Severe Tooth Decay and Erosion Regarding Cariogenic Habits: A Rampant Caries Case Report

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Abstract: Sugars and soft drinks have cariogenic potential concerning their acidogenic structure. High consumption of these cariogenic food and drinks for prolonged time may result in dental erosion and severe tooth decay. The aim of this report is to present a patient who had rampant caries and aesthetic problems resulting from his cariogenic habits. A 22-year-old man referred to our clinic with rampant caries. The patient who was stressed and anxious had also aesthetic concerns. Although he had no systemic-health problems, his oral hygiene was extremely poor. The diagnosis was severe tooth decay, multiple erosive lesions at different stages and concomitant gingivitis. The anamnesis revealed the history of consuming ~4-5 L cola and ~30-40 pieces of peppermint every day during the past 4 years. The patient also reported that he had nausea reflex and constantly chewed mentholated gum to inhibit his discomfort. The full-mouth rehabilitation was achieved with a multidisciplinary approach within the limitation of the patient cooperation. In the case of high intake of acidogenic food and drinks that caused severe tooth decay, the treatment procedures experienced were challenging. Thus, patient education/motivation and counselling on cariogenic habits were considered in multidisciplinary treatment planning for the prosperous prognosis of the case.

Keywords: Cariogenic habit, cola, erosion, rampant caries, severe tooth decay.

1. INTRODUCTION

Rampant caries is known as a rapid and aggressive carious attack which affects several teeth. It is characterized by multiple-lesions at different stages of progression [1]. It is related with the high consumption of carbonhydrates and frequent exposure to erosive attacks [2]. High consumption of sugar and acidic drinks for prolonged time results in erosion and severe tooth decay. The concurrency of erosion and severe tooth decay in rampant caries exists more aggressive destructive effect for dental hard tissues [2, 3]. Control of the progress is difficult due to the multifactorial aetiology. It is very important to understand the rampant caries phenomen for a succesful management and control of the disease.

The progressive loss of dental hard tissues due to the mechanical and chemical reasons causes tooth wear. The wear produced by interaction between teeth and other materials is defined as abrasion and that dissolution of hard tissue by acidic substances is mentioned as erosion [4, 5]. The different aetiologic reasons are the main factors to conduct differential diagnosis. The mechanism of wear cannot only be attributed to erosion or abrasion, their interaction with each other is also effective [4, 5]. Erosive tooth wear consists of the mechanical wear of the thin softened layer or the direct removal of hard tissue by prolonged demineralization [4].

The aim of this case report is to present the aetiological factors, treatment management and prognosis of rampant caries caused by the patient's cariogenic habits.

2. CASE REPORT

A 22-year old man applied to our clinic because of dental pain and aesthetic concerns. The patient, who was stressed and anxious had also defined aesthetic concerns arising from his appearance. Although he had no systemic health problems, his oral hygiene was extremely poor. The anamnesis revealed the history of consuming ~4-5 L cola and ~30-40 pieces of peppermint everyday day during the past 4 years. He also had nausea reflex and constantly chewed mentholated gum to inhibit his discomfort.

Severe tooth decay, multiple erosive lesions and concomitant gingivitis were diagnosed. Caries lesions extending to the alveolar crest and periapical lesions were also diagnosed (Figure **1**).

Oral hygiene instruction and diet control advice were administered at first hand. Chlorhexidine mouth rinse and a remineralization agent (Tooth Mousse Plus/Recaldent-GC) were recommended for daily use. The patient was warned against his cariogenic habits in detail and was encouraged to limit and then stop the cola/sugar consumption. Sugar-free cola and artificial

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Figure 1: Clinical view in initial; (**A**): Smile line, (**B**): Intraoral examination, (**C**): Radiographic examination).

sweeteners were recommended before the patient could completely give up his cariogenic habits. The patient was advised to reduce the remaining time of the cola/sugar in the mouth. In addition, xylitol chewing-gum was recommended.

