

# 한국의료방사선안전관리협회 춘계 심포지엄

순천향 천안병원 영상의학과  
김신영

# 유방영상의 이해

## -Common findings on USG-

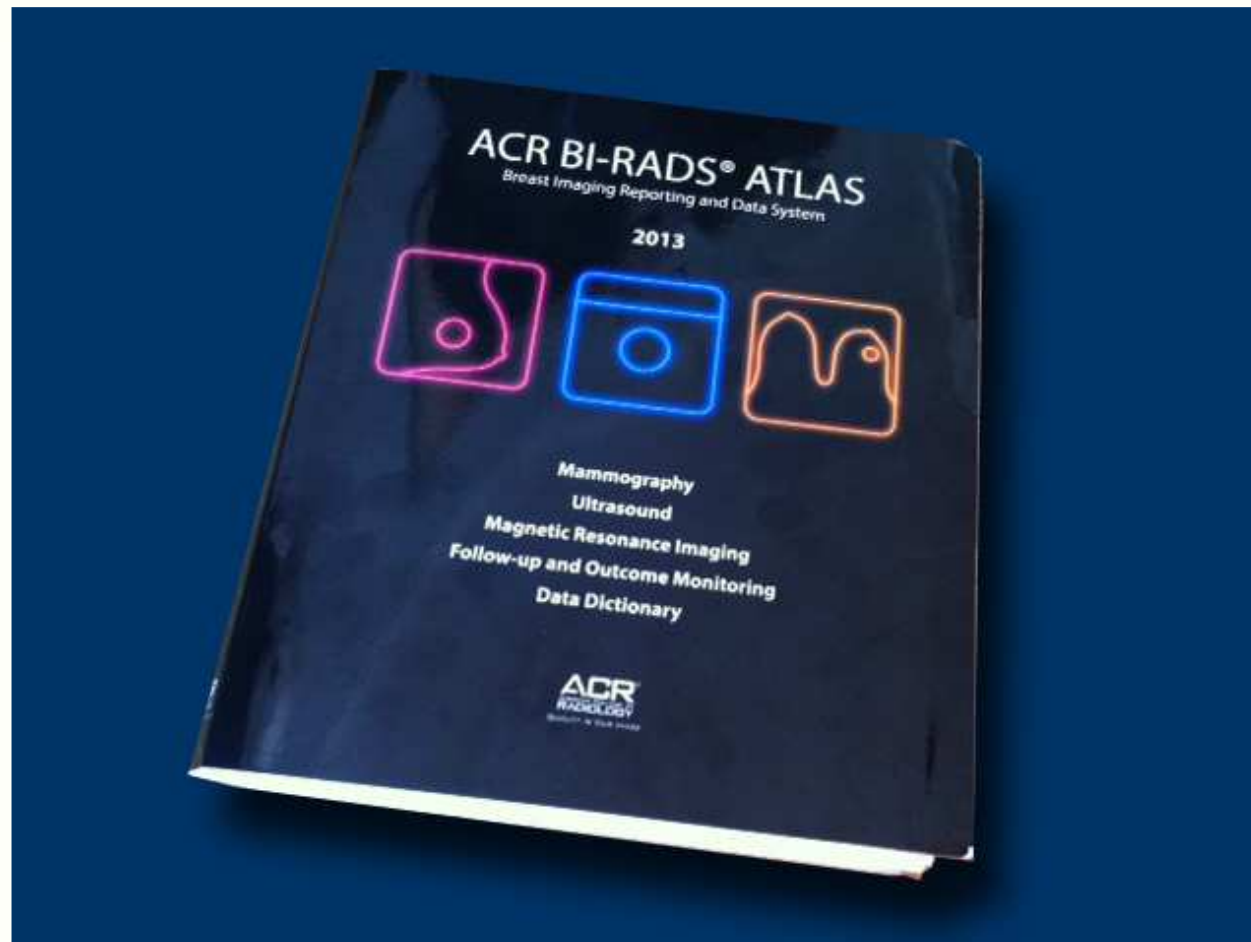
# Radiologic approach of breast

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- Mammography
- Ultrasonography
- Breast CT
- Breast MRI

# BI-RADS 5th



**BI-RADS® ASSESSMENT CATEGORIES**

**Category 0: Mammography: Incomplete – Need Additional Imaging Evaluation and/or Prior Mammograms for Comparison  
Ultrasound & MRI: Incomplete – Need Additional Imaging Evaluation**

**Category 1: Negative**

**Category 2: Benign**

**Category 3: Probably Benign**

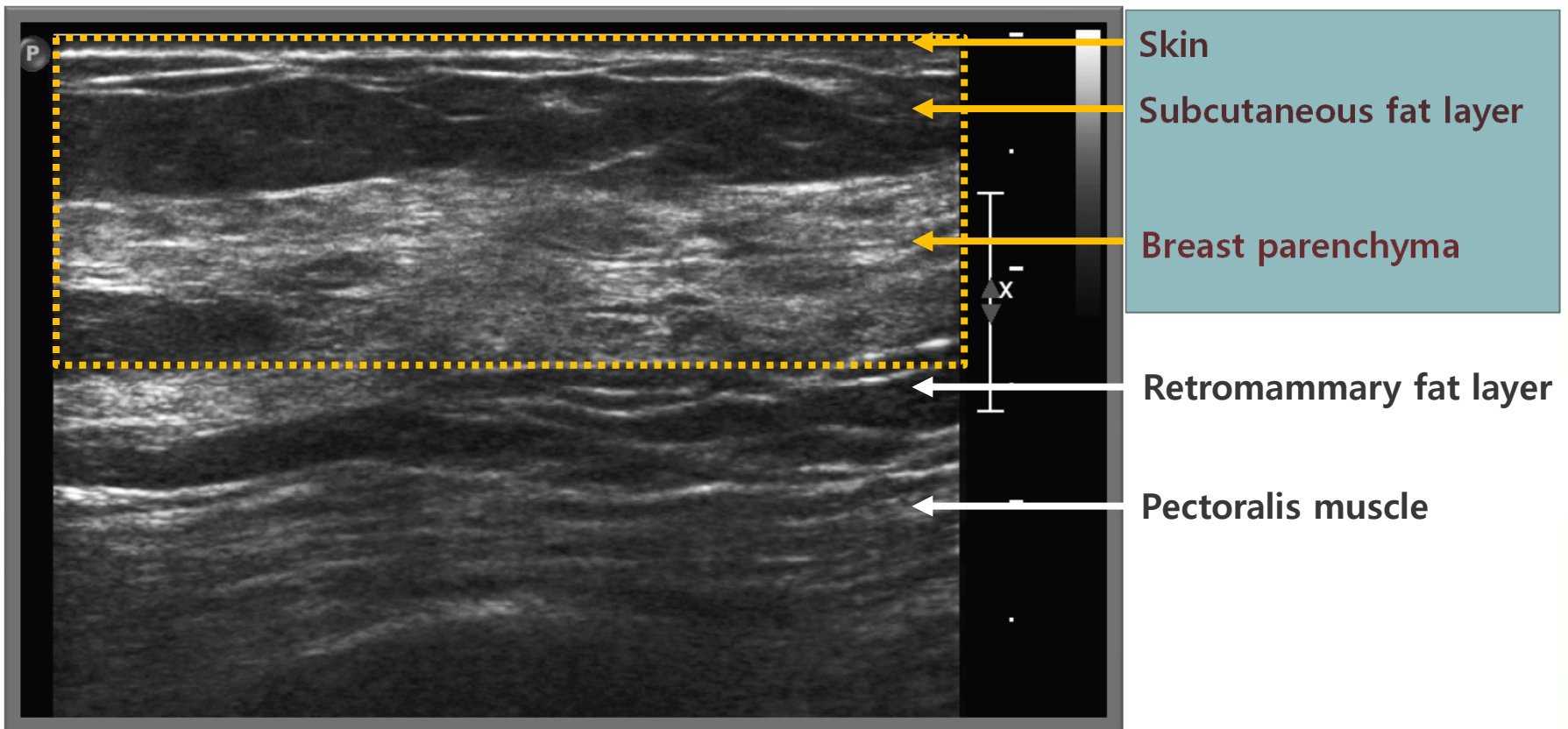
<b>Category 4: Suspicious</b>	Mammography & Ultrasound:	Category 4A: Low suspicion for malignancy Category 4B: Moderate suspicion for malignancy Category 4C: High suspicion for malignancy
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**Category 5: Highly Suggestive of Malignancy**

