

# **Role of 64 MDCT Angiography in Quantification of Coronary Artery Luminal Stenosis in Patients with Ischemic Heart Disease Comparative Study with Coronary Angiography**

*Thesis*

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## List of Contents

Subject	Page No.
List of Abbreviations.....	i
List of Tables.....	iii
List of Figures .....	iv
Introduction .....	1
Aim of the Study .....	3
Review of Literature	
- Coronary Circulation Anatomy.....	4
- Pathogenesis and Clinical Aspects of Ischemic Heart Disease .....	54
- Physical Considerations .....	70
Patients and Methods.....	78
Results.....	97
Illustrative Cases .....	108
Discussion .....	118
Summary .....	134
Conclusions .....	138
References .....	139
Arabic Summary .....	—

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## List of Abbreviations

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<b>3D</b>	3 dimensional
<b>AHA</b>	American heart association
<b>AMI</b>	Acute myocardial infarction
<b>Ao</b>	Aorta
<b>BMI</b>	Body mass index
<b>CAD</b>	Coronary artery disease
<b>CTA</b>	Computed tomographic angiography
<b>ECG</b>	Electro cardiogram
<b>IHD</b>	Ischemic heart disease
<b>IVUS</b>	Intravascular ultrasonography
<b>LA</b>	Left atrium
<b>LAA</b>	Left atrial appendage
<b>LAD</b>	Left anterior descending
<b>LCX</b>	Left circumflex artery
<b>LM</b>	Left main coronary artery
<b>LV</b>	Left ventricle
<b>MDCT</b>	Multidetector CT
<b>MIP</b>	Maximum intensity projection
<b>MO</b>	Marginal obtuse
<b>MPR</b>	Multiplanar reformat
<b>MSCT</b>	Multislice CT
<b>NPP</b>	Negative predictive value
<b>P value</b>	Probability value

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## List of Abbreviations *(Cont...)*

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<b>PA</b>	Pulmonary artery
<b>PDA</b>	Posterior descending artery
<b>PPV</b>	Positive predictive value
<b>QCA</b>	Quantitative coronary angiography
<b>QCT</b>	Quantitative computed tomography
<b>RA</b>	Right atrium
<b>RCA</b>	Right coronary artery
<b>ROI</b>	Region of interest
<b>RV</b>	Right ventricle
<b>SD</b>	Standard deviation
<b>SSD</b>	Surface shaded display
<b>VRT</b>	Volume rendering technique

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# List of Tables

<b>Table No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Table (1):</b>	Probability of CAD in relation to the calcium score .....	96
<b>Table (2):</b>	Effect of Risk factors .....	98
<b>Table (3):</b>	Comparison between QCTA & QCA results in the Left anterior descending artery (LAD)....	103
<b>Table (4):</b>	Comparison between QCTA & QCA results in the Left anterior descending artery (LCX)...	104
<b>Table (5):</b>	Comparison between QCTA & QCA results in the right coronary artery (RCA) .....	105
<b>Table (6):</b>	Sensitivity and specificity of the technique in quantification of stenosis in the RCA, LAD and LCX .....	106
<b>Table (7):</b>	Comparison between sensitivity, specificity, positive predictive value and negative predictive value as a function of severity of stenosis.....	107

# List of Figures

<b>Figure No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Figure (1):</b>	Coronary arteries .....	5
<b>Figure (2):</b>	N= non-coronary cusp, R= right coronary cusp, L= left coronary cusp.....	7
<b>Figure (3):</b>	Conventional origin of coronary arteries. Thin-slab maximum-intensity-projection CT image .....	7
<b>Figure (4):</b>	Volume-rendered CT image of heart .....	8
<b>Figure (5):</b>	Normal right coronary artery (RCA) in right atrioventricular groove.....	11
<b>Figure (6):</b>	Left: RCA comes off the right sinus of Valsalva Right: Conus artery comes off directly from the aorta .....	11
<b>Figure (7):</b>	The large acute marginal branch (AM) supplies the lateral wall of the right ventricle .....	12
<b>Figure (8):</b>	Axial thin maximum-intensity-projection CT image.....	16
<b>Figure (9):</b>	Cardiac veins .....	18
<b>Figure (10):</b>	Axial image obtained by 64-slice MDCT .....	20

## List of Figures *(Cont.)*

<i>Figure No.</i>	<i>Title</i>	<i>Page No.</i>
<b>Figure (11):</b>	Multiplanar reconstruction .....	21
<b>Figure (12):</b>	Curved multiplanar reconstruction of the right coronary artery .....	22
<b>Figure (13):</b>	The MIP image of the right coronary artery .....	23
<b>Figure (14):</b>	A maximal intensity projection demonstrating a normal right coronary artery .....	23
<b>Figure (15):</b>	A maximal intensity projection demonstrating a normal left main coronary artery .....	24
<b>Figure (16):</b>	The white-yellow color assigned to the ribs makes the image of the chest cage similar to the actual anatomy .....	25
<b>Figure (17):</b>	3D volume rendering is the most common method of display and assumes external visualization of an object, much like viewing a statue in a museum .....	26
<b>Figure (18):</b>	By increasing the opacity value of the coronary tree, decreasing the opacity of contrast inside the cavities and making the myocardium completely transparent .....	27

## List of Figures *(Cont.)*

<b>Figure No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Figure (19):</b>	Electronic casts” of the left heart cavities. The relationships between cavities are easily appreciated .....	28
<b>Figure (20):</b>	Virtual endoscopy.....	29
<b>Figure (21):</b>	3D endocardial surface modality .....	30
<b>Figure (22):</b>	Left coronary artery with its branches, as seen on a 3D (left) and a multiplanar reconstruction (MPR) of its proximal segment (right). .....	31
<b>Figure (23):</b>	Short (A) and long (B) normal variants of left main (LM) coronary artery .....	31
<b>Figure (24):</b>	Anatomical relationships of left main (LM) coronary artery. ....	32
<b>Figure (25):</b>	Anatomical relationships of the proximal segments of the main branches of the left coronary artery .....	32
<b>Figure (26):</b>	Anatomy of marginal obtuse (MO) branches.....	35
<b>Figure (27):</b>	Left circumflex (LCx) artery.....	36



