Aesthetic and functional reestablishment of patient diagnosed with perimolysis: a clinical case report

Restabelecimento estético e funcional de paciente com diagnóstico de perimólise: um relato de caso clínico

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ABSTRACT

Dental structure deterioration, like enamel erosion, is caused through dissolution by endogenous or exogenous acid substances in the oral cavities. The demineralization caused exclusively by endogenous acid as the chronic regurgitations and gastric dysfunctions that cause erosive tooth lesions are known as perimolysis. This clinical case report describes the oral rehabilitation of a patient with perymolisis using direct composite resin restorations. This patient had erosive lesions on lingual, incisor, and occlusal surfaces of almost all teeth, a situation which, among other disturbances, caused alteration in vertical dimension of occlusion, muscular pain, and esthetic damage. Multifactorial aspects were applied to diagnosis, planning, and functional and esthetic rehabilitation of anterior and posterior teeth.

KEYWORDS: Tooth erosion; Myalgia; Vertical dimension.

INTRODUCTION

Dental erosion is defined as the loss of dental hard tissue by a chemical process that does not involve bacteria and can have extrinsic or intrinsic causes[1]. The extrinsic causes comprise regular consumption of foods and acidic beverages, use of hygiene products and acidic drugs such as effervescent vitamin C or aspirin, beyond aspiration of acid gases or chemicals at work[1].

The chemical dissolution of oral hard tissue by endogenous factors is called perimolysis[2]. Among the intrinsic causes are recurrent vomiting in patients suffering from anorexia and bulimia, gastric and renal dysfunctions, hiatus hernia, peptic or duodenal ulcer, and gastroesophageal reflux[3]. Chemotherapy agents, medications, potassium chloride and alcoholism may also contribute to cause nauseas and vomiting[4]. The occurrence of chronic regurgitation of content stomach causes a typical distribution of erosion in the dental arches, which corresponds the trajectory of gastric acid. Mainly in young patients, an aspect that should be carefully analyzed is the assessment of psychological conditions, like the degree of concern about bodily esthetics, and whether or not chronic anxiety is present that may cause acid regurgitations[5].

Anamnesis, associated with clinical, radiographic, and laboratory examinations are used for differential diagnosis of perimolysis. Its main signs and symptoms in oral cavity are pH reduction, demineralization of posterior tooth occlusal surfaces, and lingual surfaces of anterior and posterior teeth[5]. The lesions are smooth with rounded contours, no signs of pigment[5, 6]. The patient may present the incisal edges thin or fractured and in many cases, when amalgam restorations are present on the occlusal surfaces of posterior teeth, an elevated amalgam island is frequently observed[5, 6].

Furthermore, an increase in dental caries, pulp exposures, dentin hypersensitivity, and absence of pigmentation in erosive lesions can occur due to loss of tooth substance[5, 6]. In more severe cases, there may be enlargement of parotid glands, alterations in the amount of saliva, characterizing xerostomia, decrease in the buffering capacity and electrolytic imbalance, cheilitis and mucosistis[5]. When associated with bruxism, the perimolysis can provoke a reduction in vertical dimension of occlusion (VDO)[5, 6]. Therefore, this study aimed to report diagnostic means, planning, and reestablishment of esthetic and oral function, using direct composite restorations in a patient that presented characteristics signs and symptoms of perimolysis, associated with vertical dimension of occlusion alteration.

CASE PRESENTATION

Initial Assessment – Diagnosis

A 25-year-old man presented at clinic to a dental school at Federal University of Uberlandia seeking treatment of a deterioration of maxillary anterior teeth (Figure 1). An oral examination showed severe erosive lesions of lingual surfaces of maxillary anterior and posterior teeth, and of occlusal surfaces of mandibular posterior teeth with amalgam restorations standing out in relation to tooth structure (Figures 2 A/B). There was altered vertical dimension of occlusion (VDO) with consequent muscular discomfort and esthetic damage.

