

Diagnosis of Gynecomastia Utilizing Mammography Student Researcher: Dempsey Hollenbeck Faculty Advisor: Lynn Blazaskie B.S.R.T. (R)

Introduction

Gynecomastia is a benign enlargement of male breast tissue, that is often diagnosed utilizing mammography. Mammography is commonly known as a routine imaging procedure to examine female breasts. Diagnostic mammography procedures are performed on males who are experiencing any breast symptoms. Whether mammography is the best modality to diagnose gynecomastia is controversial.

Mammography

- Mammography is a low dose radiographic image of the breast, utilized to detect breast cancer early and evaluate other breast diseases (National Institute of Biomedical Imaging and Bioengineering, 2017).
- Mammography is typically utilized as a screening mechanism on assymptomatic patients
- Diagnostic mammography is performed on patients presenting with symptoms or examine a suspicious area found on routine screening projections (Long, Rollins, and Smith, 2016).
- Mammography performed on male patients is considered diagnostic, because it is only performed if the patient is presenting with symptoms
- Routine mammographic projections:
- Cranio-caudal view (CC)
- A craniocaudal projection requires compression from the top of the breast, with the x-ray beam also entering the top of the breast





(Popli, Popli, Bahl, and Solanki, 2009)

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

- Mediolateral oblique (MLO)
- A mediolateral oblique projection requires compression from the medial aspect



(Popli et al., 2009)

(Thierry-Chef et al., 2012)



The images to the right and left are normal male mammograms with no pathology. The images are marked to describe the different anatomical structures seen within the projection. The triangle in the images is placed on the subcutaneous fat of the male breast. The asterick is placed on the pectoralis muscle. The image artifact seen most superior is a nipple marker, used to differentiate the nipple from a

possible pathology.



(Chau, Jafarian, Rosa, 2016)

Gynecomastia

- Gynecomastia is a benign unilateral or bilateral increase in breast tissue in males due to hypertrophy of glandular tissue (Mayoclinic, 2019).
- The majority of gynecomastia cases are idiopathic the condition arises spontaneously with an unknown cause (Basat et al., 2016).
- May develop in any male at any age (Robeva, Elenkova, and Zacharieva, 2019).
 - Newborns due to exposure to mother's estrogen (Hormone Health Network, 2018).
 - Adolescents due to hormones realated to puberty (Whiteman, 2018).
 - Prevalence peaks during adolescence due to hormonal disturbances associated with functional changes or pathological conditions
 - Adult males due to various explanations hormone imblance, medical conditions, and substance use (Robeva et al., 2019).



(Bougainvillea Clinique, 2020). The image above is a diagram of the male breast representing the physical changes associated with gynecomastia.

Symptoms

- Breast swelling and tenderness
- Nipple discharge (Mayoclinic, 2019).

Possible Causes/ Risk Factors

Imbalanced estrogen to androgen ratio (Robeva et al., 2019).

- Androgen Deprivation Theraphy a treatment for prostate cancer that would cause an imbalance in estrogen and androgen hormones (Smith, 2020).
- Use of anabolic steroids or androgen hormones

• Alcoholism

• Drug use:

- Amphetamines
- Marijuana
- Heroin
- (Mayoclinic, 2019).

• Specific Medications

- AIDS medications
- Anti-anxiety medications Cancer treatment
- Antibiotics (Basat et al., 2016).
- Pathologic conditions:
- Liver Diseases
- Kidney Diseases
- Lung Cancer
- Testicular Cancer
- Adrenal Tumor (Johns Hopkins, 2020).

Diagnosis

• The image pathology is typically 2-6 cm in size, but it may involve the whole breast

• Fan or flame shaped — the pathology starts at the glandular tissue situated behind the nipple and continuously spreads wider throughout the breast.

• Subareolar — below the areola

• Focal asymmetric density— an abnormal density that is seen on more than one view. Gynecomastia can be visualized on both the craniocaudal and the mediolaterol oblique views

• Centered at nipple

Blends into surrounding adipose tissue (Berg Lueng, 2019).



The radiographs on the right and left demonstrate a male breast diagnosed with gynecomastia. The pathology is outlined in pink on both images. Both images adequately demonstrate the diagnostic characteristics of gynecomastia, which are listed and explained above.

(Bawazeer, 2020)



• Ulcer medications

• Chemotherapeutic agents

(Berg and Lueng, 2019).

- Heart medications

- Pituitary Tumor
- Congenital Disorders
- Thyroid Disorders
- Injury
- Obesity

• Cocaine

- About 36% of males are affected by gynecomastia • Nearly 75% of gynecomastia cases are bilateral • Approximately 25% of gynecomastia cases are drugassociated
- (Basat et al., 2016)
- Pseudogynecomastia is diagnosed in about 9% of male patients who present with a breast lump (Berg and Lueng, 2019).

• Three Diagnosis Patterns

The craniocaudal and mediolateral oblique images to the left demonstrate early dendritic Gynecomastia in the male breast. Early dendritic gynecomastia is typically present for less than one year. It is characterized as a well demarcated subareolar mass that extends posteriorly and tapers off peripherally (Berg and Lueng, 2019).

Late Dendritic



The craniocaudal and mediolateral oblique images to the right demonstrate diffuse glandular gynecomastia in the male breast. Diffuse glandular gynecomastia is characterized as a dense nodular parenchyma situated in an enlarged breast. This type of gynecomastia is representative of a female breast without the cooper ligaments (Berg and Lueng, 2019).

(Chau et al., 2016)



(Chau et al., 2016)

Differential Diagnosis

- Male Breast Cancer Abscess
- Pseudogynecomastia
- Lipoma
- Myofibroblastoma
- Diabetic Mastopathy
- (Berg and Lueng, 2019)

Statistics

• Gynecomastia is the most common cause of male breast mass

Conclusion

Gynecomastia is a benign enlargement of glandular tissue of the male breast. The condition can affect males of many ages for many possible reasons. Gynecomastia is diagnosed utilizing diagnostic mammography, an imaging procedure performed on male patients presenting with symptoms. The image is then compared to specific image characteristics of the pathology to make a diagnosis.

Diffuse Glandular

The Craniocaudal and mediolateral oblique

dendritic gynecomastia in the male breast.

Late dendritic gynecomastia is typically

characterized as a central flame shaped

subareolar mass with prominent linear

projections radiating out into deep adipose

present for more than one year. It is

tissue (Berg and Lueng, 2019).

radiographs to the left demonstrate late

Early Dendritic

(Chau et al., 2016)