Young, Pregnant and Male

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Overview

- Young, Pregnant and Male
- Differential Diagnosis
- Imaging Approach
- Cases
- Pearls and pitfalls

Young

- Normal
- Cyst
- Fibroadenoma
- Phyllodes
- Cancer
- All the other things…

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Young – Imaging Management

- How young is young?
- Asymptomatic
  - High risk screening
  - Begin 10 years before mom or sister was
  - diagnosed
  - 25 and up
    - Mammography
    - MRI

Young – Imaging Management

- Symptomatic
  - Less than 29 years old
    - Diagnostic targeted ultrasound first
    - When to proceed with mammography?
  - 30 – 39 years old
    - Targeted ultrasound first?
    - Mammogram (bilateral) first?

Young – Imaging Management

Age	Risk of malignancy in the next decade[1]	ACR Appropriateness for Initial Evaluation of Palpable Lumps[2]	
		Mammogram First	Ultrasound First
20	1:1681	3	9
30	1:232	8	8
40	1:69	9	4

1. American Cancer Society Facts and Figures
2. https://acsearch.acr.org/docs/69495/Narrative/

Special Considerations for Patients Under 18

- Privacy
- Consent
- “I want it out!”
- Sensitivity of adolescence

Following Palpable Masses in Women Under 30

- Retrospective review of women under 30 with
- focal signs and/or symptoms
- Biopsy, 24 month follow up or tumor registry
- 830 patients

Loving, VA et al. Targeted ultrasound in women younger than 30 years with focal breast signs or symptoms: outcomes analyses and management implications. Am J of Roentgenology, 195(6), 1472–1477.

Following Palpable Masses in Women Under 30

BI-RADS	Number	Malignant
1 or 2	526 (63.4%)	0
3	140 (16.9%)	0
4	163 (19.6%)	2 (1.2%)
5	1 (0.1%)	1 (100%)
Total	830 (100%)	3 (0.4%)

Age: 12-29 (24)

Sensitivity: 100%

Specificity: 80.5%

NPV: 100%

PPV2: 1.8%

PPV3: 1.9%

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Working Up Palpable Masses in Women 30 – 39

BI-RADS	Number	Malignant
1 or 2	994 (82.2%)	1 (0.1%)*
3	64 (5.3%)	0
4	139 (11.5%)	12 (8.6%)
5	11 (0.9%)	10 (90.9%)
Total	1208 (100%)	23 (1.9%)

Age: 30-39 (35)

Sensitivity: 95.7%

Specificity: 89.2%

NPV: 99.9%

PPV US: 13.2%

PPV Mam: 18.4%

*Mammography detected one additional malignancy in an asymptomatic 32 year old with BRCA mutation.

Loving, VA et al. Targeted ultrasound in women younger than 30 years with focal breast signs or symptoms: outcomes analyses and management implications. Am J of Roentgenology, 195(6), 1472–1477.

Fibroadenoma vs Phyllodes

- Age distribution
- Imaging features
- Management
  - Age
  - Core biopsy
  - Surgical excision
- Histology

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Multiple Bilateral Benign Masses

- No need to callback MBBM from screening
- mammography – cancer rates are the same[1]
- Ultrasound
  - Consider 1 year follow up if detected at screening[2]

1 Leung, J. W., & Sickles, E. A. Multiple bilateral masses detected on screening mammography: assessment of need for recall imaging. AJR American Journal of Roentgenology, 175(1), 23–29.

2 Berg WA, Zhang Z, Cormack JB, Mendelson EB. Multiple bilateral circumscribed masses at screening breast US: consider annual follow-up. Radiology. 2013 Sep;268(3):673-83.

When to get a mammogram under 30:

- If the ultrasound findings are discordant from
- the physical exam findings or clinical history
- If the finding has any feature that excludes it
- from BI-RADS 2 or 3 assessment
- If there is a high risk personal or family history or known genetic mutation

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When to get a mammogram under 30:

	BI-RADS 2	BI-RADS 3	Mammogram
Margin	Circumscribed	Circumscribed Gently Lobulated	Angular Micro-lobulated
Shape	Oval	Oval	Round Irregular
Orientation	Parallel	Parallel	Anti-parallel
Echogenicity	Anechoic	Homogeneous Hypoechoic	Heterogeneous Hypoechoic
	Cyst Complicated cyst	Probable Fibroadenoma	**Potentially Suspicious**

Mammogram Under 30

- Can significantly change the level of suspicion
- Can change the understanding of the extent of disease
- Can provide guidance for wire-localization
- Can be used to assess response to therapy

