

Oral complications of gastroesophageal reflux disease

Amit Kumar Singh^{1,*}, Wagirhm Balsie², Rasli Chauhan³, Karishma⁴

^{1,4}Senior Lecturer, ²PG Student, Dept. of Oral Medicine & Radiology, ³Senior Lecturer, Dept. of Orthodontics & Dentofacial Orthopaedics,

***Corresponding Author:**

Email: dramitujjainsingh@gmail.com

Abstract

Gastro esophageal reflux is described as movement of the contents present in stomach into gastric the esophagus, and GERD is defined as symptoms or complications of GER. Lifestyle, drugs, diet plays an important role in the causation of GERD. Two major oral manifestation of GERD includes altered taste and dental erosion. Dental erosion can be treated with minimal intervention such treatment should include control of microflora, remineralization and adhesive restorations.

Keywords: GERD, Reflux, Heart burn, Oral manifestation, Dental erosion

Introduction

Gastroesophageal reflux disease (GERD) comes into notice when acid which is present in stomach useful for digestion repeatedly flows back or refluxes into esophagus. One of the most common symptom of GERD is heartburn which is often known as discomfort, pain and burning sensation in the chest. Reflux disease and proximal reflux are other names of GERD.

GERD is a normal physiologic process and mostly occurs post-prandial for almost an hour.

Most common feature that can be related to GERD is weak sphincter, hiatal hernias, obesity, pregnancy, smoking and certain medication.

GERD severity depends on lower esophageal sphincter (LES) dysfunction as well as the type and amount of fluid brought up from the stomach and the neutralizing effect of saliva.

Barrett's esophagus and esophageal adenocarcinoma can be one of the risk factor if GERD continues.

When esophageal pH is below 4.0 for or 30 seconds it is diagnosed as GERD. As stated earlier that GER is normal process it does not disturb normal gastric system or mucosa damage but it can turn into a disorder known as GERD which has a chief feature of chest pain, a burning chest and acid regurgitation.

Patients suffering from gastroesophageal reflux disease have a weak or relaxed lower esophageal sphincter, other additional factors which can contribute in patients with gastroesophageal reflux are hiatal hernias, obesity, pregnancy, certain medications, or smoking⁽¹⁾ gastroesophageal reflux is a normal physiologic process.

Pathophysiological change: Erosion is a disorder in which the characters such as: structural characteristics of teeth, physiological characteristics of saliva and dental pellicle, characteristics of acids and habit act as very important factors in their development therefore

must be carefully analysed. The seriousness of erosive changes is determined by the sensitivity of dental tissue to dissolution. Enamel is mineralised with less soluble minerals than dentine, therefore its surface is eroded more slowly.

Minerals, protein, lipids and water are the basic constituents of the hard dental tissue. They are of similar chemical composition and different morphology.

Etiology of GERD

Factors which play an important in the gastro esophageal reflux are the change in lifestyle which is also considered a universal etiology for many dental problems. Change in lifestyle includes more consumption of alcohol, cigarette smoking, and obesity.

- Change in diet or type of food consumption in today's era like food containing fat, garlic, onions, drink containing caffeine, acidic and citrus foods. Having large meals or eating just before bedtime are other exaggerating factors
- Certain Drugs like calcium channel blockers, beta blockers and theophylline can also contribute in GERD
- Medical conditions like pregnancy, Hiatal hernia, diabetes, and obesity.

Diagnostic Protocol: The primary dental care team has the expertise and the responsibility to provide the care for their patients with erosion.

To detect the dental implications of GERD symptoms, the dental professional has to conduct a thorough assessment following a diagnostic protocol, which includes collecting data on the patient's medical history and dietary history, occupational / recreational history, dental history, and oral hygiene methods, in addition to an intraoral examination, head and neck examination, and salivary function examination

Medical history: The basic evaluation begins with a thorough medical history examination which includes

symptoms of gastric reflux, any history of vomiting, previous investigations for gastro-intestinal complaints, and a listing of all prescription and nonprescription medications

Dietary history: As a dentist it is important to obtain detailed information from patients about diet to determine the etiological factors underlying dental erosion and to implement adequate preventive measures. Erosion can be related to dietary factors.

The frequency of consumption of acid drinks (soft drinks, fruit juices, sport drinks) and particular foods (citrus fruits, salad dressing) is an important factor in tooth erosion because they contain acids, such as citric acid, maleic acid, and phosphoric acid, which decrease the pH of the oral environment.

Occupational/recreational history: Contact with acids in the workplace frequently can increase the occurrence and/or the severity of dental erosion

Wine has a low pH and a low content of P and Ca and therefore has erosive potential. Professional wine tasting is very common all over the world and this is at high risk for them.

