

Tooth Wear, Etiology, Diagnosis and Its Management in Elderly: A Literature Review

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ABSTRACT

The aim of the review was to present the importance of tooth wear, etiology and its management in elderly patients. The success of rehabilitation of tooth wear in elderly depends upon finding the etiology, correct diagnosis, prevention method and its management. Recognition of the early signs of tooth wear could bring about timely prevention and improve the life span of teeth in elderly.

Keywords: Tooth wear, Attrition, Abrasion, Erosion, Tooth wear management, Elderly, Bruxism.

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INTRODUCTION

An increasing number of people are now living longer and retaining their natural teeth into old age. With growing number of elderly people retaining more of their teeth into old age and the increase in tooth wear with age, this substantial problem is likely to become even greater in the future.¹ Extensive tooth wear is considered a potential threat to functional dentition. The management of tooth wear especially from attrition is becoming a subject of interest in the prosthodontic literature both from a preventive and from a restorative point of view.² The resultant challenges in the clinical management of such patients have aroused considerable professional interest concerning tooth wear.³ It is not always possible to differentiate between erosion, attrition and abrasion, as these conditions frequently occur in combination. It is therefore necessary to have a term for the condition in which teeth become worn and tooth wear is a convenient, simple term readily understood by patients. Tooth wear has been defined as loss of tooth substance from abrasion, attrition and erosion acting singly or concurrently.⁴ When wear is due to more than one physiological factor, special terms have been suggested to highlight the multiplicity of causes. Abrasion is the wear process involving foreign object sliding or rubbing against the tooth surface.⁴ Abfraction is the noncarious cervical lesions caused by tensile stress generated from occlusal loading and microfracture of cervical enamel rods.⁵ Attrition is the

wear process of tooth substance by tooth-tooth contact.⁶ Erosion is the loss of dental hard tissue by nonbacteriogenic acid etching.⁷ The impact of tooth wear can be severe and affect the quality of life in elderly. The aim of this review was to evaluate the literature on tooth wear its etiology, diagnosis and management in elderly.

LITERATURE REVIEW

History

Extensive tooth wear seems to have been the norm in all ancient societies and is mainly attributed to factors related to diet.^{8,9} The effects of excessive function, including that of wear, on certain dentoalveolar morphological features have been shown to be similar in modern man and his ancestors.^{10,11} High proportions of tooth wear as a cause of abscesses have been documented in much later historical materials, such as in medieval Britons and in icelanders who lived in the 11th century.^{12,13} In Egyptian mummies almost all abscesses in the jaws were ascribed to tooth wear and only a fraction to caries.¹⁴ The wear of anterior teeth in addition to its masticatory role may also reflect the effects of using the teeth as tools.¹⁵ In ancient man tooth wear was generally believed to be caused by attrition and abrasion, with erosion seldom considered or even examined. Today dental erosion is widely considered to be a major cause of tooth wear.¹⁶

Epidemiology

A large survey of middle aged adults showed that in crossing tooth wear was observed with age for occlusal and incisal surfaces.¹⁷ Epidemiological studies of young adults reported that prevalence of tooth wear was in the range 6 to 45%.^{18,19} Increased levels of wear in the old age groups are reportedly consistent.^{20,21} Prevalence of tooth wear of young adults in a United Kingdom study it was reported that a mean proportions of teeth with some moderate wear increased from a few percent to 9% individuals over 65 years of age.²²

In older age group 2% of teeth exhibited severe wear. A population study in a Northern Swedish country found advanced wear of maxillary anterior teeth in 14 % of 35-year-old and 36% of wear in 65-year-old.²³

In a 717 randomly selected Swedish age 20 to 80 years, 41% of individuals showed dentinal exposure.²⁴

Etiology

Tooth wear is a multifactorial process which makes it difficult to identify single cause. The term attrition, erosion and abrasion have widespread acceptance a description of tooth wear specific factors have been implicated as a being etiological and or associated with the process of attrition, erosion and abrasion. Attrition resulting from tooth-to-tooth contact produces well-defined wear facets, parafunctional habits, bruxism, clenching,²⁵ developmental defects,²⁶ coarse diet. Natural teeth opposing porcelain, class III incisal relationship, lack of posterior support.²⁷

Erosion

It is loss of dental hard tissues by nonbacteriogenic acid. Dental erosion can be caused by intrinsic and extrinsic causes.

Intrinsic causes are mostly gastric origin from gastric reflux, vomiting or rumination, vomiting in case of anorexia, bulimia nervosa, rumination.²⁸

Extrinsic causes are dietary soft drinks, citrus fruit and food pickled with vinegar,²⁹ medications, vitamin C, aspirin and iron preparation are acidic,³⁰ lifestyle active styles greater risk of erosion, use of mood enhancing drugs such as ecstasy.³¹⁻³³

Abrasion

Abrasion is caused by the intraoral use of objects, such as toothbrush often combination with abrasive substances. Other habits include pipe smoking, tooth pick use, thread biting.³⁴

DIAGNOSIS

Based on the history and clinical examination an attempt should be made to identify the causative factors and the degree to which each may contribute to the deterioration of dentition.

