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Dental Treatment 2019 The effect of two Phosphodiesterase inhibitors on bone healing in mandibular fractures(animal study in rats)- Mohsen Maleki Gorji, Islamic Azad University

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Background and Objectives: Despite the advances in maxillofacial surgery, impaired bone healing remains a concern for surgical teams. Many studies have evaluated the effects of sildenafil and pentoxifylline on bone healing. However, their effects on healing of bone fractures have not been well investigated. This study aimed to assess the effects of sildenafil and pentoxifylline phosphodiesterase inhibitors on healing of mandibular fractures in rats.

Materials and Methods: A total of 60 rats were randomly divided into six groups of 10. Mandibular fracture was induced in all rats. After the surgical procedure, C1 group received saline, S1 group received 10 mg/kg sildenafil and P1 group received 50 mg/kg pentoxifylline. The rats were sacrificed after 1 week. C4, S4 and P4 groups received pharmaceutical therapy as in groups C1, S1 and P1 but were sacrificed after 4 weeks. The samples then underwent histological analysis.

Results: The mean rate of healing of mandibular fractures in S1 and P1 groups was significantly higher than that in C1 group at 1 week (P<0.001). The mean rate of healing of mandibular fractures in P1 group was higher than that in S1 group at 1 week (P=0.04). The mean rate of healing of mandibular fractures in S4 (P=0.001) and P4 (P=0.004) groups was significantly higher than that in C4 group at 4 weeks but no significant difference was noted between P4 and S4 groups in this respect (P=0.53).

Conclusion: Sildenafil and pentoxifylline can be used as adjuncts to enhance bone healing.

Review: Mandibular fracture, also known as fracture of the jaw, is a break through themandibular bone. In about 60% of cases the break occurs in two places. It may result in a decreased ability to fully open the mouth. Often the teeth will not feel properly aligned or there may be bleeding of the gums. To evaluate the prevalence, location and configuration of bifid mandibular canals so as to avoid injury to the nerve and inadequate anesthesia during surgical procedures. CBCT scan of 203 patients (125 males and 78 females) was evaluated for the presence and the type of the bifid mandibular canal. They were classified according to Nortje et al. The prevalence rates were determined according to gender, location, and type of bifid mandibular canal. Statistical analysis was performed using IBM SPSS software version 24. The prevalence rate of bifid mandibular canals was found to be 10.3% with 12.8% in males and 6.4% in females. The Chi-square test reveals there is a statistically significant difference between the different locations of bifid mandibular canals and most of the canals were present on the right side. The most frequent type of bifid mandibular canal observed was type II dental canal (38.1%), followed by type III forward canal (28.6%), type I retromolar canal (14.3%), and type IV buccolingual canal (14.3%). CBCT is suggested for a detailed evaluation and identification of bifid mandibular canals before any surgical procedures to avoid post-operative complications.

Luxation injuries are one of the most prevalent type traumatic dental injuries in primary dentition. The impact of these injuries may not only be limited to

the primary teeth but may also have adverse effects on the developing succedaneous tooth bud resulting in various unfavorable consequences. This systematic review aims at compiling the evidence of available literature regarding luxation injuries to primary teeth, etiology, treatment modalities, outcomes and sequelae on permanent teeth.MethodologySearch of PubMed, Google Scholar, Cochrane Database of Systematic Reviews, SCOPUS and LILACS virtual health library was conducted for the literature published from January 1, 2007 to December 31, 2017. Two authors separately reviewed the literature and extracted the data from the included studies.ResultsAfter screening 224 articles, 13 articles fulfilled the inclusion criteria. Most common etiological factor for injury (up to 44.8%) is fall while walking or running. The unfavorable outcomes which are mostly associated with luxation injuries are pulp canal obliteration ranging from 8.6% to 43.3% and pulp necrosis 8.6% –78.9%. Sequelae on succedaneous teeth vary with a high incidence of white or yellow brown discoloration of enamel (78%) and enamel hypoplasia (7.8%–28.3%). ConclusionFall is the most common cause and regular monitoring is recommended for most of the luxated teeth. Pulp canal obliteration, pulp necrosis and tooth loss due to trauma are prevalent complications observed following luxation. White or yellow brown discoloration of enamel and enamel hypoplasia are the most common undesirable sequelae to permanent teeth.

Human dental pulp stem cells (hDPSCs) are characterized by high proliferation rate, the multi-differentiation ability and, notably, low immunogenicity and immunomodulatory properties exerted through different mechanisms including Fas/FasL pathway. Despite their multipotency, hDPSCs require particular conditions to achieve chondrogenic differentiation. This might be due to the perivascular localization and the expression of angiogenic marker under standard culture conditions. FasL stimulation was able to promote the early induction of chondrogenic commitment and to lead the differentiation at later times. Interestingly, the expression of angiogenic marker was reduced by FasL stimulation without activating the extrinsic apoptotic pathway in standard culture conditions. In conclusion, these findings highlight the peculiar embryological origin of hDPSCs and provide further insights on their biological properties. Therefore, Fas/FasL pathway not only is involved in determining the immunomodulatory properties, but also is implicated in supporting the chondrogenic commitment of hDPSCs.

Keywords: Mandibular Fracture; Bone Healing; Sildenafil; Pentoxifylline