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

Essay

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قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا
عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

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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 ····· Electoron 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

٣D ……Three-dimensional

٢D ……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 ٤٠% 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., ٢٠٠٥).***

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., ٢٠٠٣).***

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., ٢٠٠٢).***

With the increasing diffusion of ٤-row,١٦-row and ٦٤ 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., ٢٠٠٥).***

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., ٢٠٠٧).***

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., ٢٠٠٧).***

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.