## List of Figures *(Cont.)*

Figure No.	Title	Page No.
<b>Figure (28):</b>	Intermediate (Int) coronary arteries from two different subjects: in case B, the vessel is large, reaching the left margin of the heart .....	37
<b>Figure (29):</b>	Anatomy of the right coronary artery .....	40
<b>Figure (30):</b>	Anatomy of the distal right coronary artery....	40
<b>Figure (31):</b>	Coronary CT anatomy.....	41
<b>Figure (32):</b>	The large acute marginal branch (AM) supplies the lateral wall of the right ventricle .....	41
<b>Figure (33):</b>	Anatomical dominance of the right coronary system where the right coronary artery (RCA) gives origin to the posterior descending artery (PDA) but not to posterolateral branches .....	43
<b>Figure (34):</b>	Anatomical dominance of the left coronary system, with a posterior descending artery .....	44
<b>Figure (35):</b>	Anomalous left main coronary artery .....	47

## List of Figures *(Cont.)*

<b>Figure No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Figure (36):</b>	Anomalous origin of the right coronary artery (RCA) emerging from the left sinus of Valsalva, viewed from 3D volume rendering images (A, C, D) and oblique MPR (B), all from the same patient .....	48
<b>Figure (37):</b>	Anomalous origin of the left anterior descending artery (LAD) from the right coronary cusp .....	48
<b>Figure (38):</b>	Anomalous origin of the right coronary artery (RCA) from the left anterior descending (LAD) coronary artery .....	49
<b>Figure (39):</b>	Patient with anomalous origin of the left circumflex artery .....	51
<b>Figure (40):</b>	Patient with anomalous origin of the left circumflex artery .....	52
<b>Figure (41):</b>	Examples of anomalous origin of the left circumflex artery .....	52
<b>Figure (42):</b>	Patient with anomalous origin of the left anterior descending .....	53
<b>Figure (43):</b>	Normal histological composition of the coronary artery vessel wall .....	59

## List of Figures *(Cont.)*

<b>Figure No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Figure (44):</b>	Coronary pathology in acute coronary syndrome.....	60
<b>Figure (45):</b>	Vascular remodeling. As a plaque progresses in size, compensatory changes occur in the vessel wall resulting in dilatation and preservation of the original luminal diameter .....	62
<b>Figure (46):</b>	Diagram demonstrating the difference between histological composition of the stable and vulnerable plaques .....	63
<b>Figure (46):</b>	Diagram demonstrating the difference between histological composition of the stable and vulnerable plaques .....	63
<b>Figure (47):</b>	Multislice CT physical basics .....	71
<b>Figure (48):</b>	The AHA 17-segment model of the coronary tree .....	87
<b>Figure (49):</b>	Coronary Calcium scoring was also assessed using Agatston Score as an essential step in the study.....	63
<b>Figure (50):</b>	Right anterior oblique (RAO) orientation of left anterior descending artery with quantitative coronary angiography .....	90

## List of Figures *(Cont.)*

Figure No.	Title	Page No.
<b>Figure (51):</b>	Distribution of patients according to age and sex .....	97
<b>Figure (52):</b>	A peripheral soft plaque detected eccentrically at the proximal segment of the RCA on CTCA.....	102
<b>Figure (53):</b>	Comparison between QCTA & QCA results in the Left circumflex artery (LAD).....	103
<b>Figure (54):</b>	Comparison between QCTA and QCA results in the LCX.....	104
<b>Figure (55):</b>	Comparison between QCTA and QCA results in the RCA.....	105



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## Introduction

Coronary artery disease is one of the leading causes of death worldwide. In symptomatic patients, diagnosis of the presence and severity of coronary artery disease is critical for determining appropriate clinical management (*Miller et al., 2008*).

Conventional invasive coronary angiography is currently the diagnostic criterion standard for clinical evaluation of known or suspected coronary artery disease (CAD) (*Kuettner et al., 2004*).

Conventional coronary angiography reveals the extent, location, and severity of coronary obstructive lesions, which are potent predictors of disease outcome and identify high-risk patients who may benefit from revascularization (*Miller et al., 2008*).

The risk of adverse events is small, but serious and potentially life-threatening sequelae may occur, including arrhythmia, stroke, coronary artery dissection, and access site bleeding (total complication rate, 1.8%; mortality rate, 0.1%). Furthermore, catheterization induces some discomfort and mandates routine follow-up care (*Hoffman et al., 2005*).

The 64-MDCT scanners have a faster gantry rotation time and faster volume coverage compared with previous-generation scanners, thus enabling a more robust examination of the coronary arteries that is less susceptible to respiratory artifact and patient movement compared to previous generations. The small diameter of the coronary segments, complex 3D geometry, and rapid movement through the cardiac cycle represent major challenges for artifact-free CT angiography; all of which challenges could actually be overcome in this ECG-gated multidetector technology with the high spatial and temporal resolution it offers (*Dewy et al., 2010*).

Still MDCT has still some limitations including radiation exposure, blooming artifacts due to a highly calcified plaque, respiratory motion artifacts, and low heart rate as a prerequisite for the study (*Shuman et al., 2008*), which mandates further progression of this technology before it could credibly replace the gold standard technique in quantification of coronary artery luminal stenosis (*Otsuka et al., 2008*).