Understanding tooth wear: aetiology, diagnosis, and management

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Introduction

Tooth wear, or Tooth Surface Loss, are interchangeable terms used to describe the pathological loss of tooth tissue by a disease process other than dental caries. A systematic review, investigating the prevalence of tooth wear in adults demonstrated that severe tooth wear affects a significant cohort of the population and increases with age, from 3% at the age of 20 to 17% at the age of 70. The review also identified molars as the most severely affected teeth, while incisors as the most commonly affected ones. Furthermore, in children up to 7 years of age, the prevalence of deciduous tooth wear extending into dentine was found to be present in up to 82% of children.

Aetiology

As our understanding of tooth wear evolves, so does our definition of what constitutes as the underlying aetiology of tooth wear. Attrition, erosion and abrasion are considered the mechanism of tooth wear, through which the actual underlying aetiology is manifested. Such underlying aetiology can relate to a number of systemic disorders, such as gastroesophageal reflux disorder (GORD) and Sjögren’s syndrome; or serious mental/psychological disorders, such as: stress, anxiety and depression, eating disorders, and alcohol and drug dependencies. Additionally, the identified aetiology can be multifactorial with a level of comorbidity. With tooth wear being one of the main oral manifestations of such disorders, early detection and management of the underlying tooth wear aetiology through a holistic multidisciplinary approach becomes cardinal. Furthermore, Dental Care Professionals (DCPs) can play an important role in assisting healthcare professionals in monitoring patients’ response and compliance to treatment through monitoring the progression of tooth wear. Moreover, DCPs can also help in educating and raising awareness of these disorders.

Diagnosis

History recording

When it comes to diagnosis of tooth wear, a systematic approach is necessary to identify all the relevant information, leading to an accurate and reliable diagnosis. The presenting complaint, or lack thereof, can be a deciding factor in the management decision process. Patient’s main concerns need to be identified at an early stage, such as aesthetics, sensitivity/pain, function, longevity, etc.
The presence of any medical conditions or signs of them need to be carefully recorded. These include: GORD, frequent heartburn, frequent use of antacids, depression, diabetes, asthma, eating disorders, Sjögren’s syndrome, previous/current history of radiotherapy, and any medication such as antidepressants, antiparkinsons and antihistamines. Dental history and oral hygiene habits need to be reviewed. With bruxism more prevalent amongst smokers, present and previous history of smoking needs to be recorded. Alcohol intake and the presence of any binge drinking habits noted. Special attention should also be given to the patient’s diet, with the type, amount, frequency, and intake mode (straw, sipping, swishing, etc.) of any acidic or sour food items or drinks. Questions regarding awareness of parafunctional habits, such as grinding, clenching, nail or pen/pencil biting should also be covered.

**Examination**

Extra-orally, careful palpation of the masseter, temporalis, sternocleidomastoid, trapezius muscles and the angle of the mandible needs to be carried out, in-conjunction with routine extra-oral examination. A simple TMD screening should also be carried out to identify the presence/previous history of: TMJ clicking, pain, discomfort, limitation of opening, crepitus, deviation on opening/closing, and locking.

Intra-orally, three main characteristics of the detected tooth wear need to be recorded: type/location of wear facets, distribution of wear, severity/progression of wear. The distribution of wear would aim to identify whether it was localised (affecting <30% of teeth) or generalised (≥30% of teeth). The severity and progression identification can, however, be more challenging given the subjective and inaccurate means and tools which are currently present for quantification of tooth wear. These include: visual inspection, use of previous intra-extra-oral photographs, casts of patient’s dentition taken at an earlier date or the use of a scaled probe (CPITN, WHO, etc.). A tooth wear index, such as the Basic Erosive Wear Evaluation, can also be employed for identifying the severity of wear and monitoring its progression.

**Management**

Management of tooth wear remains one of the least evidence-based aspects of our understanding of tooth wear. A recent systematic review investigating tooth wear treatment options concluded that the present evidence is not strong enough to form conclusions. The review, however, identified certain clinical similarities and trends of reversible/minimally invasive restorative management of tooth wear. Furthermore, there is mounting evidence that direct and indirect composite resins are a viable management option for managing tooth wear in the short/medium term.

Consequently, the management of tooth wear should consist of four main stages: emergency/immediate, stabilisation and protection, minimally invasive-reversible intervention, and/or invasive-irreversible intervention. The emergency/immediate stage aims to manage any pain, discomfort or sensitivity that might be present. The stabilisation and protection stage aims to
identify the underlying aetiology of tooth wear, halt its progression and protect the remaining tooth structures through management of aetiology, use of fluoride, sealants, dentine bonding agents and splint therapy. However, if the patient has specific concerns regarding aesthetics, sensitivity, function, longevity of tooth wear, or if the clinician is concerned with the severity of tooth wear or its rate of progression, then the next stage of active restorative management can be initiated. The minimally invasive/ reversible intervention stage aims to address specific patient/ clinical concerns in a conservative manner, through direct/ indirect composites, onlays, resin bonded bridges and removable partial dentures, as part of an appropriate treatment plan. Finally, if patient/ clinical concerns are present and the patient is presenting with severe and generalised tooth wear (<3mm of remaining sound tooth structure) accompanied by dentoalveolar compensation and reduction of overall vertical dimension, then an invasive/ irreversible restorative management might be the only feasible modality. This stage involves crowns, bridges, elective endodontics, post and cores, crown lengthening, in-conjunction with minimally invasive approaches.

Management of NCCLs should also follow a similar management approach, with active restorative management reserved for lesions that pose a risk for biomechanical fracture, pulpal exposure, plaque retention, or when patient/ clinical concerns are present 18. When restoring such lesions, the material of choice should be resin-modified glass ionomers, given their improved performance in restoring such lesions, compared to other adhesives 19.

This was a brief overview of the presentation. The take home message can be summed in three main principles:
• Identify and manage the underlying aetiology
• Stabilise and protect the existing dentition
• Consider a minimally invasive restorative intervention prior to initiating more destructive/ irreversible management modalities.

References

Medical Device Safety Alert and Drugs Safety Alert

Singapore: Azithromycin and drug reaction with eosinophilia and systemic symptoms (DRESS)