ROLE OF CARDIAC MRI (1.5T) IN THALASSAEMIA

Essay

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in Radiodiagnosis

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Candidate

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List of Contents

Subject	*Page No.*

List of Abbreviations

Abbr.	Full-term
AIVG	: Anterior interventricular groove
Ao	: Aorta
APM	: Anterior papillary muscle
AV	: Aortic valve
AV	: Atrioventricular
BB	: Black blood
BH	: Breath-hold scan
CHF	: Congestive heart failure
CMR	: Cardiac Magnetic resonance
CS	: Coronary sinus
CT	: Crista terminalis
D	: Diaphragm,
EPI	: Echo-planar imaging
EV	: Eustachian valve
FO	: Fossa ovalis
FSE	: Fast spin-echo
Gad	: Gadolinium
GRE	: Gradient-echo
IAS	: Interatrial septum,
IOC	: Iron overload cardiomyopathy
IVC	: Inferior vena cava
IVS	: Interventricular septum
LA	: Left atrium
LAAP	: Left atrial appendage
LAD	: Left anterior descending artery
LAO	: Left Anterior oblique
LCA	: Left coronary artery
LCCA	: Left Common carotid artery

LCX : Left circumflex artery
LIC : Liver iron content
LIV : Left innominate vein,
LL : Left lung
LMB : Left mainstem bronchus,
LPA : Left pulmonary artery
LV : Left ventricle
LVOT : Left ventricular outflow tract
MB : Moderator band
MIC : Myocardial iron concentration
MIP : Maximum intensity projection
MR : Magnetic resonance
mTFE : Multiecho turbo field echo
MV : Mitral valve
P4CH : 4 chamber view
PA : Pulmonary artery
PHT : Pulmonary hypertension
PMVL : Posterior mitral valve leaflet
PPM : Posterior papillary muscle
PUV : Pulmonary valve
PV : Pulmonary vein
RA : Right atrium,
RAAP : Right atrial appendage
RCA : Right coronary artery
RL : Right lung
RMB : Right mainstem bronchus
ROI : Regions of interest
RPA : Right pulmonary artery
RV : Right ventricle,
RVOT : Right ventricular outflow tract
SA : Short-axis
SPAMM : Spatial modulation of magnetization

SSFP	: Steady state free precession
SSh	: Single shot dual inversion
SVC	: Superior vena cava,
SVC	: Superior vena cava
T	: Trachea
TDT	: Thalassaemia dependent transfusion
TEs	: Echo times
TFE	: Turbo field echo
TSE-MRI	: Turbospin echo MRI
TV	: Tricuspid valve
WB	: White blood
β-TM	: β-thalassemia major

List of Tables

List of Figures

Introduction

Thalassemia is the commonest single gene disorder worldwide, with approximately 94 million heterozygotes for beta thalassemia and 60,000 homozygotes born each year ***(Weatherall et al., 1996)***.

Although survival is improving in cohorts of patients in whom deferoxamine was introduced at a younger age, myocardial siderosis resulting in heart failure remains the major cause of death (50–70%) in thalassaemia major patients. This occurs at a strikingly young age with between 15–50% dying by the age of 35 years ***(Modell et al., 2000)***.

Some thalassemia centers have used liver iron concentration by biopsy as their gold standard for chelation titration ***(Olivieri, 2001).*** The liver is the dominant iron storage organ and liver iron concentration correlates closely with the total iron balance ***(Angelucci et al., 2000).*** Elevated liver iron also prospectively predicts poor endocrine and cardiovascular outcomes in patients with thalassemia major ***(Telfer et al., 2000).***

Unfortunately, liver biopsy is invasive, expensive and subject to sampling error ***(Butensky et al., 2005).*** Although the risk of ultrasound-guided liver biopsy is relatively low, hemorrhage requiring prolonged hospitalization occurs in