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Clinical Technique/Case Report

Restoration of Erosion Associated with Gastroesophageal Reflux Caused by Anorexia Nervosa Using Ceramic Laminate Veneers: A Case Report

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Clinical Relevance

Ceramic laminate veneers are useful to restore incisors suffering from severe erosion.

INTRODUCTION

Anorexia nervosa is a serious eating disorder that affects a significant number of young adults.[1-3] This psychosomatic disease is characterized by conscious starvation, followed by a period of excessive carbohydrate intake, and then, it is often followed by deliberately induced vomiting. Early recognition of the psychiatric and pathophysiological components of this disorder is essential for diagnosis and successful treatment.[1-2,4] In patients with a history of intense vomiting and gastroesophageal reflux, severe lingual-occlusal erosion (perimylolysis) is nearly always present.[1-2,4-9] Therefore, dentists can play an important role in the early diagnosis and implementation of comprehensive treatments for patients with these types of disorders.[2,4-9] It is important for dentists to cooperate with physicians to obtain details of the psychiatric and somatic conditions of patients.[1-2]

Dental treatment modalities vary, depending on the severity of erosion of the dentition. The mental health of patients also has to be taken into consideration.[4-5,9-10] A restorative approach, which aims to preserve the natural tooth structure, whenever possible, should be the

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Figure 1. *Severe erosion and attrition were found in maxillary incisors.*

Figure 2. *Maxillary occlusal view showing extensive erosion of virtually all teeth.*

Figure 3. *Mandibular occlusal view showing erosion in posterior teeth.*

Figure 4. *The most severe erosion was observed on palatal surfaces in maxillary incisors.*

paramount concern.[5,9] However, partial or complete coverage of indirect restorations may have to be used in cases with extensive loss of tooth structure and vertical dimension.[5] This report deals with a patient who showed severe erosion associated with gastroesophageal reflux caused by anorexia nervosa. The patient needed extensive restorative treatments, including ceramic laminate veneers and partial coverage metallic crowns.

CASE REPORT

The patient is a 33-year-old female who complained of sensitive teeth and was not satisfied with the aesthetic appearance of her maxillary incisors (Figures 1-3). She is 5 feet and 4 inches in height and weighed 45 kilograms. On interview, she admitted to a six-year history of anorexia nervosa, accompanied by vomiting and gastroesophageal reflux, until she was 30 years old. A thorough analysis of her history and diet revealed a pattern of alcohol abuse during this psychologically unstable period. She said she had not consulted a physician nor had she taken medication for her psychological and gastrointestinal conditions during the period of anorexia nervosa. She added that she began to recover from the eating disorder by changing her working environment over the last three years.

Dental Manifestations

Severe erosion involved all her teeth, except the mandibular incisors. The most severe erosions of enamel and dentin were found on the lingual and incisal surfaces of the maxillary anterior teeth, and pulp cavities were identified under transparent illumination (Figure 4). Severe erosion was also found on the palatal and occlusal surfaces of the maxillary premolars (Figure 5). Those areas showed extreme thermal sensitivity. In both the maxillary and mandibular arches, the occlusal surfaces of her molars showed an elevation of metallic and composite restorations, while less erosion was found on the buccal surfaces (Figures 2-3 and 5-7). The patient showed a Class I occlusal relationship, but the vertical dimension was not maintained (Figure 1). Cuspal collapse in the molars did not allow for functional occlusion (Figures 4-7). There was a low frequen-

Figure 5. *Severe erosion was also observed on palatal surfaces in maxillary left premolars. Their palatal cusps were entirely eroded.*

Figure 7. *Preoperative plaster models with red shading to identify the severely eroded areas.*

cy of plaque and caries. Excessive gingival recession was observed in most of the anterior incisors, but no gingival inflammation was found.

Any decision to proceed with definitive treatment for patients with anorexia nervosa should be predicated upon the patient seeking psychotherapy and having ceased the habitual vomiting that caused the damaging gastroesophageal reflux.[1] Given her psychologically stable condition and her currently less stressful lifestyle, the decision was made to treat this patient. In addition, her sensitivity to her physical appearance and her desire to restore her teeth suggested that treatment would be beneficial both dentally and psychologically.

Dental Treatment

Diagnostic data, including preoperative photographs, a complete radiographic survey, a detailed clinical examination, diagnostic models and interocclusal records

Figure 6. *Metallic restorations were elevated on occlusal surfaces in maxillary right premolars.*

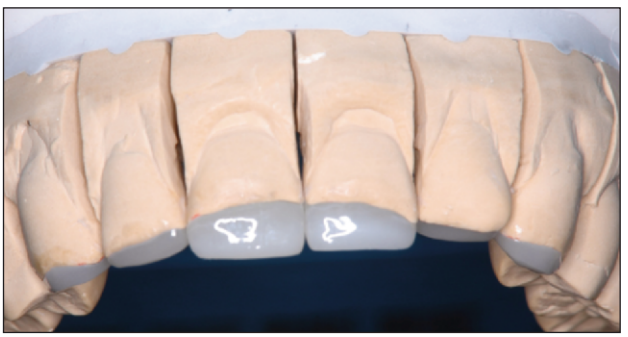

Figure 8 *Ceramic veneers for maxillary incisors were fabricated on dies.*

were obtained. Since the patient, who exhibited severe erosion, accompanied by a loss of vertical dimension, sought to achieve the best aesthetic appearance in the maxillary incisors, an intensive course of treatment was undertaken over several months. The treatment also had the secondary benefit of helping to restore her self-esteem. The treatment, which was considered necessary, included the removal of pulpal sensitivity, reconstruction of functional occlusion and extensive prosthetic treatment, including both incisors and molars. Ceramic veneers (IPS Empress 2, Ivoclar Vivadent AG, Fustentum, Liechtenstein) with incisor and palatal coverage were considered for anterior restorations (Figures 8-10), while partial and complete coverage with gold crowns (Casting Gold Type IV, Morita Co, Osaka, Japan) was chosen for posterior restorations (Figures 11-12).

