Pathophysiology & symptoms of Different types of breast cancer

Dr. mohammadreza Mobayen

Faculty Member of Burn Reconstruction Department

Assistant Prof. of General Surgery

GUMS

Mmobayen@Gums.ac.ir

Breast cancer accounts for approximately 30% of all new cancers in women and is second only to lung cancer as the leading cause of

cancer deaths among women.

Breast cancer has the highest incidence of all cancers. According to statistics from the American Cancer Society, over 252,000 new cases of breast cancer will be diagnosed in women in 2017, with more than 40,000 women succumbing to the disease during the same period . During the past 50 years, the incidence of breast cancer in the United States increased significantly and then leveled off in the last decade. Some, but not all, of this increase is felt to be related to the diagnosis of indolent cancers that may have remained asymptomatic and undetected for the duration of a woman's life in the pre- screening era.

incidence

1 IN 8 WOMEN in the United States will develop breast cancer in her lifetime.

Anatomy of the breast



- A breast mass is a nodule or growth of tissue that represents an aggregation of coherent material. A breast mass may be benign or malignant.
- A benign mass may be solid or cystic, whereas a malignant mass is typically solid. A cystic mass with solid components (complex cyst) can also be malignant.
- A breast mass can be discovered by the patient incidentally or on routine examination by a patient or clinician. It is often discovered after a breast examination prompted by other symptoms (eg, pain, nipple discharge) or trauma

- Evaluation of a palpable breast mass requires a systematic approach to the
- history,
- physical examination,
- and radiographic imaging studies to ensure a correct diagnosis

History

- The history should include a full review of medical and surgical illnesses, medications, and allergies and an assessment of risk factors for breast cancer, such as a detailed family history.
- In addition, for masses identified by the patient, subjective information about how and when the mass was first noted, if it is painful, and how it has changed over time should be recorded

Presenting symptoms

- The history of presenting symptoms includes:
- Any change in the general appearance of the breast, such as an increase or decrease in size or a change in symmetry
- .•New or persistent skin changes.





Nipple retraction



Nipple retraction occurs when only a part of the nipple is drawn in because it is tethered by a single duct, resulting in a slit-like appearance.

Grade III nipple inversion



In Grade III nipple inversion, there is no projection of the nipple and the papilla is buried below the level of the skin. Despite maximal manipulation, the nipple cannot be pulled out and would be described as invaginated.

Grade I nipple inversion



In grade I nipple inversion, the nipple is easily pulled out with gentle retraction or squeezing of the areolar skin. Nipple projection is well maintained for several minutes, but then the nipple reverts to an inverted state.

Grade II nipple inversion



In patients with grade II nipple inversion, forceful manipulation is required to pull the nipple out, and retraction recurs quickly.

New nipple inversion

Mammogram of nipple inversion associated with malignancy



Retroareolar breast cancers, within 2 cm of the nipple areolar complex, are likely to be associated with nipple inversion as shown here.

- If nipple discharge is present, whether it is bilateral, unilateral, or from one specific duct. Other important information includes the timing, color, frequency, and spontaneity of the discharge.
- The characteristics of any breast pain, the relationship of symptoms to menstrual cycles (cyclic or noncyclic), the location within the breast (or both breasts), the duration, and whether it is aggravated or alleviated by any activities or medications

The presence of a breast mass and its evolution, including :

how it was first noted (accidentally, by breast self-examination, clinical breast examination, or mammogram),

- how long it has been present,
- and whether it has changed in size

- The precise location of any breast mass
- Whether a mass waxes and wanes during the menstrual cycle. Benign cysts may be more prominent premenstrually and regress in size during the follicular phase
- Trauma to the breast (eg, car accident with seat belt, direct injury from a hard object) may result in a breast mass due to the development of fat necrosis or a hematoma. In addition, trauma may be the precipitating event to detection of an existing benign or malignant mass. Any mass after a trauma that fails to resolve will require a complete evaluation

Risk factors for breast cancer

A thorough risk assessment is part of the evaluation of women with breast complaints, and significant negative as well as positive findings should be documented in the medical record