Intraoral examination: It is difficult to distinguish the influence of abrasion or erosion and to judge the activity and progression of dental erosion.

Color changes and sensitivity can provide some information about the erosion. Signs of enamel erosion on buccal and lingual sites are the appearance of a smooth, silky-glazed, sometimes dull, enamel surface with the absence of perikymata, together with intact enamel along the gingival margin.

Eroded teeth have the appearance of having been lightly prepared for full-coverage restorations with a chamfer margin and are more prone to wear.

Dental history: During intraoral examinations of patients, restorations are of high importance for dentists. The tooth structure surrounding the restorations dissolves much more rapidly than the restorative material.

Salivary function: Evaluating salivary parameters, such as pH and buffering capacity, in the dental office is possible using commercially available diagnostic kits. The buffering capacity and, if desired, the pH of the saliva can be measured in freshly collected saliva using an indicator system. The flow rate and the buffering capacity of saliva are increased by chewing. Saliva buffers the acid within the distal esophagus, and swallowing increases the rate of peristalsis; both are recognized as major factors in esophageal acid clearance

Oral health consideration of GERD: Oral manifestation of GERD is change in taste and dental

erosion. reflux is always associated with a demineralization action resulting in dental enamel erosion.



Fig. 1: Dental erosion incisal surface

- Dental erosion can be defined as non-carious dental substance loss induced by direct impact of exogenous or endogenous acids.⁽³⁾
- Whenever a particular teeth is exposed for a long time to acids, its dissolution of components of tooth surface, which leads to hypersensitivity and can eventually lead to tooth fracture.
- Frequency of reflux, pH, type of acid and the quantity and quality of saliva and time duration of disease defines the severity of dental erosion.
- Enamel consist mostly 97% of a calcium phosphate mineral in the form of carbonated hydroxyapatite (CHA). CHA is insoluble in an alkaline medium but, its solubility increases with decrease in the oral Ph. This effect came in notice.

Causes of Dental Erosion

Factors causing dental erosion can be classified as extrinsic factors and intrinsic factors.

Extrinsic causes can be acidic beverages, acidic food and fruits, lozenges. Medications, swab sticks and saliva substitute, chlorinated water in swimming pools and parks. Battery fumes and aerosols.⁽²⁾

Intrinsic factors can be bulimia, regurgitation due to chronic gastritis which can be associated with alcohol consumption, malabsorption syndrome, xerostomia, pregnancy and chronic vomiting.

Clinical Sign

Erosion starts as superficial demineralization which causes dissolution of surface and subsurface layers and finally it can lead to loss of tooth structure. Dental erosion can cause tooth wear from any of the surface of the teeth but it is most common on the facial surface, occlusal surface and lingual surface.



Fig. 2: Palatal erosion



Fig.: Occlusal erosion

Signs of enamel loss on the buccal and lingual areas can appear as smooth, silky – glazed, may be sometimes dull.⁽⁵⁾

Thinning of enamel surface can be seen which gives an unaesthetic yellowish hue to the teeth.

Loss of dentin is faster than loss of enamel, and “cupping” of the lesion on occlusal surface can be noticed.⁽⁶⁾ Amalgam restorations in eroded teeth appear highly polished and appears to “stand above” the tooth surface.⁽⁵⁾ The eroded teeth appeared of having been lightly prepared for coverage restoration with a chamfer margin and more prone to wear.

Progression of occlusion erosion leads to a rounding of the cusps and restoration rising above the level of the adjacent tooth surface hypersensitivity to hot, cold, sweet and tactile stimulus occurs when there is the exposure of the dentinal tubules. In more advanced cases the whole occlusal morphology disappears and pulp is exposed,⁽⁵⁾ it leads for the need of endodontic therapy.

Dental erosion may lead to eruption of eroded teeth tripping and drifting of teeth and formation of diastema with loss of vertical dimension, over closure and bite collapse results in autorotation of mandible and reduction of overjet and can lead to an edge –to –edge incisal relationship. Dental erosion increases if attrition from bruxism is superimposed on erosion.

Grading of Dental Erosion

Erosion grading scale of Ganss and thers:⁽⁷⁾

Grade 0 – stated that no visible erosion was present.

