

**Validity of Tridimensional CT study
Of Maxillary Sinus Reconstruction in
Potential implant site.**

Thesis

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requirement for Master degree in Oral Radiology.**

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DEDICATION

To my family, my friend Omniya
and her family

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List of Contents

<i>Item</i>	<i>Page</i>
List of Tables	i
List of Figures	ii
Introduction	1
Review of Literature	4
1- Physics of CT.....	5
2- Anatomy of the maxillary sinus.....	40
Normal development, growth and variations.....	42
Function of maxillary sinus.....	44
Blood supply of maxillary sinus.....	44
Lymph drainage of maxillary sinus	44
Normal radiographic appearance of the antra.....	46
3- Radiographic investigation of the antra.....	47
4- Importance of implant placement.....	49
5- Maxillary sinus lifting.....	50
6- Importance of preoperative radiographic assessment.....	52
Aim of the Study	60
Materials and Methods	61
Results.....	68
Discussion	95
Summary.....	103
Conclusions & Recommendation	105
References	107

List of Tables

<i>Table</i>	<i>Item</i>	<i>Page</i>
Table (1)	Summary of the scanning parameters.....	63
Table (2)	Measurements of total sinus volume and inferior sinus volume needed to be grafted at 5, 10 and 15mm.....	88
Table (3)	Measurements of bone height& width in the potential implant site	89
Table (4)	Measurements of maxillary sinus floor angulations at 1 st molar and 2 nd bicuspid sites	89
Table (5)	Statistical analyzed values (mean±SD) of bone height&width.....	90
Table (6)	Statistical analyzed values (mean±SD) of total maxillary sinus volume and the inferior sinus volume	91
Table (7)	Statistical analyzed values (mean±SD) used to compare between the angulations measurements at 2 nd bicuspid and 1 st molar site	93

List of Figures

<i>Fig.</i>	<i>Item</i>	<i>Page</i>
Fig. (1)	Principles of CT Diagram	6
Fig. (2)	Diagram of the first-generationCT scanner.....	11
Fig. (3)	Diagram of the second-generation CT scanner	12
Fig. (4)	Diagram of the third-generation CT scanner.....	12
Fig. (5)	Diagram of the fourth-generation CT scanners	13
Fig. (6)	Principles of helical CT.....	14
Fig. (7)	Diagram of the slip-ring configuration	15
Fig. (8)	Photograph of a rotating anode x-ray.....	17
Fig. (9)	Detector configuration	19
Fig. (10)	Slice thickness in single-slice scanner.....	21
Fig. (11)	Showing umbra and penumbra.....	22
Fig. (12)	Diagram shows the concepts of beam pitch and detector pitch	24
Fig. (13)	Anatomic coverage	27
Fig. (14)	X-ray beam shape	31
Fig. (15)	A) Isotropic imaging, (B) Nonisotropic imaging.....	33
Fig. (16)	Multirow scanning offers large potential for clinical applications	36
Fig. (17)	Coronal image of Multisection CT	36
Fig. (18)	Axial (CT) section allowing visualization of sinus septa.....	42
Fig. (19)	Anterior view of the paranasal sinuses	45
Fig. (20)	Lateral view of the paranasal sinuses	45
Fig. (21)	A periapical film showing the usual appearance of antral cavity.....	46
Fig. (22)	Dental panoramic tomograph	46

Fig. (23)	<i>Sinus lift procedure.....</i>	51
Fig. (24)	<i>Sinus lift procedure.....</i>	51
Fig. (25)	<i>Sinus lift procedure.....</i>	51
Fig. (26)	<i>Sinus lift procedure</i>	51
Fig. (27)	<i>Indices for maxillary sinus and midfacial skeletal size measured on axial CT scan</i>	53
Fig. (28)	<i>Cross-sectional CT scans</i>	55
Fig. (29)	<i>Area calculation on cross-sectional CT scans</i>	55
Fig. (30)	<i>Schema for bone grafting in the maxillary sinus floor</i>	57
Fig. (31)	<i>Oblique-saggital cut with real tracement (Left) and graphically simulated on the computer (Right).....</i>	59
Fig. (32)	<i>Patient position within machine</i>	62
Fig. (33)	<i>Acquisition unit.....</i>	63
Fig. (34)	<i>Buccolingual width of the bone. (Axial cut).....</i>	64
Fig. (35)	<i>Remaining bone height. (Coronal cut).....</i>	64
Fig. (36)	<i>paraxial Reconstruction showing the medial and lateral walls of the maxillary sinus</i>	65
Fig. (37)	<i>Measurements of Total sinus volume in 3D Multiplanar Reconstruction.....</i>	66
Fig. (38)	<i>Three Dimensional CT scan Axial cut showing the total maxillary sinus volume of RT side (yellow color).....</i>	69
Fig. (39)	<i>Reconstructed Three Dimensional CT scan coronal cut showing the total sinus volume of RT side (yellow color).....</i>	69
Fig. (40)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing the total sinus volume of RT side (yellow color).....</i>	70
Fig. (41)	<i>Three Dimensional CT scan Axial cut showing inferior sinus volume at 15mm of RT side (yellow color).....</i>	70

