

Role of Multi-Slice Spiral CT
in Assessment of Coronary
Artery Disease

Essay

*Submitted for Partial Fulfillment of Master Degree
in Radiodiagnosis*

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A decorative floral frame in green, yellow, and pink, featuring intricate patterns and a central floral motif. The frame is shaped like a stylized cloud or a four-lobed flower.

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قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ
صدق الله العظيم

سورة البقرة آية (٣٢)

Acknowledgement

*Thanks to **God** for helping me to proceed and complete this work,*

*I would like to express my sincere gratitude to **Dr. Abeer Abd El-Maksoud Hafez**, Assistant Professor of Radiodiagnosis, Faculty of Medicine, Ain Shams University, for her great support and stimulating views. Her meticulous supervision and continuous encouragement pushed me to produce good valuable work,*

*A special appreciation to **Dr. Rania Ali Maarouf**, Assistant Professor of Radiodiagnosis, Faculty of Medicine, Ain Shams University, for her guidance and supervision.*

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List of Abbreviations

ACC	American college of cardiology
AHA	American heart association
AV	Atrioventricular
CABG	Coronary artery bypass graft
CAD	Coronary artery disease
CMR	Cardiac magnetic resonance
CMV	Cytomegalovirus
C.pneumoniae	Chlamydia Pneumoniae
CS	Calcium scoring
CT	Computed tomography
coronary CTA	Coronary CT angiography
DHE	Delayed hyperenhancement
EBCT	Electron beam computed tomography
ECG	Electrocardiography
IMA	Internal mammary artery
HDL	High density lipoprotein cholesterol
H.pylori	Helicobacter Pylori
HSV	Herpes simplex virus
LAD	Left anterior descending
LCA	Left main coronary artery

List of Abbreviations (Cont.)

LCX	Left circumflex arteries
LDL	Low-density lipoprotein cholesterol
LPL	Left posterolateral branch
LV	Left ventricle
LVEF	Left ventricular ejection fraction
MDCTA	Multidetector CT angiography
MI	Myocardial infarction
MRA	Magnetic resonance angiography
MRI	Magnetic resonance imaging
OM	Obtuse marginal
PDA	Posterior descending artery
PET	Positron emission computed tomography
RCA	Right coronary artery
SA	Sinoatrial
SPECT	Single photon emission computed tomography
SVGs	Saphenous vein grafts
3D	Three-dimensional
2D	Two-dimensional
TTC	Triphenyltetrazolium chloride

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Introduction

The investigation and treatment of coronary disease continues to impose a significant burden on health service resources. Invasive coronary angiography remains the gold standard for the investigation of suspected coronary disease. However, it can detect only advanced relatively stable atheroma causing obstruction of the coronary lumen. It is invasive, with a small associated morbidity and mortality. About 40% of studies require no further intervention after exposing patients to the unnecessary procedure risks. Consequently there has been a search for alternative non-invasive methods of visualising and assessing coronary arteries, giving information about the total plaque burden and the presence or absence of significant coronary stenoses (*Donnelly et al., 2009*).

The non-invasive tests available were focused on analysis of the coronary function using physical or pharmacologic stress in an attempt to induce myocardial ischemia in order to detect it (*Rittman et al., 2007*).

The advent of multidetector CTs, work stations with high processing capacity and the acquisition of images with isotropic resolution, made it possible to perform non-invasive coronary anatomical studies in vivo that are accurate and reproducible (*Nieman et al., 2007*).

With the increasing diffusion of 4-row, 16-row and 64 row multislice computed tomography scanners widespread

coronary calcium scoring has become possible. This relatively easy-to-perform test has a high sensitivity and low specificity for the detection of significant coronary artery stenosis, and may have an important role in the risk stratification for future coronary artery events in selected groups of patients such as those intermediately at risk (*Cademartiri et al., 2009*).

As multidetector computed tomography (MDCT) can play a role in diagnosis of coronary artery disease, it also has a role in the assessment of left ventricle (LV) global function, with initial good correlation results with standard modalities. The initial results on accuracy are promising and the clinical applicability of MDCT should rapidly increase (*Flohr et al., 2009*).

So with the latest generations of multidetector row computed tomography (CT) scanners, CT of the heart is about to fulfill its promise to become the premier noninvasive imaging modality for the cardiac assessment (*Nieman et al., 2009*).

Aim Of The Work

The aim of this study is to investigate the use of multi-slice spiral CT for the assessment of coronary artery disease.