Breast Masses in the Distinctive Patient: Men, Transgender, Pregnant & Post-Partum
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NC ACR 22nd Annual Breast Imaging Course
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Disclosures: None

Lecture Outline:
Male Patient
- Distinguishing Gynecomastia, Breast Cancer
- Other Male Breast Masses
Transgender Patient
Pregnant & Lactating (PostPartum) Patient
- Benign Masses and PABC
- Puerperal Mastitis and Abscess
<table>
<thead>
<tr>
<th>MALE BREAST</th>
<th>PREGNANT &amp; LACTATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gynecomastia</td>
<td>1. (FA)</td>
</tr>
<tr>
<td>2. Male breast cancer</td>
<td>2. (Cyst)</td>
</tr>
<tr>
<td>3. Lipoma and other mesenchymal tumors</td>
<td>3. Lactating adenoma</td>
</tr>
<tr>
<td>4. Epidermal inclusion cyst</td>
<td>4. Galactocele</td>
</tr>
<tr>
<td>5. Hematoma</td>
<td>5. Puerperal mastitis / abscess</td>
</tr>
</tbody>
</table>
Unknown Case #1  71yo male right breast mass
Men are referred for breast imaging when they have a palpable mass or breast enlargement that may or may not be associated with pain and tenderness.

The differential diagnosis for male breast symptomatology is not broad . . . Gynecomastia is by far the most common culprit.

However, it is important to be able to differentiate benign from malignant in order to avoid unnecessary imaging and intervention.
Male Breast

Diagnostic Evaluation

- < 1% of mammographic studies performed in breast imaging centers
- Because men present with breast symptoms . . . they should be scheduled as a diagnostic exam
- **Both breasts should be imaged** with mammographic standard views (MLO & CC) The risk factors for breast cancer affect both breasts! Spot compression magnification views when needed
- Although there are no significant data supporting screening mammography in men, annual mammography of male patients with documented gene mutation or who have a personal history of breast cancer (status post mastectomy) is something to consider
Male Breast

Diagnostic Evaluation

- After the mammogram is reviewed, **ultrasound only if:**
  a. Suspicious finding not characteristic of gynecomastia
  b. Palpable area is not definitely explained by mammo

- Male breast cancers have the same mammographic and sonographic appearance as in women

- Magnetic resonance imaging is not typically performed
  a. the cancers are readily visible with more traditional breast imaging
  b. men are not candidates for breast conserving surgery
Anatomy
- Composed of subcutaneous fat retroareolar ducts with no significant branching
- Cooper ligaments are not present
- Lobular units are rare in men

- All lesions seen in female patients can be seen in the male patient!
- Significantly lower incidence of lobular-derived lesions
  - Cyst • Fibroadenoma • ILC
Differential Dx for Male Breast Mass

- Gynecomastia (most common abnormality overall)
- Pseudogynecomastia
- Breast Cancer (most commonly IDC, DCIS, Papillary)
- Papilloma
- Mesenchymal tumors
- Metastases
- Abscess / EIC
- Hematoma
Gynecomastia is simultaneous proliferation of ducts and stroma without encapsulation, so it must blend into the surrounding fat tissue.

Three types are **nodular, dendritic, diffuse**:
- Nodular (acute florid phase)
- Dendritic (chronic fibrotic phase)
- Diffuse glandular
Nodular Glandular Pattern:

- Most common type
- Appears as “fan/flame-shape” dense tissue radiating from the nipple blending into the surrounding fat.
- It also may be seen as increased dense tissue focally with a more spherical appearance
- Mammogram is usually diagnostic and US is not necessary for workup.

