Value of Subtraction MRI in assessing treatment response after Radiofrequency ablation for hepatocellular carcinoma

Thesis

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

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ABSTRACT

Dyanmic MRI with its new subtraction technique is a powerful tool in detection of tumour viability after Radiofrequency ablation of hepatocellular carcinoma. We found that dynamic study is the gold standard in detection of viable residual lesions. Well defined nodular enhancement, thick irregular marginal enhancement or gross enlargement of the lesion with arterial phase enhancement and contrast wash out were considered positive for malignancy. We also found that subtraction technique is very helpful in differentiation between the viable residule /recurrent malignant lesions and the post treatment coagulative necrosis with significant statistical differences between the conventional dynamic MR and when we add the subtraction technique.

KEY WORDS

MRI, Radiofrequency ablation, hepatocellular carcinoma, subtraction.

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LIST OF ABBREVIATIONS

2D	Two dimensional
3D	Three dimensional
ADC	Apparent diffusion coefficient
BB-EPI	black-blood echo planar
BH	breath-hold
CT	Computed tomography
DCE	Dynamic contrast enhanced
DW	Diffusion weighted
DWI	Diffusion weighted imaging
EASL	European Association for the Study of the Liver
EPI	Echo planner imaging
FOV	Field of view
FS	Fat suppression
FSE	Fast spin echo
Gd	gadolinium
Gd-BOPTA	gadobenate dimeglumine
Gd-DTPA	gadolinium diethylenetriamine penta-acetic acid
GRE	gradient recalled echo
HCC	Hepatocellular carcinoma
HCV	Hepatitis C Virus
HPI	hepatic perfusion index
IVC	Inferior vena cava

LAVA	liver acquisition with volume acceleration
MIP	Maximum intensity projection
Mn-DPDP	mangafodipir trisodium
MR	magnetic resonance
MRI	Magnetic resonance imaging
MRS	Magnetic resonance spectroscopy
MW	Microwave
MWA	Microwave ablation
RARE	rapid acquisition with relaxation enhancement
RECIST	Response Evaluation Criteria in Solid Tumors
RF	Radiofrequency
RFA	Radiofrequency ablation
ROI	Regions of interest
RT	respiratory-triggered
SD	Standard deviation
SGE	Spoiled gradient echo
SIR	Society of Interventional Radiology
SNR	Signal to noise ratio
SPAIR	spectral selection attenuated inversion recovery
SPIO	superparamagnetic iron oxide
SSFP	steady-state free precession sequence
SSTSE	single-shot turbo spin-echo sequence
STIR	Short-tau (T1)inversion recovery
TACE	Trans arterial chemoembolization

TE	Time of echo
THRIVE	T1 weighted high-resolution isotropic volume examination
TR	Time of repetition
TSE	Turbo spin echo
VIBE	volume interpolated breath-hold examination
WHO	World Health Organization
WI	Weighted images

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INTRODUCTION