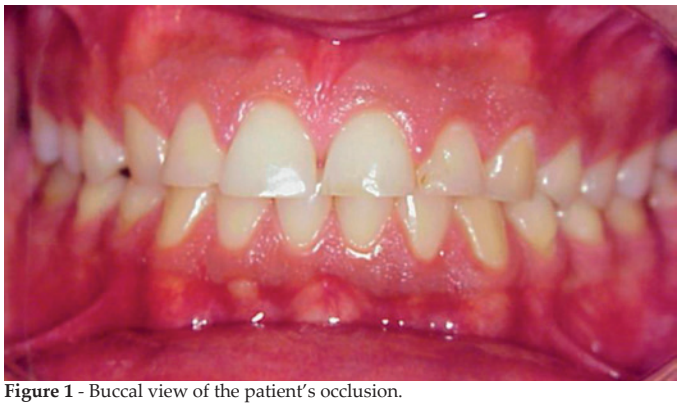

Figure 1 - Buccal view of the patient's occlusion.

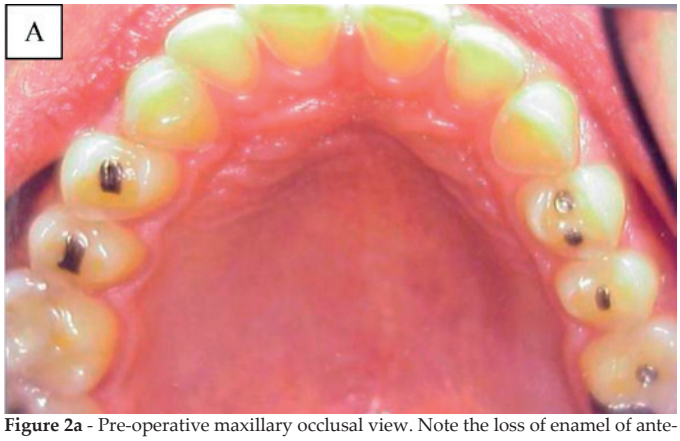

Figure 2a - Pre-operative maxillary occlusal view. Note the loss of enamel of anterior and posterior teeth.

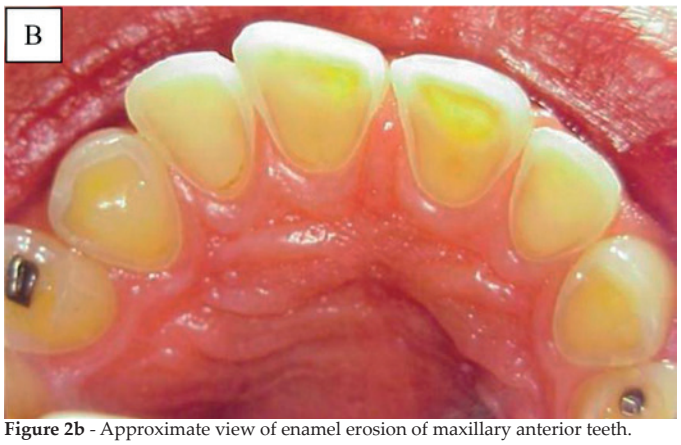

Figure 2b - Approximate view of enamel erosion of maxillary anterior teeth.

The clinical signs described are characteristic of perimolysis[4-6], however, after anamnesis, no etiological factors of this erosive process were found. During systemic assessment, the patient was submitted to endoscopy and there were no signs of gastric dysfunction. Reflux mechanisms are not clearly defined and are difficult to diagnose, which generally is based on clinical suspicion and on patient's response to acid suppression, when other causes for the symptoms are not found.

The patient was submitted to the development of the pH-monitoring probe, with which pharynx and esophageal acidity levels may be jointly assessed, and the reflux characteristics can be associated with pH and patient's symptoms[3]. The exam consists of histological examination of gastric and esophageal biopsies by monitoring pH during 24 hours. The results showed that the return of stomach and duodenum acid content to the oral cavity is considered to be one of the etiological factors of perimolysis and this was the cause of patient's erosive lesions.

