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## PROSTHETIC APPROACH OF DENTAL EROSION IN PATIENT WITH GASTROESOPHAGEAL REFLUX DISEASE - CASE REPORT

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**Abstract :** Dental erosion is defined as the loss of tooth structure due to a multifactorial chemical process that does not involve bacterial action. Erosion may be due to extrinsic sources of acid, such as acidic foods, drinks, and acidic medications. Gastroesophageal reflux disease (GERD) is the most common source of dental erosion, where the cause this erosion can be a chronic regurgitation of gastric acid in patients, resulting in extensive loss of coronal tooth tissue.

Case report. This clinical report describes prosthetic approach to tooth erosion caused by GERD in 65 years old male patient. After the medical treatment of GERD we made preparation of the teeth and provisional restoration where the vertical occlusal dimension was reestablished. After three weeks wearing without discomfort and difficulty in function we fabricated full mouth restoration – metal-ceramic fixed partial dentures for both mandibular and maxillary arches, cemented with glass-ionomer cement.

Discussion and conclusion. GERD very often is a reason for dental erosion and loss of tooth tissue. Dental rehabilitation should follow the medical treatment and elimination of the acid reflux. After medical control of GERD, the patient’s dentition was restored to correct form, function, and esthetics with metal-ceramic fixed partials dentures with a long-term prognosis.

**Keywords:** erosion, gastroesophageal reflux, prosthetic approach

### 1.INTRODUCTION

Gastroesophageal reflux disease (GERD), is defined as involuntary muscle relaxing of the upper esophageal sphincter, which allows refluxed acid to move upward through the esophagus into the oral cavity (Picos, Badea and Dumitrascu, 2018). Dental erosion is very often present at the population as high as 42% (Gregory-Head, Curtis, Kim and Cello, 2000). In adult population, GERD as disease ranges from 21% to 56% in some countries (Broliato, Volcato, Reston, Kramer, Marquezan and Ruzzarin, 2008; Gayal, 2001).

Acid reflux in the esophagus can damage the mucosal lining. Reflux esophagitis can be mild, involving only microscopic changes in the cells of the mucosa, or erosive, causing bleeding and superficial linear ulcers. From a dental standpoint, acid reflux in the oral cavity causes the loss of coronal tooth structure by chemical erosion. It has been reported that patients experiencing vomiting once or more times during a week, heartburn, pain on awakening, acid taste, or stomach pain have dental erosion thirtyone times more frequently than controls (Ortiz, Fideles, Pomini and Buchaim, 2021).

Risk factors for GERD are hiatal hernia, obesity, and pregnancy. Approximately one half of persons age 50 and more have hiatal hernias. 84% of patients with erosive esophagitis have hiatal hernias (Rodney, 2002). GERD and heartburn are reported by 45%–85% of women during their pregnancy (Milani, Borba, Farre, Grando, Bertol and Fornari, 2022). Substernal burning after eating, the most common symptom, is worsened by fatty or spicy foods, large meals, alcohol, or caffeine. Heavy lifting, or bending following a meal may cause food or liquid to rise into the throat.

GERD can be diagnosed by endoscopy. To identify the existence of GERD visual identification of mucosal inflammation and oesophagitis can be used (Jarvinen, Meurman, Hyvarinen, Rytomma and Murtomaa, 1988). How long the disease has been present and the frequency and quantity of regurgitation can influence the degree of erosion (Ramashandran, Raja Khan and Vaitheeswaran, 2017).

Erosion from dietary or gastric acids forms smooth lesions which typically appear as cupped occlusal/incisal and concave buccal/facial surfaces. When erosion is the dominant factor, the lingual and buccal surfaces of the upper incisors appear smooth and shiny with a loss of anatomy. The tooth surface constantly changes as the acid partially dissolves the outer layer of enamel or dentine which then becomes more susceptible to abrasion or attrition (Bartlett, 2005).

Studies show that refluxed acid first attacks the palatal surfaces of the upper incisor teeth. Later, erosion of the occlusal surfaces of the posterior teeth in both arches and the labial or buccal surfaces results from an extended

period of acid reflux (Lechien, Chiesa-Estomba and Calvo Henriquez, 2020; Yanushevich, Maev and Krikheli, 2022).

