Case Report

TREATMENT OF PATHOLOGICAL TOOTH WEAR WITH CAST LINGUAL GOLD VENEERS

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إن تآكل الأسنان في ذكور القوقازيين من الأمور النادرة – إن هذا المرض يصيب الإناث أكثر من الذكور في البلدان الغربيـــة سجلت حالة تآكل مرضي وقد عولجت باستعمال طريق تانان أوكسيد النحاس لصب من التيجان الذهبية.

Teeth erosion in Caucasian males is a fairly rare condition and the pathosis afflicts more females than males in Western Countries. This is a case report of a 22 year old male with pathological teeth wear due to anorexia bulimia. He was treated using Tanaka'scopper oxide treatment to cast gold veneers.

Introduction

Teeth erosion is the loss of dental hard tissue from a non-bacterial chemical attack, involving acidic substances. Intensified teeth wear often results from a combination of erosion, abrasion and attrition. The main causes of teeth erosion reported include: a high acidic dietary intake, (Smith[1] reported that dietary and regurgitation erosion were the most common causes of tooth wear), alcoholism and erosion caused by gastric regurgitation,[2] and exposure to acidic contaminants in the working environment.[3]

Case Report

A twenty-two year old Caucasian male presented in December 1995 as a new patient. His complaint was increased translucency of the tips of his maxillary incisors and a marked sensitivity to thermal stimuli of these teeth. The symptoms had gradually worsened over the past two to three years. Although he had kept regular dental check-ups, his previous dentist had assured him that there was nothing to worry about.

Intra-oral examination revealed localized marked erosion of the lingual surfaces of all maxillary incisors. The peripheral enamel was intact, but there was a large amount of exposed dentin (Fig. 1). The labial appearance revealed uneven and jagged incisal edges with a high degree of translucency (Fig. 2). No other teeth surfaces had signs of pathological wear. His oral hygiene was excellent and there were no signs of caries or periodontal disease. The radiographic examination was unremarkable

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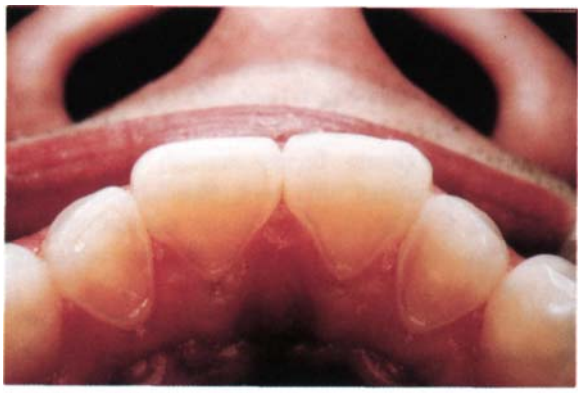

Figure 1. Erosion of the palatal aspects of the maxillary incisors demonstrating large dentine exposures and an intact enamel margin.

Figure 2. Labial view of maxillary incisors demonstrating increased translucency and uneven incisal tips.

(Fig. 3). The anterior maxillary teeth displayed a hyper-responsive vitality to ethyl chloride and to electric pulp testing.

Management

Successful treatment of severe teeth wear (erosion) requires that the aetiological factors be identified and eliminated. Secondly, restoration of the affected teeth is accomplished if required. The patient's medical history was non-contributory and the dietary analysis

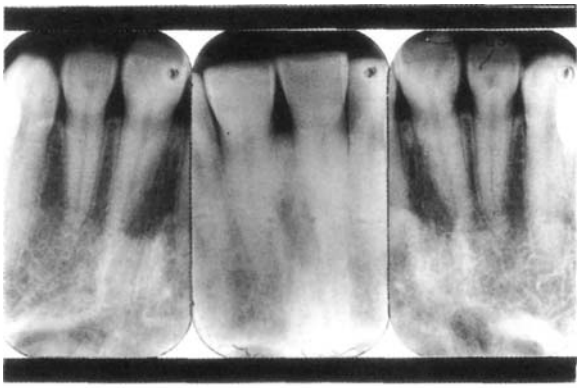

Figure 3. Radiograph of the maxillary incisors.

revealed nothing abnormal. However, communication with the patient's medical practitioner revealed that the patient had a previous history of anorexia bulimia. The patient had received professional counselling, and is no longer considered bulimic. The patient was advised to use a fluoride mouthrinse daily. Upper and lower elastomeric impressions were taken along with an arbitrary face-bow record to produce mounted study casts on a Denar Mark II semi-adjustable articulator.

