بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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Diagnosis of breast microcalcifications with contrast enhanced digital mammography and histopathological correlation

Thesis

Submitted for Partial Fulfillment of Master Degree
in ***Radio-diagnosis***

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Amira Lotaif Abdullah

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List of Abbreviations

Abb	Full term
ACR:	*American society of radiology*
BIRADS:	*Breast imaging reporting and data system*
CC:	*Craniocaudal*
CEDM:	*Contrast enhanced digital mammography*
CEMRI:	*Contrast enhanced magnetic resonance imaging*
cm:	*Centimeter*
CT:	*Computed tomography*
DCIS:	*Ductal carcinoma in situ*
FFDM:	*Full field digital mammography*
HER2:	*Human epidermal growth factor receptor 2*
IDC:	*Invasive duct carcinoma*
ILC:	*Invasive lobular carcinoma*
Kg:	*Kilogram*
LCIS:	*Lobular carcinoma in situ*
mg:	*Milligram*
mL:	*Milliliter*
MLO:	*Mediolateral oblique*
mm:	*Millimeter*
MRI:	*Magnetic resonance imaging*
PND:	*Pectoral nipple distance*
PNL:	*Pectoral nipple line*
TDLU:	*Terminal ductal lobular unit*
US:	*Ultrasound*

INTRODUCTION

Microcalcificaitons are a common finding on mammography and constitute up to 31% of lesions detected at screening mammography ***(Bluekens et al., 2012).***

Ductal carcinoma in situ (DCIS), a potential precursor lesion of invasive ductal carcinoma, often presents with microcalcificaitons on mammography. Of all mammographically detected DCIS lesions, up to 79% manifest with microcalcifications only ***(Bluekens et al., 2012).***

Therefore, careful evaluation of mammogrpahically detected microcalcifications is essential. However, not all microcalficications are associated with in situ or malignant disease ***(Verchuur-Maes et al., 2011).***

Contrast enhanced digital mammography (CEDM) is a relatively new contrast-enhanced technology for breast imaging and holds great promise for assessing clinical indications similar to those of breast MRI ***(Hobbs et al., 2015).***

Contrast enhanced mammography generates a high-resolution, low-energy, full-filled digital mammography image ***(Friedewald et al., 2014).*** Post iodinated contrast recombined image is used to assess tumor neovascualrity ***(Weigert, 2017).***

Aim of the Work

The purpose of this study is to evaluate diagnostic value of contrast enhanced digital mammography in breast microcalcificaations.

Chapter 1

NORMAL ANATOMY OF THE BREAST

The great advances achieved in the surgical treatment of breast cancer have made it essential for mastologists to have detailed knowledge of all anatomical features of the breast and the thoracic wall and axillary region ***(Macèa, 2006).***

The breast is a modified skin gland enveloped in fibrous fascia. The superficial pectoral fascia is located just beneath the skin and in the retromamary space. The undersurface of the breast lies on the deep pectoral fascia ***(Harris et al., 1996).***

Although there are fascial layers between the breast proper and the pectroalis major muscle, the breast is not completely separate from the pectroalis major muscle, as there are penetrating lymphatics and blood vessels **(Figure 1).**

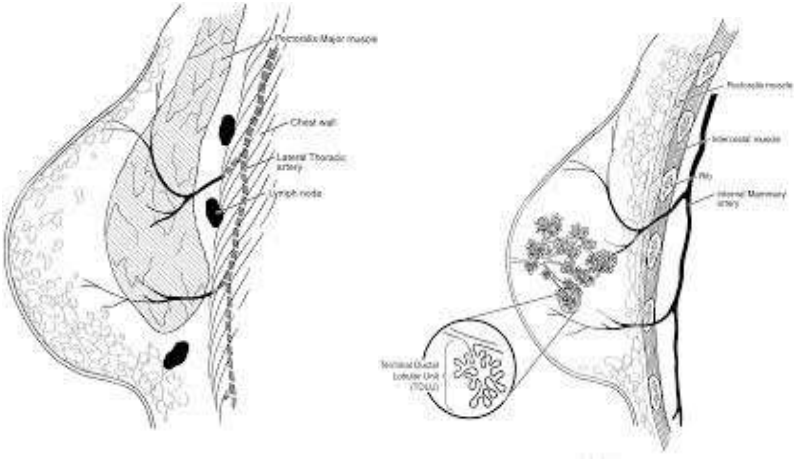

Figure (1): Penetrating lymphatics and blood vessels, medially the internal mammary artery and branches are seen; the terminal duct lobular unit (TDLU), laterally the lateral thoracic artery and branches supply the breast ***(Morris, 2005).***

The pectorlais muscles, though attached to the chest wall, are not considered part of the chest wall. This is an important distinction when it comes to staging the patient ***(Morris, 2005).***

The breast is composed of three major structures: Skin (normal skin appears smooth and measures usually 0.5 – t 2.0 mm thick, except caudally where it may be slightly thicker due to its usual dependency ***(Wilson and Adam, 2005),*** subcutaneous tissue, and breast tissue (parenchyma and stroma). The parenchyma is divided into 15 to 20 lobes or segments that converge at the nipple in a radial arrangement, being supported by surrounding connective or stromal tissue (Figure 2). The distribution of lobes is not even as there is a preponderance of glandular tissue in the upper outer quadrant of the breast ***(Harris et al., 1996).***

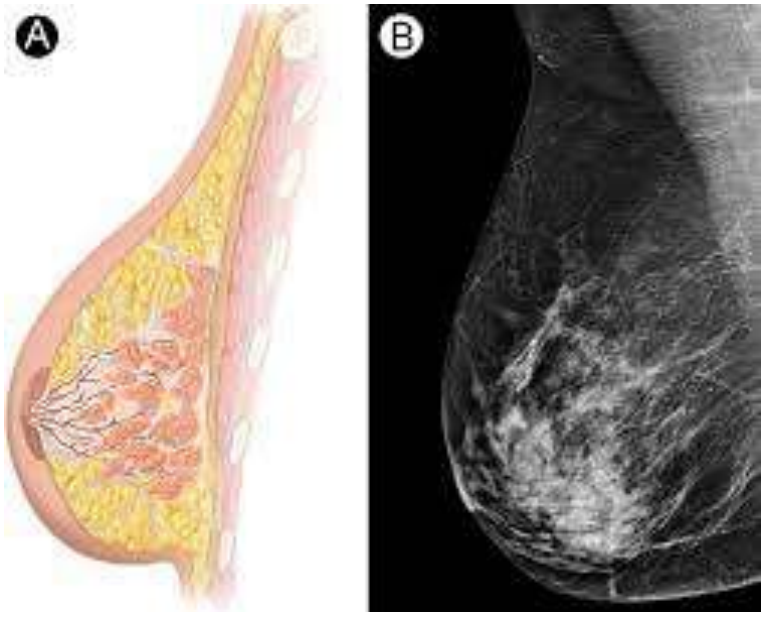

Figure (2): Normal female breast anatomy (A-illustrating diagram, B-mammographic image MLO view) ***(Jesinger, 2013).***