﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ﴾

صدق الله العظيم

سورة البقرة: آية (٣٢)

RADIODENSITOMETRIC EVALUATION OF LOW INTENSITY LASER THERAPY ON THE OSSEOINTEGRATION OF IMMEDIATELY LOADED DENTAL IMPLANTS UNDER THE INFLUENCE OF CALCIUM AND VITAMIN C

Thesis
Submitted to the Faculty of Oral and Dental Medicine, Cairo University in partial Fulfillment of Requirement for the Master Degree in
Oral Surgery

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DEDICAION

This work is dedicated to my dear parents, my grateful helpful wife and my father & mother in-laws due to there durable love, care, support and guidance throughout my life. I owe all of them a great debt that can only be paid back, by being what they desired me to be.

تحت إشراف

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INTRODUCTION

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Dental implants are one of the most important kinds of the prosthetic dental appliances .Therefore, dental implants become one of the fastest growing dental treatment nowadays. They are used as replacement for a single tooth loss, to support prosthesis either partial or complete dentures, or to support a bridge either to a natural tooth or to another implant[(1)]. Poor bone quality and insufficient quantity of bone are from the reasons that lead to compression of the intended implant site[(2)].

In implant dentistry, Osseointegration is becoming the most accepted phenomenon for success in dental implants procedures. It has been recognized recently that impaired healing, infection and overload are associated with other devices that lead to failure of dental implants procedures[(3)].

Osseointegration refers to microscopic evidence of direct contact of bone implant, but is by no means limited to titanium two-stage implants. A direct bone interface or contact can be observed with ceramic, other metal implants and one stage implants[(4)].

Osseointegration has provided treatment opportunities which have revolutionized the rehabilitation of body part losses such as edentulizm. Traditional guide lines suggested that 2-3 months of alveolar ridge remodeling following tooth extraction and an additional 3-6 months of load-free healing that known as two-stage surgical or conventional approach after implant insertion were needed for osseointegration to take place. The extended treatment period and the need for a removable prosthesis during the healing phase may be inconvenient to certain patients[(5-6)].

Changing the world of implant dentistry can be done if we combine the concepts of biomimetics and dental implants that would be a solution due to the absence of the biomimetic

implant system commercially. Basically, because of the need to ensure the absence of undesired host tissue reaction, patients with different situations (as poor bone, quantity or quality) will benefit from an improved predictable treatment modality, short initial healing times and better long-term, performance of the dental implant. To ensure progress in this rewarding field of dentistry achieving a lot of future improvements in implant design as well as the implant geometry, bioactivity, chemistry and all the interactions between them[(2)].

Adequate dietary calcium is essential for the growth and development for normal skeleton, and essential for normal bone structure and function. Calcium supplementation increase bone mass in children and adolescence and reduce age associated bone less[(7)].

Several studies found that increased dietary vitamin C intake favored the adult bone health, increased bone mass density (BMD), reduced risk of fracture and free radical formation, which was involved in bone resorption in vitro and in rodents. Furthermore, it enhanced TGF- β to stimulate osteoblast differentiation and hence bone formation. It also neutralized the increased oxidative stress associated with most of the risk factors for osteoporosis (smoking, hypertension and diabetes mellitus) which affected the human bone negatively[(7)].

The effect of Low Intensity Laser Therapy (LILT) on bone regeneration has become a focus of recent research. LILT is based on biostimulation of the tissues with more chromatic light. Various biostimulatory effects have been reported on wound healing[(8)] and collagen synthesis[(9)]. With respect to bone, LILT has been shown to modulate inflammation, accelerate cell proliferation[(10)]. LILT resulted in significant increase in cellular proliferation, bone nodule formation and alkaline phosphatase activity[(11)].

This study conducted to evaluate the effect of LILT on the osseointegration of immediate loading dental implants by radiodensitometric assessment under the influence of calcium and vitamin C.