Occlusal Assessment

Because of general loss of hard tooth tissues, the VDO and the physiological muscular functions were altered. To diagnose the change VDO, the phonetic method was used[7,8]. In the phonetic method, the patient is instructed to pronounce sibilants sounds, according to Silverman in 1953[7] and the closest speaking space should be at least 2 mm. If interferences or contacts between anterior teeth are found when pronouncing sibilants sounds, the patient's VDO is probably altered, and the basic functions, like speaking normally, should be re-established.

After occlusal assessment, molds were obtained in alginate (Dentsply Caulk, Dentsply International Inc, Milford, Del, USA) to make plaster casts (Durone, Caulk, Dentsply International Inc), which were transferred to the semi-adjustable articulator in centric relation. A facial arch was used to transfer and mount the maxillary cast and an anterior jig was used to mount the mandibular cast (Figure 3). Thus, it was easier to verify the amount of tooth structure lost[8]. Next, a complete diagnostic waxing was done on the casts to restore anatomy and VDO altered by erosive process (Figures 4 A/B).

The patient's VDO was restored with a maxillary acetate bite guard (Figures 5 A/B), re-establishing stomatognathic apparatus harmony, providing muscular relaxation, and reducing discomfort and headaches, until restorative treatment could be concluded.

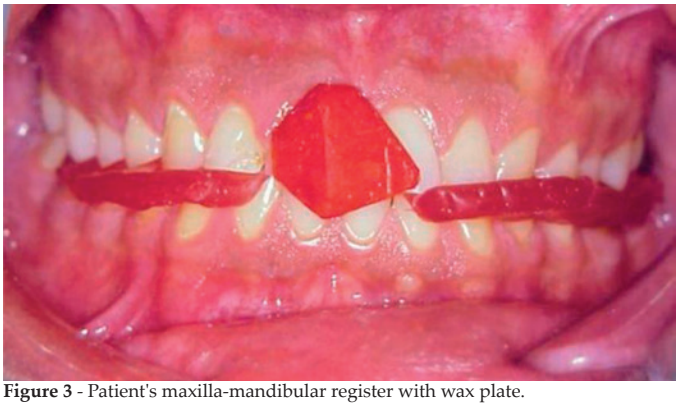

Figure 3 - Patient's maxilla-mandibular register with wax plate.

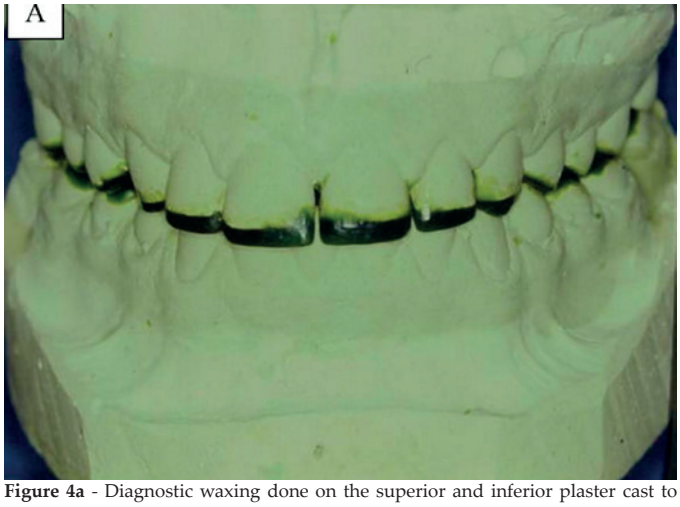

Figure 4a - Diagnostic waxing done on the superior and inferior plaster cast to restore anatomy and VDO altered by erosive process.