Risk factors

The main characteristics that are believed to influence breast cancer risk are gender and age. While invasive ductal carcinoma sometimes affects men, the majority of patients are women who are diagnosed at age 55 and older. Because these and other risk factors cannot be controlled, it is doubly important to be aware of them, to use this information to make informed health care choices and to consult with a physician promptly if any health changes occur. In addition other factors include:

- A family history of breast cancer
- A personal history of breast cancer or benign breast disease
- Prior radiation treatment administered to the chest area
- Dense breast tissue
- Long-term use of hormone replacement therapy
- Exposure to diethylstilbestrol (DES)
- Obesity
- A sedentary lifestyle
- Night-shift work
- Alcohol and tobacco use

On the other hand, certain factors, such as *fewer menstrual cycles over a woman's lifetime, can reduce the risk of breast cancer*. For instance, a late onset of menstruation, an early menopause, multiple pregnancies and breastfeeding have all been shown to have a protective effect.

Risk and protective factors for developing breast cancer

	Risk group		
	Low risk	High risk	Relative risk
Risk factors			
Deleterious BRCA1/BRCA2 genes	Negative	Positive	3.0 to 7.0
Mother or sister with breast cancer	No	Yes	2.6
Age	30 to 34	70 to 74	18.0
Age at menarche	>14	<12	1.5
Age at first birth	<20	>30	1.9 to 3.5
Age at menopause	<45	>55	2.0
Use of contraceptive pills	Never	Past/current use	1.07 to 1.2
Hormone replacement therapy (estrogen + progestin)	Never	Current	1.2
Alcohol	None	2 to 5 drinks/day	1.4
Breast density on mammography (percents)	0	≥75	1.8 to 6.0
Bone density	Lowest quartile	Highest quartile	2.7 to 3.5
History of a benign breast biopsy	No	Yes	1.7
History of atypical hyperplasia on biopsy	No	Yes	3.7
Protective factors			
Breast feeding (months)	≥16	0	0.73
Parity	≥5	0	0.71
Recreational exercise	Yes	No	0.70
Postmenopause body mass index (kg/m ²)	<22.9	>30.7	0.63
Oophorectomy before age 35 years	Yes	No	0.3
Aspirin	\geq Once/week for \geq 6 months	Nonusers	0.79

Relative Risk	Factor
>4.0	Female
	Age (65+ vs. <65 yr, although risk increases across all ages until age 80)
	Certain inherited genetic mutations for breast cancer (BRCA1 and/or BRCA2)
	Two or more first-degree relatives with breast cancer diagnosed at an early age
	Personal history of breast cancer
	High breast tissue density
	Biopsy-confirmed atypical hyperplasia
2.1–4.0	One first-degree relative with breast cancer
	High-dose radiation to chest
	High bone density (postmenopausal)
1.1–2.0	
Factors that affect circulating hormones	Late age at first full-term pregnancy (>30 yr)
	Early menarche (<12 yr)
	Late menopause (>55 yr)
	No full-term pregnancies
	Never breast-fed a child
	Recent oral contraceptive use
	Recent and long-term use of HRT
Other factors	Obesity (postmenopausal)
	Personal history of endometrium, ovary, or color cancer
	Alcohol consumption
	Height (tall)
	High socioeconomic status
	Jewish heritage

Self examination



Raise your arms.



Lower your arms and press them firmly against your hips.



Turn slowly from side to side and look for changes in

- size or shape of breasts.
- · nipples

appearance of skin



Use small, circular movements to feel your ampits for lumps. Starting from the outside, feel around your breasts in circles. Feel behind the nipple.



Finally, gontly squoeze your nipple to check for any bleeding or discharge.



Lie down and repeat steps 4 and 5.

Physical examination

The breast examination includes both breasts and the nodal basins of the neck, chest wall, and both axillae and is part of a complete physical examination



Inspection

- The patient should be examined in both the upright and supine positions. The patient must be disrobed from the waist up, allowing the examiner to visualize and inspect the breasts.
- The breast examination is started with the patient in a seated position with her arms relaxed.
- The patient is then asked to raise her arms over her head so the lower part of the breasts can be inspected.
- Finally, the patient should put her hands on her hips and press in to contract the pectoral muscles so that any other areas of retraction can be visualized.