The models were articulated on a semi-adjustable articulator (Hanau Articulator, Teledyne, Buffalo, NY, USA). After diagnostic waxing was undertaken, acrylic resin and metallic provisional restorations for anterior and posterior teeth, respectively, were fabricated. These provisional restorations were used for the critical assessment of aesthetics, phonetics and function before moving onto definitive restorations. Once provisional

Figure 9. *Maxillary incisors were restored with ceramic veneers luted with resin composite cement. Substantial loss at their incisal edges, especially in central incisors, was recovered, as can be seen from this picture taken one year after the original restorations.*

Figure 11. *Maxillary occlusal view shown one year after the restorations.*

restorations were considered appropriate, definitive restorations were fabricated using the former as a guide. After confirming that there was no discomfort in the TMJ or any pulpal sensitivity after a six-month temporary setting period of the posterior metallic restorations, all definitive restorations were luted with a dual-cured resin cement (Panavia F, Kuraray Medical, Tokyo, Japan) in conjunction with a dentin adhesive system (SE Bond, Kuraray Medical). A metallic (Alloy Primer, Kuraray Medical) or a ceramic primer (Porcelain Activator, Kuraray Medical) was applied on adhesive surfaces of the metallic or ceramic restorations, respectively.

Currently, the patient is enrolled in a three-month recall program involving topical neutral fluoride application, and she uses a dentifrice containing fluoride at home. A centric relation splint was prescribed in order to protect the final restorations from posterior wear because of her bruxism habit.

Figure 10. *The entire palatal surfaces of the upper incisors were covered.*

Figure 12. *Mandibular occlusal view shown one year after the restorations.*

DISCUSSION

Severe erosion is an important dental problem that may have different causes. Among those who are at risk are individuals who habitually take acidic products or those who frequently vomit or exhibit gastric symptoms, as well as those with a low salivary flow rate.[11] It is important to diagnose erosion at an early stage and to identify the risk factors. Early diagnosis increases the prospects of successful treatment and reduces the complications associated with mechanical investigation. Erosion in the patient described in this report was almost certainly because of gastroesophageal reflux caused by anorexia nervosa, and urgent treatment to protect the pulpal tissues needed to be considered.

Using the best policy of a minimally invasive approach, conservative restorations with resin composites are recommended, provided that sufficient tooth structure still exists to achieve promising adhesion.[9] Another option is adhesive cast restorations that cover the occlusal and axial surfaces without preparation of the teeth. Such successful prognoses have been reported for both anterior and posterior teeth in children affected by amelogenesis imperfecta or dentinogenesis imperfecta.[10] It has been suggested that this treatment

is an effective way of protecting the remaining tooth structure and is compatible with patient comfort. In this case, ceramic veneers were selected for maxillary anterior restorations, because of their excellent aesthetic appearance and firm coverage of the sensitive palatal site. Dual-cured resin composite cement, in conjunction with a modern dentin bonding system, was used with the expectation that it would offer promising longevity of restorations and protection of pulp. Since it was apparent that the vertical dimension had decreased in this patient, interocclusal relation needed to be restored in order to obtain sufficient space for ceramic restorations. Resin facing metallic restorations are an alternative choice to all ceramic restorations, but ceramic veneers were chosen as a better way of preserving the remaining tooth structure.

Partial coverage metallic restoration, rather than all ceramic or porcelain fused ceramo-metallic crowns, was selected for posterior restorations to reconstruct functional occlusion, because less tooth cutting was required for metallic partial coverage restorations compared to that in tooth-colored complete coverage crowns. Coverage of occlusal and palatal sites with severe pulpal sensitivities was considered necessary, because it seemed prudent to protect those lesions for preventive purposes against any possible relapse into the eating disorder.

The patient in this study said in an interview that she had a habit of aggressive tooth brushing to purge gastric juices and also to remove traces of vomit. This may have caused the excessive gingival recession observed in most of the anterior incisors. Advising such patients to rinse their mouth with water, rather than persistently brushing their teeth, can be helpful in protecting tooth structure, since there is always the prospect that it may damage the teeth, once acidic vomit has reached the mouth.[7] To reduce enamel damage, a fluoride rinse is also recommended for use after vomiting.[8]

In this patient, who had suffered severe erosion, to achieve the best long-lasting aesthetic and functional results, extensive prosthetic treatments were conducted. As an important secondary benefit, the treatment showed a clearly positive effect upon the patient's self-esteem and her overall health. However, long-term continuous observation of the results of the prognoses is indispensable.

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