Grade 1 – it stated that small pits and slightly rounded cusps, flattened fissures, moderate cupping, preservation of occlusal surface morphology as present

Grade 2 – it stated that depression of cusps with severe cupping and grooving, margins raised above level of surrounding tooth and flattening of occlusal surface morphology as present

Erosion grading scale of Eccles and Jenkins⁽⁸⁾

Grade 0- no erosion was present

Grade 1-Loss of surface detail; change confined to enamel was present

Grade2-Exposure of dentin affecting less than one-third of crown as present

Grade 3-Exposure of dentin affecting one-third or more of crown was noticed.

Management of dental erosion caused by GERD

Management of GERD is multidisciplinary which involves family, physician, oral and maxillofacial medicine & radiologist, prosthodontist, orthodontist and most important of all gastroenterologist.

Patient has to first concern his /her gastroerologist for the underlying disease, and get themselves treated first for the same. Dental treatment involves treatment of dental erosion.

It involves first identifying the main cause of dental erosion.

Pattern and the site of erosion and the location of erosive tooth wear is important

a. Restorative treat:-

1. the structure of the teeth should not be disturbed
2. the teeth should not become hypersensitive
3. check the loss of tooth structure and enhance the esthetic
4. protect teeth from pulpal exposure.

Restoration is one of the best treatment because of esthetic need of the patient Direct composite coating should be done and porcelain is prescribed for more severe cases.⁽⁵⁾

b. **Antacids:** Antacids should be given as they help in neutralizing acid already present.

c. **Dietary Counseling:** Restrict amount of acidic and citrus food and drinks. Chewing sugar free gums results in increase of salivary flow and thus increase tooth remineralisation.

At the end of every meal patient should have cheese or milk to neutralize intra oral acid.

d. **Lifestyle modification:** Avoidance of large meals Avoiding fatty and greasy food, chocolates, caffeine, citrus food and even alcohol consumption⁽⁹⁾

Loose weight and maintenance of good posture.

e. **Measures of enhancing the defence mechanism (salivary flow and pellicular formation):** This means establishing hyper-salivation in the mouth

which is likely to intensify the protective characteristics of saliva. Consuming pastilles without sugar initiates salivation.

- f. **Measures of enhancing resistance and remineralisation of hard dental tissue:** The increase of resistance and remineralisation of hard dental tissue may be achieved by preparations based on fluorine in the form of 2% solution of sodium fluoride and fluoride pastilles, jellies and lacquer.

Pastilles have the most positive effect because they contain fluorides, and on they cause hyper-salivation.

- g. **Use fluoride mouthrinses**

- h. **Use of neutralizing agent:** Sodium bicarbonate mixed with baking soda can act as a good neutralizer to the acidic oral fluid.

Conclusion

Dental professions are the first to notice dental erosion and can be of great value for the patients general consideration. As a dentist we should make the patient realize about his underlying systemic disease. So dentist are the first health care providers to recognize GERD because of its oral manifestation. Restorative treatment is the treatment of choice and dental professionals can also prescribe for plaque control. And reduction in amount of refined food products and carbonated drinks and fruit juices to increase the potential for remineralization and optimize the Ph.

References

1. Eating Disorders and Gastroesophageal Reflux Disease- American college of Prosthodontics 1-3.
2. Asher C, Read MJ. Early enamel erosion in children associated with the excessive consumption of citric acid. *Br Dent J* 1987;162(10):384-7.
3. Christeffi Mabel Rolands Oral health presentations and considerations in gastrointestinal diseases. *Journal of Indian Academy of Oral Medicine and Radiology* Jul-Sep 2015;27(3).
4. W. Yang, Understanding Acid Reflux and its Dental Manifestation 2-8.
5. Ayse Dundar, Abdulkadir Sengun, Dental approach to erosive tooth wear in gastroesophageal reflux disease *African health sciences*, 14(2):June-2014481-486.
6. Lazarchik DA, Filler S. Jental erosion: predominant oral lesion in gastroesophageal reflux disease *American Journal of Gastroenterology* 2000;95(8):33-38.
7. Robert P. Barron, Robert P. Carmichael, Margaret A. Marcon, George K.B. Sandor, *Journal of the Canadian Dental Association* 84 February 2003, Vol. 69, No. 2.
8. Ganss C, Klimek J, Giese K. Dental erosion in children and adolescents- a cross-sectional and longitudinal investigation using study models. *Community Dent Oral Epidemiol* 2001 29(4):264-71.
9. Eccles JD, Jenkins W Dental erosion and diet *J Dent* 1974;2(4):153-9.
10. Habsha E. The etiology and pathogenesis of tooth wear Part I. *Oral Health* 1999; 83-92.
11. Mayuresh J Baheti, Nandlal Girijalal Toshniwal. Acidity and Dentistry: Problems and Solutions International

Dental Journal of Student's Research, July - September 2015 3(3):113-119.