

Interpretation of Patterns of Enhancement on Contrast-Enhanced Digital Mammography: An Approach to a Standardized Scheme

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INTRODUCTION

The American College of Radiology (ACR) (5, 6, 7) issued new guidelines for the interpretation and relation of morphological enhancement and kinetics features in an attempt to standardize the communication language, a similar one is not issued for CESM and is now becoming crucial for better management.

AIM OF WORK

The aim of this work is to establish whether or not the patterns of enhancement encountered on CEDM can be analysed according to the MRI BIRADS Lexicon. The ability to set forth specific terminologies as seen with other breast imaging modalities will result in a standardized scheme when it comes to reading the CEDM report and thus enable better communication between the radiologist and clinicians.

CONCLUSIONS

Our aim in the study was an attempt towards achieving a standard form of communication that can be used between radiologists and clinicians based on the similar experience achieved with MRI through the MRI BIRADS Lexicon.

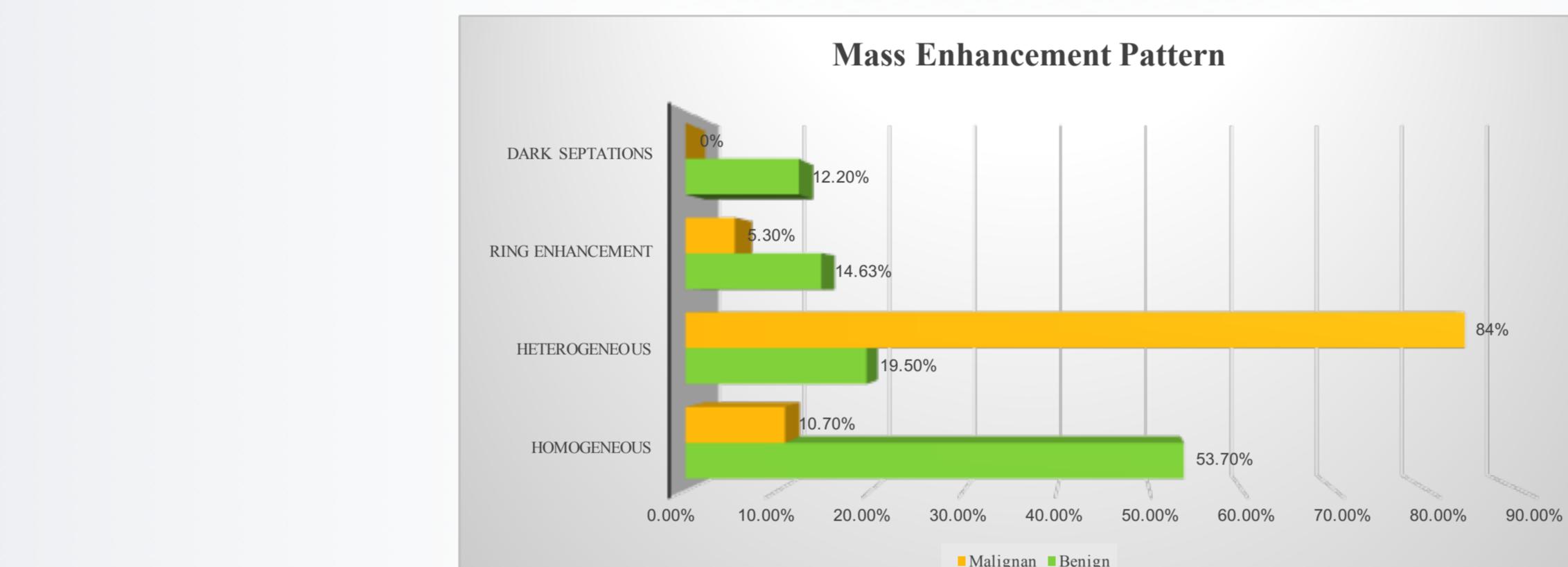
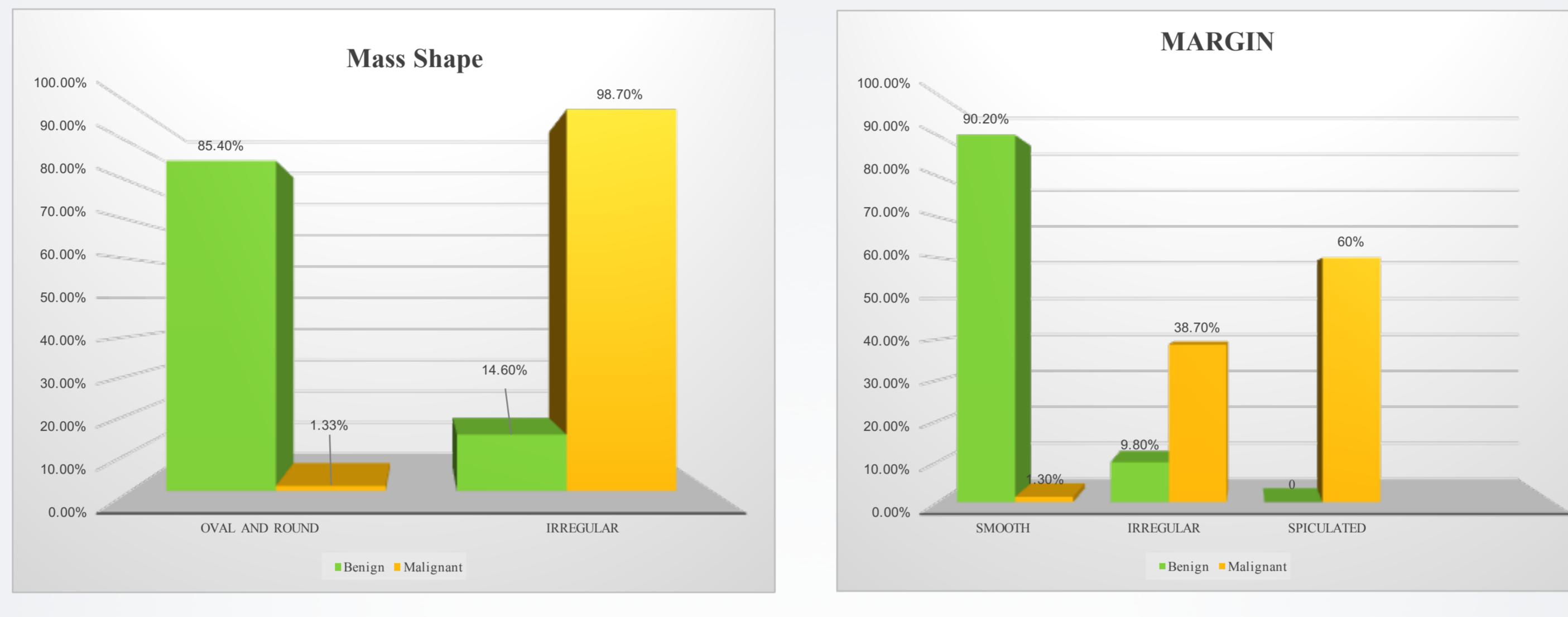
The definite malignant descriptors that we think can be confidently used when describing a malignant mass are irregular shape, spiculated margin and heterogeneous enhancement. The ring enhancement for us lies in a grey zone that can perhaps be clarified later with a larger study.

