Application of Contrast Enhanced Digital Mammography in The Characterization of Breast Lesions

Thesis

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Abstract

(Key Words: dual energy- contrast enhanced- characterization –breast lesions).

Our aim: is to assess the applications and possible indications for contrast enhanced digital mammography and its impact on characterization of breast lesions. **Materials and methods**: 168 patients provided with an overall of 211breast lesions. Written informed consent was obtained. Contrast enhanced digital mammography CEDM was performed by using a digital mammography unit (Seno DS; GE, Buc, France) after injection of 1-1.5 ml/kg of contrast agent (omnipaque) in both CC and MLO views. Findings were correlated with the final pathological results. **Results**: The average sensitivity was slightly higher for CEDM than for MX (88.99 % versus 88.07%). CEDM had a better diagnostic accuracy mainly due to improved specificity, and better positive and negative predictive values. **Conclusions:** Dual-energy contrast-enhanced digital mammography as an adjunct to mammography improves diagnostic accuracy compared to mammography alone. Addition of iodinated contrast agent to mammography facilitates the characterization of equivocal breast lesions mainly in dense breasts. Also, it is useful in the clarification of equivocal lesions on conventional imaging, particularly in follow-up after breast-conservative surgery. CEDM with its ability to demonstrate both morphology and tumor enhancement could be beneficial in the assessment of treatment response, accurate lesion size evaluation and can identify multi-focal and multi-centric breast cancer.

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List of abbreviation

ACR	American College of Radiology
AGD	average glandular dose
BIRADS	Breast Imaging-Reporting and Data System
BRCA	Breast cancer gene
BRCA1	Breast cancer gene 1
BRCA2	Breast cancer gene2
CAD	Computer-aided detection or computer-aided diagnosis
CBS	Conservative breast surgery
CC	Cranio-caudal
CE-MRI	Contrast enhanced MRI
CE-DBT	Contrast-enhanced digital breast tomo-synthesis
CEDM	Contrast-enhanced digital mammography
CM	Contrast medium
CT	Computer tomography
Cu	Copper
2D	Two-dimensional
3D	Three-dimensional
DBT	Digital breast tomo-synthesis
DC	Ductal carcinoma
DCIS	Ductal carcinoma in situ
DE	Dual energy
DM	Digital mammography
DSM	digital subtraction mammography
FFDM	Full-field digital mammography
FN	False negative

FP	False positive
G2	Grade 2
HE	High energy
HRT	Hormone replacement therapy
IDC	invasive duct carcinoma
ILC	infiltrating lobular carcinoma
IPC	invasive papillary carcinoma
ITC	invasive tubular carcinoma
keV	Kilo Electron Volt
kVp	Kilovolts Peak
LE	Low energy
LIQ	Lower inner quadrant
LN	Lymph node
LR-ve	Negative likehood ratio
LR+ve	Positive likehood ratio
mGy	Milli-gray
MLO	Medio-lateral oblique
MR	Magnetic resonance
MRM	Modified radical mastectomy
MX	mammography
NPV	Negative predictive value
PPV	Positive predictive value
RR	Relative risk
SCC	Squamous cell carcinoma
SFM	Screen-film mammography
Sn	Selenium

TN	True negative
TP	True positive
UOQ	Upper outer quadrant
US	Ultrasound
U.S.	United states

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