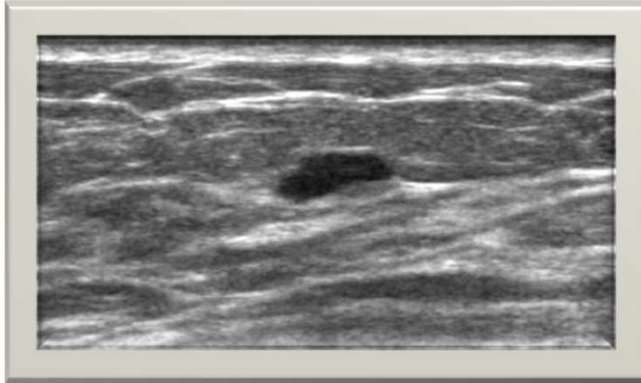
**Category 6: Known Biopsy-Proven Malignancy**

# Background

## Normal breast anatomy - Ultrasonography



# Shape -USG



Oval



Round



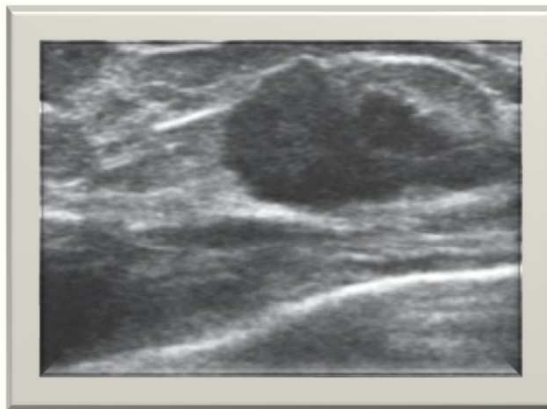
Irregular

Masses	Shape	Oval
		Round
		Irregular
	Orientation	Parallel
		Not parallel
	Margin	Circumscribed
		Not circumscribed
		- Indistinct
		- Angular
		- Microlobulated
		- Spiculated

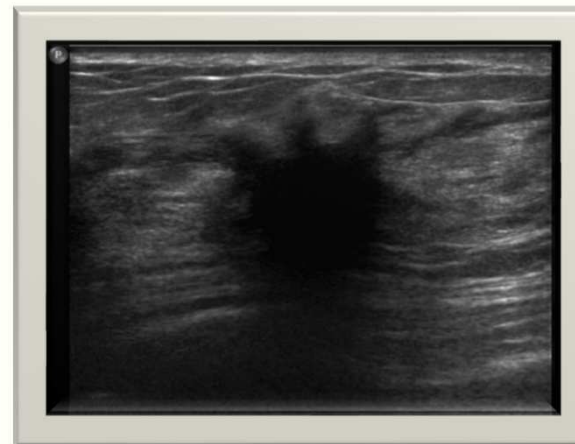
# Margin-USG



Angular



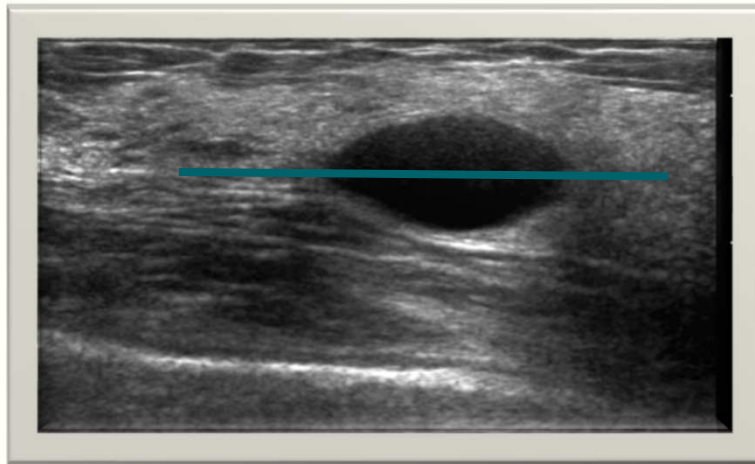
Microlobulated



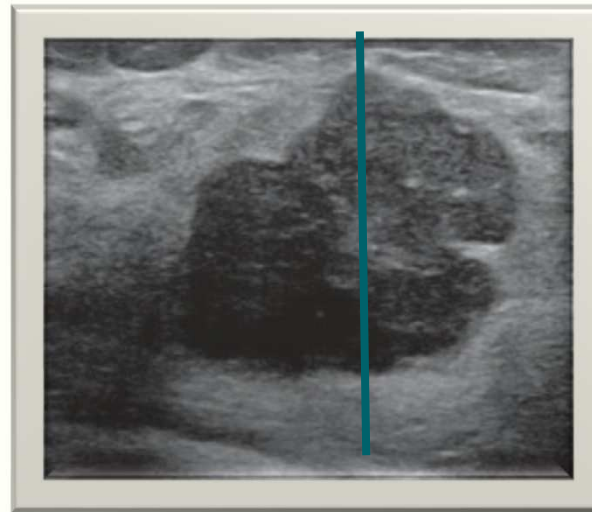
Spiculated

Masses	Shape	Oval
		Round
		Irregular
	Orientation	Parallel
		Not parallel
	Margin	Circumscribed
		Not circumscribed
		- Indistinct
		- Angular
		- Microlobulated
		- Spiculated

# Orientation -USG



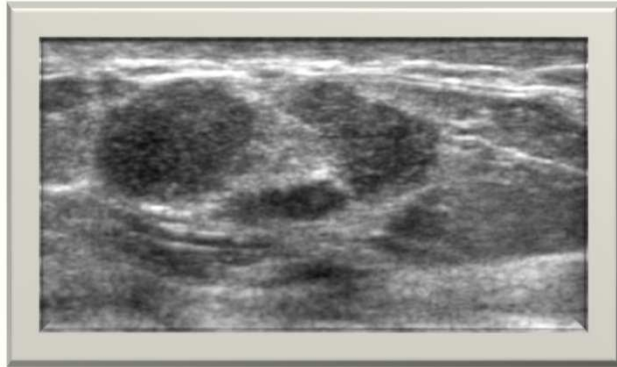
Parallel



Not parallel

Masses	Shape	Oval
		Round
		Irregular
	Orientation	Parallel
		Not parallel
	Margin	Circumscribed
		Not circumscribed
		- Indistinct
		- Angular
		- Microlobulated
		- Spiculated