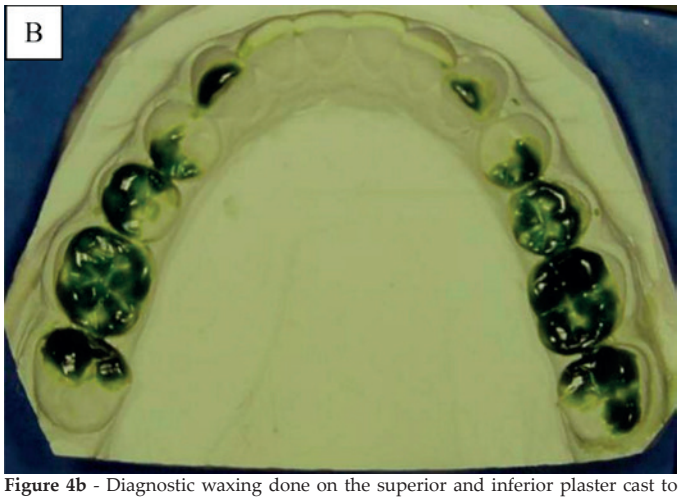

Figure 4b - Diagnostic waxing done on the superior and inferior plaster cast to restore anatomy and VDO altered by erosive process.

Planning and Restorative Procedures

With the evolution of restorative materials and adhesive systems[9], direct restorative procedures with composite have become more conservative and have better esthetic results. This procedure starts with color selection, with similar luminosity when visualizing the color scale and the tooth to be restored[10]. Enamel and dentin resins Filtek Z250 (3M-ESPE, St. Paul, MN, USA) in color A2 were selected to use on anterior teeth, and resin Filtek P60 (3M-ESPE) in color A3 to use on posterior teeth (Figures 6 A/B).

Cavity preparation of erosive lesions is restricted to making a bevel on the vestibular surface of anterior teeth[11], and removing amalgam restorations of posterior teeth, as well as carious tissue (Figure 7). Dentin may darken in a physiological repair process because of the stimulus caused by enamel removal and dentin exposure[12]. This sclerotic dentin is highly mineralized with disorganization of dentin tubules, and becomes a more acid resistant substrate, resulting in lower bond strength [12]. To optimize demineralization and exposure of the collagen net fiber that would be impregnated by adhesive agent[9], an increase to 30 seconds in conditioning time is proposed in sclerotic dentin regions, which may be extended to enamel without impairing adhesion[12] (Figure 8). For washing the substrate and consequent removal of the product of reaction between phosphoric acid and dentin and enamel mineral portion, it is necessary to apply a jet of air/water for the same period as conditioning time. To maintain the collagen fibers structuring and later interaction of adhesive agent, the excess of humidity should be removed without, however, dehydrating the dentin surface[13]. Drying was done with absorbent paper to leave the surface slightly moistened[14].

The adhesive system Single Bond 2 (3M-ESPE), was applied over all conditioned structures. After waiting 20 seconds, another layer of adhesive was applied, the excess was removed, and then photoactivated for 20 seconds using halogen light (Elipar 3M-ESPE) with light intensity of 800 mW/cm^2. The incremental restorative technique was used. An acetate molding was used in the last layer of composite to facilitate obtainment of occlusal anatomy and VDO (Figure 9), established initially with the diagnostic waxing. Composite was inserted at the mold base that was positioned in oral cavity. Activation with halogen light (Elipar 3M-ESPE) was done over the mold for 40 seconds on each face of each tooth (Figure 10).

After rubber dam removal, occlusal adjustment was done in maximal intercuspation and on lateral and protrusive excursions. Finishing and polishing were done using an association of extra-fine granulation diamond burs (KG Sorensen, Barueri, SP, Brazil) and Aluminum-Oxide Disks (Sof-Lex, 3M-ESPE) for anterior teeth and silicone points for posterior teeth (Figure 11).

