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Laser Usage in the Treatment of a Maxillary Lateral Luxation: A Case Report

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ABSTRACT: *At least one third of all dental trauma involves adults. This case report discusses the use of laser in the management protocol of dental trauma in adults. Low level laser therapy can affect healing of dental trauma in adults' damage.*
Key words: *Endodontics, laser, trauma*

I. INTRODUCTION

Researches on dental injuries in adults are rare but it is known that one third of dental trauma involves adults (1). Adult dentoalveolar trauma occurs because of falls, sports activities, traffic accidents. Coronal fracture is the first result of adult dentoalveolar trauma (65-75%) followed by tooth luxation (8-20%) (2,3). The regeneration capacity of adults is lower than the children therefore the therapy of severe injuries can fail (4). Laser is one of the effective methods of disinfection of pockets and root canals (5). On the other hand, the usage of laser therapy for biostimulation of soft tissue wound provide healing of lesion faster and create less post-traumatic discomfort and pain (6). The purpose of this case study is to see the results of the laser applications on the therapy of severe injury of an adult without any periodontal surgery.

II. CASE REPORT

A 32 years old, male patient came to our clinic, two weeks after from the formation of injury. His complaints are pain and mobility in his maxillary central incisor following by a traumatic injury during sport. On radiographic

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examination, it was diagnosed that only the tooth number 11 was affected (rad.1). On clinic examination, it was seen the feeding of upper gum wasn't good and severe lateral luxation was observed (figure.1). There was no fracture of alveolus and root. After the repositioning of the tooth gently into its original location with digital pressure method, the splint was performed by using Ribbond® (figure.2). After splinting, root canal treatment was performed by using diode laser (Ezlase 940, Biolase, USA) for canal disinfection.

Bone loss on the vestibule and mesial surface of the tooth was serious. The periodontal curettage was made and then the Er,Cr:YSGG laser (Waterlase, Biolase , USA) was used to disinfect root surface in the pocket minimal invasively. Biostimulation with diode laser was performed at the first, third and seventh days of the treatment. During 8 weeks, in all appointment the pocket was disinfected with Er,Cr:YSGG laser. After 8 weeks, the augmentation of bone has seen on the parallel periapical radiograph and the splint was removed (rad.6 and figure.6). The tooth was supported with digital pressure during this procedure. A plaque was made to prevent push of the tongue (figure.5). At the controls, the tooth's mobility was grade 2 and the appearance wasn't aesthetic. So six aesthetic restorations were performed on the upper jaw (Figure.7, .8 and .9). In CT images (CT.1), on the vestibule of the tooth number 11 there was no bone, for this reason the permanent splint was performed for the further periodontologic operation (figure.9). At follow up examination, the tooth was found asymptomatic and radiographically it showed that the bone loss was repaired . In addition, mobility of the tooth was significantly decreased and soft tissue was much better than the first time.

III. DİSCUSSİON

The way of dealing with injured permanent teeth is careful diagnosis, continued follow-up and conservative treatment (7). Lateral luxation in the maxillary right central was detected in this case report, in which the patient demonstrated periodontal tissue injury. For reposition and splint of the increased mobile tooth flexible splinting was necessary (8).

Injured tooth with closed apex needed root canal treatment (8). Prognosis is depended on the healing of injured periodontal tissues. If normal ligament is formed, the tooth can stay more time in the mouth. If inflammatory resorption occurred, we could lose the tooth (8).

The laser application in the adult injury can be effective on the healing, elimination of endodontic and periodontal microorganism and minimally invasive surgical modality for treatment of periodontal diseases of the pocket (5,6,9). The wound-healing mechanism for LLLT was reported previously (10,11,12). Studies on wound healing and pain relief are highlighted to show the clinical efficacy of laser therapy (11). In examining the effects of LLLT on cell cultures in vitro, some articles report an increase in cell proliferation and collagen production (12). However there have been several studies that have addressed the action of LLLT on bone repair, osteogenesis, (13) pulpal tissue, (14,15) and the dentin repair process (16). In this case, using different lasers are a viable alternative to the injury treatments that applied in clinical conditions similar to the cases reported in this study.

To obtain the aesthetic and mechanical resistance fracture of restoration of traumatized anterior teeth Ribbond® fibers are suitable. Because their esthetic properties and their mechanical strength contribute to the composite restoration . So in this case we use Ribbond® to support our esthetic restoration (17).

IV. FIGURE AND TABLE


RAD.1 The pre-tretment radiograph shows lateral luxation


rad.2 the radiograph after splinting and CaOH replacement that shows bone loss


rad.3 the radiograph after finishing root canal treatment (two weeks)


rad.4 the radiograph four weeks after splinting


rad.5 the radiograph six weeks after splinting


rad.6 the radiograph 8 weeks after splinting that shows bone augmentation


rad.7 the radiograph after removal of splint

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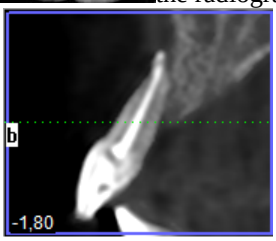
rad 9. the radiograph after esthetic restoration



rad.10 the ct image shows no bone on the vestibul of the tooth

figure.1

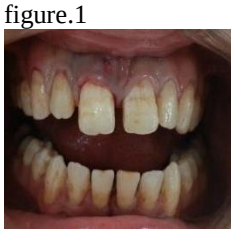

this photograph shows pre-treatment status of the patient

FİGURE.2


after splinting using Ribbond


after two months of splinting

FİGURE.4


plaque made to protect the tooth from tongue push

FİGURE.5

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after removal of Ribbond splint

FİGURE.6


after esthetic restorations

FİGURE.7


after esthetic restorations

FİGURE.8

Figure 9. the photograph shows palatinal Ribbond splint with esthetic restorations

V. CONCLUSION

The laser application in the adult injury can be effective on the healing process.

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