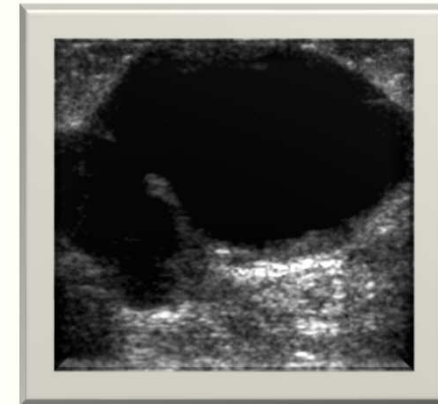
# Echo pattern-USG



Heterogeneous



Hypoechoic



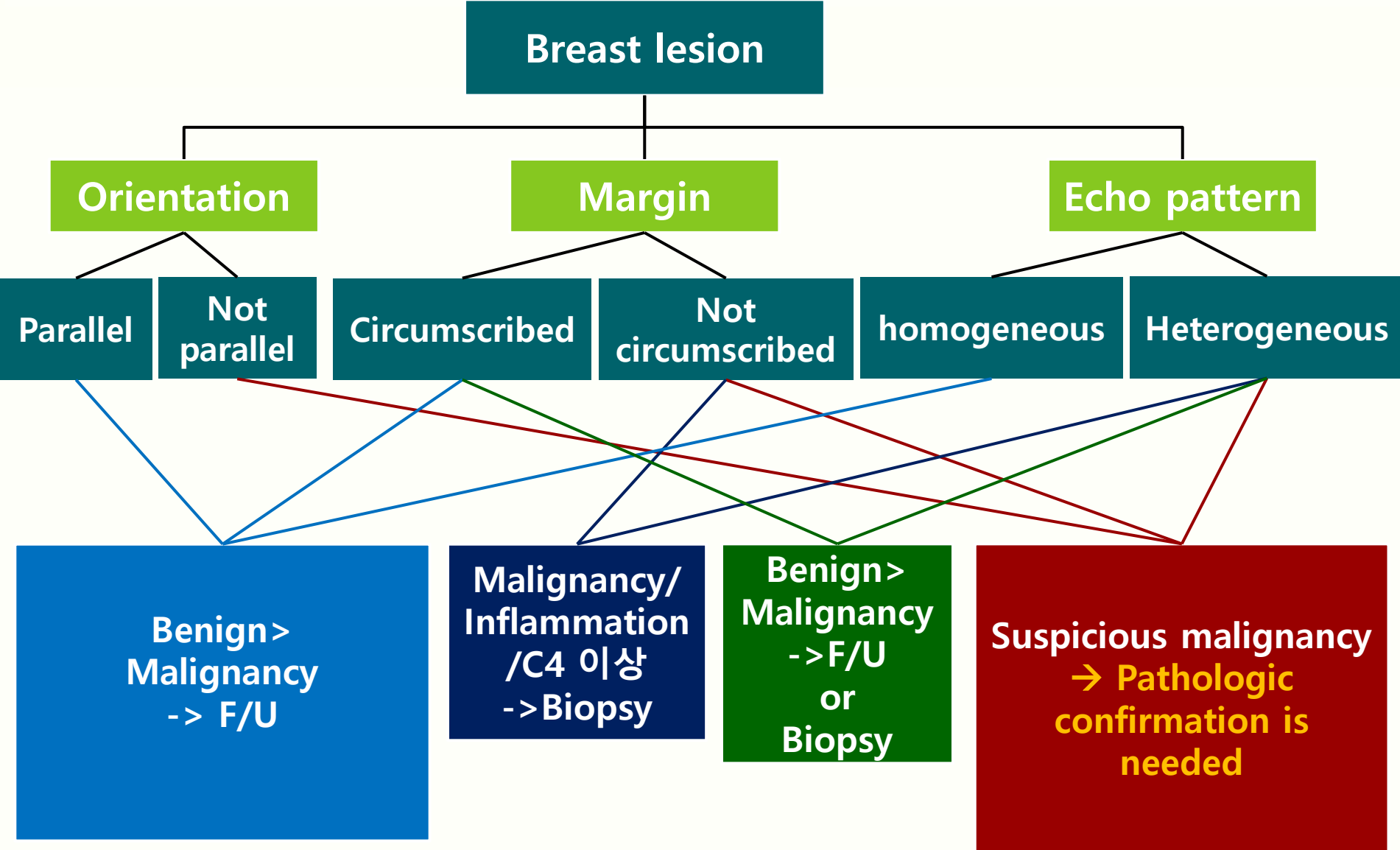
Complex cystic and solid



Hyperechoic

Echo pattern	Anechoic
	Hyperechoic
	Complex cystic and solid
	Hypoechoic
	Isoechoic
	Heterogeneous

