Regenerative Endodontic Procedures Using Blood Clot in Conjunction with Autologous PRF in Necrotic Mature Teeth with Apical Periodontitis in Dogs
(An Experimental Histological Study)

Saad El Gendy 1 * MSc, Sybel Moussa 1 PhD, Nayera Mokhles 1 PhD,
Nesma Khalil 2 PhD, Ahmed Ghareeb 3 PhD
1. Endodontics, Conservative Dentistry Dept, Faculty of Dentistry, Alexandria University, Egypt.
2. Oral biology Dept, Faculty of Dentistry, Alexandria University, Egypt.
3. Preclinical Studies, Pharmaceutical and Fermentation Industries Development Centre, SRTA-city, Egypt.
*Corresponding author: Email: saad.elgendy@alexu.edu.eg

INTRODUCTION
The scope of REPs is now extending to include treatment of necrotic mature permanent teeth with closed apices. (1) Platelet rich fibrin (PRF) is a natural fibrin-based scaffold that is prepared from patient’s own blood without any biochemical additives. It is rich in platelets, growth factors and important cytokines, which can fasten the regeneration process. Hence, PRF could be used as a scaffold in regenerative endodontics. (2) The aim of this study is to evaluate histologically the nature of the regenerated tissues following REPs in necrotic mature permanent teeth, in dogs using two different scaffolds: Induced blood clot (BC) and PRF together with BC.

METHODOLOGY
Pulpal necrosis was induced by accessing dogs’ incisors and leaving them exposed to the oral cavity for 3 weeks to develop apical periodontitis, which is confirmed radiographically. Under rubber dam isolation, root canals were instrumented using ProTaper Next system up to size X3 (#30) under constant irrigation with 1.5% NaOCl. Calcium hydroxide was then placed as intracanal medicament for 2 weeks.

In BC group, apical foramen was furtherly enlarged using hand K-files till #30 and a sterile pre-curved K-file #25 was inserted beyond the canal to induce intracanal bleeding. (Fig. 1A) While in PRF+BC group, after induction of bleeding, paper points were used to dry the excess blood so that the blood filled the apical third only and PRF small pieces were condensed inside the root canal space. (Fig. 1B)

Three mm of MTA was placed in the cervical third of the root canals followed by resin-modified glass ionomer as a coronal restoration. Three months later, dogs were euthanized and bone blocks containing incisors were processed for histological evaluation.

RESULTS AND DISCUSSION
In BC group, the regenerated tissues contain more mineralized tissues (Bone-like) that are embedded in a vascular dense fibrous tissue (Periodontal ligament-like).

(Fig. 2A&B). While in PRF+BC group, the regenerated tissues are well-vascularized loose fibrous tissues that look more closely to the structure of normal pulp but without odontoblasts. It also showed a higher degree of inflammation. (Fig. 2C&D) Mineralized tissue was found to be formed on the canal walls in both groups.

CONCLUSION
Based on our preliminary results, it appears that using PRF in conjunction with blood clot in REPs regenerate tissues that looks, histologically, more closely to the structure of the normal pulp, but it lacks odontoblasts.

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REFERENCES