

Treatment of Horizontal Root-fractured Teeth with Decoronation Procedure: Two Case Reports

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ABSTRACT: Early loss of permanent anterior teeth due to trauma can cause esthetic and functional problems for young patients. In such cases, replacement of the missing tooth with traditional approaches is possible. One of the methods applied for ankylosing teeth is decoronation. This method consisted of leaving the root fragment inside the alveolar socket following the removal of the crown. Case 1; a 16-year-old female patient referred to clinic with a history of trauma. Horizontal root fracture in tooth no.11 was detected. To avoid alveolar bone loss due to early tooth extraction, decoronation procedure was applied. After removal of the crown, the root fragment which inside the alveolar socket instrumented for bleeding. For the rehabilitation of the missing crown, extracted crown part which hidden physiological serum was placed with fiber network. Case 2; 13-year-old male patient referred to clinic who was applied to the tooth no.11 apexification treatment 1.5 years ago. After radiographic examination horizontal root fracture was detected and mobility was observed. Decoronation procedure was applied. For the rehabilitation of the missing crown, extracted crown part which hidden physiological serum was placed with fiber network. In these case reports, decoronation was shown to be a suitable alternative for a fractured, also for non-anklosed tooth.

Keywords: Decoronation, dental trauma, root fracture.

I. INTRODUCTION

Traumatic dental injuries to the young people are a serious problem. The incidence of dental trauma has increased significantly during the last decades in particular for anterior teeth of children and adolescents (1,2). The mean prevalence of dental and oral injuries reported in the literature has oscillated between 4% and 33%, depending on the sex and age of the patients (3,4). Most maxillofacial traumatic injuries happen to the dentition alone (50%) or involve both the dentition and adjacent soft tissue (36%) (5). The most common injuries for permanent teeth occur to

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falls, followed by traffic accidents, violence, and sports. The permanent incisors were the most commonly injured teeth (6).

Root fracture implies fracture of the cementum, dentin and pulp. These injuries are relatively rare, occurring in less than 3% of all dental injuries (7). Immature teeth with vital pulps rarely sustain horizontal root fractures (8). When a root fractures horizontally, the coronal segment is displaced to a varying degree, but generally the apical segment is not displaced. Because the apical pulpal circulation is not disrupted, pulp necrosis in the apical segment is extremely rare (9). The prognosis of root fractures depend on the location of the fracture and healing patterns of root fragments (10,11,12).

Decoronation is an alternative surgical method for treating ananklyosed teeth that the alveolar ridge is preserved. The crown is removed, leaving the root to be resorbed and covered with a mucoperiosteal flap (13). Following complete crown removal, the existing root canal filling (when present) is removed the prevent foreign body reaction. The empty root canal is throughly rinsed with saline and intentionally filled with blood for promoting additional replacement resorption continues without interruption (13) The alveolar ridge was maintained and the bone level increased after decoronation in patients treated before or during pubertal growth periods. Also, vertical bone apposition is frequently observed on top of the decoronated root (14). The normal alveolar condition is important for succesfull prosthetic treatment and implant replacement later (15).

Ribbon fibers introduced in 1992 to the market is a bondable reinforced fibers occuring ultrahigh strength polyethilen fibers with a high elasticity coefficient (117 GPa) that makes them highly resistant to stretch and distorsion and a high resistance to traction (3 GPa) that allows them to easily adapt to tooth morphology and dental arch (16). Ribbon fibers absorb less moisture than the dental resins (17). Ribbon is biocompatible, esthetic, translucent, colorless and disappears within the composite or acrylic without show-through (16). Ribbon can be used in stabilizing traumatized teeth, restoring fracured teeth and creating a fixed partial denture and for direct bonded endodontic posts and cores (18,19).

The aim of this paper is report cases in which decoronation was performed in horizontal root fractured teeth and discuss the literature on the philosophy of decoronation addressing technique, advantages and factors influencing their choice.