# Author's flowchart in the field -Subjective



# Classification of benign breast lesions



## Terminal and lobular ducts

- Cyst

## Intralobular connective tissue

- Fibroadenoma
- Phyllodes tumor
- Hamartoma

## Ductal system

- Ductal ectasia
- Papillary neoplasm

## Fatty tissue lesion

- Lipoma
- Fat necrosis

## Fibrous tissue lesion

- DM mastopathy
- Pseudoangiomatous stromal hyperplasia

## Vascular origin

- Hemangioma

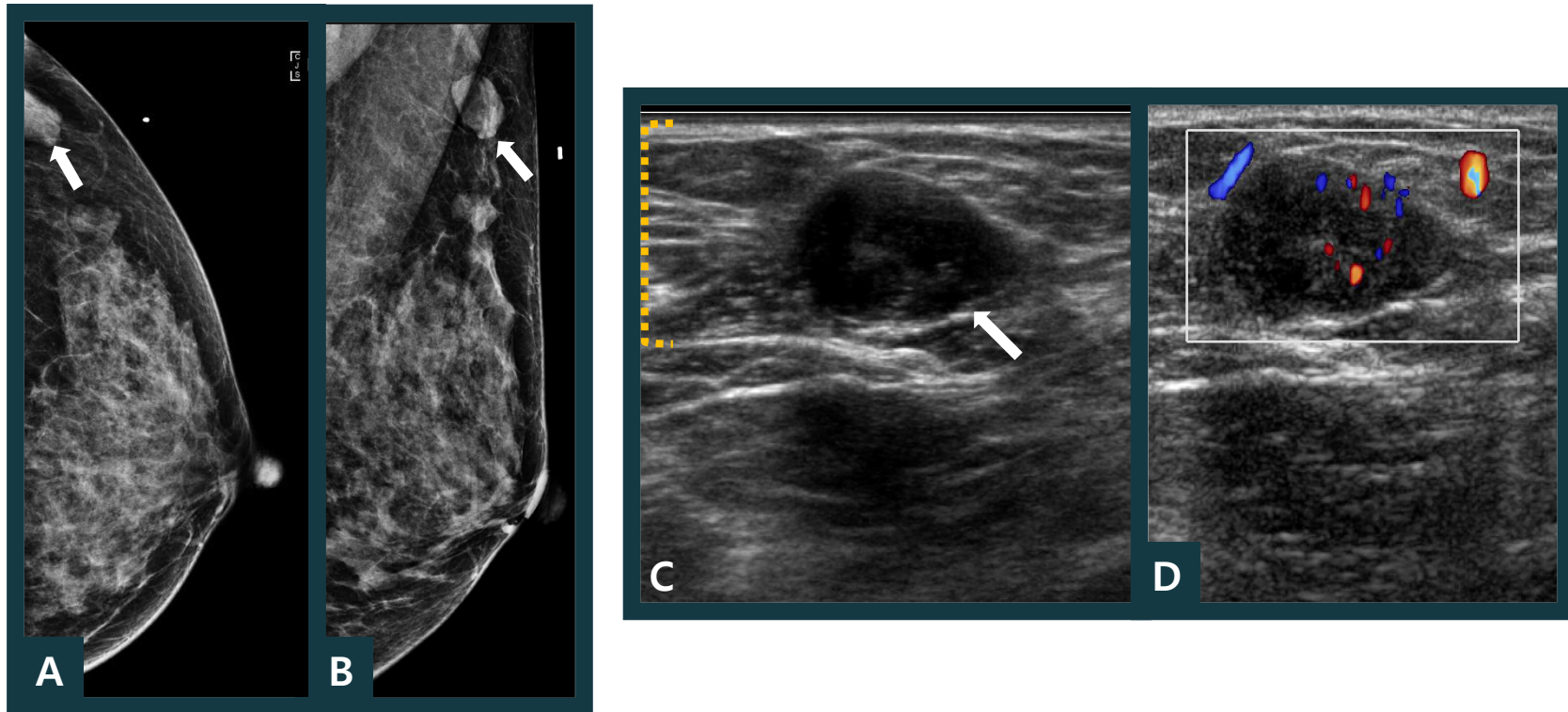
## Inflammatory lesion

- Mastitis, abscess

**Benign**

## Benign #1

### Fibroadenoma

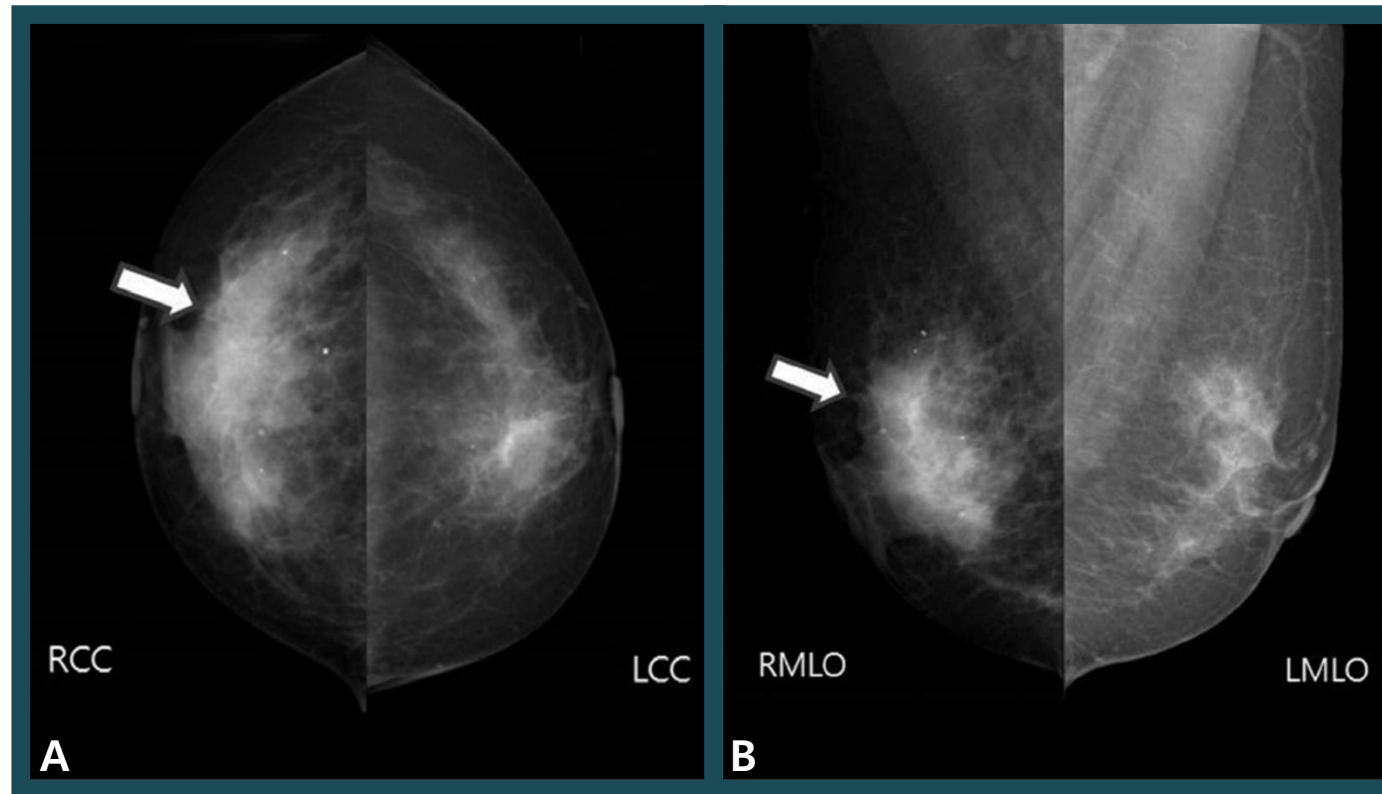


Mammography shows a circumscribed oval iso-density lesion (arrow) in UOQ of left breast **(A, B)**.

Ultrasonography shows a oval shaped hypoechoic mass (arrow) in left breast **(C, D)**.

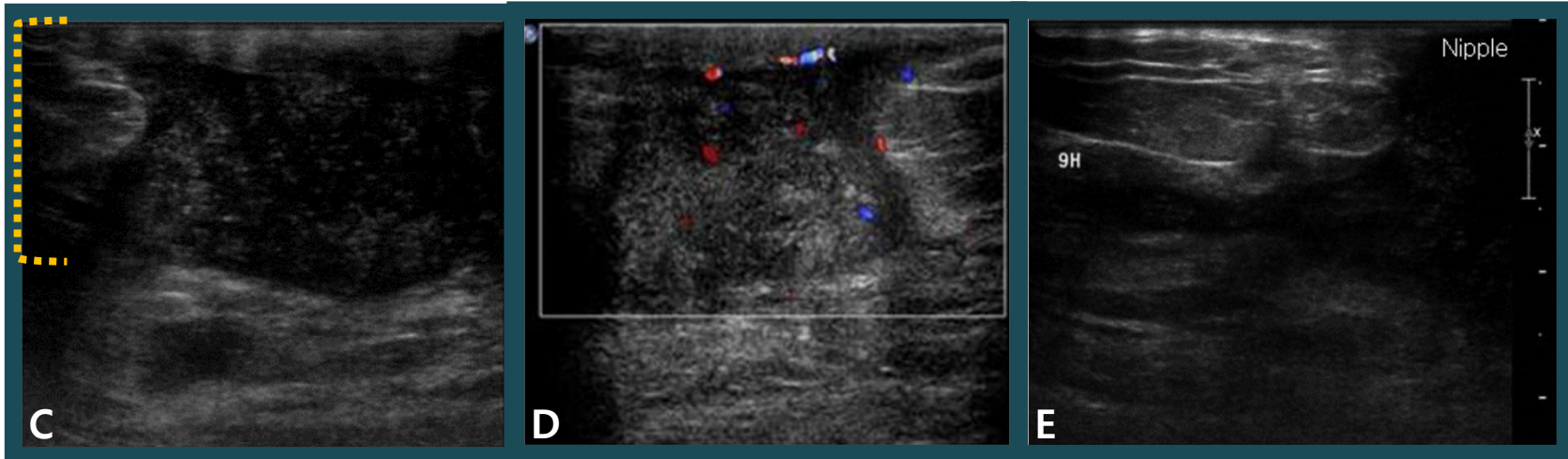
Benign #2

# Abscess



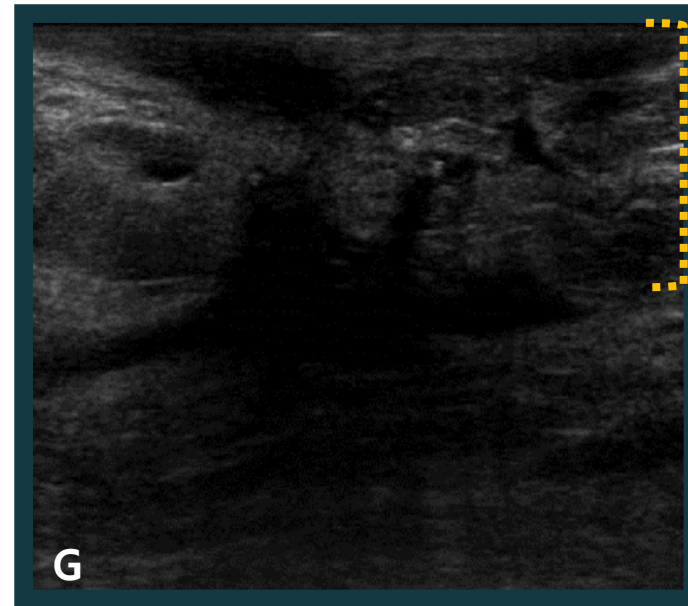
Mammography shows global asymmetry on right breast (arrows) (A, B).

## Abscess



Ultrasonography shows about 4cm sized a complicated cystic lesion at right subareolar area extending to upper outer and upper inner quadrant. Increased peripheral vascularity is noted on Doppler exam **(C-E)**.