Inspection of the breast includes:

- •Asymmetry Observe the breast outline and contour for any bulging areas.
- Skin changes Check for dimpling or retraction, edema, ulceration, erythema, or eczematous appearance, such as scaly, thickened, raw skin.
- Nipples Assess for symmetry, inversion or retraction, nipple discharge, or crusting.

Palpation

- After careful inspection, proceed with the palpation of regional lymph nodes and the breasts.
- •Regional lymph node examination While the patient is sitting, the regional lymph nodes are examined, with attention to the cervical, supraclavicular, infraclavicular, and axillary nodal basins.
- The best examination of the axillary nodes requires that the patient relax her shoulders and allow the examiner to support her arm while the axilla is palpated. This allows relaxation of the latissimus and pectoralis muscles for ease in palpating high into the axilla. It is important to note the presence of any palpable nodes and their characteristics, whether they are soft and mobile or firm, hard, tender, fixed, or matted

Breast examination

- A bimanual examination of the breasts is performed while the patient is still in the sitting position, supporting the breast gently with one hand and examining the breast with the other hand.
- The examination is completed with the patient in a supine position, with the ipsilateral arm raised above her head. This allows the examiner to flatten the breast tissue against the patient's chest. It is sometimes useful to have the patient roll onto her contralateral hip to flatten the lateral part of the breast.
- The entire breast must be examined, including the breast tissue that comprises the axillary tail of Spence, which extends laterally toward the axilla. To be sure that all breast tissue is included in the examination, it is best to cover a rectangular area bordered by the clavicle superiorly, the midsternum medially, the midaxillary line laterally, and the lower rib cage inferiorly

Documentation

- The location of the mass as well as any abnormality found on examination should be accurately documented.
- The size of any mass should be measured in centimeters and its location, mobility, and consistency recorded.
- It is helpful to record the location of any abnormality by documenting both the position on the breast and the distance in centimeters from the areola. In this manner, the precise location can be easily identified on subsequent follow-up examinations, by the initial examiner as well as other practitioners

mammography findings

- The main body of the report includes the location and description of any abnormality using standard BI-RADS descriptors.
- The location of any lesion is described with reference to a quadrant or clock position, and the depth within the breast. The breast is arbitrarily divided into anterior, middle, and posterior depth.
- Each breast is divided into four quadrants: upper-outer, upper-inner, lower-outer, and lower-inner. The location can also be indicated using the breast as a clock with nipple in the center

Breast quadrants



The breasts are divided into 4 quadrants with the nipple as the center.

Clock position in locating a lesion



The location can also be indicated as a clock position. Each breast is divided into clock positions with the nipple as the center.

mammography





Mammographic features of breast cancer

- There are two general categories of mammographic findings suggestive of a breast cancer: soft tissue masses and suspicious microcalcifications
- Briefly, the four main breast density categories are
- •A The breasts are almost entirely fatty
- B There are scattered areas of fibroglandular density
- •C The breasts are heterogeneously dense, which may obscure small masses
- D The breasts are extremely dense, which lowers the sensitivity of mammography

- Soft tissue mass/architectural distortion The most specific mammographic feature of malignancy is a spiculated soft tissue mass; nearly 90 percent of these lesions represent invasive cancer
- Microcalcifications Grouped microcalcifications are calcium particles of various size and shape measuring *between 0.1 to 1 mm* in diameter and numbering more than four to five per cubic centimeter.
- Microcalcifications are seen in approximately 60 percent of cancers detected mammographically Histologically, these represent intraductal calcifications in areas of necrotic tumor or calcifications within mucin-secreting tumors such as the cribriform or micropapillary subtype of intraductal cancer.

Mammogram grouped calcifications B



Magnified craniocaudal mammogram showing linear branching calcifications in a segmental distribution (red arrow). Grouped microcalcifications such as these are highly suggestive of carcinoma, and the linear branching is suggestive of a ductal lesion. Biopsy confirmed a high-grade ductal carcinoma in situ (DCIS).

Mammogram grouped calcifications A



Spot compression view of a mammogram showing a high-density spiculated mass (arrow) with heterogeneous linear clacifications in a ductal distribution (arrowheads). These "casting" calcifications are characteristic of high-grade ductal carcinoma in situ (DCIS). Pathology revealed infiltrating duct cell carcinoma with DCIS, comedo type.