In fact gynecomastia on US usually has an irregular spiculated appearance and may actually confuse the workup.
Gynecomastia: Nodular flame
Gynecomastia: Nodular discoid
 stil blends into fat

Nodular type mimics mass
Gynecomastia

26yoM painful left breast mass

Suspicious ultrasound appearance i.e. irregular mass with angular margins
Gynecomastia: Unilateral breast mass on CT
Gynecomastia

Suspicious ultrasound appearance
ie irregular mass with spiculated and microlobulated margins
Chronic Dendritic Pattern (chronic phase):
- Seen in patients with gynecomastia >1 year
- Pathologic rather than imaging diagnosis
- “Flame-shape” and may extend to upper outer quadrant
- Fibrosis is dominant process, usually irreversible
- Mammograms typically show a dendritic retroareolar density with posterior linear projections radiating into the surrounding tissue toward the upperouter quadrant
Gynecomastia: Unilateral on US, MR
Gynecomastia

Diffuse Glandular Pattern:
- Most often seen in patients receiving exogenous estrogen
- Mammography demonstrates large breasts with diffuse density containing both dendritic and nodular features
Gynecomastia: Diffuse

27yo male with breast enlargement and pain
Gynecomastia

- Most common abnormality in the male breast
- Bi-modal: pre or peri-pubertal, and >50yrs (tri-modal if you want to include neonate)
- Central to nipple, unilateral or bilateral, symmetric or asymmetric, and truthfully, it can occur at any age
- Unilateral or asymmetric in majority
- No secondary features such as axillary LN
- Associated with increased levels of estrogen (seen in puberty, elderly males, cirrhosis, testicular tumors or other hormone producing tumors, gender reassignment), androgen deficiency, renal failure, HIV, nonprescription meds heavy marijuana use, and prescription meds anti-depressants, B-blockers
Unknown Case #1  71yo male right breast mass

WORKUP?
FINDINGS?
DDx?
Gynecomastia Rule of 3s

* 3 times for gynecomastia: neonate, puberty, senescence
* 3 types gynecomastia: nodular, dendritic, diffuse
* 3+ etiologies gynecomastia: physiologic, drugs, hyperestrogen, systemic (cirrhosis, CRF)
* Gynecomastia: soft tender mass, mobile, bilateral, central to nipple, typical mammogram flame-shaped appearance with no secondary features, no axillary LN
Gynecomastia Rule of 3s

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Pseudogynecomastia

- Usually bilateral
- No palpable mass
- Excessive fat deposition in the breasts
- Results from genetic normal variant, truncal obesity, and occasionally in neurofibromatosis
Pseudogynecomastia

72yo M asymptomatic breast enlargement
In Contrast... 72yo male right breast mass
Mammo
Irregular shape
Spiculated margins
High density

US
Irregular shape
Not parallel orientation
Not circumscribed margin

ASSESSMENT: BI-RADS CATEGORY 5: HIGHLY SUGGESTIVE OF MALIGNANCY

MANAGEMENT RECOMMENDATION: Biopsy should be performed in the absence of clinical contraindications
Male breast CA: soft or firm nontender mass, nonmobile or mobile; unilateral; eccentric to nipple, typical mammogram irregular hyperdense mass may have calcifications, skin thickening, nipple retraction, axillary LN, ie secondary features

* Histologies: IDC NOS, DCIS, Invasive papillary

* Males > 60 years

* 2014 male new breast CA: 2,240 deaths: 410
PRACTICE CASE: 67yoM with right breast mass

FINDINGS?

Mammo
Irregular mass
High density
Not circumscribed margin, spiculated
Nipple retraction

US
Irregular mass
Not parallel
Spiculated, microlobulated margin
PRACTICE CASE: 67yoM with right breast mass

RIGHT BREAST CANCER AND LEFT GYNECOMASTIA
Male Breast Diseases Take Homes

* Gynecomastia is most common etiology mass
* Male breast CA <1% of breast cancers. NOT Infiltrating lobular

All other disease present analogous appearance to female:
* Male breast abscess - typically present as tender palpable mass with erythema warmth. Rx male breast abscess is similar to female
* Hematoma - antecedent trauma or anticoagulant therapy, complex mass
* Male breast other - IMLN, EIC, fat necrosis, lipoma /granular cell tumor / other mesenchymal tumors, papillary breast disease
Intramammary lymph node
Oil cyst
Lipoma and other Mesenchymal tumors
Hematoma
Abscess
Remember

- All lesions eccentric to the nipple need biopsy unless they are characteristically benign, i.e. contain fat, resemble abscess, s/p trauma, or are typical of lymph node.