## Abscess

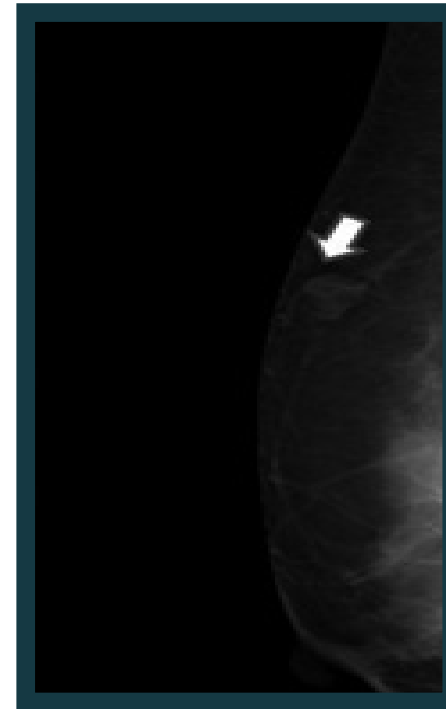
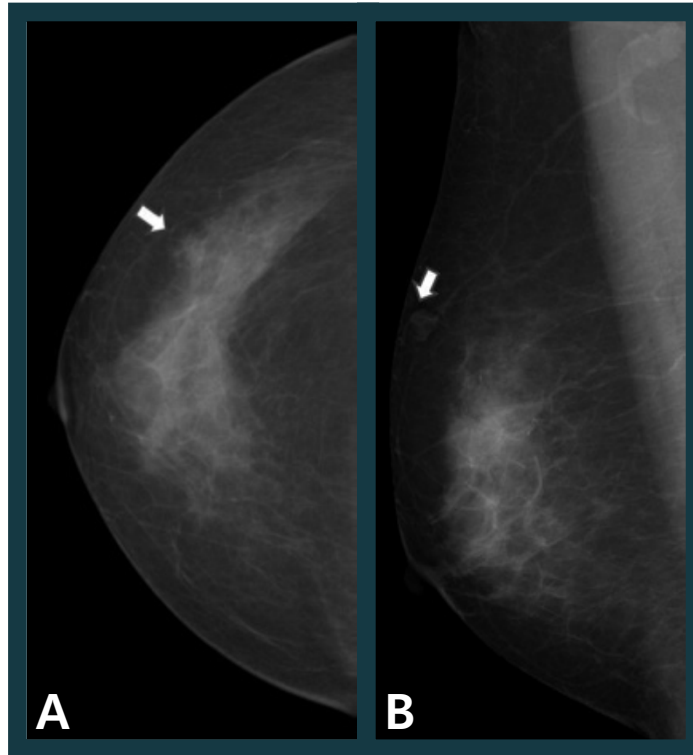


About 3 mL light brown colored fluid was aspirated on ultrasonography-guided fine needle aspiration (**F**).

Follow-up ultrasonography performed after 2 weeks of treatment shows improving state of a subareolar abscess on right breast (**G**).

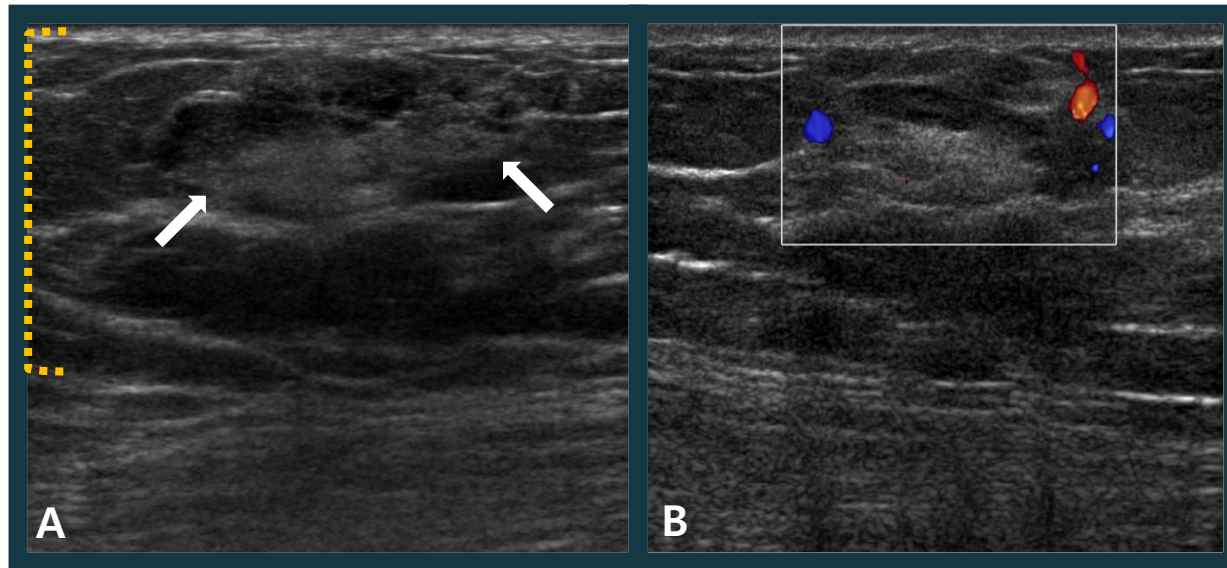
Benign #3

## Hemangioma



Mammography of the right breast shows a partly obscured oval iso-density nodule (arrow) in the UOQ (**A, B**).

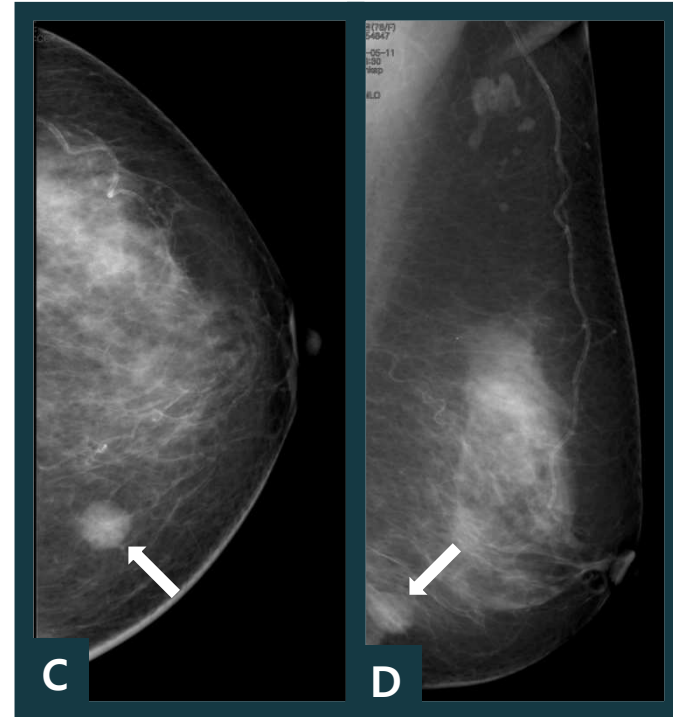
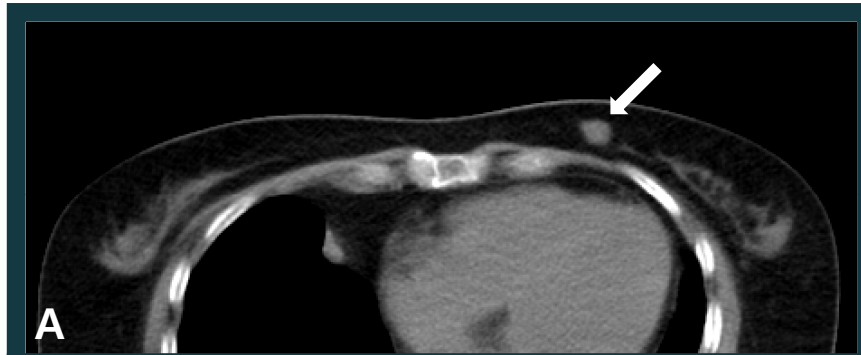
## Hemangioma



Ultrasonography shows a microlobulated heterogeneous hyperechoic mass (arrows) in subcutaneous layer of right breast (A-B).