When looking at the non mass criteria focal, linear/ductal, segmental heterogeneous or clumped are what stood out for us when looking for malignant descriptors. Again, a larger number of patients would have been more informative.

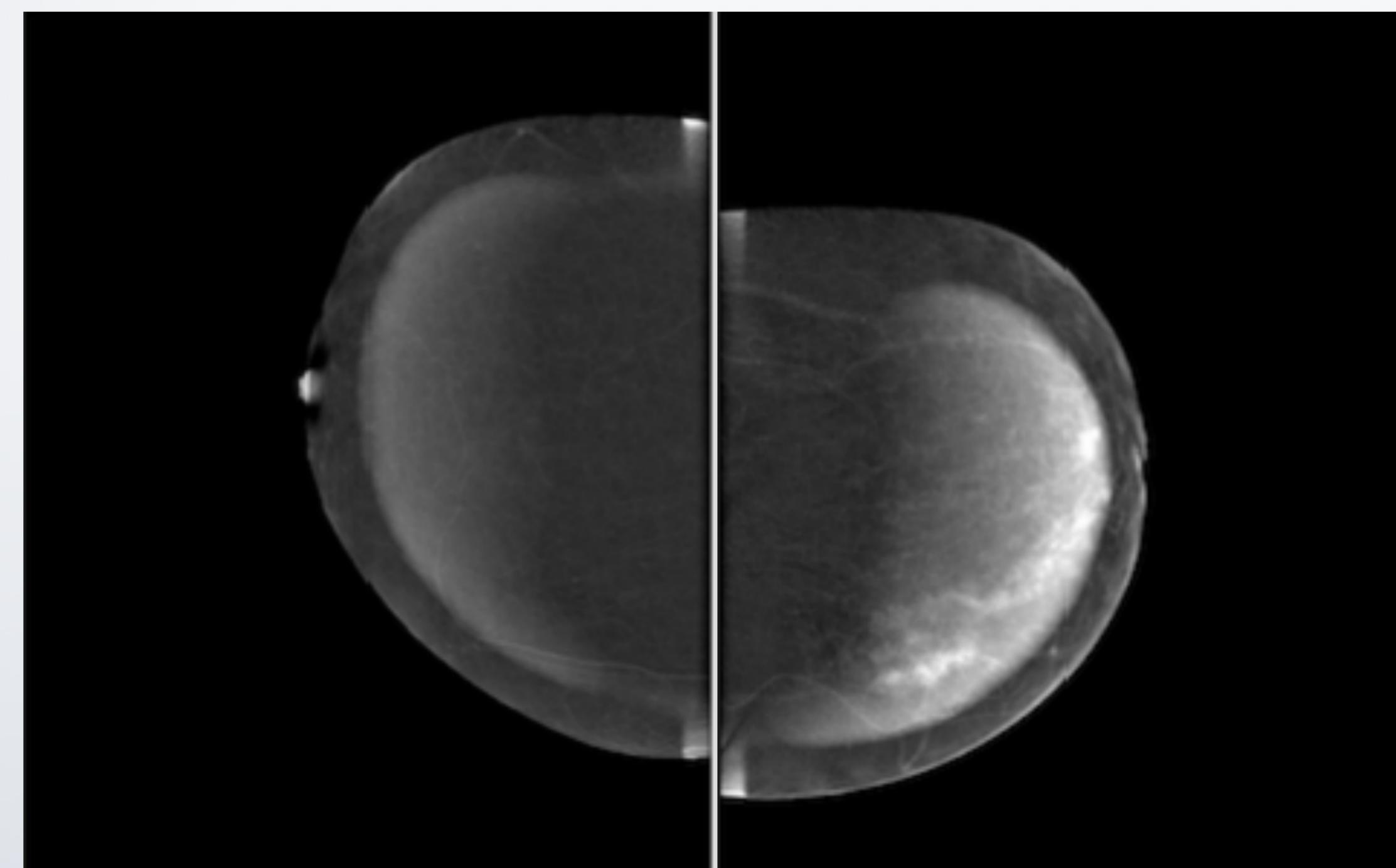
CEDM is a promising technique in several ways and deserves the attention that MRI has been receiving in the past few decades and that is why further analysis in a form of a multicentre study is recommended to validate our results so far.

