

OBJECTIVE CLINICAL EVALUATION OF OSSEOINTEGRATED DENTAL IMPLANTS

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

IN THE NAME OF ALLAH

MOST GRACIOUS, MOST MERCIFUL

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LIST OF ABBREVIATIONS & SYMBOLS

Abbreviation/Symbol	Explanation
BI	Bleeding Index
BOP	Bleeding on Probing
CAD-CAM	Computer Aided Design/Computer Aided Manufacturing
CBC	Complete blood count
CT	Computerized Tomography
e.g.	exempli gratia, «Latin» for example
et al	et alii «Latin» and others
FBR	Fast Bone Regeneration
FDA	Food and Drug Administration
GI	Gingival Index
HIP	Hot Isostatic Pressing
HVOF	High Velocity Oxy-Fuel
IBAD	Ion-Beam-Assisted Deposition
IS	Image Score
ITI	International Team for Implantology
KFT	Kidney Function Test
LFT	Liver Function Test
MGI	Mean Gingival Index
MPI	Mean Plaque Index
MPSD	Mean Peri-implant Sulcular Depth
MPTV	Mean Periotest Value
MSPSD	Mean Surface Peri-implant Sulcular Depth
MMSPSD	Mean of the Mean Surface Peri-implant Sulcular Depth
P	«Mathematical» Probability- Palatal/Lingual Surface
PI	Plaque Index
PSD	Peri-implant Sulcular Depth
PTV	Periotest Value
rpm	Revolutions Per Minute
SPI	Subperiosteal Implant
SSI	Smooth Staple Implant
SD	Standard Deviation
TE	Tapered Effect
TPS	Titanium Plasma Spraying- True Pressure Sensitive
VTPS	Vacuum Titanium Plasma Spraying

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INTRODUCTION

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In spite of huge development in the field of Dentistry, still natural tooth loss cannot be avoided; hence the rapidly growing field of Implant Dentistry ^(1, 2).

Oral/Dental Implantology is the science and discipline of restoring missing teeth and oral structures to regain function, comfort and esthetics through the use of dental implants ⁽³⁾. An oral or dental implant is a biomaterial surgically inserted into soft or hard tissues of the mouth for functional and/or cosmetic purposes ⁽⁴⁾. It is the "tooth root" analogue and is often referred to as a "fixture" ⁽⁵⁾. Dental implants provide studs to which prosthesis can be fixed ⁽⁶⁾, and usually restricted to patients with completed craniofacial growth ⁽⁷⁾.

Because of ill performance of removable prosthesis, the necessity to reduce virgin tooth/teeth prior to bridgework and the advantages of implant-based prosthesis - including improvement of tissue morphology- the number of inserted implants is rapidly and steadily increasing ⁽⁸⁾. Dental implants are effective in the treatment of complete and partial edentulism with high rate success and long-term stability ^(9, 10). In fact, they are used routinely to support dental and craniofacial restorations ⁽¹¹⁾.

According to Bilhan ⁽¹²⁾ endosseous implant-based prosthesis are successful, effective and predictive devices for replacing missing teeth, even in severely atrophied jaws. In fact, replacement of missing teeth by means of endosseous dental implants has become an important and fundamental part of dentistry ⁽¹³⁾.

The goal of modern modalities in dentistry is to have patients with normal contour, function, comfort, aesthetics, speech and health regardless of the atrophy, disease or injury of the stomatognathic system; the replacement of lost natural teeth by osseointegrated implants represents one of the most significant advances in restorative dentistry that serves to achieve this goal⁽¹⁴⁾.

The use of dental implants in the reconstruction of oral cancer patients is well documented and has significantly improved their rehabilitation. Large defects of the hard or soft tissues in the maxillofacial region are treated more frequently with the aid of dental implants. The advent of improved bone grafting techniques and the use of hyperbaric oxygen therapy for patients who have received radiotherapy have increased the numbers of patients for whom implant placement is possible, providing functional, psychological and aesthetic benefits⁽¹⁵⁾.

lizuka et al⁽¹⁶⁾ concluded from a 4-year follow-up study included 28 patients who underwent the ablative tumor surgery and mandibular reconstruction that the application of oral implants seemed to be advantageous for the oral rehabilitation of patients who had undergone intraoral resections.

Kovacs⁽¹⁷⁾ concluded from a study done on 90 patients received 320 dental implants after oral tumor resection and immediate soft tissue reconstruction that prosthetic restoration of these patients can be achieved with dental implants with similar long-term efficacy as found in healthy subjects adhering to internationally established requirements.

The American Dental Association Council on Scientific Affairs developed an updated report on endosseous implants to aid dental professionals in considering and incorporating practical applications of implantation therapy in general practice and recommended that dental practitioners use implantation therapies and systems judiciously in accordance with the current best evidence. The Council also urged evaluators to use common and consistent criteria for reporting the outcomes assessment in clinical studies of various implant treatments ⁽¹⁸⁾.

Thousands of implants -of different systems- are installed annually all over the world. More than 220 implant brands produced by about 80 manufacturers are commercially available worldwide ⁽¹⁹⁾.

Various methods for evaluating implant stability have been developed, but most of them are subjective, having lack of accuracy and vary from clinician to another. Reliable standardized method(s) should be developed to evaluate the stability of these implants. It should be atraumatic, sensitive and easy to be used clinically ⁽²⁰⁾.

Recent studies have attempted to develop criteria for the evaluation of implant fixation (stability). Periotest is the most recent, although it was originally used for detecting periodontal condition of natural teeth since its marketing for clinical use early in 1980's ⁽²¹⁾. Periotest is supplied with a micro-computerized rod that hits the natural tooth or the dental implant and gives an audible reading -Periotest Value "PTV" - that appears on a digital screen and ranges from -08 to +50. Higher readings indicate less implant stability. Clinically stable implants have a Periotest value from -08 to +09 ^(22, 23).

In this study, we will evaluate and discuss the Periotest as a method for evaluating implant stability.



REVIEW OF LITERATURE