Fig. (42)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 15mm of RT side (yellow color).....</i>	70
Fig. (43)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 15mm of RT side (yellow color).....</i>	71
Fig. (44)	<i>Three Dimensional CT scan Axial cut showing inferior sinus volume at 10mm of RT side (yellow color).....</i>	71
Fig. (45)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 10mm of RT side (yellow color).....</i>	71
Fig. (46)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 10mm of RT side (yellow color).....</i>	72
Fig. (47)	<i>Reconstructed Three Dimensional CT scan Axial cut showing inferior sinus volume at 5mm of RT side (yellow color).....</i>	72
Fig. (48)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 5mm of RT side (yellow color).....</i>	72
Fig. (49)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 5mm of RT side (yellow color).....</i>	73
Fig. (50)	<i>Three Dimensional CT scan Axial cut showing Bucco-lingual width measurements.....</i>	73
Fig. (51)	<i>Reconstructed Three Dimensional CT scan coronal cut showing bone height measurements.</i>	73
Fig. (52)	<i>CT scan Paraxial reconstruction showing sinus floor angulation measurement at 2ND bicuspid site (pink color).....</i>	74
Fig. (53)	<i>CT scan Paraxial reconstruction showing sinus floor angulation measurement at 1ST molar site (pink color).....</i>	74
Fig. (54)	<i>Reconstructed Three Dimensional CT scan images showing the maxillary sinus and the relationship between mandible and maxilla.....</i>	75

Fig. (55)	<i>Three Dimensional CT scan Axial cut showing the total sinus volume of LT side (yellow color).....</i>	76
Fig. (56)	<i>Reconstructed Three Dimensional CT scan coronal cut showing the total sinus volume of LT side (yellow color).....</i>	76
Fig. (57)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing the total sinus volume of LT side (yellow color).....</i>	77
Fig. (58)	<i>Three Dimensional CT scan Axial cut showing inferior sinus volume at 15mm of LT side (yellow color).....</i>	77
Fig. (59)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 15mm of LT side (yellow color).....</i>	77
Fig. (60)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 15mm of LT side (yellow color).....</i>	78
Fig. (61)	<i>Three Dimensional CT scan Axial cut showing inferior sinus volume at 10mm of LT side (yellow color).....</i>	78
Fig. (62)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 10mm of LT side (yellow color).....</i>	78
Fig. (63)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 10mm of LT side (yellow color).....</i>	79
Fig. (64)	<i>Three Dimensional CT scan Axial cut showing inferior sinus volume at 5mm of LT side (yellow color)</i>	79
Fig. (65)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 5mm of LT side (yellow color).....</i>	79
Fig. (66)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 5mm of LT side (yellow color).....</i>	80
Fig. (67)	<i>Three Dimensional CT scan axial cut showing Bucc-lingual width measurements</i>	80