II. CASE

Case-1: A 16-year-old female patient referred to our clinic with a history of trauma and chief complaint of pain in maxiller central incisors. In clinical examination mobility was detected in tooth number 11 and in radiographical examination cervical horizontal root fracture was detected in the same tooth (figure 1). To avoid alveolar bone loss due to early tooth extraction, decoronation procedure, an alternative approach, was applied to tooth no. 11. After removal of the crown, the root fragment which inside the alveolar socket instrumented and irrigated with salin for bleeding (figure 2). After bleeding for the rehabilitation of the missing crown, extracted crown part which hidden physiological serum was placed with fiber network (Ribbon) neighbour teeth (figure 3). 3 months later she came for control and her fiber bridge fell down. We restorated the missing crown with Ribbon again and she had no complain (figure 4).

Case-2: 11-year-old male patient referred to our clinic with a history of trauma and chief complaint of abcess in tooth number 11 and an apexification treatment was recommended. Because patient was hindered treatment procedure, apexification treatment was terminated and tooth was filled with MTA and it was followed (figure 5). 1.5 years later patient came our clinic with mobility and swing complaints in the same tooth. After radiographic examination horizontal root fracture in tooth no 11 was detected and mobility was observed (figure 6). To avoid alveolar bone loss due to early tooth extraction, decoronation procedure, was applied to tooth no. 11. For the rehabilitation of the missing crown, extracted crown part which restorated with resin composite was placed with fiber

networkneighbour teeth (figure 7). He was followed six months (figure 8). Radiographic alveolar bone level reduction was not seen in 6 months.

Figure 1: First radiography



Figure 2: Bleeding



Figure 3: Ribbond



Figure 4: Ribbond (again)



Figure 5: Apexification



Figure 6: Horizontal fracture



Figure 7: Completed tooth



III. DISCUSSION

The management of the traumatized teeth requires an multidisiplinary approach to maximize the treatment options. Rehabilitation of single anterior edentulous space is very important for function and especially for esthetic. Treatment alternatives are partial prosthesis, Maryland bridges, resin bridges and dental implants. The treatment options based on colour and form of the symmetric tooth, parafunctional habits, alveol bond level, esthetic expectations and patients' age (20,21). At the same time mentioned treatment alternatives have advantageous and disadvantageous, today most advantageous method is dental implants. But dental implants may adversely affect growth in adolescent period (22).

Dental implants' success depend on many factors. Alveol bone resorption occurs after tooth extraction, may cause many esthetic and placing the implant problems. In pediatric patients early loss of anterior teeth because of trauma, placing dental implants are enhanced for clinicians (23).

Decoronation provides certain advantages over other treatment options: it is reliable in terms of width and height preservation of the alveolar process, it is a simpler and more economical surgical procedure than ridge augmentation, and vertical bone apposition is possible (2,24).

Decoronation, an alternative treatment to the extraction of anklyosed teeth which attempts to preserve its surrounding alveolar bone and prevent tooth infra positioning. This procedure involves gingival mucoperiosteal flap evaluation, subcrestal removal of the tooth crown leaving the root in its alveolus to be replaced by bone (25). Following complete crown removal, the existing root canal filling is removed to prevent foreign body reaction. The empty root canal is thoroughly rinsed with salin and internationally filled with blood to promote additional replacement resorbtion from its internal aspect, while the external replacement resorption continues without interruption (13). One of our case reports an empty root canal rinsed with salin and filled with blood and the other one,MTA filling material can not be removed through channel so that was left intact.

In these cases, the root fragments of teeth which must extwere held in the socket by decoronation. This process provide aesthetic implants and prevent resorbtion of bone.

Decoronation is considered one of the optimal procedure for an anklyosedtooth ,in a child and adolescent. It is a simple and less traumatic procedure compared with extraction (26). This procedure generally for anklosed teeth but in these cases it was applied non-anklosed teeth. There was no such examples in the literature. In these cases there was no infection the root fragments in the sockets. There was no symptoms 3 and 6 months follow up. Furthermore, in our case series we need long-term follow-up which bone preservation was evident after decoronation.

In two cases there was no resorbtion and no infection in alveolar bone. The patient is still under control. Decoronation is reliable alternative procedure for prevent resorbtion of bone for anklyosed teeth. We saw that we can use this treatment technique in cervical horizontal root fractures.

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