BI-RADS assessment categories

The radiologist summarizes the mammographic findings using the American College of Radiology (ACR) BI-RADS (Breast Imaging Reporting and Data System) final diagnostic assessment categories, which indicate the relative likelihood of a normal, benign, or malignant diagnosis

BI-RADS assessment categories

Assessment	Management	Likelihood of cancer	
Category 0: Incomplete – Need additional imaging evaluation and/or prior mammograms for comparison	Recall for additional imaging and/or comparison with prior examination(s)	N/A	
Category 1: Negative	Routine mammography screening	Essentially 0% likelihood of malignancy	
Category 2: Benign	Routine mammography screening	Essentially 0% likelihood of malignancy	
Category 3: Probably benign	Short-interval (6-month) follow-up or continued surveillance mammography	>0 but $\leq 2\%$ likelihood of malignancy	
Category 4: Suspicious	Tissue diagnosis*	>2 but <95% likelihood of malignancy	
Category 4A: Low suspicion for malignancy		>2 to $\leq 10\%$ likelihood of malignancy	
Category 4B: Moderate suspicion for malignancy		>10 to \leq 50% likelihood of malignancy	
Category 4C: High suspicion for malignancy		>50 to <95% likelihood of malignancy	
Category 5: Highly suggestive of malignancy	Tissue diagnosis*	≥95% likelihood of malignancy	
Category 6: Known biopsy-proven malignancy	Surgical excision when clinically appropriate	N/A	

BI-RADS: Breast Imaging-Reporting and Data System.

* Practice guidelines recommend biopsy for all BI-RADS 4 and 5 lesions. If there are clinical factors (eg, age, comorbidities, etc) for which the patient, in consultation with the clinician. chooses to defer biopsy. the reasoning should be documented in the medical record.

BI-RADS

- a mammogram is assigned category 0, additional evaluation is required for further characterization, which may include additional mammographic views and or ultrasound and, rarely, magnetic resonance imaging (MRI).
- A BI-RADS designation of 4c or 5 should alert the pathologist that a malignant diagnosis is strongly suspected and that further evaluation of the specimen (and possible rebiopsy) is needed if the biopsy is initially interpreted as benign.

BI-RADS 0

- Incomplete, need additional imaging evaluation and/or prior mammograms for comparison — This category is used when there is not enough information from the views available to derive a conclusion.
- This is more commonly used in screening studies, which are interpreted as abnormal when the radiologist is not providing immediate reads.

BI-RADS 1and 2

- BI-RADS 1: Negative This is a completely negative examination).
- The woman should continue with screening mammography and clinical breast examination based on current screening guidelines.
- BI-RADS 2: Benign Benign nodules such as fibroadenomas or cysts or benign vascular or parenchymal calcifications may be reported.

There is no concern for malignancy and no further action needs to be taken. The rationale in reporting these findings is to document benignity and to prevent unnecessary evaluation. Routine follow-up is recommended.



Normal CC (craniocaudal) views of both breasts

By convention, the mammograms of both breasts are viewed as mirror images. The upper half represents the lateral or outer aspect of the breast and the lower half represents the medial or inner aspect of the breast. The nipples are in profile and normal fat is visible between the edge of the film and the glandular tissue. Normal MLO (mediolateral oblique) view of both breasts



By convention, the mammograms of both breasts are viewed as mirror images. The pectoralis muscle is seen at least till the level of the nipple. The top portion of the image represents the upper half of the breast and the bottom portion of the image represents the lower half of the breast.

Benign solid mass on mammogram and ultrasound



A well-defined oval mass (arrow) is seen in the lateral aspect of the breast on CC and spot CC views (Panels A and B). On ultrasound (Panel C), it has benign features and is consistent with a fibroadenoma.

Benign breast cysts



Multiple circumscribed oval and round masses seen on CC mammogram (A). Simple cyst is seen on ultrasound (B), confirming the benign nature of the mammographic mass.

Benign patterns of calcifications



Vascular calcifications are seen in the lateral aspect of the breast on a CC mammogram (Panel A). Multiple coarse "popcorn" calcifications are characteristic features of calcifying fibroadenomas (Panel B). Bilateral, benign, large, rod-like secretory calcifications are seen in CC views of both breasts (Panels C and D). The rod shape is better seen on the magnification view (Panel E).

