Effect of Topical Application Of Growth Hormone on Osseointegration of cpTi implant

(Histological and Immunohistochemical Study in Rabbits)

A thesis

Submitted to the Council of the College of Dentistry at the University of Baghdad, in partial fulfillment of the requirements for the Degree of Master of Science in Oral histology and Biology

By

Abdul Naser Hatem Warwar

B.D.S.

Supervised By

Assis .Prof. Dr.Ban A. Jamil

(B.D.S., M.Sc., Ph.D. Oral histology and Biology)

2013 A.D. **1434 A.H.**

Abstract

Background: Dental implants provide a unique treatment modality for the replacement of lost dentition .Bone healing around implants involves the activation of a sequence of osteogenetic, vascular and immunological events that are similar to those occurring during bone healing. Various cell types, growth factors and cytokines are involved and interact throughout the stages of osseointegration, including inflammation, vascularization and bone formation and ultimately bone remodeling.

Aims of Study:

1. To evaluate the effect of topical application of growth hormone on osseointegration of cpTi implant histologically and radiographically .
2. Immunohistochemical estimation of growth hormone effect on molecular events in ossointgration of cpTi implants by cellular expression of VEGF and TGF-B .

Materials and Methods: 80 Screw titanium implants ready made (8 mm length and 3 mm width) inserted in the tibia of the forty adult rabbits. The right side is considered as experimental group and the left side considered as control group.

Implants were prepared and divided as follows:

1. Control group (40 implants): this group includes 10 implants for each healing interval(3days,1,2 and 6 weeks).

2. Experimental group (40 implants to be used with growth hormone) : this group includes 10 implants for each healing interval(3days,1,2 and 6 weeks). Histological and immunohistochemical tests were performed on the bone – implants blocks of both control and experimental groups for (3days1,2, and 6weeks) healing intervals.

Mechanical test (torque removal test)was also performed to the implants for only two and six weeks healing intervals(four rabbits for each healing period) for all study groups .

Results:

1. The result of the mechanical test showed increase in removal torque mean values for both experimental and control groups with increasing time . also the experimental group recorded higher mean torque values than that of controls.
2.Radio graphical examinations showed that the process of osseointegration started after 2weeks and prominent radio opacity detected around the titanium implant after six weeks.
3.Histological findings for coated titanium implant with growth hormone revealed an early bone formation, minerlization and maturation in comparison to control.
4.Immunohistochemical findings revealed strong positive expression for VEGF and TGF-B in experimental implant in comparison to control one.

Conclusion: Topical application of growth hormone may act as a bone stimulant in the placement of endosseous dental implants ,and enhances osseointegration.