- Carcinoma is eccentric (may be subtle), while gynecomastia is never eccentric.

- Interrogate axilla during diagnostic evaluation. Surgical Rx male breast cancer Mastectomy, SNI.

- Oft delay in dx; stage for stage, male breast cancer prognosis is the same as breast cancer in women.
Lecture Outline

Male Patient
- Distinguishing Gynecomastia, Breast Cancer
- Other Male Breast Masses

Transgender Patient

Pregnant & Lactating (PostPartum) Patient
- Benign Masses and PABC
- Puerperal Mastitis and Abscess
Transgender patients are people who feel an incongruity between their self-identified gender and their birth gender.

Patients may simply live their lives as members of the opposite sex, they may choose to undergo partial transition with hormonal therapy and/or some minor physical changes, or complete the transition with genital reassignment surgery.
Surgical Options

- Male-to-Female Breast/chest surgery: augmentation mammoplasty (implants/lipofilling)
- Female-to-Male Breast/chest surgery: subcutaneous mastectomy, chest contouring

Hormonal Options

- Male-to-Female: Estrogen therapy
- Female-to-Male: Testosterone therapy
Transgender Patient

Surgical Options
- Male-to-Female Breast/chest surgery: augmentation mammoplasty (implants/lipofilling)
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Hormonal Options
- Male-to-Female: Estrogen therapy*
- Female*-to-Male: Testosterone therapy

*breast cancer risk
Because none of the breast cancer data registries ask or record a patient’s transgender status, we have no knowledge of the incidence of breast cancer in this population.

Screening Recommendations for Transgender Women:
- ≥50 years old with past or current hormone use
  *Annual mammography if the patient has additional risk factors:
  - a. Estrogen & progestin use for > 5 years
  - b. Body mass index > 35
  - c. Family history of breast cancer
Screening Recommendations for Transgender Women:

- ≥50 years old with past or current hormone use
  - Annual mammography if the patient has additional risk factors:
    - Estrogen & progestin use for > 5 years
    - Body mass index > 35
    - Family history of breast cancer

- If no hormone use
  - Routine screening is not indicated unless additional risk
    Klinefelter’s syndrome

*Phillips et al. Breast Imaging the Transgender Patient. AJR 2014; 202:1149–1156*
Imaging Findings

- Physiologic changes of HRT
- Breast tissue will increase over time, reaching maturity by 2–3 years with a more pronounced nipple-areola complex
- Transgender women can develop a spectrum of breast tissue density including heterogeneously dense and extremely dense breast tissue
- The breast tissue that develops should not be referred to as gynecomastia
Gynecomastia Heterogeneously dense normal

27yo TRANSGENDER FEMALE with breast enlargement and pain
Transgender Patient

*Phillips et al. Breast Imaging the Transgender Patient. AJR 2014; 202:1149–1156*

Transgender women:
- **Breast cancer** can occur with appearance same as in natal women
- Concern for a new palpable mass *especially* if the patient has been on hormonal therapy for >5 years
- Invasive ductal or invasive lobular carcinoma

Transgender men:
- Those who have not had ‘top surgery’ have similar lifetime risk for breast cancer as natal women and therefore Annual mammography is recommended >40yo
Transgender Patient


Transgender men:
- Those who have not had ‘top surgery’ have similar lifetime risk for breast cancer as natal women and therefore Annual mammography is recommended >40yo

- Once undergoes bilateral subcutaneous mastectomies with male chest contouring including nipple repositioning as part of sex reassignment surgery, his breast cancer risk dramatically decreases by nearly 90% and therefore Screening mammography is not indicated
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Unknown Case #2

33yo lactating female left breast pain erythema

Expanded Field of View US can be extremely helpful in highlighting architectural distortion
Physiologic Changes

Non-Pregnant Breast: TDLU and Stromal background

Pregnant Breast:
1st trimester Estrogen yields • Lobular & ductal growth • Involution of fibrofatty stroma • Increase in vascularity often associated with infiltration by mononuclear cells

2nd & 3rd trimester Progesterone yields • Marked lobular growth • Cellular enlargement • Stromal decrease

