Reparative Activity Of Bioglass And Tricalcium Phosphate
To Induce Apical Closure Compared To Normal Apexogenesis
(Histological and Histochemical Study).

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Abstract:
Four dogs of 6-7 months old, having incompletely developed incisor teeth were used to compare the apical and periapical reaction of Bioglass and Tricalcium phosphate to induce apical closure versus normal apexogenesis. The root canals of lateral and corner incisors of left side were apically plugged with tricalcium phosphate, while Bioglass was inserted apically in the corresponding teeth of right side. The central incisors were left intact and served as control. Two dogs were sacrificed at 2 and 4 months experimental periods. Before decalcification process, each dog’s jaw was radiographed by Degura system, to measure the density of newly formed apical and periapical calcified tissues in both experimental groups and compared statistically with the control group. The apical closure of control as well as experimental teeth was determined at 2 months period by radiographic and histological examinations. The mean density of hard tissue at apical foramen and periapical tissues was increased at 4 months than that at 2 months. The mineral density of apical and periapical tissues obtained with Bioglass was significantly greater values, while that obtained by tricalcium phosphate was the lower values versus control group. Histological examination revealed that, dentin and cementum completed the apices of control teeth. However in Bioglass and tricalcium phosphate groups, the apical barrier consisted of non-homogeneous cellular calcified substances intermixed with soft tissues or some spaces. The reparative ability of Bioglass in apical closure was more exaggerated than that of tricalcium phosphate group and also the bone developed periapically was more organized and dense. At two and four months intervals the developed periodontal ligament at the apical region of Bioglass treated teeth showed well-organized pattern of fibrous arrangement and orientation. On the other hand a disorganized pattern of development was manifested in the periodontal ligament of tricalcium phosphate group after two months, at the 4 months period, the fibers were irregularly oriented, enclosed wide spaces and rich in the carboxylated MPS. Histochemical finding revealed that the glycoproteins and total proteins were markedly increased in apical calcified barrier and periapical bone of teeth treated with tricalcium phosphate. The deposits of calcium salts were difficult to be identified in the apical calcifying material or bone of this group. However in Bioglass, the glycoproteins were increased in the apical barrier and periapical bone apical calcified material but to a lesser extent than in tricalcium The total proteins were slightly increased in apical calcified material at the 4 months period. The deposits of calcium salts were noticeably detected in excess in apical and periapical hard tissues.