## Benign #4

### Phyllodes tumor

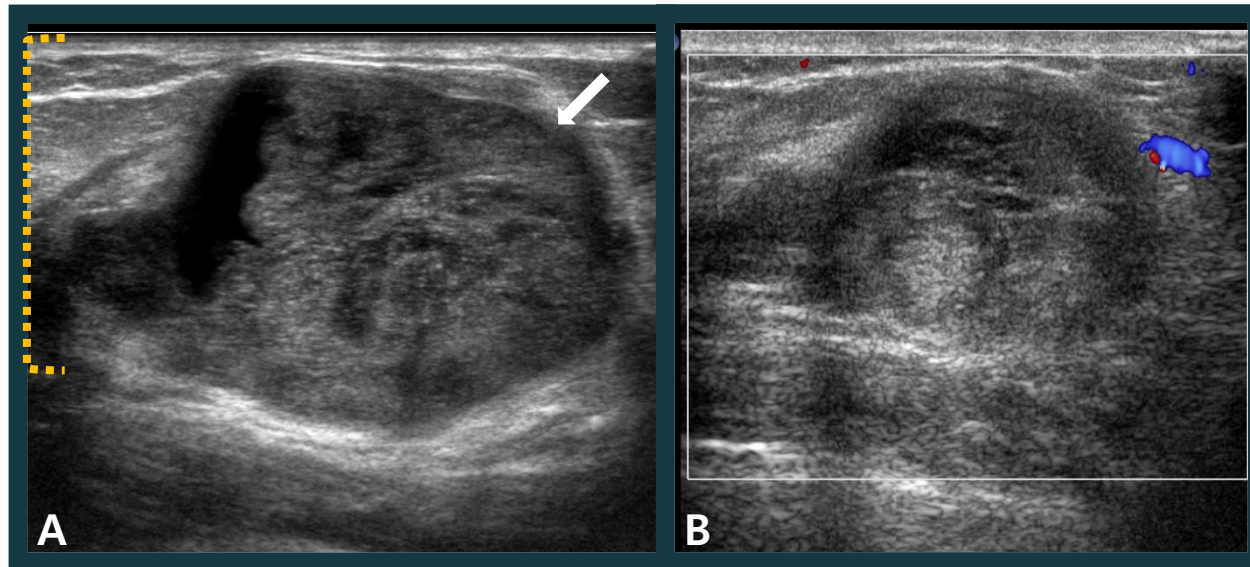


CT shows a isodense mass in left breast **(A, B)**.

Mammography shows a circumscribed round iso-density lesion (arrow) in LIQ of left breast **(C, D)**.

Benign #4

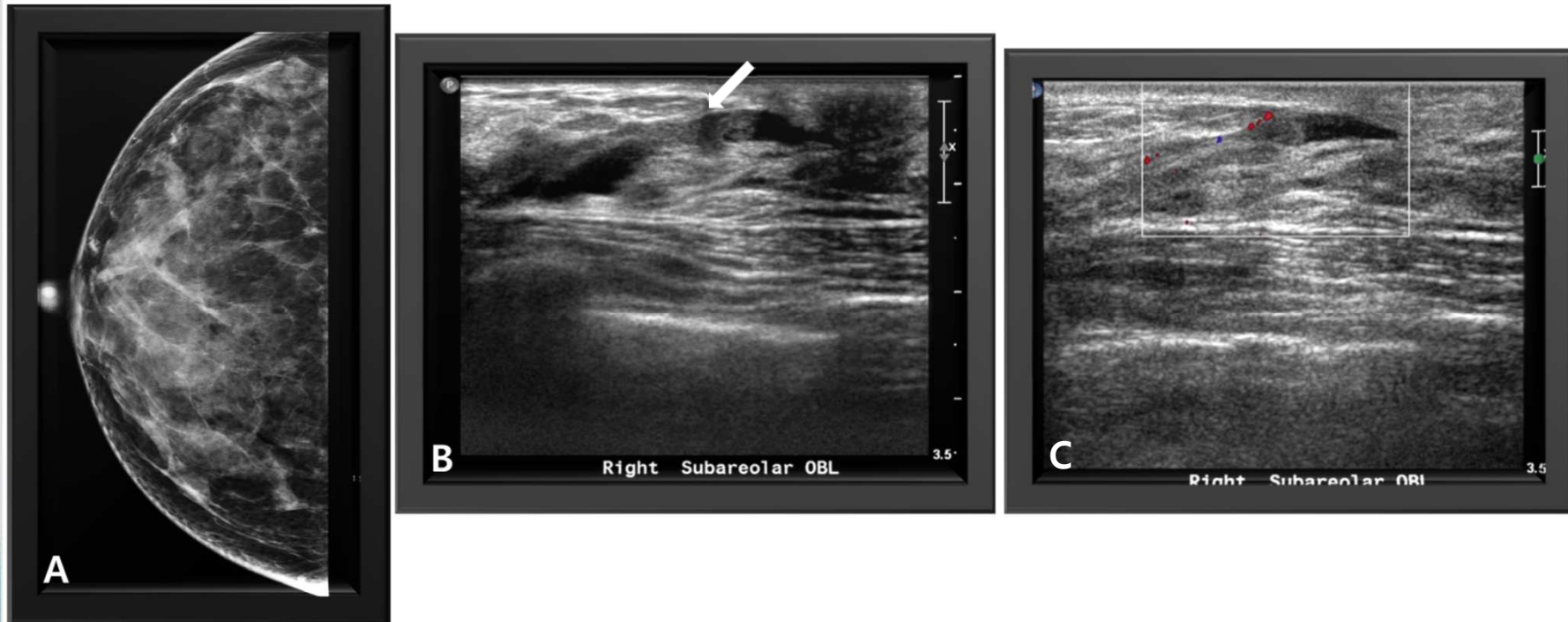
## Phyllodes tumor



Ultrasonography shows a circumscribed round heterogeneous hypoechoic mass (arrow) without vascularity in left breast **(A, B)**.

## Benign #5

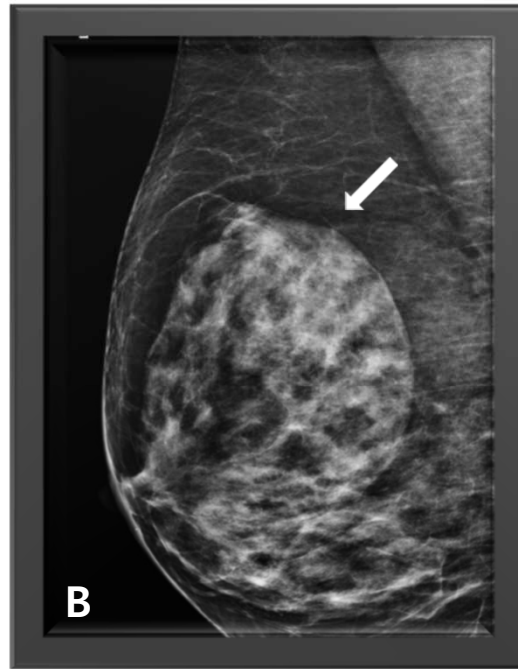
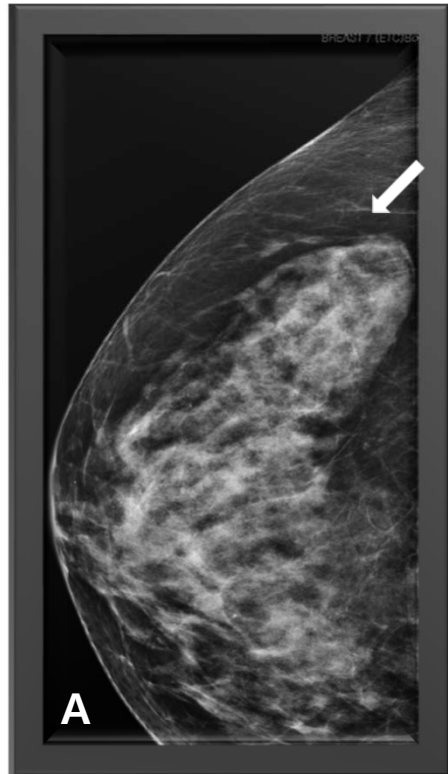
### Papillary neoplasm



Mammography of the right breast shows no abnormality (A).  
Ultrasonography shows a intraductal nodule with increased vascularity (arrow) (B,C).

