A MINIMALLY INVASIVE TREATMENT OF A PATIENT WITH LOCALISED OCCLUSAL WEAR. A CASE REPORT

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Abstract

The present paper discusses the case of a 32 year-old male patient with localized wear in the upper central incisors and canines due to malocclusion, lack of overjet and parafunction, and recurrent failure of the direct composite restorations. The treatment plan aimed at applying the most minimally invasive procedures in order to preserve the teeth structures as much as possible. To achieve this goal, the initial orthodontic treatment was followed by adhesive palatal lithium disilicate veneers (for occlusal needs) and minimal prep buccal veneers (for aesthetic purposes).

Keywords: localized wear, minimally invasive, orthodontic, no prep oral veneers, adhesive.

1. INTRODUCTION

Advanced tooth wear has been increasingly observed lately, especially in young people. Its etiology is varied - malocclusion, parafunctions, erosion - and can determine functional discomfort, raising questions about treatment planning. The literature in the field acknowledges different etiologies and mechanisms, but there is no consensus regarding a standardized treatment protocol, timing and materials to be used [1]. Moreover, its mechanisms can be mixed and its consequences sometimes very severe. The main goal is to identify as soon as possible the etiological factors, to correct them, and finally, to address patients’ complaints. The younger the patient, the less invasive the treatment plan, which permits a contingency plan in the future.

2. CASE REPORT

The article presents the case of a 32 year-old male patient who addressed our clinic unhappy with the aesthetic appearance of his central upper incisors. Anamnesis revealed that the patient underwent a series of repeatedly failed direct composite restorations on 1.1 and 2.1. The patient was looking for a more consistent result.

Clinical examination revealed the following aspects: severe wear of the incisal edges and of the incisal third of the oral surface of 1.1 and 2.1, incipient wear of the incisal edges of 1.2 and 2.2, and moderate wear of the cusp tip of 1.3 and 2.3, while the rest of the teeth presented no obvious wear signs [1,2]. Both maxillary and mandibular arches were complete, yet with moderate crowding in the frontal area (Fig. 1).

Fig. 1. Initial status
Static occlusal analysis showed an Angle Class I with minimal overbite in canines and central incisors but, more important, no overjet in incisors (Fig. 2).

Dynamic occlusal analysis showed no interferences in centric relation and maximum intercuspation (point centric), however disfunction appeared in eccentric movements. In both right and left laterotrusive movements, the canine (due to wear and minimal overbite) failed to dis-occlude the posterior teeth on the active and passive side. At the end of both movements, contacts occurred on the antagonistic lateral incisors (hence the wear). In propulsive movement, there was excessive contact between the oral surfaces of the upper teeth and the vestibular surface of the lower incisor with active interferences, and premature contacts that generated massive wear. Due to a minimal overbite, there was no posterior dis-occlusion [2]. Wear of the central incisors is associated with egression and modified gingival level and symmetry [3] (Fig. 3).

The objectives of our treatment protocol were as follows: to obtain the restorative oral and incisal space, to restore the functional occlusion, to touch the tooth structures as little as possible, to restore the aesthetics, and thus to achieve long-term stable results.

Consequently, an orthodontic treatment was planned in the first stage. Teeth alignment was planned for the maxillary arch, namely intrusion of 1.1 and 2.1 and slight protrusion of all incisors. For the lower arch, frontal teeth alignment and retraction were considered necessary [4] (Fig. 4).

After 8 months of orthodontic treatment, the gingival levels of 1.1 and 2.1 were aligned to the other maxillary teeth and inocclusion was obtained in both central incisors and canines (Fig. 5).

The restorative treatment consisted of a diagnostic wax-up made in the dental lab, followed by an indirect mock-up (Fig. 6).
veneers. We decided to apply no prep oral lithium disilicate (Emax Ivoclar) veneers 0.6mm HTA1 in 1.3, 1.1, 2.1, and 2.3. The veneers were pressed and then stained and glazed (Fig. 7).

For bonding, we used light cure resin and 7th generation adhesives (Variolink Esthetic, Adhese One Ivoclar) [5]. After bonding the oral veneers, functional anterior and bilateral canine guidance was obtained. The aesthetic aspect of 1.1 and 2.1 was not completely restored because the transition line between the tooth and the oral veneer was evident. To correct this situation, the teeth were minimally prepared (0.3 mm buccally and 1mm incisally) and two pressed veneers were bonded (lithium disilicate HTA1 stain and glaze Emax Ivoclar) (Fig. 8).

The difficulty was related to the bonding protocol: the veneers had two different substrates - enamel on the vestibular and ceramic on the incisal. For the incisal part, 5% fluorhydric acid for 20 seconds and a silane (Monobond) for 60 seconds, respectively, were used. For the vestibular part, 37% orthophosphoric acid and 7th generation adhesive (Adhese one) were used.

3. DISCUSSION

At the end of the treatment, the functional occlusal parameters were obtained: anterior guidance on the mesial slopes of 1.1 and 2.1 with posterior disocclusion and bilateral canine guidance without active and passive interferences with four no-prep oral veneers (Fig. 9).

The aesthetic result was acceptable for the patient with only two buccal veneers (Fig. 10).

Minimal preparation of the vestibular aspects of the upper central incisors was performed. Patient’s status was assimilated to class IV in ACE classification (oral wear and loss of more than 2 mm of incisal edge), which implied the sandwich technique [6,7]. The torque of the upper incisor was modified from 20⁰ to 24⁰, whereas the torque of the lower incisor changed from 25⁰ to 23⁰ (Steiner), thus allowing the achievement of a normal overjet (1 mm) [8,9]. Some authors suggest the use of composites for the oral veneers, but lithium disilicate as well as hybrid ceramics are also good options [10,11]. The follow-ups scheduled at 6-12-24 months showed no failure of the reconstructions.
4. CONCLUSIONS

Identification of the wear mechanisms as soon as possible allows the application of minimally invasive treatments. If the wear is moderate to severe, with extensive loss of teeth structure, it is of paramount importance not to destroy the tissue anymore and to find treatment protocols and materials that preserve the teeth structure and correct the damage.

References