BI-RADS 3

Probably benign

- This category is used when there is a finding that does not have characteristic benign features, but the likelihood of malignancy is less than 2 percent.
- Examples of lesions in this category would **include** a parenchymal asymmetry calcifications, or a mass that does not have classic benign imaging features.
- These types of findings are followed at shorter intervals than one year to assess for stability. Generally, the lesion is followed with diagnostic mammography and/or ultrasound at six month intervals for one year and annually for an additional two years or every six months <u>for a total of two years</u>.
- Follow-up at shorter intervals may be requested for close surveillance of a lesion that is not clearly benign. At any of these interval follow-ups, the lesion could be downgraded (BI-RADS 2) if it declares itself as clearly benign, or upgraded (BI-RADS 4 or 5) if there is a change with sufficient concern for malignancy.

Parenchymal asymmetry



An asymmetry (arrow) is seen in the lateral aspect of the breast on the CC view. A follow-up mammogram is usually obtained to assess stability.

BI-RADS 4

- Suspicious This category implies that there is a lesion with suspicious features for malignancy.
- The chance that the imaging finding is a cancer ranges between 2 and 94 percent. The degree of suspicion or worry for malignancy varies both with the lesion and with the interpreter.
- The BI-RADS 4 category is very broad, and the findings are compatible with both ductal carcinoma in situ (DCIS) and invasive breast cancer.
- Subdivisions of this category were introduced to convey the level of concern, so the patient and their clinician can make an informed decision regarding management. These subcategories are **BI-RADS 4A** (chance of malignancy 2 to 9 percent); **4B** (chance of malignancy 10 to 49 percent); and **4C** (chance of malignancy 50 to 94 percent).

Suspicious calcifications



Grouped microcalcifications in 3 different cases. A loose group of coarse heterogenous calcifications are seen in Panel A. A small cluster of amorphous calcifications are seen in a background of dense breast parenchyma in Panel B. Fine pleomorphic calcifications are seen in between coarse larger calcifications in Panel C.

BI-RADS 5

Highly suggestive of malignancy - Lesions which have classic worrisome imaging features such as spiculations ,pleomorphic calcifications and skin retraction are placed in this category. The suspicion for malignancy is 95 to 100 percent.

Pleomorphic calcifications (suspicious)



3 different cases of suspicious calcifications: segmental coarse heterogenous distribution (Panel A); and faint, with some grouped linear branching and fine pleomorphic calcifications (Panels B and C).

Suspicious mass



Mammogram spiculated mass

Spot magnification view of a mammogram showing 2 small adjacent interconnected spiculated masses (red arrows). Pathology revealed tubular carcinoma. Tubular carcinoma characteristically appears spiculated on mammogram and is often associated with satellite lesions.



Spiculation from cancer in 3 different cases. In Panel A, an irregular mass with spiculated margins is seen. In Panel B, the cancer is not seen as a mass, but extensive distortion is seen. In Panel C, an indistinct mass is seen with spiculations extending far beyond the mass (arrows).

BI-RADS 6

Known, biopsy-proven malignancy - This includes patients with *established* **biopsy-proven cancers** that have yet to be surgically excised who present for further imaging to either evaluate the contralateral breast or assess response to **neoadjuvant** chemotherapy, or who present for second opinion with interpretation of outside imaging studies

ULTRASONOGRAPHY

- Ultrasound can be used to differentiate between solid and cystic breast masses that are palpable or detected mammographically.
- In addition, ultrasound evaluation of the axilla can be used to detect lymph nodes that are suspicious for axillary metastases. Ultrasound provides guidance for interventional procedures of suspicious areas in the breast or axilla.
- Breast ultrasound Ultrasound (US) examination of the breast is an important diagnostic adjunct to mammography. In patients suspected of having a breast cancer, breast US is most useful in the following circumstances:

Magnetic resonance imaging (MRI)

- Magnetic resonance imaging (MRI) of the breast is an important tool for the detection of breast cancer and assessment of silicone implant integrity .
- The use of MRI with contrast agents for the detection of breast cancer was first reported in 1986. The high sensitivity of MRI for breast cancer has led to the increasing use of MRI for breast cancer **detection**, assessment, and treatment monitoring, although appropriate indications, scanning technique, and interpretation remain variable among facilities.

