlights oral hygiene education as a key preventive strategy. According to WHO data, inadequate brushing and flossing, combined with poor dietary habits, contribute to rapid plaque accumulation and subsequent tartar formation. Early detection and removal of calculus are therefore essential to maintaining oral and overall health.

Additional literature, such as Pavlova (2018) and Kolesnikov (2017), explores the influence of nutrition and lifestyle on tartar formation. High-sugar diets, tobacco use, and certain systemic conditions can accelerate calculus buildup. These studies reinforce that effective prevention requires a combination of proper home care, patient education, and routine professional dental visits.

In summary, the analysis of current literature indicates that dental calculus is a multifactorial issue. Its prevention and management depend on understanding genetic, environmental, and behavioral factors. Professional cleaning, combined with proper oral hygiene and lifestyle modifications, remains the most effective approach to controlling tartar and preventing associated oral and systemic health problems.

## Results

The analysis of current research and clinical data on dental calculus demonstrates several key findings. First, dental calculus formation is a multifactorial process influenced by genetics, oral hygiene habits, diet, lifestyle, and systemic health conditions. Individuals with poor oral hygiene or high-sugar diets tend to accumulate plaque more rapidly, which then mineralizes into tartar.

Second, professional dental cleaning, including scaling and polishing, is the only effective method to remove hardened calculus. Home care such as brushing and flossing can prevent plaque accumulation but cannot eliminate already mineralized deposits. Regular professional intervention is therefore essential for maintaining oral health.

Third, early detection and prevention of dental calculus are critical in reducing the risk of periodontal disease, gum inflammation, tooth decay, and associated systemic conditions such as cardiovascular disease and diabetes. Preventive measures, including patient education and routine dental check-ups, significantly reduce the likelihood of severe oral health complications.

Finally, literature emphasizes that the presence of dental calculus affects both oral and overall well-being. By addressing the causes, promoting proper oral hygiene, and implementing regular professional care, dental professionals can effectively control tartar formation and maintain long-term dental health.

In conclusion, dental calculus is a preventable oral health issue, and its management requires a comprehensive approach that combines home care, professional cleaning, and lifestyle adjustments. Awareness and timely intervention are key factors in minimizing the negative effects of tartar on oral and systemic health.

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