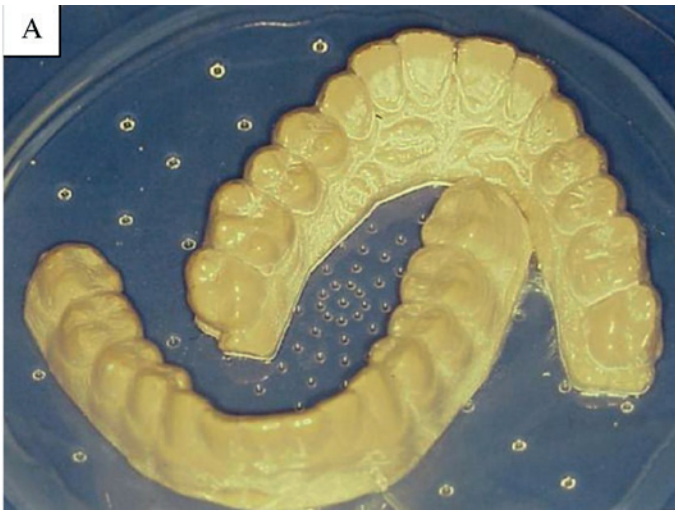

Figure 5a - Acetate bite guards made to restore the patient's VDO, re-establishing stomatognathic apparatus harmony

Figure 5b - Acetate molding used to facilitate the obtainment of occlusal anatomy and VDO established initially with the diagnostic wax.

Figure 6a - Mandibular occlusal view. Note the left semi arch restored with direct composite restorations.

Figure 6b - Pre-operative approximate view of mandibular left posterior teeth.

Figure 7 - Operative approximate view.

Figure 8 - Phosphoric acid used after cavity preparation of mandibular left posterior teeth.

Figure 9 - Acetate molding on the left posterior teeth.

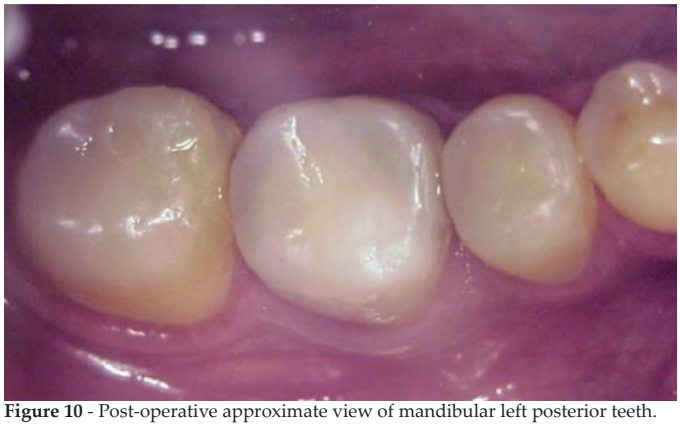

Figure 10 - Post-operative approximate view of mandibular left posterior teeth.

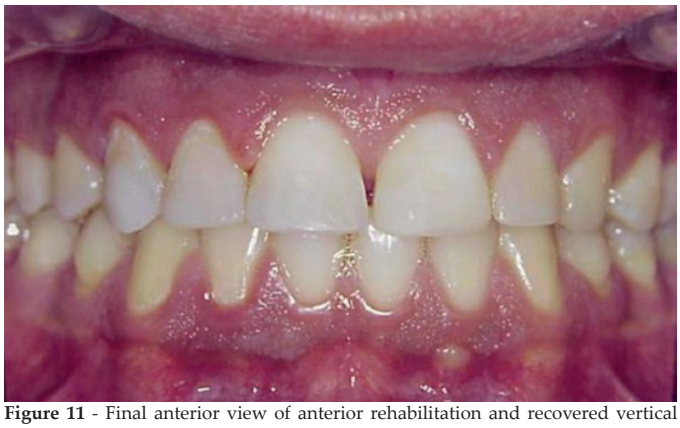

Figure 11 - Final anterior view of anterior rehabilitation and recovered vertical dimension.

DISCUSSION

Due to the large number of people with gastroesophageal reflux disease undiagnosed[15] the dentists may be the first professional to suspect the presence of this disease due to the presence of unexplained dental erosion[3]. The first contact between patients with perimolysis and dental surgeons usually occurs because of esthetics damage, caused by decalcification of mineralized tooth tissues, and mainly to discomfort due by dentin hypersensitivity. Such situations are considered priority and should receive emergency treatment[2, 4]. As pain relief, it is proposed to protect the exposed dentin with the use of glass-ionomer cements, fluoride varnishes or, if necessary, endodontic treatment[5]. Thus, the dental surgeons must be aware of this signs and symptoms of this disease and especially talk to the patient's need to looking for a doctor. The association between medical and dental treatment will ensure an integrated treatment, so that the patient treat the cause and then of disease sequel. In the case presented, the patient went to a gastroenterologist and underwent treatment with diet and medication for six months until the disease had been controlled.

