THE ROLE OF MULTIDETECTOR HELICAL COMPUTED TOMOGRAPHY IN ASSESSMENT OF LOCAL BREAST CANCER EXTENT

Essay

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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ
الْحَكِيمُ

صدق الله العظيم

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List of Abbreviations

AJCC…….	**American joint committee on cancer.**
BCLE ……...	**Breast cancer with limited extent.**
BCS…….	**Breast conserving surgery.**
BCT……	**Breast conserving treatment**
BI-RADS……..	**Breast imaging-reporting and data system.**
CE-MDCT……...	**Contrast enhanced multidetector computed tomography.**
CIS…….	**Carcinoma in situ**
CT……...	**computed tomography.**
DCIS……	**Ductal carcinoma in situ**
EIC……..	**Extensive intraductal components**
Enh%……	**Enhancement percent ratio**
Fig……..	**figure**
FOV……	**Field of view**
HRCT……	**High resolution CT**
HU……..	**Housefield unit**
IDC……...	**Invasive ductal carcinoma.**
IDS……...	**Intraductal spread.**
ILC……..	**Invasive lobular carcinoma.**
LCIS……	**Lobular carcinoma in situ.**
MDCT……	**multidetector computed tomography.**
MIP ……..	**Maximum intensity projection.**
MPR……	**Multi-planar reformatting.**
MRI……	**Magnetic resonance imaging.**
MSCT……	**Multislice CT**
Non-BCLE……..	**Breast carcinoma with non limited extent.**
PPV…….	**Positive predictive value.**
RE……	**Rim enhancement.**
ROIs	**Regions of interest.**
RSNA…….	**Radiology society of north America.**
SLN……..	**Sentinel lymph node.**
SSD……..	**Shaded surface display.**

SSP…… Section sensitivity profile.
US…….. Ultrasonography.
VR…… Volume rendering.

Introduction

Breast cancer is one of the most important disease for women in the

world and Constitute one fourth of all cancers in females. The lifetime probability of developing breast cancer is 1 to 7 for females

Breast cancer is 100 times less common in men than in women.

Breast cancer accounts for approximately 15% of female cancer death. It is the leading cause of death in women aged 44 – 50 years **(HamantSinghal 2006).**

Conventional mammography and Sonography of the breast are routinely used as imaging techniques in the diagnosis of the breast cancer worldwide,However,both mammography and U.S have well recognized limitation either due to factors in the breast parenchyma such as dense breast in young females,post operative changes of effect of irradiation or factors in the modality itself such as ,the inability of mammography to demonstrate the deep part of the breast and the operator dependency of ultrasonography **(Heywang and Beck 2000).**

Nowadays with the progression of CT technology, helical MDCT is

now has a very promising role as complementary tool to mammography and sonography. In practice, MDCT is indicated for pre-operative patients with breast cancer to detect multicenteric or multifocal lesions and to assess the extent of breast cancer and for patients with indeterminate findings for breast lesions on conventional modalities to differentiate malignancy from benign lesion **(Sardanelli F 2002).**

In comparison between helical MDCT and mammography, the standard mammography detects tumors at an average size of 11 mm in diameter,about the size of garbanzo bean (chicken pea).MDCT of breast

aim to detect tumors of average size 5 mm or less, about the size of pea **(John M Boone 2007) .**

MDCT is designed to distinguish benign lesions and calcifications from tiny cancers that are sometimes hidden within dense tissue also, the MDCT system clearly displays tissue around the ribs and outer breast toward the armpit, where 50% of cancers are found. **(O,Conell et al 2007).**

One of the disadvantages of MDCT is the breast exposure to radiation.

The measured radiation dose at the skin surface of the breast for a single breath-hold acquisition of MDCT is about 25 MGy, similar to the dose reported for conventional CT and approximately 10 times higher than the dose received during standard mammography (**Uematso 2001).**

This disadvantage may not be a serious problem for patients who are thought to have breast cancers on basis of findings on other diagnostic techniques.

Helical MDCT examination of the breast has been introduced as a promising method of diagnosis of breast neoplasms and for clarifying uncertain cases after mammography and or US and it may be able to provide information similar to all much better than that obtained with dynamic MR **(Sardanelli 2002).**