MATERIALS AND METHODS

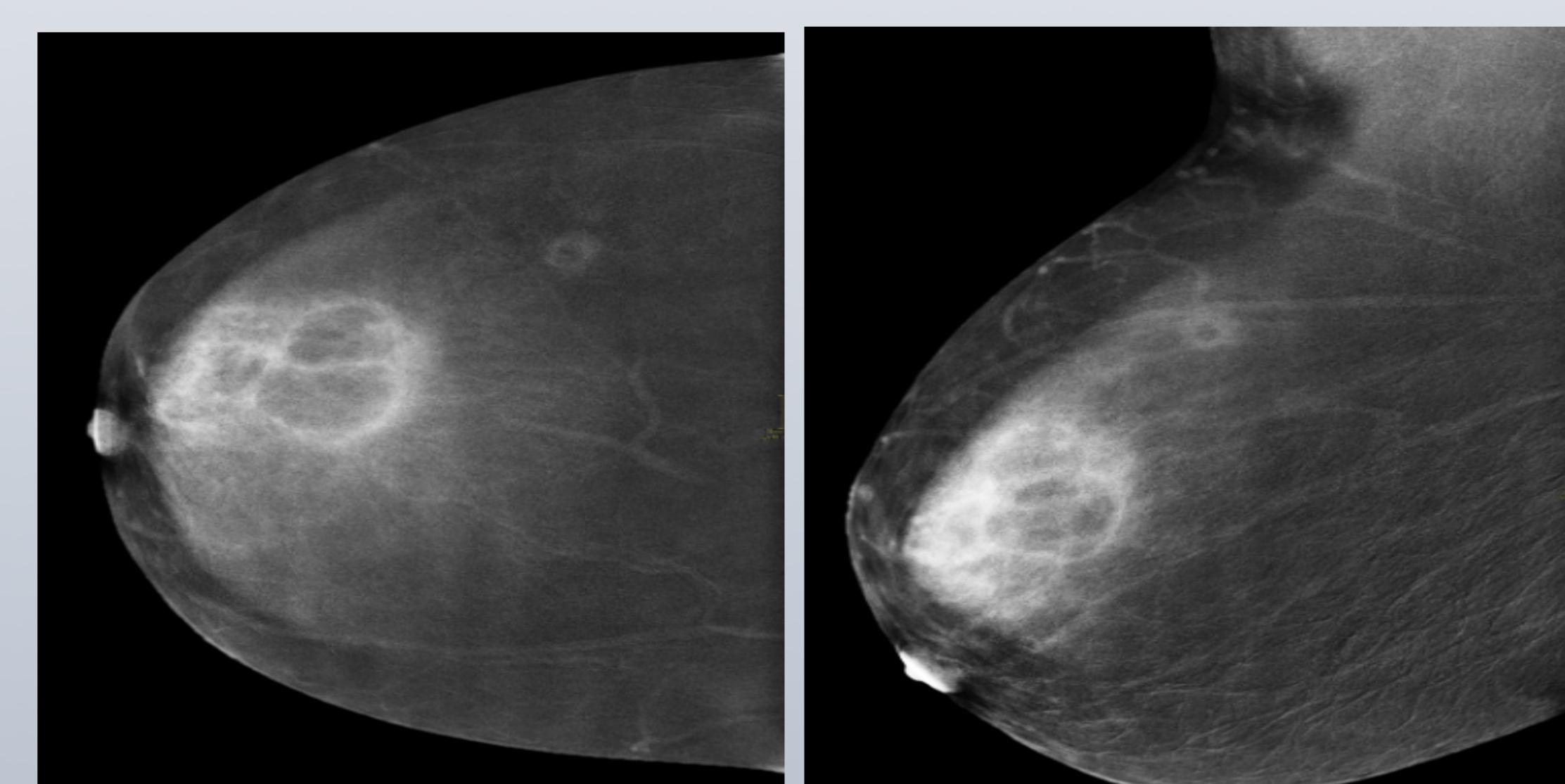
Morphological categorization of the included lesions was presented into focus, mass and non-mass forms. Furthermore classifications included (1) the margin, enhancement intensity for "focus", (2) the shape, margin and internal enhancement for "mass" and (3) the distribution and internal enhancement for "non-mass". Each morphology descriptor was evaluated separately (irrespective of the other descriptors) by calculating its sensitivity, specificity, (PPV78 breast lesions in patients with mean age 46 years in a prospective study were included.) and (NPV)



DCIS



Granulomatous Mastitis



RESULTS

This study included 104 malignant lesions versus 74 benign. Diagnostic accuracy parameters for CEDM were sensitivity 98 % (102/104) and specificity 76% (56/74). Irregular margin intense enhancement focus (1/8) was diagnosed malignant, (7/8) while regular margin faint enhancing foci were benign.

Irregular shape, spiculated margin and heterogenous internal enhancement descriptors of mass lesion descriptors conformed to malignancy (PPV 92.5% of the former and 88.7% of the latter, p value ≤ 0.001).

