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Prosthetic Rehabilitation to Abrased Teeth: A case Report

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Abstract

In dental clinics, dental wear is the common reason for the loss of dental structures. Generally, dental wears are classified into 4 groups: attrition, abrasion, erosion and abfraction. Dental wear is one of the general causes of the dentine hypersensitivity. Nowadays, “erosion” is supplanted by the term of “corrosion”. “Toothpaste abrasion” can be another cause of dental wear. The determination of the etiology of worn dentition can be complex. In order to be successful in treatment of worn dentition, clinician must be able to determine the cause. For esthetic restorations of worn anterior teeth, the patient's expectations and the physician's experience are very important factors. Porcelain laminate veneers, metal-ceramic restorations, all-ceramic crowns and zirconia restorations can be options for the treatment of defects.

Key words: Abrased Teeth, Prosthetic Rehabilitation

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Introduction

Dental wear is a pathological tooth tissue loss occurred by several factors except caries.(1,2) Dental wear is classified as "attrition", "erosion", "abrasion" and "abfraction".(1,3) Attrition means physiological dental wear because of tooth-tooth contact during chewing. Attrition's exact meaning is gradual decrease of dentition. According to this terminology, the word of attrition can be used as a synonym for the word of wear. Therefore, instead of wear, we should classify the attrition into the three groups: abrasion, erosion and abfraction.(1,4)

Abrasion is a tooth tissue loss caused by friction between tooth and an external agent.(1,2) Bacteria-free, chemical or electrochemical dissolutions described as erosion(1,2,4). Tooth structure losses occuring in the Cemento-enamel junction described as "cervical erosion / / abrasion lesions" or "abfraction".(1,5) These lesions are classified according to their forms: wedge-shaped, disc-shaped, flattened, irregular and shaped areas (1,2,6).

Because of the lack of effective materials, tissue loss, aesthetical approach and high risk of dental caries, restoration of the tooth may be preferred as a treatment for dental abrasions. Nowadays for this purpose the composites,porcelain laminate veneers, metal-ceramic restorations, all-ceramic crowns and zirconia restorations can be used. (7,8)

Newly core material for all-ceramic FPDs is yttrium-oxide partially-stabilized (Y-TZP) zirconia. (9,10) Y-TZP shows superior strength, better mechanical performance, high fracture resistance, more abrasion resistance, color stability and aesthetics than other all-ceramic cores. Additionally, Oxide ceramic exhibits high biocompatibility with low bacterial surface adhesion, reduced thermal conductivity. (9,11)

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Case

45-years-old male patient admitted to Dicle University Faculty of Dentistry Department of Prosthodontics with severe tooth wear of maxillary incisors. The patient did not have any systemic problem. In the radiographic and clinical examinations, dental crowns of maxillary incisors were not in normal sizes.(Fig 1)

Fig 1. The first image of the patient

Fig.2 After teeth preparation

We took impression from maxilla and mandible by alginate impression material (Tulip Alginate impression material, Cavex, Haarlem-Holland) and diagnostic models were obtained by using type 4 plaster (Gypstone 3000 + Die Stone, IMICRYL, Konya-Turkey). Face arc (Denar Slidematic Facebow, Whip Mix Corp., USA) and centric relation records were obtained from the patient. The patient's rest vertical dimension and the occlusal vertical dimension were compared. There was no decrease in occlusal vertical dimension (Free-way space of 3 mm). Models were moved to semi-adjustable articulator (Denar Advantage, Whip Mix Corp., USA). Wax-up models were prepared in the laboratory for the prescribed treatment. Teeth preparations were made in the design of proper marjin type according to the zirconia ceramic restorations. (Fig.2)Temporary restorations were made properly to the

wax-up model. Zirconia ceramic restorations were designed one by one by thinking aesthetics, gingival health and tooth gaps for easy cleaning.(Fig3-4)

Fig.3 Clinical control of zirconia structures

Fig.4 Clinical control of zirconia ceramic restorations

After evaluating aesthetics and functions during try-in, we cemented zirconia ceramic restorations by zinc polycarboxylate cement (Durelon, 3M Espe, Seefeld-Germany). Class 1 upper and lower jaw relationship was provided and patient satisfaction was achieved functionally and aesthetically.(Fig 5)

Fig.5 After cementetion procedure of zirkonia ceramic restorations

The patient was recalled for 3-6 month intervals. There was no oral evidence and pain complaint.

Discussion

For the success of treatments to patients with excessive tooth wear, we have to determine the cause of the problem. First, the etiology of wear must be known. Causing factors of abrasion affects the treatment planning directly. If abrasion is due to chemical reasons, the chemical effects must be eliminated, if it is due to mechanical reasons, the teeth must be protected against mechanical influences or the patient's harmful habits should have been changed.(12,13)

Short-term forces are well tolerated by the tissues but the excessive forces during bruxism can cause damage to the system. Parafunctional activities such as bruxism can cause irregularities to TMJ.(12,14,15,16)

According to the researchers, occlusal splints have pain and spasm relieving symptomatic effect instead of permanent treatment. While designing prosthetic rehabilitation for individuals who have abrasion, canine protective occlusion should be established. (12,17) In our study, in accordance with these purposes, we generated canine protective occlusion to our patient.

A variety of prosthetic approaches can be applied in cases of abrasion. For example, laminate veneer restorations, metal-supported restorations, all-ceramic restorations and zirconia ceramic restorations. In our case, because of aesthetic excellence and high stress resistance, zirconia framework ceramic restorations were used one by one.

As a result, in our case report, the patient's aesthetic, phonation, and function were restored by the appropriate prosthetic rehabilitation technique for excessively abrased teeth.

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