ROLE OF MULTISLICE DENTAL CT IN ASSESSMENT OF DENTAL IMPLANTS

Thesis

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٢٠١٣

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Contents

Page

List Of Abbreviations

ABPA	Allergic broncho-Pulmonary Aspergillosis
ACS	American Cancer Society
BA	Bronchial Artery
BAE	Bronchial Artery Embolization
CB	Central Bronchiectasis
CT	Computed Tomography
C-TYPE	Central Type
BI	Bronchus Intermedius
Cm	Centimeter
3D	3 Dimensional
DA	Descending Aorta
GE	General Electric
HAM	High Attenuation Mucus
HU	Hounsfield Unit
HRCT	High Resolution Computed Tomography
FOB	Fiberoptic Bronchoscopy
ICBT	Intercostobronchial trunk
IPA	Interlobar pulmonary artery
IV	Intravenous
MIP	Maximum Intensity Projection
MinIP	Minimum Intensity Projection
Min	Minute
ml	Milliliter

List of tables

List Of Figures

List of Charts

Introduction

The use of dental implants to restore missing teeth has become increasingly widespread over the past two decades. Numerous clinical studies with dental implants have revealed encouraging outcomes ***(Turkyilmaz & McGlumphy, 2008).***

Dental implants are made of biocompatible materials and they are surgically inserted into the jaw bone primarily as a prosthetic foundation ***(Chaturvedi, 2009).***

The successful outcome of any implant procedure requires a series of patient-related and procedure-dependent parameters. The volume of bone available and quality of the bone are highly associated with the type of surgical procedure and the type of implant, and both of these factors play a vital role in the success of dental implant surgery ***(Turkyilmaz and McGlumphy, 2008).***

The jaw comprises two complex bony structures: the mandible and maxilla. Their curved or archlike configuration makes radiographic imaging difficult. Furthermore, the superimposition of dense teeth and roots may obscure underlying tissues ***(Abrahams, 2001).***

Assessment with panoramic images, which were used previously, was inadequate because they give two dimensional

images providing no information relating to the thickness of the jaw. They had a distortion factor of about 25%, which made accurate measurements difficult ***(Abrahams, 2001).***

Dental CT has proved to be an excellent procedure for characterizing the anatomy and dental-related abnormalities of the jaw. It is particularly important for preoperative planning in dental implantology because it aids in the appropriate choice of implant size and helps to avoid injury of critical structures such as the mandibular canal or maxillary sinus ***(Gahleitner, et al. 2001).***

Dental CT is a useful tool to determine the bone density in the implant recipient sites identifying sites suitable for implant placement and favorable for osseointegration ***(Turkyilmaz &McGlumphy. 2008).***

Postoperatively, dental CT images can show the failure of an endosseous implant to osseointegrate, improper placement of an implant, and violation of important structures (eg, the mandibular canal, nasal cavity, or maxillary sinus) ***(Sommer, 2009).***

Dental computed tomography provides high spatial resolution images and also offers the additional possibility of multi-planar reconstructions in high-quality and true-to-size hard copies. And these reconstruction images help eliminate the streak artifact from dental restorations that degrades direct coronal CT scans ***(Abrahams, 2001).***

The image quality was improved with the advent of multi-slice CT scanning, which allows acquiring more slices in a shorter time, due to multiple detector rows, faster table speeds and the opportunity of greatly increasing the speed of data acquisition. So, more anatomic sites are scanned with thinner slices than those provided by spiral CT, which results in more accurate measurements for placement of fixtures ***(Paes Ada, et al. 2007).***

Multi-slice CT scanning has improved the 3D reconstruction, providing images with richer details and more precise information about the mandibular canal, incisive foramen and alveolar process location ***(Paes Ada, et al. 2007).***