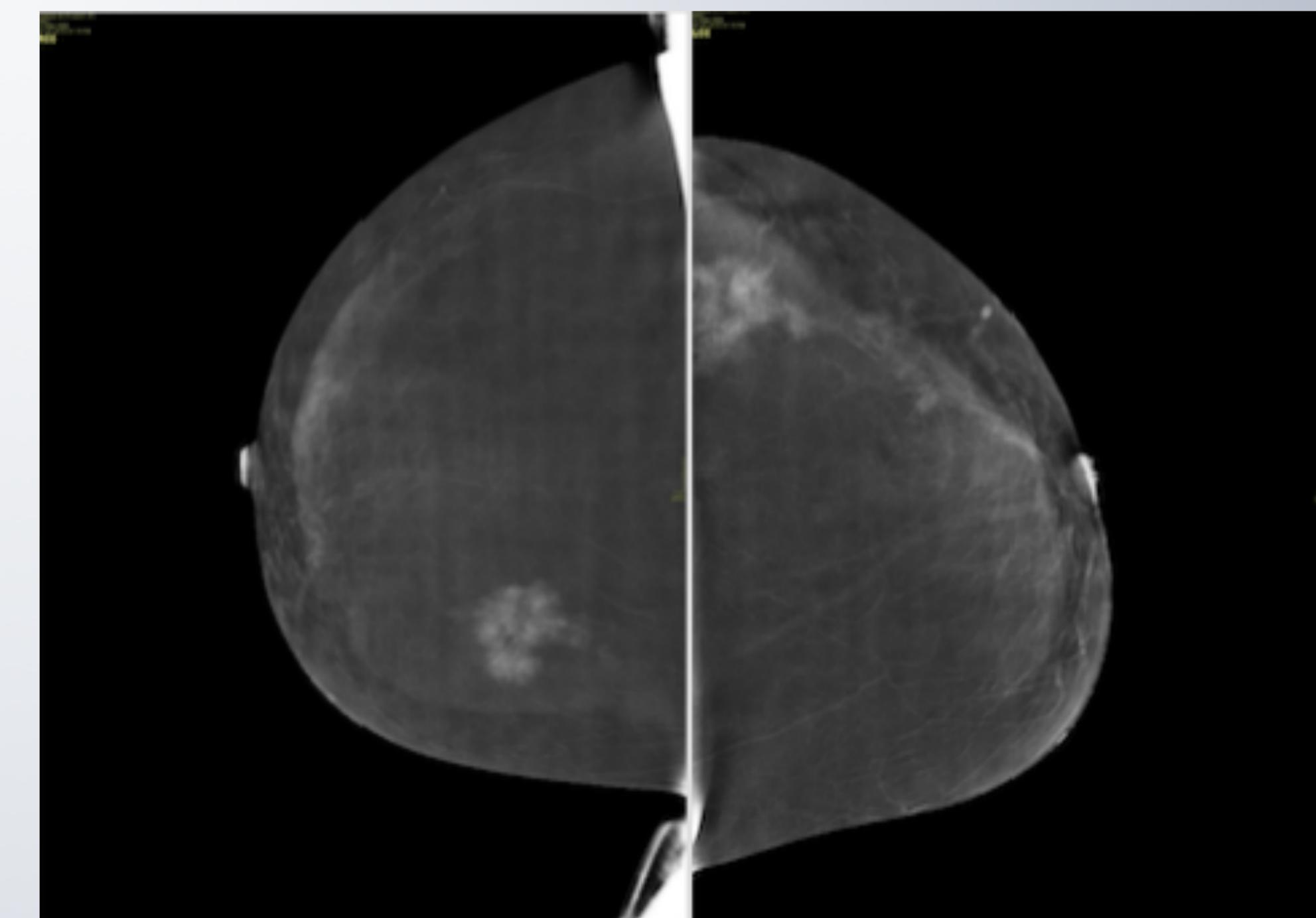
Asymmetry with segmental distribution, (17/27) (70.8%) heterogeneous and clumped internal enhancement patterns were indicative for malignancy in non mass enhancement (PPV <0.001)

	Sensitivity	Specificity	+vePV	-vePV	Accuracy
Shape	98.7	84.6	92.5	97	92
Margin	98.7	90	94.8	97	95.7
Pattern (mass)	89	65.8	82.7	77	81

Distribution (NME)	85	44	82	50	75
Pattern (NME)	100	55	87	100	89

Diagnostic indices of individual parameters

Bilateral IDC



Fibroadenoma

