

**A Study of the Effect of Placental
Collagen on Pulp Exposure
(Histological, Ultrastructural,
Biochemical and Radiological *In Vivo*
Study)**

**A Thesis Submitted to the Council of the
College of Dentistry, University of Baghdad in
Partial Fulfillment of the Requirement for the
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Abstract

This study was designed to evaluate the ability of human collagen as a pulp capping material (to induce reparative dentin after pulp exposure) and to compare this new material in this field to dycal which were used for many decades.

A total of 216 teeth of 6 mongrel dogs were used in this study, Class V cavity was done on each tooth and exposure was induced the teeth were divided into three groups according to medication used:

- I - Control group (without medication): A Tinfoil disk were put at the exposure site and cavities were sealed with glass ionomer cement.
- II - Experimental group (dycal): the exposure copped with dycal and cavities sealed with glass ionomer cement.
- III - Experimental group (collagen): the exposure capped with collagen and also the cavities sealed with glass ionomer cement.

The dogs were divided into 3 groups according to the time intervals (2 dogs for each):

Group A : 3 days

Group B : 14 days

Group C : 60 days

At the end of each interval teeth were extracted. Each of these groups divided into 3 subgroups (8 teeth for each) according to the investigation.

Microbiological Study:

For the pulp: after filling removal and swabs were taken from the exposure site

For peripical area: immediately after extraction of the teeth.

Radiographic Study:

After exposure induction (preoperative radiograph) were taken (Digitally), then after filling removal (postoperative) radiograph were taken to compare the opacity at the exposure site and to examine the condition of periapical area.

Histologic Study:

After preparing the samples, they were studied under light microscope to examine: pulp tissue disorganization, inflammatory cell infiltration, fibroblast proliferation, fibrous matrix formation, reparative dentin.

Transmission electron Microscopic Study:

Sections studied under electron microscope to examine the ultrastructure of cells especially at active stage with the pulp tissue.

Biochemical Study:

Samples were prepared for biochemical analysis of dentin for calcium and phosphorous concentration by spectrophotometer to observe the degree of calcification of dentin bridge in exposed pulp with different medication.

Results of the different studies concluded that collagen from human placenta is a biologically compatible material for pulp capping as it induce reparative dentin formation more consistent and earlier compared with dycal and with less inflammatory response