Gastroesophageal reflux disease, tooth erosion, and prosthodontic rehabilitation: A clinical report

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Gastroesophageal reflux disease (GERD) is a relatively common gastrointestinal disorder in the United States. The reflux of acid adversely affects the mucosal lining of the esophagus and is responsible for dental erosion. This article briefly reviews the etiology, risk factors, and medical management of GERD. The patient presentation describes the rehabilitation of a young adult with GERD who needed multidisciplinary care.


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documenting the type and extent of tissue damage. Barium esophagography is used to identify any stricture in patients with severe dysphagia. The 24-hour ambulatory esophageal pH manometry test is the best study for determining the severity of the gastric reflux into the esophagus. This test is performed by passing a pH probe sensitive catheter through the nose into the esophagus. The pH probe is positioned above the LES. Connected to the other end of the catheter is a small computer that is worn around the waist. The pH probe is left in place for 24 hours. During this time the patient may consume a normal diet but is instructed to not swim, bathe, or shower.

This report presents the clinical manifestations, diagnosis, and medical and dental management of a patient with GERD with severe tooth erosion.

Clinical Report

A 14-year-old Caucasian male first presented to the author for a dental evaluation in 1998. The patient was referred by his pediatrician, who had noted the patient’s significant loss of coronal tooth structure and made a diagnosis of bruxism. Clinically, the appearance of the teeth was inconsistent with that usually seen in people with bruxism. Besides the occlusal/incisal surfaces, loss of tooth structure also occurred on the buccal and lingual surfaces. This indicates that erosion, rather than attrition, was responsible for the destruction.

The patient’s medical history revealed that he experienced periodic regurgitation of stomach acid and food from 1993 to 1998. He also felt some retrosternal burning several times a month. The patient’s previous dentist fabricated a bite guard appliance to control tooth wear that the patient had used from 1995 to 1998. It was clear that the patient needed further medical evaluation to adequately address his dental needs.

The patient was referred to a gastroenterologist for an upper gastrointestinal (GI) radiograph to evaluate possible gastric regurgitation of stomach acid and food from 1993 to 1998. The results of the upper GI radiograph were normal; the results of the 24-hour pH reflux monitoring test indicated episodes of reflux. The patient was placed on omeprazole, 20 mg/day, and instructed to elevate the head of the bed 6 inches. The patient’s symptoms then resolved.

This patient needed a multidisciplinary approach to dental rehabilitation. Because of the large volume of tooth structure that had been lost, it was necessary to restore the patient’s occlusal vertical dimension to permit the fabrication of cast restorations for the anterior and posterior teeth (Fig 1A-C). The diagnostic waxing procedure on casts mounted in centric relation on a semiadjustable articulator indicated that orthodontic treatment was needed so that a mutually protected occlusion could be developed prosthetically. A semiadjustable articulator was selected because the occlusal scheme provided anterior disocclusion. The patient’s 4 impacted third molars were removed before orthodontic treatment. Crown-lengthening procedures were performed surgically on the mandibular left second premolar, first molar, and second molar to expose sufficient tooth structure to permit the placement of orthodontic bands. Composite resin was bonded to the occlusal surfaces of the remaining posterior teeth to provide sufficient

Figure 1. Pretreatment. (A) Front view. (B) Right lateral view. (C) Left lateral view.
Root canal therapy was performed on both maxillary canines and the maxillary left lateral incisor to permit fabrication of cast dowel and cores to develop adequate retention and resistance form in the tooth preparations. All of the teeth in both the maxillary and mandibular arches were prepared, and provisional restorations were fabricated at the new occlusal vertical dimension.

The patient experienced significant gingival hyperplasia during orthodontic treatment (Fig 3). This necessitated performing a gingivoplasty using an electrosurgical unit to facilitate tooth preparation and impression-making procedures. Noncompliance with daily oral hygiene procedures made it necessary to reduce the hyperplastic tissue both at the time of tooth preparation and again when impressions were made.

The definitive restorations were fabricated first for the maxillary and mandibular anterior teeth, then for the opposing posterior teeth on the left side, and finally for those on the right side. Metal ceramic restorations were placed on all teeth except the second molars. The second molars received full-veneer gold crowns due to restricted interocclusal space and clinical crown length. Prosthetic treatment was completed in August 2002 (Fig 4 A–C).

Discussion

Dental erosion is defined as the loss of tooth structure due to a chemical process that does not involve bacterial action and may be multifactorial in origin. Erosion is not an uncommon finding during oral examination; a prevalence as high as 42% has been reported. Erosion 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.

Figure 2. Composite resin bonded to posterior occlusal surfaces to increase the vertical dimension of occlusion. (A) Right lateral view. (B) Left lateral view.

Figure 3. Front view illustrating postorthodontic gingival hyperplasia.
The pattern of loss of tooth structure is similar to that seen in bulimia nervosa. The palatal surfaces of the maxillary teeth are affected first. 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. The lower anterior teeth are the last to be affected.16

Many patients with GERD do not experience heartburn, belching, unexplained sour taste, or regurgitation. This condition has been termed “silent GERD.”17 Enamel erosion of the posterior teeth may be the first symptom of GERD. Thorough history taking and oral examination are essential to eliminate bulimia nervosa, attrition, and abrasion as possible causes for the lost tooth structure. Referral to a physician or gastroenterologist for appropriate testing is necessary to confirm a diagnosis of GERD. Dental rehabilitation should not be initiated until medical treatment has eliminated the acid reflux.

Summary

Gastroesophageal reflux disease affects all age groups. The prosthodontist must take this into consideration when faced with the task of restoring teeth with significant loss of coronal tooth structure. GERD by itself or in combination with attrition or abrasion may be responsible for the loss. A thorough diagnostic evaluation is necessary to ascertain the possible medical and/or dental sources for the problem. In the case presented here, the patient’s previous dentist was treating him for a dental condition (bruxism) when in fact a medical condition (GERD) was responsible for the lost tooth structure. The patient was subsequently referred for a medical evaluation. The medical diagnosis was made, the appropriate pharmacologic agent was prescribed, and the GERD was controlled. After medical control of the GERD was established, the patient’s dentition was restored to correct form, function, and esthetics with an expectation of a favorable long-term prognosis.

References


Figure 4. Definitive restorations. (A) Front view. (B) Right lateral view. (C) Left lateral view.