Lactating Breast: Prolactin, insulin, steroids, oxytocin yield Secretion in distended lobular glands and Milk ejection
### DDx Breast Masses & Utility of US

#### PREGNANT & LACTATING

1. (FA)
2. (Cyst)
3. Lactating adenoma
4. Galactocele
5. Puerperal mastitis / abscess
6. Pregnancy-associated breast cancer (PABC)

#### ULTRASOUND

1. Modality of choice in these women
2. Non ionizing
3. Non invasive
4. Easy to perform
5. Cost effective
6. Majority of lesions are benign and those that aren’t typically follow rules ie BI-RADS Ultrasound
Ultrasound Features of Benignity

- Oval shape
- Parallel orientation
- Circumscribed margins
- Anechoic, Hyperechoic echogenicity
- Enhanced or no posterior acoustic features

Ultrasound Features of Malignancy

- Irregular (round) shape
- Not parallel orientation
- Not circumscribed (indistinct, angular, microlobulated, spiculated) margins
- Hypoechoic, isoechoic, complex cystic and solid, and heterogeneous echogenicity
- No, shadowing, or combined posterior acoustic features
- Architectural distortion, skin thickening, skin retraction, edema associated features

DDx Breast Masses

PREGNANT & LACTATING

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ULTRASOUND

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Galactocele

* Benign mass with milk contents
* Results from obstructed milk duct
* During and following cessation of lactation
* Most regress over time
* Aspiration can be diagnostic and therapeutic
* Oval or round, variable internal echogenicity
* Fat-fluid level
Galactocele

* Benign mass with milk contents
* Results from obstructed milk duct
* During and following cessation of lactation
* Most regress over time
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* Oval or round, variable internal echogenicity
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Lactating Adenoma

* Variant of fibroadenoma, tubular adenoma, or lobular hyperplasia - Benign stromal tumors
* Third trimester through lactation
* Natural course is regression following cessation of breast feeding
* Oval or lobulated
Lactating Adenoma

31yo lactating F bloody nipple discharge father BRCA gene mutation
Lactating Adenoma

31yo lactatingF bloody nipple discharge father BRCA gene mutation
Lactating Adenoma
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Lactating Adenoma

31yo lactatingF bloody nipple discharge father BRCA gene mutation

Extremely dense breast composition
Unknown Case #2

33yo lactating female
left breast pain erythema

Expanded Field of View US can be extremely helpful in highlighting architectural distortion
Puerperal Mastitis

35yo lactating F erythema and pain Lt versus normal asx pt Rt
Puerperal Mastitis Abscess

* Progression of mastitis most common etiology
* Delayed or inadequate antibiotic treatment
* Staph aureus in nursing woman, also strep
* Pain, erythema, edema, mass
* US study of choice for diagnosis and IR guidance
* Round or irregular complex mass, fluid-debris levels or mobile debris
* US surveillance
Pregnancy Associated Breast CA

- PABC defined as breast cancer found during pregnancy or in the first year following
- 1 in 3000 pregnancies complicated by breast CA
- Increasing incidence
- 50% are high grade and 80% are lymph node +
- Poorer prognosis including recurrence < 3yrs
- 90% present with palpable mass

Next step?
33yoF lactating, with left breast mass x 2mo

Next step?
Case Illustrates:
50% are high grade and
80% are lymph node +
Poorer prognosis
90% present with palpable mass
Though Cyst and FA are still commonly encountered consider the 4 DDx unique to pregnant and lactating patient

Unique clinical presentations with little overlap

- **Puerperal Abscess** inflammatory sx early postpartum
- **Lactating Adenoma** present like FA as painless, soft, mobile masses. They may also become infarcted and present atypically as a firm tender mass. Unique feature of LA is the tendency to occur earlier then regress after cessation of breast-feeding
- **Galactocele** tendency to occur near cessation of breast-feeding
- **PABC** defined as breast cancer found during pregnancy or in the first year following. Increasing incidence due to US maternal demographics. 50% are high grade and 80% are lymph node +. Poorer prognosis including recurrence < 3yrs. 90% present with palpable mass
Thank you very much!

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