

9:40-10:10

## 표준화된 유방촬영술과 초음파의 판독

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## 고 은 영

Breast Imaging Reporting and Data System (BI-RADS®)은 유방촬영술의 판독을 표준화하고 유방 영상의 해석에 있어서 혼동을 피하기 위해 고안된 것이다.

유방촬영술이나 초음파에서 보이는 병변의 성질을 파악하고 판독문을 작성할 때에는 BI-RADS에서 권고하는 용어를 이용하여 권장되는 판독문의 구성을 따라 작성한다.

## 유방촬영술의 판독

## I. 판독에 쓰이는 용어

## 1. Mass (종괴)

Two orthogonal views에서 보이는 바깥쪽으로 볼록한 경계를 갖는 3차원 구조물을 표현할 때.

Density는 mass의 성질 중 음영감쇠를 표현하는 용어이며, mass 이외의 이상 소견을 표현할 때에는 혼돈을 피하기 위해 density 보다는 asymmetry라는 용어를 쓰기를 권장한다.

Asymmetry는 mass에 비해 바깥쪽으로 볼록한 경계가 없으며, mass의 성격이 뚜렷하지 않을 때 쓰는 용어이다.

## 1) Shape

Round  
Oval  
Lobular  
Irregular

## 2) Margin

Circumscribed (Well-defined or Sharply-defined)

margin

Microlobulated

Obscured

Indistinct (Ill-defined) margin

Spiculated margin

### 3) Density (Equal volume of fibroglandular breast tissue의 expected attenuation과 비교한 것)

High-density

Equal density (Isodense)

Low density, but not fat-containing

Fat-containing radiolucent

## 2. Calcifications (석회화)

모양을 기술하는 용어인 punctuate ( $\geq 0.5$  mm)와 round ( $< 0.5$  mm)는 크기의 차이만 있을 뿐 나머지는 같다. 특별한 원인이 주어져 있지 않은 경우, Calcifications을 기술할 때에는 모양(morphology)과 분포(distribution)를 포함하여야 한다. Obviously benign calcifications need not always be reported. 그러나 다른 판독자가 잘못 판단할 수 있다고 판단되는 석회화에 대해서는 전형적인 양성이라도 기술하도록 한다.

## 1) Typically benign

Skin calcifications

Vascular calcifications

Coarse or "Popcorn-like" calcifications

Large rod-like calcifications

Round calcifications

Lucent-centered calcifications

“Eggshell” or “Rim” calcifications  
Milk of calcium calcifications  
Suture calcifications  
Dystrophic calcifications

## 2) *Intermediate concern, suspicious calcifications*

Amorphous or indistinct calcifications  
Coarse heterogeneous calcifications

## 3) *Higher probability malignancy*

Fine pleomorphic calcifications  
Fine linear or fine-linear branching calcifications

## 4) *Distribution modifiers*

Diffuse / scattered  
Regional  
Grouped or clustered  
Linear  
Segmental

3. Architectural distortion

4. Special cases

Asymmetric tubular structure / solitary dilated duct

Intramammary lymph node

Global asymmetry

Focal asymmetry

5. Associated findings

Skin retraction

Nipple retraction

Skin thickening

Trabecular thickening

Skin lesion

Axillary adenopathy

Architectural distortion

Calcifications

6. Location of lesion

### 1) *Locations :*

병변의 기술은 항상 triangulation하여 유방 내의 3차원적인 위치를 알 수 있도록 기술한다. 병변의 기술은 Side (Right / Left), location, depth 의 순서로 기술한다.

