The Role of Multidetector CT In The Assessment of The Left Ventricular Function

Essay

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دور الأشعة المقطعية متعددة المقاطع فى تقييم وظائــف البطــين الأيســر للقلــب

بحث

مقدم توطئة للحصول علي درجة الماجستير في الأشعة التشخيصية

مقدم من

ماري ربيع محروس

بكالوريوس الطب وا لجراحة

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Mary Rabea Mahrous

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List of Abbreviations

Abbreviation	Stands for
AHA	American heart association
AM	Acute marginal branch
ASC Ao	Ascending aorta
AV	Atrio-ventricular
bpm	Beats per minute
BSA	Body surface area
CAD	Coronary artery disease
CB	Conus branch
CCT	Cardiac computed tomography
CMPs	Cardiomyopathies
CMRI	Cardiac magnetic resonance imaging
CO	Cardiac output
CS	Coronary sinus
CT	Computerized tomography
CTA	Computerized tomography angiography
ECG	Electrocardiogram
EDV	End diastolic volume
EF	Ejection Fraction
ESV	End-systolic volume
HCM	Hypertrophic Cardiomyopathy.
HM	Hibernating myocardium
HR	Heart rate
HU	Hounsfield unit
IMB	Intermediate branch
IVC	Inferior vena cava
LA	Left atrium
LAA	Left atrial appendage
LAD	Left anterior descending
LCx	Left circumflex
LV	Left ventricle
LVEF	Left ventricular ejection fraction

List of Abbreviations (Cont.)

LVMM	Left ventricular myocardial mass
LVV	Left ventricular volume
MDCT	Multidetector Computerized tomography
MI	Myocardial infarction.
MIP	Maximum-intensity projection
MRI	Magnetic resonant imaging
MV	Mitral valve
PA	Pulmonary artery
PDA	posterior descending artery
PV	Pulmonary vein
RA	Right atrium
RAA	Right atrial appendage
RCA	Right coronary artery
RV	Right ventricle
SN	Sinus node
SPECT	Single photon emission computed tomography
SV	Stroke volume
SVC	Superior vena cava
TTE	Trans thoracic echocardiography

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Introduction

Accurate detection of left ventricular volumes and ejection fraction is fundamental for the diagnosis, prognosis and follow-up of many different forms of cardiovascular disease. **(Vural et al., 2010).**

Evaluation of the left ventricular structure and function is an integral step in determining prognosis and therapy for heart failure patients. **(Mangalat et al., 2010).**

Echocardiography is the most widely used imaging technique for this purpose. It is an easily available bedside method that is also cheap, fast and noninvasive. Despite these advantages, echocardiography has some handicaps such as a poor acoustic window and operator dependency. The image quality can be unfavorably affected in obese patients and patients with chronic obstructive lung disease, and quality echocardiographic views cannot be obtained in up to 10% of the patients. Although sonographic contrast agents can be administrated to obtain better image quality, they are not widely used. **(Vural et al., 2010).**

Radionuclide ventriculography and cine ventriculography have also been used for assessment of LV ejection fraction (EF) in selected patients, but are limited by poor spatial resolution and geometric assumptions**. (Curtin et al., 2007).**

Currently, magnetic resonance imaging (MRI) is the gold standard technique for assessing left ventricular volumes and ejection fraction**. (Salm et al., 2006).**

However, due to the duration and multiple prolonged breath-holds required to obtain adequate images, inability to perform the study in patients with devices and claustrophobia in some patients, MRI is not always feasible. **(Mangalat et al., 2010).**

With increased utilization of devices in heart failure such as implantable cardioverter defibrillators (ICDs) and pacemakers and