

# Dental attrition and periodontal disease

Wei Chen

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## ABSTRACT

Tooth Wear (TW) or Tooth Surface Loss (TSL) is the permanent loss of hard tooth structure caused by sources other than dental caries. Clinically, TSL manifests itself as attrition, abrasion, abfraction and erosion.

It may cause symptoms such as tooth hypersensitivity and function impairment, as well as morphological changes in the affected tooth. It could also be asymptomatic, which means the patient isn't aware of it.

**Key Words:** *Dental attrition; Periodontitis; Dental health; Periodontal tissues; Oral hygiene*

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## INTRODUCTION

The term "dental attrition" refers to the wear of tooth surfaces rubbing against each other as a result of bruxism, or parafunctional muscle activity. The tribological name for this is two-body abrasion. The word "tooth wear" encompasses acid erosion, abrasion, and attrition. Mechanical rubbing from sources other than teeth, such as chewing pencils or pipe smoking, can be abrasive. Tooth wear is caused by attrition, erosion, and abrasion, which cause changes to the tooth. Each classification has a particular mechanism of action that is linked to distinct clinical criteria. Because indices do not always measure one single aetiology, or the study groups are too variable in age and features, accurate prevalence statistics for each classification is not available. Identifying the characteristics connected with each aetiology will determine how teeth are treated in each categorization. Some cases will necessitate specific restorative techniques, while others may not. The end effect can be worn teeth, which is becoming a more common dental issue. According to the recent UK Adult Dental Health Survey (ADHS), 77% of persons evaluated exhibited tooth wear, with 15% having moderate wear and 2% having severe dental wear [1]. The wide range of risk factors varies depending on the form of wear, but dietary acids and gastric acid have been linked to erosion, and attrition is a result of stress-related bruxism (clenching and grinding). Tooth wear is also associated to age, with more than 80% of over 50 year olds in the UK ADHS exhibiting tooth wear [2]. As a result, it is a widespread problem, and many patients seek therapy simply to improve their appearance, despite the possibility of sensitivity and functional issues [3]. Short, worn teeth pose a special restorative problem. Alternative restoration approaches are required due to insufficient clinical crown height for the retention of conventionally cemented crowns. Furthermore, the pressures applied across teeth during para-function or bruxisms are so great that traditional feldspathic porcelain-fused-to-metal crowns are prone to failure. This difficulty could be solved by bonding to the remaining tooth structure to promote retention.

The effectiveness of all-ceramic crowns used to replace worn teeth hasn't been well studied. In a small sample of 59 dentine bonded crowns put in 16 patients over four years, a 6% failure rate was documented. The study time was acknowledged to be brief, and no survival data was provided [4]. A recent evidence-based search to find the best approach to restore damaged teeth discovered no systematic reviews and concluded that it is unknown which restorative option is optimal in terms of longevity, vitality preservation, or opposing tooth wear minimization. The loss of material on opposing occlusal units or surfaces as a result of attrition or abrasion causes occlusal wear. Abrasion is defined as the wearing away of a substance or structure by some unusual or abnormal mechanical process or by causes other than mastication. Attrition is defined as mechanical wear resulting from mastication or parafunction, limited to contacting surfaces of the teeth, whereas abrasion is defined as the wearing away of a substance or structure by some unusual or abnormal mechanical process or by causes other than mastication. Although attrition or wear of the occlusal surface of teeth is not physiologically normal, it is important for function. Abrasion and erosion can contribute to tooth surface loss, but occlusal wear loss is a physiological process that occurs at an ultrastructural level. Attrition is linked to a variety of factors, including nutrition, clenching, bruxism, and bite force. Small polished facets on the cusp or incisal edge or on the ridge to minor flattening or more over to the exposed dentine surface are clinical signs of attrition.

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*Managing Editor, Dentistry Case Reports, Berkshire, UK*

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Correspondence: Wei Chen, Managing Editor, Dentistry Case Report, Berkshire, UK, E-mail: [dentistrycase@clinicalres.org](mailto:dentistrycase@clinicalres.org)

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## Chen.

Tooth wear (attrition, erosion, and abrasion) is seen as a growing problem around the world. Many clinical and epidemiological investigations have been developed to compare, diagnose, and classify the loss of tooth hard tissues [5]. Confusion has also arisen in the literature, as the majority of researchers have traditionally focused on one cause in their attempts to measure the amount of tooth tissue loss owing to dental wear, and these indices tend to be surface limited [6]. The wear patterns presented frequently do not appear to represent the aetiology stated, which is due to a lack of consistency in tooth wear terminology and translation mistakes. Many diagnostic indices do not accurately reflect morphological problems, and worldwide standardisation is lacking. All of these aspects make it difficult to compare data and assess the efficiency of preventive and therapeutic interventions [7-8]. The definition of the condition and the parameter of measurement are the limitations of tooth wear surveys. Loss of hard tissues of the tooth, regardless of the surface, causes one or more complications, but occlusal surface loss attracts our attention for a variety of reasons, including its impact on the TMJ and masticatory efficiency; in severe cases, attrition can progress to dentine, which is less resistant than enamel. In addition, pulpal involvement may develop into a concern [9].

### Periodontal disease

Periodontal disorders are a group of inflammatory conditions that induce periodontal degeneration and affect all of the teeth's supporting systems, including the gingiva, periodontal ligament, cementum, and alveolar bone, leading to tooth loss. According to the WHO, roughly 10-15% of the world's population suffers from severe periodontal disease? It's a complicated infectious illness caused by bacteria growth on the teeth. The primary goal of this research is to provide a comprehensive overview of periodontal disease, including its stages, occurrence, pathogenesis, diagnosis, therapy, and management. Periodontal disease pathophysiology is linked to dental plaque, microbial biofilm development, and host cell immunogenicity. The severity of this condition is determined by risk factors and stage of development. Oral hygiene should be practised on a daily basis to prevent tooth decay. To control the production of microbial biofilm, a variety of surgical and non-surgical treatments are available. The treatment of this disease on a daily basis and on a regular basis prevents the problem from worsening and demonstrates a significant improvement in oral health.

Periodontal illness is a microbial and inflammatory condition characterised by the presence of sulcular pathogenic bacteria, a weakened host immune response, loss of the connective tissue that holds teeth in place, and alveolar bone resorption. In order to start the illness process, bacterial pathogens are required.

Periodontal disease patients' gingiva crevicular fluid and entire saliva have been found to have higher quantities of circulating chemicals, making them possible biomarkers of the condition [4-6]. Periodontal infections activate host cells, causing them to release proinflammatory mediators [7-8], and cytoplasmic enzymes [9], which promote periodontal tissue deterioration. Inflammatory cytokines like IL-1,

PGE<sub>2</sub>, and lysosomal and cytoplasmic enzymes like metalloproteinases (MMPs) are released more readily in inflamed periodontal tissues [10-11]. Furthermore, in comparison to periodontally healthy controls, several enzymes, cytokines, and indicators of bone turnover have been discovered to be higher in the saliva of periodontitis patients [12].

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