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Pregnant – Differential Diagnosis

Pregnant

- Normal
- Cyst
- Fibroadenoma
- Lactating adenoma
- Phyllodes
- Cancer

Lactating

- Normal
- Cyst
- Mastitis, abscess
- Galactocele
- Fibroadenoma
- Lactating adenoma
- Phyllodes
- Cancer

Pregnant – Imaging Management

- What test to start with?
- Does age play a role?
- Radiation risks
- Biopsy risks
- Strategies for image optimization

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Clinical Management

- Antibiotics
- Follow up ultrasound
- Biopsy
  - Milk fistula
  - Small gauge
  - Decrease tension

Pregnancy Associated Breast Cancer (PABC)

- During pregnancy or within 12 months of
- delivery
- 32 patients, matched control study
- Similar overall survival
- Shorter disease free survival for post-partum diagnosis

Halaska MJ et al. Presentation, management and outcome of 32 patients with pregnancy-associated breast cancer: a matched controlled study. Breast J. 2009 Sep-Oct;15(5):461-7. PMID: 19624421

Pregnancy Associated Breast Cancer (PABC)

	PABC[1]	Non-PABC[2]
Median Age	33.7 years	61 years
Tumor > 2 cm	26/32 (81%)	39%
5 Year Survival	72%	89%
Lymph node positive	18/32 (56%)	32%
Metastatic disease	6/32 (19%)	5%

[1]Halaska MJ et al.

[2]SEER Cancer Statistics Factsheets: Breast Cancer. National Cancer Institute. Bethesda, MD http://seer.cancer.gov/statfacts/html/breast.html

Pregnancy Associated Breast Cancer (PABC)

- Retrospective case control study
- 1990 – 2005, 40 cases
- Median follow up: 100 months

	PABC	Non-PABC	P value
Overall survival	4.9 years	6.0 years	0.02
Disease free survival	2.7 years	5.1 years	0.01

Ali SA, Gupta S, Sehgal R, Vogel V. Survival outcomes in pregnancy associated breast cancer: a retrospective case control study. Breast J. 2012 Mar-Apr;18(2):139-44. PMID: 22356297

Fertility Treatment and Breast Cancer Risk

- Registry based cohort study, Norway
- 1984 – 2010, median follow up 16 years
- 808,834 women eligible
- 8,037 diagnosed with breast cancer
- 138 with fertility treatment
- HR 1.20 (95% CI 1.01-1.42)

Reigstad MM et al. Risk of breast cancer following fertility treatment--a registry based cohort study of parous women in Norway. Int J Cancer. 2015 Mar 1;136(5):1140-8.

PMID: 25042052

Male – Differential Diagnosis

- Gynecomastia
- Normal
- Cancer
- Pseudogynecomastia
- All others…

Male – Imaging Management

- Bilateral 4 view mammogram
  - Spot views can be difficult
  - Spot views are often unnecessary
- Ultrasound
  - If there is any feature that doesn't fit with gynecomastia
  - Can be deceiving

Normal Male Breast

- Anatomy
  - Subareolar ducts are similar to prepubertal females
- Imaging
  - Entirely fatty
  - Large pectoralis muscles
  - NO parenchymal tissue

Gynecomastia

- Benign enlargement of the male breast due to
- the proliferation of the glandular component
- Psychological distress
- Anxiety
- Discomfort
- Fear of breast cancer

Gynecomastia - Mechanism

- Imbalance between estrogen (stimulatory) and androgen (inhibitory) action on breast tissue
  - Elevated estrogen
  - Extragonadal conversion of androgens to estrogens by tissue aromatase
  - Low testosterone – primary or secondary gonadal failure
  - Neonatal, puberty, elderly

Gynecomastia – Causes

- Medical conditions
  - Androgen resistance syndromes
  - Hyperthyroidism
  - Chronic liver disease
- Medications
  - Spironolactone, digoxin, cimetidine, bicaluatamide
  - Marijuana

Gynecomastia

- Lobule formation and lesions of lobule (cysts and fibroadenomas) are rare
- Clinical
  - Unilateral or bilateral mass, tenderness
  - Early: reversible if cause corrected
  - Late: irreversible periductal edema with stromal fibrosis

