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Healing patterns of transplanted roots coated with an allogeneic fibrin-fibronectin concentrate

Sing-Rambiritch, Simitha

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5 DISCUSSION

Baboons and humans bear remarkable degrees of similarity with regards to their bone physiology and wound repair process as confirmed by histomorphometrical studies conducted on iliac crests (Schnitzler *et al.,* 1993). Therefore, baboons were subjects ideally suited for the purpose of this study.

Healing was evaluated on root surfaces which had been surgically exposed and planed without having been contaminated by periodontal pathogens. Some authors (Nyman *et al.*, 1982; Gottlow *et al.*, 1984; Magnuson *et al.*, 1985) have confirmed that there is regeneration of connective tissue on exposed root surfaces which have been adequately decontaminated.

In this study, new attachment, non-inserted fibres, ankylosis and root resorption occurred to a varying degree on all four regions of all root surfaces. The histomorphological examination revealed essentially non-inserted fibres parallel to the root surfaces, root resorption and ankylosis. There were few areas of new attachment in the vicinity of the apices where root planing had not been done.

The analysis of variance demonstrated no significant differences in percentage of NA between the experimental and control groups in any of the four regions. Overall (all four regions together), the experimental group had a significantly lower percentage of NA

than the control group. There were no significant differences in percentage of RR between the experimental and control groups in any of the three regions or overall; although the experimental group had a higher proportion of RR than the control group. The higher proportion of RR in experimental roots could be explained as follows: the binding of fibronectin at the surgical sites promotes the retention of monocytes and enhance their phagocytic capacity due to their affinity for fibrin and collagen (Bevilacqua *et al.*, 1981). Furthermore, there were no significant differences in percentage of A and NI between the experimental and control groups in any of the four regions or overall.

Within the limits of this study, the potential for connective tissue attachment is not enhanced on transplanted roots treated with an allogeneic fibrin-fibronectin concentrate when compared with root treated with citric acid only. The main healing patterns, i.e. non-inserted fibres, root resorption and ankylosis were similar between experimental and control roots.

The outcome of this experiment is in sharp contrast to a study by Ripamonti *et al.* (1987) where substantial cementum, periodontal ligament and alveolar bone were regenerated on surgically exposed roots treated with citric acid (control roots) and citric acid and AFFP prepared from pooled fresh frozen baboon plasma (experimental roots). The results of this study however concur with those of the study of Ripamonti *et al.* (1989), in which AFFP, coating of the roots neither enhanced connective tissue regeneration and attachment nor prevented dento-alveolar ankylosis after replantation.

The experimentations of Proye *et al.* (1982), Caton *et al.* (1986) and others reveal that tooth replantation in their own alveoli may result in an initial clinical success, but in a long term failure due to ankylosis and root resorption.

New research has shown good results in an attempt to control, or at least reduce the incidence of ankylosis and root resorption on replanted and transplanted teeth. Seshima *et al.* (2010) assessed the effect of recombinant fibroblast growth factor (FGF-2) on replanted mandibular premolars in dogs. Experimental roots were treated with FGF-2 showed formation of new cementum eight weeks after treatment. Moreover, the incidence of root resorption was significantly lower than in the control group. The authors concluded that FGF-2 promotes formation of a new periodontal ligament and significantly reduces ankylosis and root resorption following tooth replantation, at least in the short term.