Before each session, antiemetic (Emedur 200 mg/Sanofi-Aventis) was administered to reduce his nausea reflex. Non-surgical periodontal treatment was applied. The root canal treatments of the teeth (13, 12, 11, 21, 22, 23, 33, 32, 31, 41, 42, 43, 44, 45) were performed with rotary instrument system (ProTaper Universal Rotary/Dentsply). Maksiller and mandibular anterior flap operation was performed to correct the gingival lines and crown lengths. The fiber posts (Unicore Post System/Ultradent) were placed into the canals (13, 12, 11, 21, 22, 23, 31, 41, 42, 43, 44, 45) and composite cores (Filtek Z250/3M-ESPE) were built up (Figure **2**). Then, porcelain fused-to-metal crowns were fabricated for the same teeth except for 45 (Figure **3**). Additionally 34, 35 and 45 were restorated with resin composite (Filtek Z250/3M-ESPE).

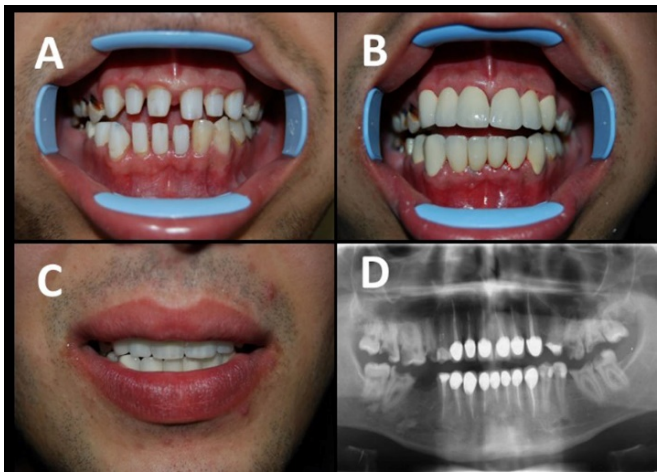

Figure 3: The stages of prosthetic treatment, (**A**): Tooth preparation, (**B**): Cementation, (**C**): Smile line after treatment, (**D**): Radiographic examination after treatment.

Improved aesthetic appearance positively contributed to the psychological aspects of the patient. He reported positive progresses in his life such as having been employed and getting married. On the other hand, he suspended the treatment for a while. Then, his maxillary left first molar was extracted, but it

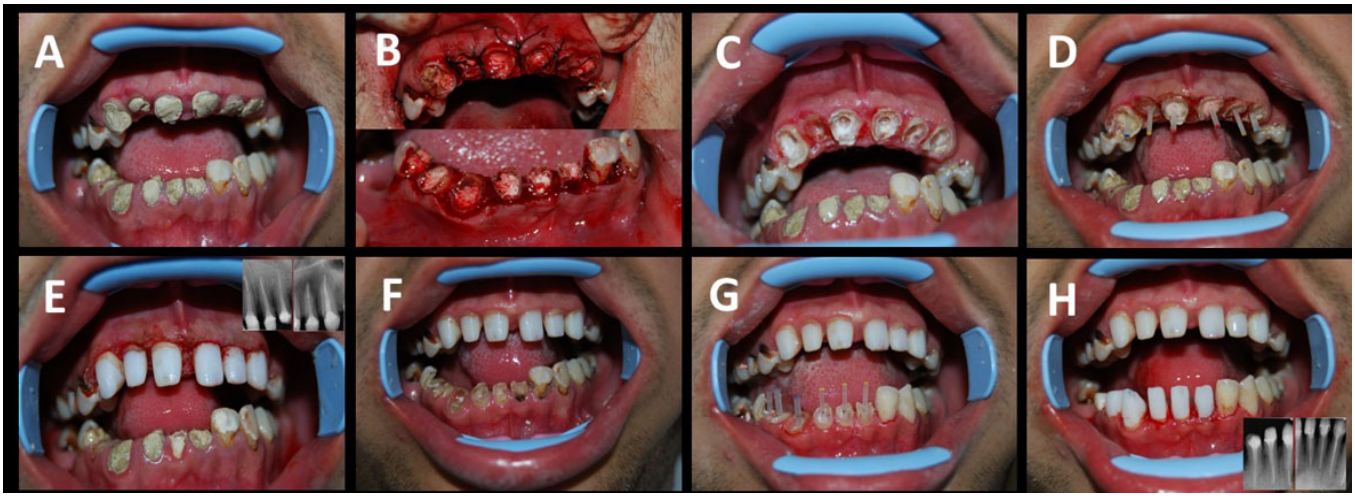

Figure 2: The stages of periodontal, endodontic and restorative treatment; (**A**): After non-surgical periodontal treatment, (**B**): After the flap operation, (**C, F**): Root-canal treatment, (**D, G**): Fiber post replacement, (**E, H**): Composite-core structures).