The clinical situation observed in the present case was characterized by perymolysis. In according to Greer and Poulson[16] (1983), the principal cause of enamel losses is the gastroesophageal alterations[3, 13, 17]. The diagnosis of alterations in vertical dimension of occlusion and its re-establishment should receive dental surgeon's special attention, since such alterations interfere in the physiological balance of the stomatognathic apparatus and, consequently, in the patient's well being[8].

In this case, it was possible to determine small alterations in the patient's VDO only with the phonetic method[7]. However, in cases

where an accentuated reduction in the VDO occurs, more precise methods may be used, such as defining the distance between two anatomical structures of the face, like the vertical distance from the external corner of the eye to the corner of the mouth, by means of Willis compass, whose distance is similar to the original VDO[18].

Because the patient was young, the search for conservative clinical solutions oriented the treatment plan. It was therefore chosen to use direct adhesive restorations with composite to preserve the remaining dental structures and re-establish function and esthetics of anterior and posterior teeth that were lost during the erosive process.

When restoring anterior teeth with considerable loss of tooth structure, it becomes a matter of great controversy. Whether to indicate direct or indirect restorative procedures is frequently analyzed exclusively by the amount of tooth structure lost. However, a stable occlusion is obtained by a mutually protective scheme between anterior and posterior teeth, with prior interventions in posterior teeth determining posterior stability[19]. Thus, it is feasible to indicate a composite associated with adhesive systems when there is less tooth structure wear, which results in an esthetic and functional restoration of anterior teeth[11].

The great majority of current composites may effectively replace amalgam if the dental surgeon respects their physical properties, knows the main techniques for using them, and mainly, knows how to indicate them correctly[20]. The composite high load quantity (approximately 80% of weight) with reduced size (1-3μm) contributed towards increasing wear resistance, without affecting the polishing capacity, and thus optimizing the material physical properties by stress reduction on each particle.

It is important that together with the dental treatment is made medical and psychological if appropriate in patients with these disorders. It is important that the patient receives multidisciplinary and interdicisplinary treatment in order to treat the causes and consequences of the disease. Thus, the final restorative treatment should preferably be carried out when the etiological factors are under control. Therefore, re-establishing esthetics before concluding the psychological and medical treatment may increase patient's self-esteem, stimulate the desire for cure, and thus improve the patient's cooperation.

CONCLUSION

It is important for the patient to be aware of the importance of carrying out psychological and systemic treatment concurrently with dental treatment, to enable the etiological factor of enamel erosion to be eliminated and oral rehabilitation to be successful. The use of direct adhesive restorations provided the reestablishment of the occlusal vertical dimension, and assured the patient occlusal stability, functional and aesthetic. Thus, the restorative procedure contributed significantly to improving the quality of life and well-being of it.

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RESUMO

A deterioração estrutural dental, como a erosão do esmalte, é causada por dissoluções de substâncias ácidas endógenas ou exógenas nas cavidades orais. A desmineralização causada exclusivamente por ácido endógeno como as regurgitações crônicas e disfunções gástricas que causam lesões dentárias erosivas são conhecidos como perimólise. Este relato de caso clínico descreve a reabilitação oral de um paciente com perimólise usando restaurações de resina composta direta. Este paciente apresentava lesões erosivas na língua, incisivos e superfícies oclusais de quase todos os dentes, uma situação que, entre outros distúrbios, causa alteração na dimensão vertical de oclusão, dor muscular e dano estético. Aspectos multifatoriais foram aplicados ao diagnóstico, planejamento e reabilitação funcional e estética dos dentes anteriores e posteriores.

PALAVRAS-CHAVE: Erosão dentária; Mialgia; Dimensão vertical.

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