KARNATAKA RADIOLOGY EDUCATION PROGRAM

MAMMOGRAPHY

Mammography is a dedicated radiographic technique for imaging the breast, and the resultant images are known as mammograms.

Types of mammography

In general terms, there are two types of mammography: screening and diagnostic.

Mammography differs significantly in many respects from the rest of diagnostic imaging.

Screening mammography

In general terms, screening mammography is performed on asymptomatic women to identify malignant breast pathology at an early, potentially curable stage. Regardless of confusing statistics in lay publications, the earlier breast cancer is picked up, all other factors being equal, the better the survival rate. Screening mammography is performed on clients, not patients.

Diagnostic mammography

Imaging performed on symptomatic patients, or to work-up an abnormality found on screening mammography. The objective is to use imaging to typify pathology and arrive at a diagnosis. This is important because different diagnoses have significantly different outcomes and survival rates. For instance, a diagnosis of a simple breast cyst has few implications and does not affect the patient's life expectancy. In contrast, a diagnosis of breast cancer has significant implications for the patient and their life expectancy.

Differences between the screening and diagnostic environments

Screening studies are well performed by trained sympathetic staff in environments that are not necessarily located in hospitals. Screening centers function very well as stand-alone locations without a physician on-site. The studies are usually read by breast radiologists and/or breast physicians in an isolated environment. In contrast to the rest of radiology, these studies are read in batches (boards) and in large volumes, and comparison to prior

mammograms is vital. Where screening studies are read in environments where interruptions, phones and distractions are present, the risk of mistakes occurring is higher.

In many countries, breast cancer screening programs require screening mammograms to be double-read (i.e. two independent breast imagers read the mammogram) with any discordance being referred to a third independent reader. The standard screening views performed are the craniocaudal (CC) and mediolateral oblique (MLO) projections of each breast.

Diagnostic studies are performed with a radiologist on-site, involved with every step of the imaging procedure. Standard views are supplemented with additional views (e.g. coned views, cleavage view, compression view, lateral view, mediolateral view) to further assess the screening-detected abnormality.

Why is a diagnosis of breast cancer significant?

The diagnosis of breast cancer is significant for many obvious and perhaps less obvious reasons. The diagnosis not only affects the patient, but affects those around her e.g. her female relatives. The disease has a sinister reputation because of the debilitating cosmetic results traditionally associated with surgery and the invariably bad outcome for the patient traditionally associated with the disease.

Why is mammography important?

Until a cure for the disease is found, mammography is the best tool we have to find breast cancers early i.e. before they are palpable. The result of this is a potential cure for the patient and cosmetically-acceptable surgery if required. In general terms, the earlier a cancer is found, the better the outcome. We luckily no longer live in a world of Halsted mastectomies.

Why does a breast imager read mammograms?

For some strange reason, not all radiologists are "wired" to read breast imaging. The reason for this is unclear. This has nothing to do with capability, intelligence or competency in other fields of imaging. Mammogram readers must have statistically proven, reproducible proficiency to allow them to qualify to read the images and to objectively and independently confirm their proficiency. This is important because of the emotive and potentially disturbing consequences of a significant finding on a mammogram. Unnecessary recalls cost money, do not add value and upset the patient and her physician.

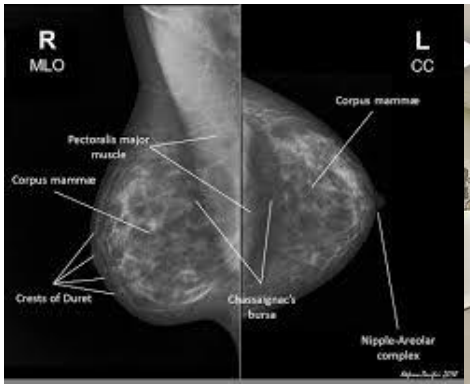
Why all the adverse publicity for mammography?

It has become politically correct to question the value of mammography. Most of the adverse publicity has a single source out of The Cochrane Collaboration and from one author. The emotion around the disease and its appeal in the lay literature then fuels the publicity which detracts from the scientifically proven value of early diagnosis, improved survival and cosmetically acceptable treatment. A review of the ongoing debate in this regard is out of the

scope of this website. Suffice to say that in many respects this is an unfortunate debate driven by people who are not breast imagers and it detracts time, money, effort and attention from the real issue - finding a cure. This debate has many features in common with the infamous debate surrounding autism and MMR vaccination.

Criteria for image quality assessment
all breast glandular tissue imaged
image annotation
date
patient ID (name and URN or DOB)
side markers
radiographer ID
cassette ID (ideally)
correct exposure - can "bright light" skin and nipple
no movement artifact or grid artifact
no skin folds
symmetrical images

Standard Views



Adequate craniocaudal (CC) views
all glandular tissue identified
nipple in profile
nipple in the midline of image
length of posterior nipple line (PNL) within 1 cm in size (cf. PNL on MLO)
images symmetric

Adequate mediolateral oblique (MLO) views

pectoral shadow is seen down to the level of the nipple or lower
inframammary fold is well seen
nipple in profile

length of posterior nipple line (PNL) within 1 cm in size (cf. PNL on CC)
images symmetric
Additional (supplementary) views
These views are used in diagnostic breast workups in addition to the standard views.

true lateral view - 90º view
mediolateral view - ML view
lateromedial view - LM view
lateromedial oblique view - LMO view
late mediolateral view - late ML view
step oblique views
spot view - spot compression view
double spot compression view
magnification view(s)
exaggerated craniocaudal views - exaggerated CC views
XCCL view
XCCM view
axillary view - axillary tail view
cleavage view - valley view
tangential views
caudocranial view - reversed CC view - 180° CC view
bullseye CC view
rolled CC view
elevated craniocaudal projection
caudal cranial projection
20° oblique projection
inferomedial superolateral oblique projection
Eklund technique

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REF : Christensen's Physics of Diagnostic Radiology , SumanjaliAnjali