

Erosion, Etiology and Its Management- A Review

*Roseline, **Ramesh K.Nadiger, ***Lekha K.

*Associate Professor, **Prof. & Head, ***Professor, Dept of Prosthodontics
SDM College of Dental Sciences and Hospital, Sattur, Dharwad- 580 009, Karnataka

Abstract

Dental erosion has been reported with varying prevalence in the population. The term dental erosion describes the processes that do not involve bacteria. Dental erosion can have intrinsic and extrinsic causes. Intrinsic causes include vomiting, rumination, regurgitation, gastro oesophageal reflux. Extrinsic causes include acidic foods such as citrus fruits and acidic beverages. The presence of erosive lesions warrants the evaluation of a proper case history to note and know the specific reason, so that further damage can be halted. It is essential that etiology of erosion can be identified earliest as the clinical management of the patient is based on management of etiological factors.

Key words

Tooth wear, Erosion, Gastrooesophageal reflux, Vomiting

Introduction

Tooth wear is recognized as a major problem in both children and adults. The trend of erosion, attrition and abrasion has been known for many years but the contribution of erosion to tooth wear is increasing. Dental erosion is the irreversible loss of dental hard tissue due to a chemical Process, not involving bacteria and not directly associated with mechanical or traumatic factors or with dental caries¹. In developed countries, the incidences of the previous major dental diseases, caries has declined² more and more patients and teeth are therefore at risk of developing other dental lesions which include erosion. Epidemiological studies over the past

ten years both in UK and abroad have elucidated the prevalence for dental erosion³. Prevalence data from UK studies indicates that dental erosion increases between different ages cohorts of young people over time⁴⁻⁸. Dental erosion can have extrinsic or intrinsic causes⁹. The risk of erosion can increase as a result of changes in dietary habits and when gastric symptoms are exhibited². The etiology of erosion should be identified prior to patient management.

Etiology

It is essential that the etiology of erosion is identified as the clinical management of the patient is based on management of the etiology factors, before definitive preventive measures or restorative care are undertaken. It is important therefore to question each patient about their medical history and medication. Dental erosion can have extrinsic or intrinsic causes.

Intrinsic sources

Intrinsic sources are mostly of gastric origins which enter mouth from gastric reflux, vomiting or rumination¹⁰. It is known to cause erosion in susceptible patients and should always be considered a possible cause for erosion in the presence of indigestion, heart burn or epigastric pain¹⁰.

Vomiting

May be spontaneous or self induced and may be associated with variety of medical problems. Self induced vomiting is the commonest form of purging and weight loss in the eating disorders of anorexia and bulimia nervosa. In children cyclic vomiting syndrome is recognized to be linked with irritable bowel syndrome, motion sickness, migrane and epilepsy¹¹.

Rumination

The ability to relax the lower esophageal sphincter, refluxgastric content into the mouth and reswallow is uncommon but has been reported¹².

Reprint requests: Dr. Roseline Meshramkar, MDS

Associate Professor

Department of Prosthodontics

SDM College of Dental Sciences and Hospital

Sattur, Dharwad- 580 009

Karnataka

Email:roselinemeshramkar@yahoo.co.in

Extrinsic Sources

Dietary

The consumption of soft drinks with erosive potential particularly age groups is significant^{13,14}. Fresh fruit and in particular citrus fruit have erosive potential as do foods pickled in vinegar¹⁵.

Medication

Medications such as vitamin C, aspirin and some iron preparations are acidic¹⁶.

Life style

Active life styles, leisure and fashion trends can be associated with greater risk of erosion^{17, 18}. The use of mood enhancing drugs such as ecstasy increases the risk of erosion^{19,20}.

Environment

Work related exposure to acids can result in dental erosion²¹.