Oral symptoms associated with GERD can be dental sensitivity, vertical dimension loss, burning mouth syndrome, and some esthetic problems (Ali, Brown, Rodriguez, Moody and Nasr, 2002). Wear of tooth which can be progressive but usually slow, is a complicated process caused by multiple factors. This can result in shortened clinical crowns and in conjunction with alveolar compensation complicates the treatment attrition (Bartlett, 2005).

## 2. CASE REPORT

A 65 years old male patient came to the Department of Prosthodontics at the University Dental Clinic in Skopje with the lack of esthetics and function of his teeth.

In his medical examination he had gastroesophageal reflux disease history for about 3-4 years. The clinical examination showed dental erosion including dentin on the occlusal buccal and palatinal surfaces of maxillary teeth; occlusal and buccal surfaces of mandibular teeth and cervical lesions were seen. [Figures 1, 2, 3]

*Fig. 1 Pre-treatment front view*



*Fig. 2 Pre-treatment view of upper arch*



*Fig. 3 Pre-treatment view of lower arch*



There was also decreased occlusal vertical dimension after we took impressions of both arches with irreversible hydrocolloid (Cavex Impressional, Cavex Holland BV, The Netherlands). We made a working cast mounted on a semi-adjustable articulator. The patient was instructed to visit a gastroenterologist. On the endoscopic examination GERD was confirmed. The appropriate pharmacological agent was prescribed and GERD was successfully controlled. Our dental treatment followed the medical treatment.

Because of increased occlusal vertical dimension (OVD), we made temporary acrylic dentures with increase of the vertical dimension by 1-1,5 mm. After wearing them for about three weeks, there was no complain for a muscle

pain, discomfort or difficulty in function reported by the patient. At this moment the patient was ready for metal-ceramic fixed partial dentures. We took the definitive impression of the prepared maxillary and mandibular teeth using polysiloxane impression material. Working casts were mounted into articulator using interocclusal records. Metal-ceramic fixed partial dentures were fabricated as full mouth restoration in both maxillary and mandibular arches, because of splinting all teeth which will give better support to individual teeth. Patient was clearly informed of the importance of oral hygiene by giving more attention using proximal brushed and dental floss. Full mouth restorations were cemented with glass-ionomer cement (Meron, Voco, Germany). [Figure 4]

*Fig.4 Post-treatment front view*



### **3. DISCUSSION**

Dental erosion by definition is loss of tooth structure due to a chemical process that may be multifactorial in origin and does not involve bacterial action. Erosion is very usual finding during oral examination (Li, Liu, Chen, Wang and Zhang, 2017). It may be due to extrinsic sources of acid, such as acidic foods, drinks, and acidic medications. However, the most common source of intrinsic acid in children is regurgitation of gastric contents into the oral cavity, as occurs in GERD (Linnett and Seow, 2001).

First affected are the palatal surfaces of the maxillary teeth. Extended period of acid reflux can lead to erosion of the occlusal surfaces of the posterior teeth in both arches and the labial or buccal surfaces. And last affected are the lower anterior teeth (Yanushevich, Maev and Krikheli, 2022).

Many patients with GERD do not experience symptoms like unexplained sour taste or regurgitation, heartburn, or belching. This is also called “silent GERD” (Ali, Brown, Rodriguez, Moody and Nasr, 2002). The first symptom of GERD can be enamel erosion of the posterior teeth. For diagnosing GERD visit to a physician or gastroenterologist for appropriate examination. Dental rehabilitation should not be initiated until medical treatment has eliminated the acid reflux.

### **4. CONSLUSION**

This case report describes fabricating metal-ceramic fixed partial dentures as a treatment of a patient with GERD after his medical diagnosis and treatment.

Gastroesophageal reflux disease affects patient at all ages. The prosthetic specialists must consider this fact when has to restore teeth with significant loss of coronal tooth structure. Attrition or abrasion, in combination with GERD by may be responsible for the loss.

After the diagnose and prescription of pharmacologic agent GERD was successfully controlled. After GERD was medically controlled, the patient’s dentition was restored to correct form, function, and esthetics with an expectation of a long-term prognosis.

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