Diagnosis of Triple Negative Breast Cancer (TNBC) using Mammography

Student Researcher: Sarah Mihalka
Faculty Advisor: Michelle Adams, B.S., R.T. (R)

MISERICORDIA UNIVERSITY

Mammography Introduction

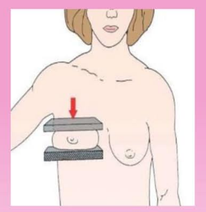
Mammography uses low dose radiation to take images of breast tissue in two different projections. These projections are craniocaudal and mediolateral oblique. At the age of 40 years old, women are recommended to begin screening mammograms. This is said to be helpful in diagnosing breast cancer early.

If an individual is having a problem or a suspicious mass or area on a screening mammogram, regardless of age, a diagnostic mammogram is performed. This includes special views such as spot compression over the suspicious area or a 90-degree lateral.

(Peart, 2017, p. 232)

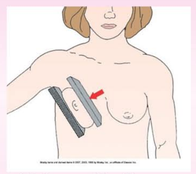
Mammogram Projections

- Routine Projections
  - Craniocaudal (CC)



(Thierry-Chef, Simon, Weinstock, Kwon, and Linet, 2012)

  - Compresses breast top to bottom with x-ray beam entering top of breast
  - Best demonstrates anterior, central, medial and posteromedial portions
  - Mediolateral Oblique (MLO)

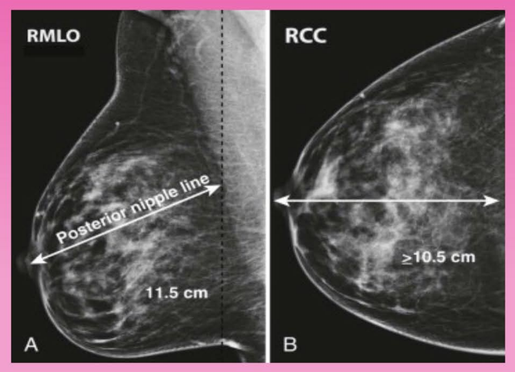


(Thierry-Chef et al., 2012)

  - Compression from the medial aspect of the breast
  - Angle between 30-60 degrees

(Peart, 2017, p. 232)

- Diagnostic Projections
  - 90-degree mediolateral (ML)
  - Spot compressions
  - Magnification views



- Left image: MLO view; normal mammogram; arrows indicating posterior nipple line (PNL) is demonstrated well
- Right Image: CC view; normal mammogram; arrows indicating PNL is demonstrated well

(Radiology Key, n.d.)

Triple Negative Breast Cancer (TNBC)

- TNBC represents 15-20% of all breast cancer cases.
- It is characterized by the absence of hormone markers: estrogen receptor (ER), progesterone receptor (PgR), and human epidermal factor receptor (HER-2).
- It tends to be of a higher grade and more aggressive than other types of cancer.
- It is classified as an invasive ductal carcinoma.
- Only treatment is cytotoxic chemotherapy.

(Syed, Arora, Premi, Sharda, Varghese, Chaudhary, Rao, Ravi, 2021)

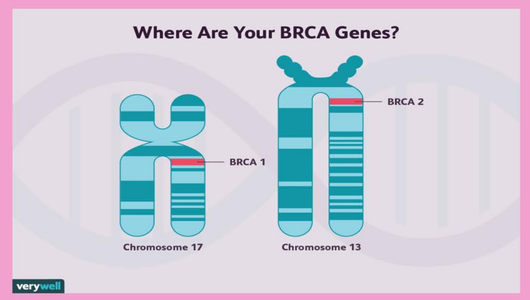
Symptoms

- Lumps or masses felt on or within a breast
- Breast skin changes, such as redness, swelling or pitting (an “orange peel” texture)
- A change in the size or shape of one or both breasts
- Changes in the appearance of one or both nipples, such as flaking or peeling nipple skin
- Nipple discharge (other than breast milk)
- Breast pain, warmth, irritation, itchiness or hardness

Risk Factors/Causes

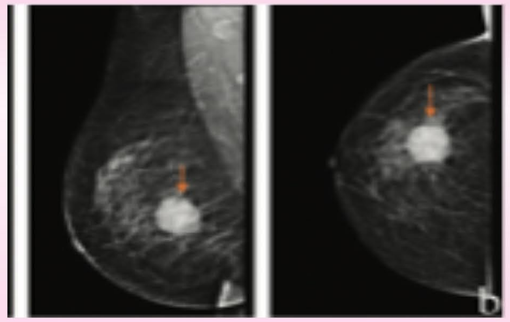
- Unknown cause
  - Thought to be from a mutation of the BRCA1 gene
- Risk Factors
  - Individuals younger than 50
  - BRCA1 gene mutation
  - Hispanic of African American races

(Mema, Schnabel, Chun, Kaplowitz, Price, Goodal, Moy, 2020)



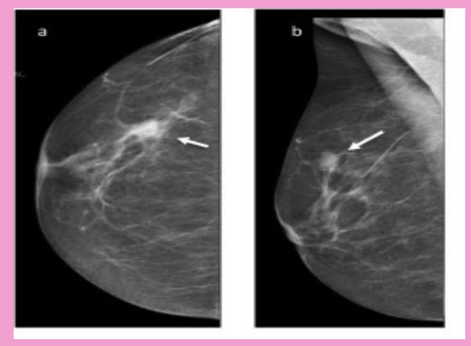
Diagnosis

- Round/oval mass with no architectural distortion
  - With or without calcifications
- Microlobulated margins with the absence of spiculation



- Left image: MLO view; mammogram indicative of TNBC; arrow pointing to a round/oval mass
- Right image: CC view; mammogram indicative of TNBC; arrow pointing to a round/oval mass

(Shaikh & Rasheed, 2021)



- Left image: CC view; arrow is pointing to the suspicious mass; appears to be round/oval with no architectural distortion
- Right image: MLO view; arrow is pointing to the suspicious mass; appears to be round/oval with no architectural distortion

(Nakashoji, Matsui, Nagayama, Iwaata, Sasahara,Yuya, 2017)

Diagnosis

- Round/oval mass with no architectural distortion, with or without calcifications
- Microlobulated margins with the absence of spiculation

Discussion

- Early detection is key for a better prognosis of TNBC.
- According to Mema et.al (2020), TNBC presented as an invasive ductal carcinoma and most tumors were stage III.
- Additionally, this can lead to higher rates of relapse and shorter overall survival times.
- According to Shaikh et. al (2021), the median age of the women was 49.2.

Conclusion

In conclusion, Triple Negative Breast Cancer is an aggressive, higher tumor grade cancer that bares no disregard for age. Mammography is important for diagnosis in conjunction with other modalities such as magnetic resonance imaging (MRI) and ultrasound. If detected early, the prognosis may improve along with survival rate.

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