Discussion

Erosion on its own causes much greater loss of tooth substance than abrasion alone, but the two in combination produce more destruction than can be accounted for by simply summing the effects²². The pattern of tooth loss may give some clues as to the most important of the etiological factors. All acids whether from within the body or from external sources are capable of de-mineralizing tooth tissue and therefore causing erosion. Gastro oesophageal reflux is the uncontrolled movement of gastric juice through the lower oesophageal sphincter into the distal oesophagus. In some patients the reflux continuous past the upper oesophageal sphincter to reach the mouth then it is called regurgitation. Signs and symptoms associated with reflux are heart burn, retrosternal discomfort, epigastria pain, dysphasia, other symptoms such as chronic cough, hoarseness, chronic laryngitis could indicate that the refluxate has entered the upper respiratory passage and investigation should be considered if they are severe²³. One study observed that nearly 25% of patients presenting with extensive palatal erosion had pathological GERD diagnosed by standard criteria, but did not have any symptoms of reflux¹⁰. Vomiting is the propulsion of stomach contents coordinated by a center in the brain and triggered by a well recognized pattern of physiological mechanism²⁴.

Regurgitation on the other hand is the passive movement of gastric juice from the stomach into the mouth.

Extrinsic sources include environmental causes such as contact with acids as part of work or leisure activities, professional wine tasters and fertilizer factory workers have all been reported as having significant dental erosion¹⁷.

Much emphasis has been placed on healthy food and drink in recent years and dietary habits are apparently changing. A number of common medicines including vitamin C and iron preparation are very acidic. Vitamin C has been produced in a tablet form which has been associated with extensive destruction when used in excess²⁵.

Management

Although the etiology of erosion is acidic substances from a variety of sources there are some individual factors that may predispose to erosion. The most used index for epidemiological studies is the TWI of Smith and Knight²⁶.

Intrinsic acid sources

If there is evidence or suspicion of gastric reflux or vomiting activity then contact should be made with patient's general medical practitioner, outlining the problem. Referral to gastroenterologist for investigation and treatment may be desirable¹⁰. If acid from the stomach is repeatedly entering the patient's mouth they should be advised to rinse out with water or sodium bicarbonate and avoid tooth cleaning at this time. A hard acrylic occlusal guard may be used at night if there is evidence of parafunctional activity causing attrition combined with reflux activity at night. Dietary counseling can be given after the diet has been thoroughly assessed. The use of chewing gum is helpful in increasing the salivary flow²⁷. Finishing a meal with something that neutralizes the acid like milk, cheese are useful²⁸. Patients should be advised to avoid acidic food and drink between meals and particularly lastly at night. Fluoride mouth rinse, varnishes and desensitizing agent can be prescribed which aids in re-mineralization and decrease sensitivity^{29,30}. High fluoride concentration & low abrasive tooth paste should be prescribed and appropriate oral hygiene technique should be followed^{31,32}. Patient can use

Sugar free chewing gum to increase salivary flow and re-mineralization. Dentine bonding agents can be applied to area of exposed dentine³³. Palatal erosion of upper anterior teeth with no inter occlusal space can be managed by providing removable Dahl appliance³⁴, this is effective as an anterior bite platform which provides a posterior open bite it allows relative extrusion of posterior teeth and intrusion of anterior teeth in order to gain space for restoration of shortened, eroded upper anterior teeth.

Clinical studies have supported the concept of restoring the worn upper anterior teeth at an increased occlusal vertical dimension OVD without the interim stage of a removable Dahl appliance as the restorations themselves have a Dahl effect³⁵.

Generalized erosion of many surfaces may also result in over closure. Evaluation of free way space is recommended in order to determine the need or otherwise of encroaching upon it in order to restore teeth

Restorative Treatment

The eroded teeth can be restored by means of a conventional crown or the application of adhesive restorations, such as composite or resin bonded crown. Caution must be exercised in cases where full mouth re-habilitation is planned.

Conclusion

It is important to identify the problems first and try to address the ecological factors. All potential causes of dental erosion should be considered before any definite diagnosis is made. Early diagnosis is paramount in recognizing the etiology of the dental erosion. Preventive programmes must remain corner stone of management of dental erosion.

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