

Diagnostic performance of kinetic parameters derived from ultrafast breast MRI in characterizing benign and malignant breast lesions: The added value of the semiautomatically based parameters

ELECTRONIC SUPPLEMENTARY MATERIAL

Table (S1): MRI criteria of the 264 patients included in this study:

Variables	Numbers (%)
All subjects (n=264)	
Amount of FGT ▪ Fatty ▪ Scattered FG ▪ Heterogenous FG ▪ Extreme FG	26 (9.8%) 91 (34.5%) 94 (35.6%) 53 (20.1%)
BPE symmetry • Symmetrical • Asymmetrical	170 (64.4%) 94 (35.6%)
BPE level • Minimal • Mild • Moderate • Marked	29 (11%) 111 (42%) 109 (41.3%) 15 (5.7%)
Presence of enhancing foci: • Present • Absent	97 (36.7%) 167 (63.3%)

NB: FGT: fibro glandular tissue, BPE: background parenchymal enhancement.

Table (S2): Comparison between MRI morphologic features of benign vs. malignant lesions:

Characteristic	Benign (n=120)	Malignant (n=153)	P-value
Mass Lesions (n=186)	(N=69) (%)	(N=117) (%)	
▪ Shape Irregular Rounded Oval	36 (52.2%) 18 (26.1%) 15 (21.7%)	66 (56.4%) 30 (25.6%) 21 (17.9%)	0.792
▪ Margin Circumscribed Speculated Irregular	36 (52.1%) 3 (4.3%) 30 (43.5%)	14 (11.9%) 47 (40.1%) 56 (47.8%)	<0.001*
▪ Enhancement pattern Homogeneous Heterogeneous Rim Dark internal septations	18 (26.1%) 12 (17.4%) 24 (34.8%) 15 (21.7%)	40 (31.2%) 48 (25.8%) 49 (26.3%) 31 (16.7%)	0.036*
NME lesions (n=87)	(N=51) (%)	(N=36) (%)	
▪ Distribution Focal Linear Segmental Regional Multiple regions	7 (13.7%) 8 (15.7%) 7 (13.7%) 23 (45.1%) 6 (11.8%)	5 (13.9%) 4 (11.1%) 16 (44.4%) 11 (30.6%) 0 (0%)	0.009*
▪ Enhancement pattern Homogeneous Heterogeneous Clumped	16 (31.4%) 22 (43.1%) 13 (25.5%)	15 (41.7%) 5 (13.9%) 16 (44.4%)	0.011*

Notes: Data are N (%). The test of significance is Fisher's exact test. *statistically significant. NME: non-mass enhancement.

Table (S3): Comparison between diagnostic performance of Ultrafast MRI and conventional DCE-MRI in detection of breast cancer:

Measure	Ultrafast MRI	Conventional DCE-MRI
Sensitivity	94.1%	98%
Specificity	90%	90%
PPV	92.3%	92.5%
NPV	92.3%	97.3%
AUC	0.921	0.940
Accuracy	92.3%	94.5%
false positive	12	12
False negative	9	3
True positive	144	150
True negative	108	108

NB: DCE-MRI= Dynamic Contrast Enhanced MRI

Table (S4): Interobserver reliability of the ultrafast kinetic parameters:

Ultrafast parameter:	Agreement degree	ICC	95% CI
TTE	Strong	0.911	0.848-0.949
MS	Moderate	0.758	0.484-0.897
IE phase	Strong	0.953	0.918-0.974
RE	Strong	0.862	0.652-0.946
ME	Strong	0.922	0.866-0.955
MRE	Strong	0.959	0.928-0.977
TTP	Strong	0.805	0.656-0.889
wash in rate	Strong	0.865	0.773-0.921

NB: ICC: interclass agreement coefficient, CI: confidence interval, TTE: time to enhancement, IE: initial enhancement, MS: maximum slope, RE: relative enhancement, ME: maximum enhancement, MRE: maximum relative enhancement and TTP: time to peak.