Figure 4: The views after 36 months, (**A**): Smile line, (**B**): Intraoral view, (**C**): Radiographic view).

had been very traumatic for the patient, psychologically. He could not tolerate further teeth extractions. He even denied the alternative treatment option with general anaesthesia. Thus, the patient did not attend the appointments for the posterior region. The situation in the end of 36-months was presented in Figure **4**.

3. DISCUSSION

In this case report, a patient with the severe tooth decay, multiple erosive lesions at different stages and concomitant gingivitis resulting from his cariogenic habits was presented. The case was complex and challenging in a way that it contained both erosion and rampant caries which caused severe coronal tooth destructions. The concurrency of multiple factors made the case more difficult and complicated. Although such clinical cases are common in dental practice, the case reports on this subject seem to be limited in the literature.

The dental erosion is defined as chronic chemical loss of tooth structure caused by acids without bacterial involvement. On the other hand, dental caries is related with the high sugar intake and bad oral hygiene [3]. Sugar containing carbonated drinks with low pH like cola has the potential to erode enamel and cause tooth destruction. In our case, the lesions that resulted in severe hard tissue destructions were diagnosed to be rampant caries. The lesions were soft and yellowish-brown. They could even be detected at low-risk areas like occlusal one-third of the facial surface of lower incisors. There were also white-spot lesions of erosion distributed all over the enamel structure of all teeth. All the mentioned symptoms were indicative of caries activity. Thus, the patient was instructed to shift his sugar consumption to sugar-free, non-acidic drinks immediately, to prevent further destructions. The rehabilitation was started with non-surgical periodontal treatment in order to restore gingival health and remove plaque and calculus. Even though this therapy is a must to eliminate bacteria, daily removal of dental plaque with tooth brushing and flossing is essential [6]. When these basic oral hygiene methods are neglected by patients who find it time consuming and difficult even after instructed by his dentists, the plaque formation is inevitable and non-surgical treatment is sabotaged. Thus, in addition to toothbrushing and flossing, antimicrobial mouthrinse was recommended to keep the patient actively in plaque control. As tooth brushing following erosive attack causes more hard tissue loss, he was informed to rinse his mouth with water immediately after cola consumption and brush his teeth at least 30 min later to protect the enamel and dentin [7, 8]. Another important point in the daily oral care recommendations was fluoride and casein phosphopeptide–amorphous calcium phosphate containing products to enhance remineralization in addition to plaque control. For the success of prognosis, it was important to start changing his lifelong habits without giving any discomfort.

In the treatment plan, the patient's aesthetic concerns had the priority in order to increase his motivation. Thus, the rehabilitation was started with the anterior region. This approach provided positive results in the patient's social life and his primary expectation was fulfilled. However, the patient did not show the same cooperation for the posterior region. It can be discussed whether it could be more advantageous if the rehabilitation was started with the posterior. On the other hand, we still think that it would lead the patient to give up his treatment earlier.

The most important factors in treatment decision were quick and practical options. Endodontic treatment was applied in the anterior region due to the pulp exposure and apical lesions. The conservative treatment was not enough, as the teeth had excessive tissue loss. Therefore, the prosthetic treatment was also applied. Endodontic treatment was not possible at posterior region and in fact tooth extraction could be performed for only one tooth.

The aggressive carious progress in rampant caries results in severe destructions of teeth. In this case, with an incompatible patient, poor oral hygiene, cariogenic diet habits, and nausea reflex the treatment became more challenging, complex and time-consuming. Thus, a practical treatment method that could easily be accepted by the patient was preferred. The primary aim was to change the patient's cariogenic habits to eliminate the aetiological factors. Although the treatment could not be completed, the abuse progress was prevented. The stabilization of the situation suggests that the mentioned approach would be advantageous in such cases.

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