Breast MRI invasive cancer



The MRI reveals an invasive ductal cancer of the breast characterized as a dark mass on T2 (ringed by the circle) and as an enhancing mass on the post contrast T1 images (arrow) in the axial (B and D) and sagittal projections (C). The spiculations emanating from the mass (arrowheads) and heterogeneous enhancement are well demonstrated. The signal void (dashed arrow) represents a clip placed at time of ultrasound guided biopsy.



Management algorithm for patients with abnormal mammograms

This algorithm helps to guide management of the patient who presents with an abnormal mammogram, whether it is performed at your institution or outside. BI-RADS 4 is a broad category that includes patients with a probability of malignancy that ranges from 2 to 95%. The management of more suspicious lesions (>50% probability) should include surgical evaluation before percutaneous biopsy. The designation often implies lower suspicion of malignancy. Also, some patients and some lesions are not appropriate candidates for percutaneous biopsy.

BI-RADS: Breast Imaging Reporting and Data System; MRI: magnetic resonance imaging.

* A situation in which it may be useful to incorporate staging MRI.





LCIS: lobular carcinoma in situ.

* If no cytologic expertise available, initial ultrasound preferred.

¶ If cytology indicates cancer, treat as appropriate. If nondiagnostic, indeterminate, or atypia, do ultrasound.



Diagnostic algorithm for palpable breast abnormalities in women aged 30 years and over

When lesions are palpable, clinically directed biopsies are often the most efficient. Fine-needle aspiration (FNA) is the biopsy of choice, but if it is not available or reliable at an institution, percutaneous core biopsy can easily be substituted.

BI-RADS: Breast Imaging Reporting and Data System; LCIS: lobular carcinoma in situ; MRI: magnetic resonance imaging. * The asterisk indicates a situation in which it may be useful to incorporate a staging MRI into the management of a patient with breast cancer if this technique is available.

- The differential diagnosis of a palpable breast mass includes benign and malignant etiologies. Palpable breast masses are very common in women, and most palpable masses are
- Approximately 90 percent or more of palpable breast masses in women in their 20s to early 50s are benign; however, excluding breast cancer is a crucial step in the assessment of a breast mass in a woman of any age

Benign

The following types of masses are among the most common benign breast masses palpated.

Fibroadenoma

- A simple fibroadenoma is a **benign solid mass**.
- It typically is identified in young women but can also be identified as a calcified mass in older women. The mass is firm and often mobile.
- A fibroadenoma may be solitary, multiple, and bilateral.

Cyst

- A simple cyst is a benign fluid-filled mass that can be palpated as a component of fibrocystic changes of the breast or as a discrete, compressible, or ballotable solitary mass.
- Breast cysts are commonly found in premenopausal, perimenopausal, and occasionally postmenopausal women



Simple cyst

Ultrasound image with color of palpable breast mass: simple cyst.

Mammographic image of a density: Large cyst



A BB (a radiopaque marker seen as a hyperdense dot on A and B) was placed on a palpable mass. The mammogram that followed shows a solitary ill-defined soft tissue mass underlying the BB and surrounded by a ring. A subsequent ultrasound confirmed the cystic nature of the mass.

Breast cyst ultrasound: Pear shaped



The ultrasound of a palpable mass in the right breast (A) shows a 3 cm pear-shaped anechoic structure with back wall enhancement (arrow), through transmission (arrowheads), and no internal enhancement on the Doppler study (B), consistent with a benign simple cyst. The mammogram revealed a nonspecific soft tissue mass.

Ultrasound appearance of complex and complicated cysts



- (A) Complex cyst with nodule.
- (B) Complex cyst.
- (C) Cyst with thin septa and nodular portion.
- (D) Complicated cyst with "swirling."

MRI cluster of breast cysts



The T2-weighted MRI image of the breast (A) reveals hyperintense, small, clustered cysts (arrow) and larger isolated cysts (double arrow). The cysts do not show enhancement on the T1-weighted fat-saturated post-contrast sequence (B).

MRI: magnetic resonance imaging.

- Galactocele -
- A galactocele is a milk retention cyst common in women who are breastfeeding.