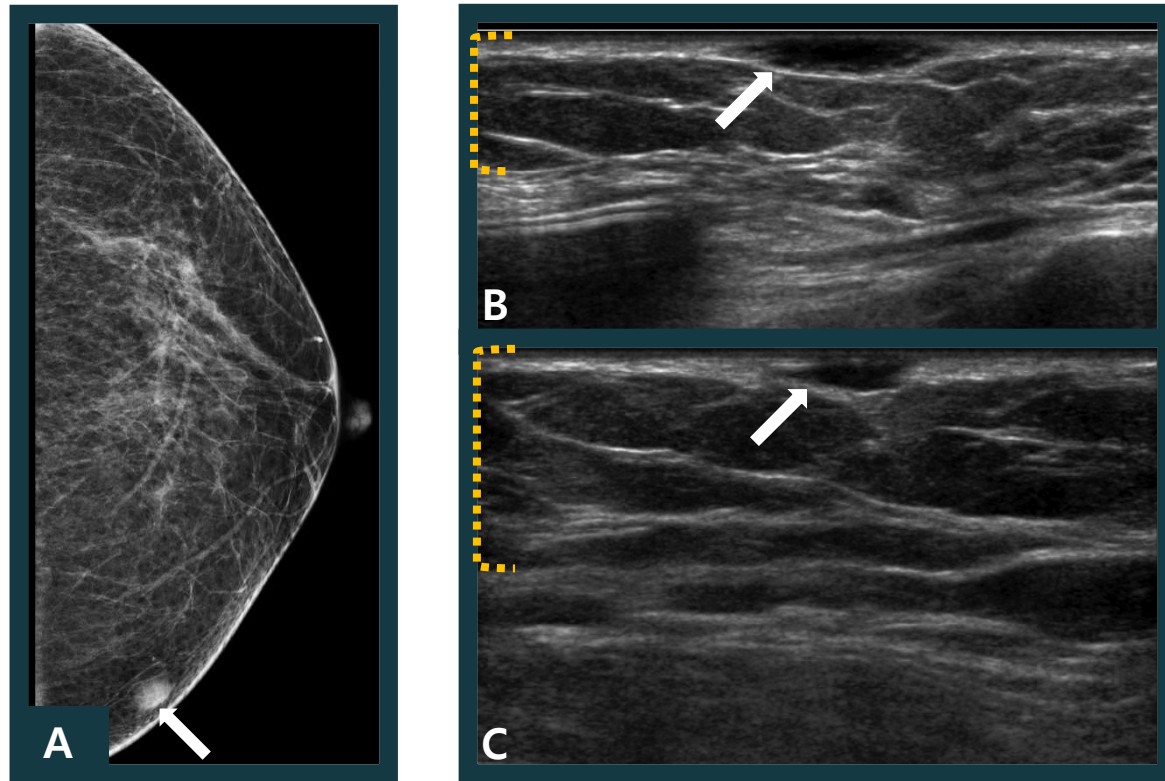
## Benign #6

### Hamartoma



Mammographs show a 8cm fat containing mass in right UOQ (arrows) (A,B).  
Ultrasonography shows a heterogenous echogenic mass in right breast (C).

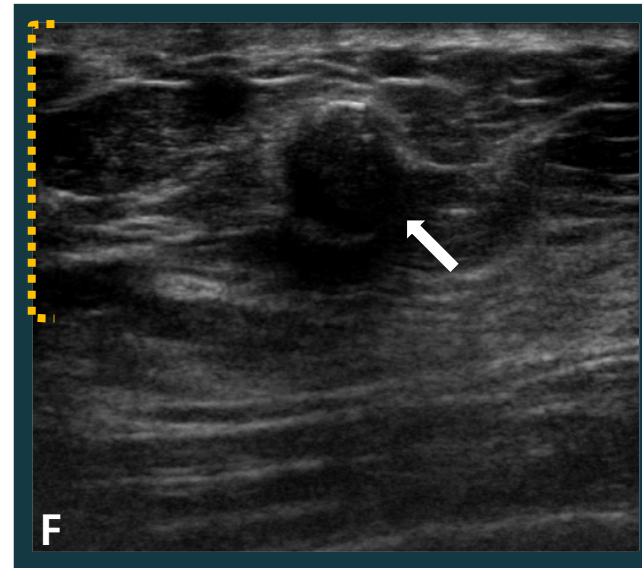
## Neurofibromatosis



Mammography shows 1.2cm skin nodule (arrow) in left inner **(A)**.  
Ultrasonography shows a few hypoechoic nodules (arrow) in skin layer of left breast **(B, C)**.

Benign #8

Fat necrosis



A calcific nodule (arrow) on mammography and ultrasonography in right breast (E, F).

# Malignant

# Classification of malignant breast lesions



**Ductal Carcinoma In Situ**

**Invasive Ductal Carcinoma**

**Invasive lobular Carcinoma**

**Medullary Carcinoma**

**Mucinous Carcinoma**

**Metaplastic Carcinoma**

**Tubular Carcinoma**

**Apocrine Carcinoma**

**Inflammatory Breast Cancer**

**Paget's disease**

**Male Breast Cancer**

**Lymphoma**

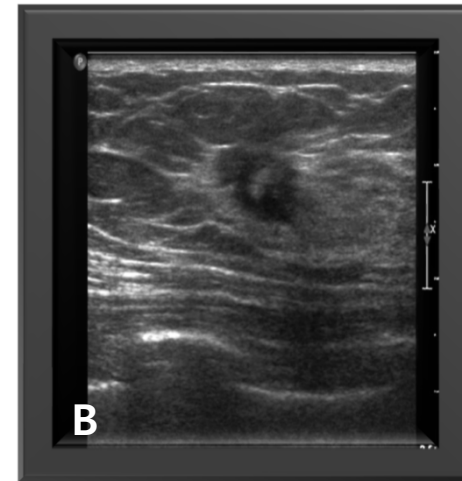
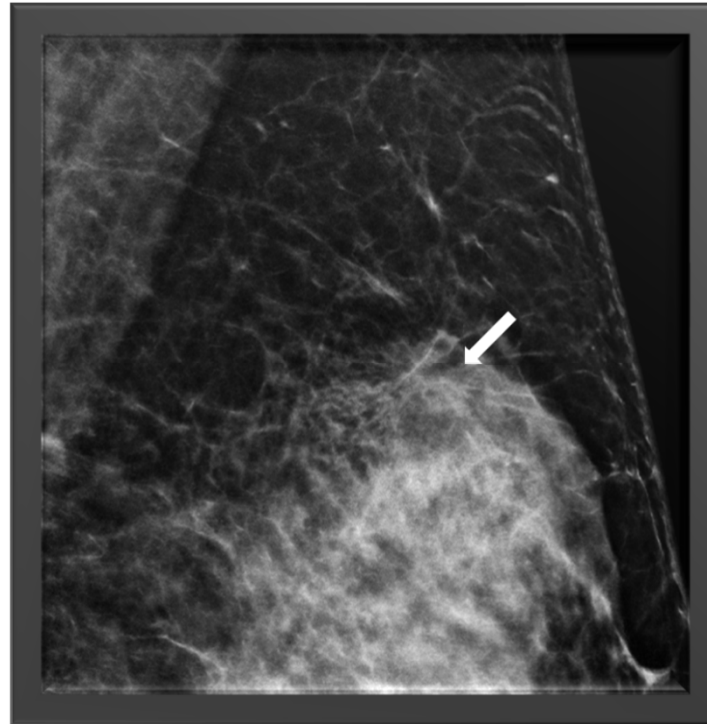
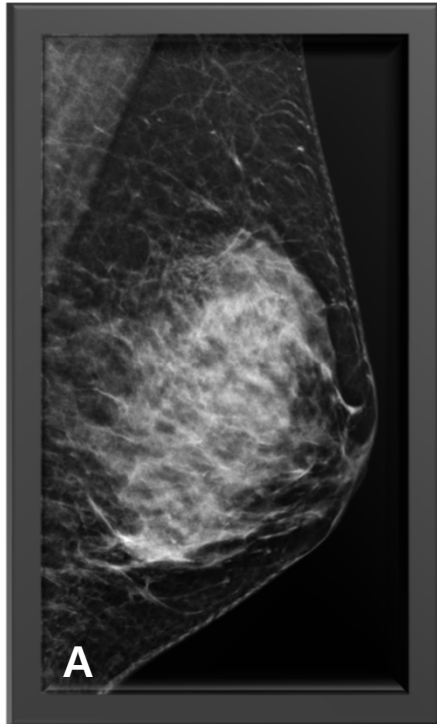
**Leukemia**