Gynecomastia - Appearance

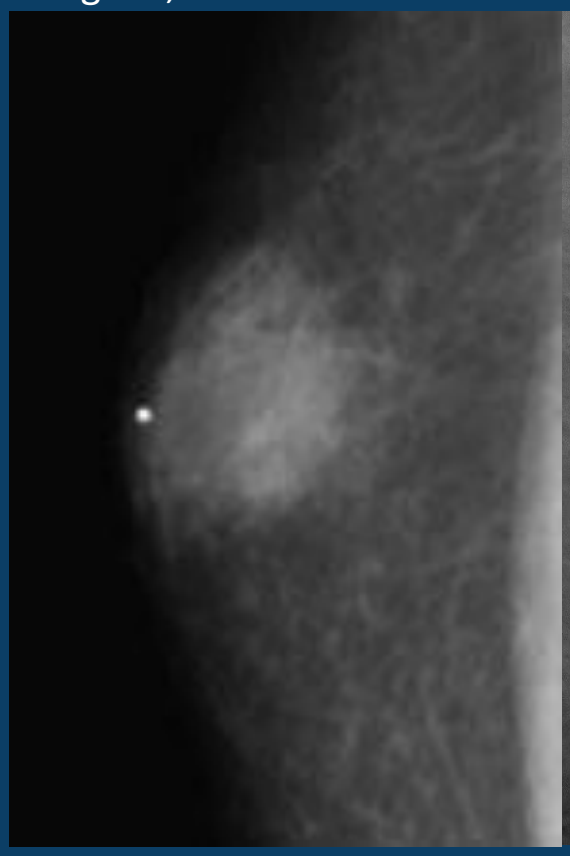
- Nodular
  - Disc
  - Fan
- Dendritic
- Diffuse

Nguyen C, Kettler MD, Swirsky ME, Miller VI, Scott C, Krause R, Hadro JA. Male breast disease: pictorial review with radiologic-pathologic correlation. Radiographics. 2013 May;33(3):763-79. PMID: 23674773

3 Stages and Appearances:

Nodular (early)

Subareolar, round or triangular, reversible

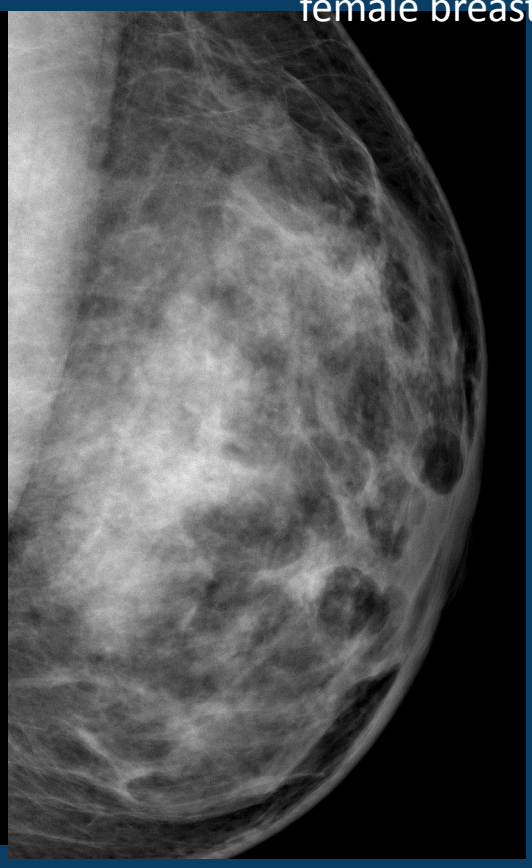


Dendritic

Subareolar, flame or triangular shape

Dense Fibrotic (late)

Diffuse and identical to normal female breast



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Male Breast Cancer

- 1% of all breast cancer
- Approximately 2000 cases per year
- 1 per 100,000 men
- Mean age 67

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Male Breast Cancer

- Prognosis at comparable stage similar to females
- Histology similar to females: invasive ductal is most common
- Imaging identical to females
  - Calcifications
  - Mass
  - Asymmetric density
  - Secondary findings

Male Breast Cancer

- Presentation is most often a firm subareolar mass
- Other signs and symptoms
  - Nipple retraction
  - Blood nipple discharge
  - Skin ulceration
  - Axillary adenopathy

Other Male Breast Findings

- Intramammary lymph node
- Sebaceous cyst
- Hematoma, fat necrosis
- Lipoma

Summary

- Young, cancer is rare
  - Under 30, start with ultrasound, get a mammogram is anything is amiss
  - 30 and up, start with mammography
- Pregnancy and lactation, cancer is rare
  - Treat similar to “Young”
  - Radiation…
- Male, cancer is rare, gynecomastia is the most common and a mammogram is usually all that is needed