Fat necrosis -

- Fat necrosis is a benign breast mass that can develop after blunt trauma to the breast; injection of native or foreign substances such as fat paraffin, or silicone an operative procedure such as breast reductive surgery or autologous breast reconstruction; and radiation therapy to the breast.
- Fat necrosis from trauma is generally associated with skin ecchymosis. Fat necrosis can often be clinically and even radiographically difficult to distinguish from a malignant mass

Breast abscess

- A breast abscess is a localized collection of inflammatory exudate (ie, pus) in the breast tissue.
- Primary breast abscesses develop when *mastitis or cellulitis* is left untreated or does not respond to antibiotic treatment.
- Patients with primary breast abscess present with localized, painful inflammation of the breast associated with fever and malaise, along with a fluctuant, tender, palpable mass. The diagnosis is established via ultrasonography demonstrating a fluid collection

Breast abscess with skin necrosis



When the overlying skin is thinned or necrotic, the optimal procedure is excision of the necrotic skin, which allows the abscess to drain.

Ultrasound appearance of a breast abscess



This image shows an abscess in the breast using ultrasound.

Surgical drainage of a breast abscess



Skin compromise necessitates incision and drainage. Note pus can be drained adequately though a small skin incision.

Malignant

The differential diagnosis of a malignant breast mass includes multiple invasive and noninvasive cancers.

The following types of masses are among the most common malignant breast masses palpated. Further review of the pathology of breast cancer is discussed separately



American Cancer Society Guidelines for the Early Detection of Cancer

- Breast cancer
- Women ages 40 to 44 should have the choice to start annual breast cancer screening with mammograms (x-rays of the breast) if they wish to do so.
- **Women age 45 to 54** should get mammograms every year.
- Women 55 and older should switch to mammograms every 2 years, or can continue yearly screening.
- Screening should continue as long as a woman is in good health and is expected to live 10 more years or longer

- The most common breast cancer is an infiltrating ductal breast carcinoma. This invasive histology accounts for approximately 70 to 80 percent of invasive breast cancers.
- Other invasive breast cancers include infiltrating lobular carcinoma and mixed ductal/lobular carcinoma. Infiltrating lobular carcinoma often presents as a prominent diffuse thickening of the breast rather than as a discrete mass. There are also variants of the invasive ductal carcinomas that can be detected as a palpable mass.
- Rarely, noninvasive cancers (ductal carcinoma in situ [DCIS]) with or without microinvasion can develop into a palpable breast mass

PATHOLOGY

- Breast cancer may arise in the intermediate-size ducts, terminal ducts, or lobules. The diagnosis of ductal or lobular carcinoma is based on histologic appearance rather than the site of origin.
- The cancer may be either in situ or invasive. Ductal Carcinoma In Situ By definition, in situ disease does not invade beyond the basement membrane and, therefore, lacks the ability to spread. The incidence of diagnosis of ductal carcinoma in situ (DCIS) has increased dramatically since the introduction of screening mammography
- The standard treatment of DCIS includes resection to negative margins via segmental mastectomy followed by radiation or mastectomy

Types & Subtypes

Non-invasive breast cancers:

- Ductal carcinoma in situ (DCIS)
- Lobular carcinoma in situ (LCIS)

Invasive breast cancers:

- Invasive ductal carcinoma (IDC)
- Invasive lobular carcinoma (ILC)
- Paget's disease of the nipple
- Inflammatory breast cancer (IBC)
- Phyllodes tumors of the breast
- Locally advanced breast cancer
- Metastatic breast cancer



TNM Classification for Breast Cancer

Tumor size	Tumor size < 2 cm	Tumor size 2-5 cm	Tumor size > 5 cm	Tumor extends to skin or chest wall T4
Lymph	N0	N1	N2	N3
Nodes	No lymph node metastasis	Metastasis to ipsilateral,	Metastasis to ipsilateral fixed	Metastasis to infraclavicular/
N		movable, axillary LNs	axillary, or IM LNs	supraclavicular LN, or to
- 1				axillary and IM LNs
Metastasis	M 0	M1	LNs= Lymph Nodes; IM= Internal Mammary	
Μ	No distant metastasis	Distant metastasis		





Thanks for your attention