**Metastasis**

**Angiosarcoma**

**Malignant #1**

## Invasive Ductal Carcinoma

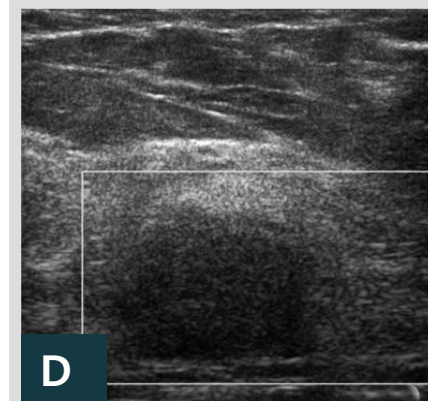
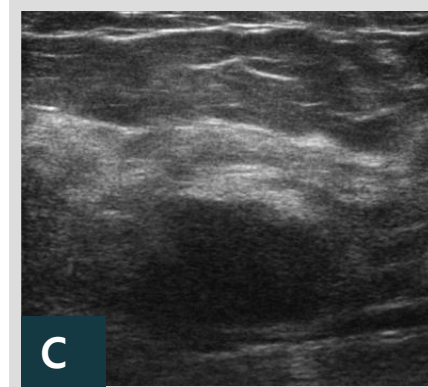
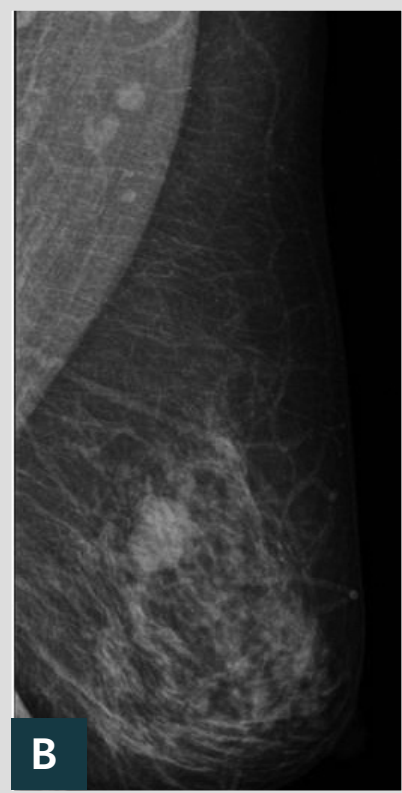
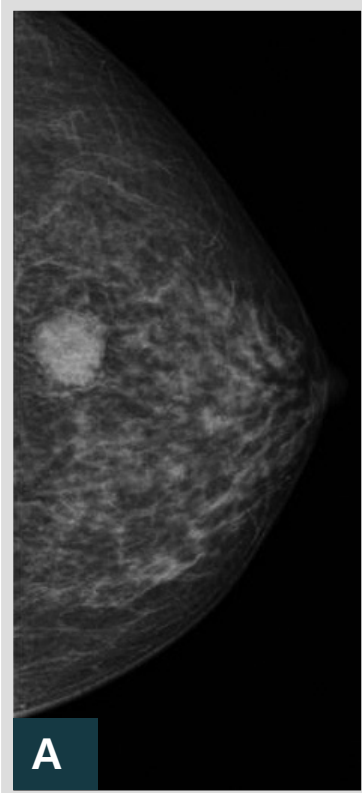


Mammography shows a spiculated irregular isodense mass in left upper breast (arrow) (A).

USG shows a spiculated irregular hypoechoic mass in left breast (B).

## Malignant #2

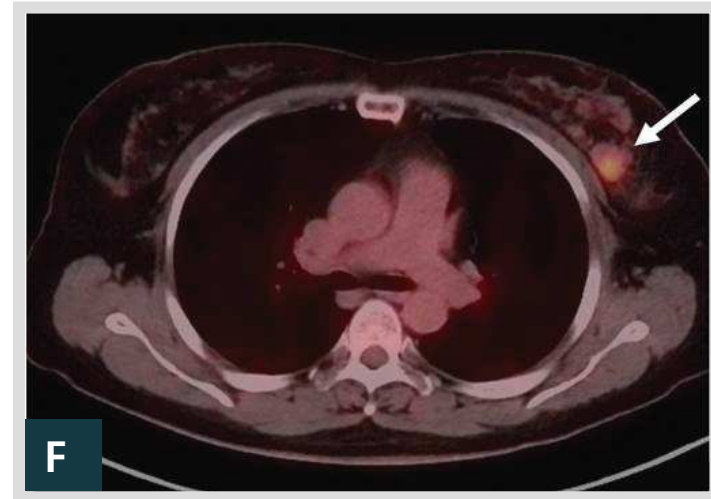
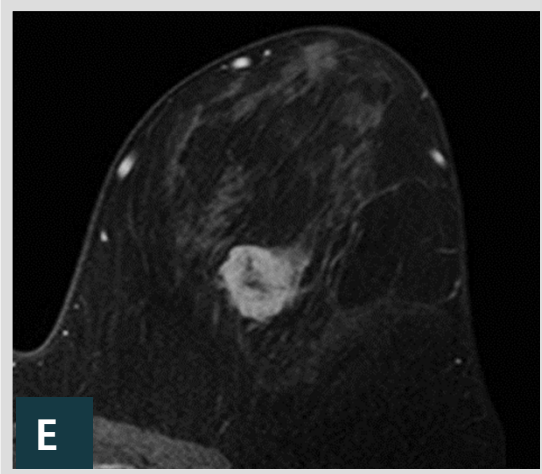
### Adenoid cystic carcinoma



Mammographs show circumscribed round isodense mass in left upper center (A,B).  
USG shows indistinct oval hypoechoic mass in left breast upper center without increased vascularity (C,D).

**Malignant #2**

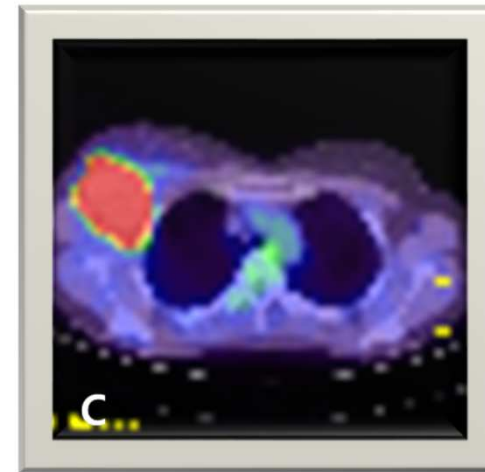
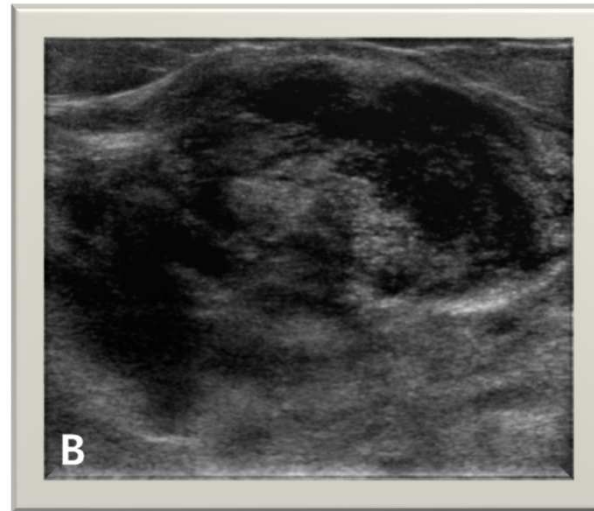
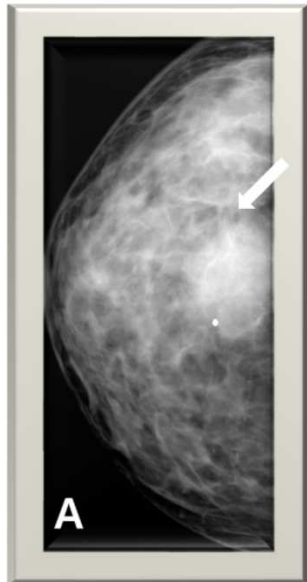
## Adenoid cystic carcinoma



MRI image shows malignant mass in left breast (E).  
PET-CT show remarkable FDG uptake in mass in left breast  
(arrow)(max SUV3.4) (F)

## Malignant #3

### Lymphoma



Mammography shows indistinct oval isodense mass in right breast (A) (arrow).  
USG image shows indistinct oval hypoechoic mass in right breast (B).  
PET-CT image shows remarkable FDG uptake in mass of right breast (C) (maxSUV22)

**감사합니다!**