Fig. (68)	<i>Reconstructed Three Dimensional CT scan coronal cut showing bone height measurements.....</i>	80
Fig. (69)	<i>CT scans Paraxial reconstruction showing sinus floor angulation at 2ND bicuspid site (pink color).....</i>	81
Fig. (70)	<i>CT scans Paraxial reconstruction showing sinus floor angulation at 1ST molar site (pink color).....</i>	81
Fig. (71)	<i>Reconstructed Three Dimensional CT scans images showing the maxillary sinus, remaining teeth and the relationship between the mandible and maxilla.....</i>	82
Fig. (72)	<i>Three Dimensional CT scan axial cut showing Bucc-lingual width measurements.....</i>	83
Fig. (73)	<i>Reconstructed Three Dimensional CT scan coronal cut showing bone height measurements.....</i>	83
Fig. (74)	<i>Three Dimensional CT scan axial cut showing total sinus volume of LT side (yellow color).....</i>	84
Fig. (75)	<i>Reconstructed Three Dimensional CT scan coronal cut showing total sinus volume of LT side (yellow color).....</i>	84
Fig. (76)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing total sinus volume of LT side (yellow color).....</i>	84
Fig. (77)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 15mm of LT side (yellow color).....</i>	85
Fig. (78)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 15mm of LT side (yellow color).....</i>	85
Fig. (79)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 10mm of LT side (yellow color).....</i>	85
Fig. (80)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 10mm of LT side (yellow color).....</i>	86

Fig. (81)	<i>Reconstructed Three Dimensional CT scan coronal cut showing inferior sinus volume at 5mm of LT side (yellow color).....</i>	86
Fig. (82)	<i>Reconstructed Three Dimensional CT scan sagittal cut showing inferior sinus volume at 5mm of LT side (yellow color).....</i>	86
Fig. (83)	<i>CT scan Paraxial reconstruction showing sinus floor angulation measurement at 1ST molar site (pink color).....</i>	87
Fig. (84)	<i>CT scan Paraxial reconstruction showing sinus floor angulation measurement at 2ND bicuspid site (pink color).....</i>	87
Fig. (85)	<i>The inferior sinus volume needed to be grafted at 5, 10 and 15mm in potential implant site.....</i>	92
Fig. (86)	<i>The effect of maxillary sinus floor angulations on maxillary sinus membrane.....</i>	94

Introduction

Poor oral function and detriment to self-esteem can debilitate millions of people who are partially or totally edentulous. Dentures, which are often used to treat this condition, may not completely restore function because of poor fit related to atrophy. As a result, dental implants have gained popularity for treating edentulism and to improve aesthetics and the function of mastication. **(James, et al 2000)**

To be a candidate for the dental implant procedure, a patient must have sufficient bone in the maxillary and mandibular alveoli to support these posts. Unfortunately, after a prolonged period of being edentulous, the alveolar ridge that once supported the teeth becomes atrophic and sufficient bone may not be present for implants. To increase the amount of bone in the maxilla, the sinus lift procedure, or subantral augmentation, has been developed. This procedure involves placing bone-graft material in the maxillary sinus to increase the height and width of the alveolus. **(James, et al 2000)**

The sinus lift procedure has proven to be successful and has become popular, allowing patients with insufficient bone to undergo implantation surgery. **(James, et al 2000)**

The Paranasal sinuses are air-filled cavities of craniofacial complex, comprising the maxillary, frontal, sphenoid and ethmoid air cell. The maxillary sinuses are of particular importance to the dentist because of their proximity to dental structures. **(Hengerer AS 1984, Som PM 2003 and White SC, Pharaoh MJ 2004)**

The maxillary sinus consists of an area of unique characteristics as after dental extraction; there may be pneumatization of the cavity, i.e increase in its volume, consequently reducing, even more, the available bone height. Furthermore, in this area, we find bone density that is less favorable for placement of Osseo- integrated implants. **(Jaffin, et al 1991 and Velloso, et al 2006)**

Implant placement is a rapidly growing component of dental practice. Accurate dental implant placement requires comprehensive pre-operative radiographic examination. **(Shimura, et al 1990, James, et al 1991, Abrahams JJ 1993, DelBalso, et al 1994, Cavalcanti, et al 1998 and Cavalcanti, et al 2002)**

Computed tomography (CT) is a method of acquiring and reconstructing the images of a thin cross section, and attenuation measurement. In comparison with conventional radiographs, CT images are free of superimposing tissues and capable of much higher contrast due to elimination of scatter. Most of the development in CT since its introduction can be considered as attempts to provide faster acquisition times, better spatial resolution, and shorter computer reconstruction times. From the early design, the technology progressed with faster scanning times and higher scanning plane resolution, but true three-dimensional (3D) imaging became practical only with helical scanning capabilities. The recent advents of multiple-row detector helical scanners have the capability to produce 3D images that approach the ideal of a true "3D radiograph". **(Mahesh 2002)**