Initially, glass ionomer cement was used to restore the lingual surfaces of the upper incisors. After three months, the restorations had worn away and the teeth were again becoming sensitive. However, there was no more loss of teeth tissue, except that the incisal edges had thinned.

fFluorigard, Colgate Palmolive, Guildford (UK) Ltd. Surrey, UK G425W2
[§]Impregum, ESPE, Knutsford, England
tfChemfil, Detrey/Dentsply, Surrey, England

It was decided along with the patient's concurrence, that due to the severity of the symptoms in relation to the age of the patient, that the lingual surfaces of the maxillary incisors should be restored with a long lasting material. Cast gold lingual veneers, using an adhesive technique, was decided upon to minimize further loss of teeth tissue. Since the inter-incisal distance in centric occlusion was insufficient, a removable modified Dahl[5,6] appliance was fabricated in order to create sufficient inter-incisal space for the lingual veneers. After minor adjustments to the appliance (Figs. 4 and 5), the patient was instructed to wear the appliance at all times except when cleaning it and brushing his teeth. The patient was seen every 3 weeks to assess the space and after about two and a half months, a sufficient inter-incisal space of 0.5 mm was created. No teeth preparation were deemed necessary and upper and lower final polyvinyl siloxane impressions* were taken.

The working casts were mounted in centric relation occlusion (RCP) on a semi-adjustable articulators using a facebow transfer and an inter-occlusal record. The veneers were cast in Type III yellow gold* and then the internal surfaces were treated with copper oxide.[7] Because there were obvious finishing lines caused by the pattern of wear, no preparation of the teeth was necessary and the veneers were finished to these lines. The metal veneers were cemented under rubber dam using Panavia® 21[f] resin cement.* Incisal rests, subsequently removed, assured an accurate positioning onto each tooth. Panavia® 21[f] is a revised two-paste formulation of Panavia®Ex[f], which is a powder-liquid material. This product has been effective for clinical bonding to non-precious metals, but requires knowledgeable handling.[8] First, the teeth surfaces to be restored were cleaned with pumice and water, washed, and dried. Then the enamel was etched with the etchant provided for 30 seconds, rinsed thoroughly, and dried. The dentin activator was applied to the dentinal surfaces for 10 seconds and both dentin and enamel were rinsed and dried. The base and

* President, Coltene AG, Altstatten, Switzerland
[§]Denar Mark II System, Denar Corp., Calif. USA
tTrucast Hard, Englehard, Chessington, England
Kuraray, Osaka, Japan

catalyst were mixed and placed in a separate dish. The fitting surfaces of the veneers were wetted with the mixed solution. The brush was dipped into the solution, excess was wiped off, and the liquid was painted onto the veneer surface, the whole surface being covered quickly in this manner. The restoration was then seated completely and excess cement was removed after setting. All the restorations were cemented individually. The rubber dam was removed after cementation, and the occlusion of the new restorations was harmonized and polished (Fig. 6).

The patient was seen one month after cementation and then every six months. To date (August 1998) the patient has reported no further teeth sensitivity and there were no signs of further teeth wear (33 month follow-up).

Discussion

Crisp et al[9] reported that bulimia nervosa affects between 1-4% of white females in the USA aged between 18 and 30. It is also more

Figure 4. Labial view with intrusion appliance in-situ.

common in females, than in males, with a ratio of 10:1.[10] People suffering from such eating disorders tend to brush their teeth frequently after vomiting, thereby increasing teeth wear.

Treating these patients with cast gold veneers, when indicated, offered protection to the lingual teeth surfaces while restoring occlusal function. Gold alloy has a number of advantageous properties over other dental materials including strength, durability, lack of wear to the

Figure 5. Side profile of intrusion appliance in-situ. Additional acrylic was added at first review appointment.

Figure 6. Gold veneers after cementation and polishing.

opposing teeth and ease of manipulation during the manipulation during the laboratory preparation (Hussey et al 1994).[11] With modern technology, adhesion of gold alloy to both enamel and dentin can be obtained with new methods of surface treatment.[7]

The aesthetic appearance of the maxillary incisors was not altered by the metal veneers, as the problem of "graying out" of the incisal area was managed by reducing the incisal coverage of the casting (Fig. 6). The reduced lingual surface coverage has not caused any clinically significant loss of veneer retention. The gold plating procedure and a proper design with good interproximal wrap-around allowed the casting to be kept well away from the incisal edges. Another method of controlling the problem of incisal "graying out" would require a more opaque luting resin to mask out the grayness of the alloy.[11]

The patient was strongly advised to continue with the daily fluoride mouth rinse. The potential for further erosion around the metal restoration margins must not be overlooked since this may occur regardless of which restorative materials is used. Monitoring is essential in such cases, and after 33 months (August, 1998) there was no evidence of further teeth erosion.

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