Successful management of different degrees of tooth wear requires early diagnosis of the problem. Diagnosis of tooth wear may not be easy particularly because the patient may not recognize the signs or symptoms themselves.

Evaluation of the family and social history can reveal if the patient is in the unusual stress which may be related to bruxism, changes in diet and regurgitation. A diet sheet is useful for recording the quantity and frequency of intake of citrus fruits and carbonated drinks.

Clinical examination of the dentition has two primary objectives:

1. To document and record the location, appearance and degree of tooth wear
2. To evaluate the progress of tooth wear overtime.

Tooth wear index (TWI) and modified tooth wear index³⁵ had been proposed as a tool for quantifying the degree of damage to different tooth surfaces and possible identification of etiological factors.³⁶ Clinical application is limited as the naked eye can detect only wear of more than 100 microns.

Clinical examination can be supplemented with high dentistry stone casts, intraoral radiographs, photographs and salivary tests. Stone casts allow easier assessment of tooth wear. Intraoral photographs are helpful for identification of areas of dentin/pulp exposure.²⁷

Periapical and bitewing radiographs are important for assessment of thickness of remaining enamel and dentin.²⁷ To quantify the severity and progression of wear different techniques are available ranging from sophisticated optical or laser scanning methods to relatively simple ordinal scales.³⁷

Management

After the history has been established and the clinical examination and diagnosis completed, management should be directed toward elimination of etiologic factors.

The long-term success of rehabilitation is dependent on good oral hygiene and regular maintenance.⁴¹ To protect teeth from further attrition an occlusal splint made in hard acrylic resin can be prescribed if most of the teeth are retained. The maxillary splint should have full occlusal contacts on closure and correct anterior guidance.²⁷ For the elderly the longer times for which they remain dentate as well as increasing life span imply a risk of advanced tooth wear and need for rehabilitation. In addition to the identification of etiological and modifying/aggravating factors and before any definitive reconstructive procedures are carried out the rate of progression of wear should be assessed.³⁸ A 0.7% fluoride solution in office followed by at home application of stannous fluoride gel to active a long-term effect of sensitivity.³⁹

Composite may be placed temporarily or overexposed areas while dentin bonding agents may be effective in reducing sensitivity and preventing further damage.⁴⁰ Definitive restorative procedures should not be performed without identification of etiological factors in conjunction with adequate preventive measures.

Extensive wear may result in changes in the occlusal vertical dimension (OVD), possibly with increased inter-occlusal space. It has been shown that dentoalveolar compensation may cause the OVD to remain relatively constant or even increased, despite the tooth wear.⁴¹

In many cases anterior teeth wear is commonly involved. The complete occlusal reconstruction in restoration of

anterior teeth with little available interocclusal space is based on the principles of combined forced intrusion of anterior teeth and supra eruption of posterior teeth was first described by Dahl et al.⁴² This method has successfully withstood long-term scrutiny. In generalized wear it has shown that tooth wear does not necessarily lead to decreased vertical dimension compensatory eruption generally maintains adequate facial height.⁴³

Fixed restoration should be designed a single unit whenever possible. Fixed partial denture should be of minimal extension. In elderly patients fixed prosthesis are expensive and not affordable for many patients who require treatment for tooth wear.

In many countries RPD are common because of tradition or economic. The use of gold copings on the abutment teeth supporting overdenture may produce good longtime results.⁴⁴

Removable partial dentures with occlusal overlays can also be used to reestablish OVD and to protect worn teeth.⁴⁵ In older patient the availability of increasingly reliable adhesive technologies and material would seem to offer promise as a less invasive option for the treatment of the worn dentition. In addition to fixed adhesive and conventional castings, removable partial dentures or a combination of both fixed and removable prostheses may be considered in the management of generalized tooth wear. Our treatment philosophy is to restore function and esthetics by preserving and protecting the remaining tooth tissue, with minimal alteration of the supporting structures and occlusal relationships. Long-term management of tooth wear should start with a sound differential diagnosis, strenuous efforts at prevention, long-term monitoring and proceed to active treatment only when indicated. When treatment is indicated, it should be limited to solving specific problems, although this may well indicate extensive reconstruction in some situations.

CONCLUSION

Recognition of early signs of tooth wear could bring about timely prevention and improve life span of teeth in elderly and successful management of different degrees of tooth wear requires early diagnosis of the problem and an understanding of the different treatment strategies and techniques available.

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