유방촬영술의 경우 병변의 위치는 film location (영

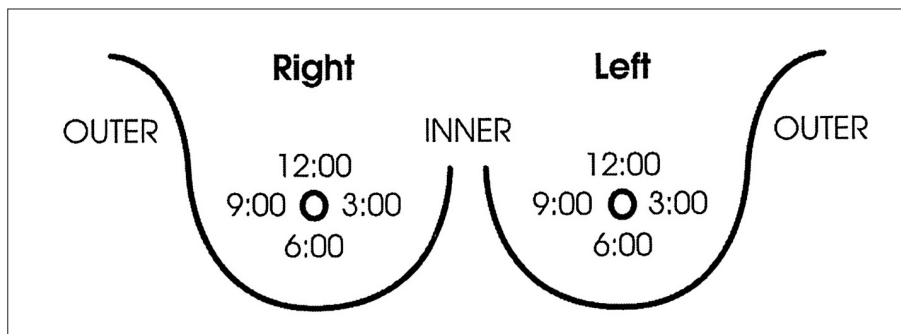


Fig. 1. Clock face locations

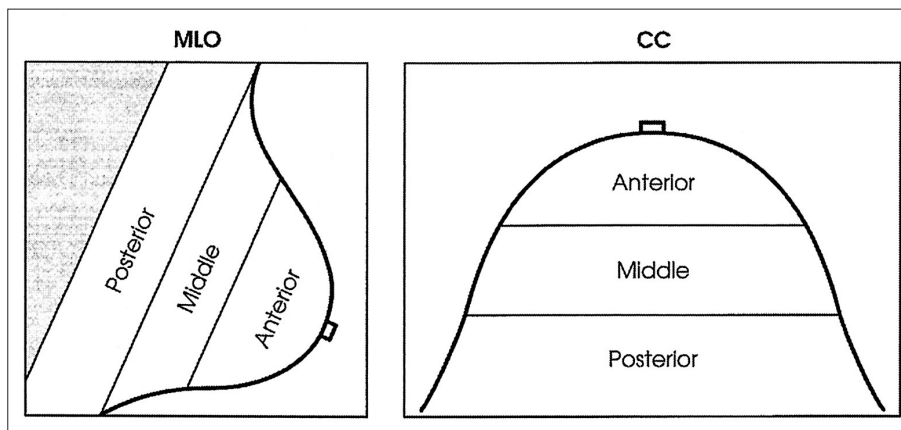


Fig. 2. Depth

상에서 보이는 위치)로부터 추정하여 clinical orientation으로 기술한다.

- -> Right / Left, Quadrant, Clock face 등이 권장됨.

Upper outer quadrant/ Upper inner quadrant/  
Lower outer quadrant/ Lower inner quadrant

## 2) Depth

anterior, middle, posterior thirds

subareolar - immediately beneath the nipple

central - directly behind the nipple in both projections

axillary tail

\* subareolar, axillary tail - -> do not require depth

\* subareolar, central, axillary tail - -> do not require clock-face location

## II. 판독문의 구성

이전 영상과 비교 판독을 한 것인지를 반드시 언급하도록 하며, 그런 언급이 없을 때에는 비교 판독이 안 된 것으로 간주한다. 꾸미는 말을 자제하고 공인된 용어를 사용하여 간결하게 작성한다. 구구절절이 이야기하듯이 써내려 가서는 안 된다.

### 1. Indication for examination

: screening / screening에서 어떤 이상이 있어서 다시 하는 exam인지 and/or clinical finding / cancer 수술하고 F/U 하는 경우인지 기록: Screening / Diagnostic

### 2. Overall breast composition에 대한 간결한 기술

the sensitivity of examination을 알게 함.

1) The breast is almost entirely fat (<25% glandular).

2) There are scattered fibroglandular densities (approximately 25 - 50% glandular).

3) The breast tissue is heterogeneously dense, which could obscure detection of small masses (approximately 51 - 75%).

4) The breast tissue is extremely dense. This may lower the sensitivity of mammography (>75% glandular).

### 3. Finding(s) 기술

Mass size  
morphology - shape, margin and density  
associated calcifications  
associated findings  
location

Calcifications morphology - type or shape and modifiers  
distribution  
associated findings  
location

Architectural distortion associated calcifications  
associated findings  
location

Special cases associated calcifications  
associated findings  
location

\*\*\* Location: clinical location of the abnormality as extrapolated from the mammographic location

4. 이전 study들과의 비교 - 새로 생겼더라, 뭐가 어떻게 변했더라 하는 내용

5. Overall (Summary) impression

## Final assessment category

### (Complete assessment)

Category 1: Negative

Category 2: Benign finding(s)

Category 3: Probably benign

Category 4: Suspicious abnormality - biopsy should be considered

C 4a: low suspicious for malignancy

C 4b: intermediate suspicious for malignancy

C 4c: moderate suspicious for malignancy

Category 5: Highly suggestive of malignancy

Category 6: Known biopsy-proven malignancy

### (Incomplete assessment)

Category 0: Need additional imaging evaluation and/or prior mammograms for comparison

- -> 다음에 뭘 해야 하는지 (the next course of action)이 판독문에 포함되어야 한다.

Suspicious abnormality가 있는 경우에는 biopsy를 하라는 내용이 판독문에 포함되어야 한다.

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1. INDICATION FOR THIS EXAM
  2. BREAST COMPOSITION
  3. FINDING(S)
  4. COMPARISON TO PREVIOUS STUDIES  
(If deemed necessary by the radiologist)
  5. ASSESSMENT  
(with any recommendations)

The discussions between the radiologist, clinician or patient should be documented.

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## 유방초음파의 판독

### I. 판독에 쓰이는 용어

유방 초음파에서 병변을 기술할 때 쓰이는 용어는 기본적으로 유방촬영술에서 쓰이는 것을 그대로 쓰이기도 하지만 orientation이나 echogenicity과 같이 초음파에서만 쓰이는 용어들도 있다.

### II. 판독문의 구성

1. Clinical history, Reason for examination에 대한 요약
2. 이전 영상과 비교 판독에 대한 언급, 만약 언급

이 없을 때에는 비교 안 한 것으로 간주.

3. Targeted US인지 survey US인지, 사용된 technique에 대해 기록
4. Analysis of the significant lesion(s) or finding(s)
  - brief description of type of breast tissue
  - lesion size (at least two dimensions, every small simple cyst의 측정은 필요 없음)
  - location of the lesion(s): reproducible system을 이용, clock face & distance from the nipple
  - abnormal finding(s)에 대한 characterization
5. Correlation of US with P/E, Mammography, MRI or other studies  
이전 검사들과의 비교 기술
6. Overall final assessment using BI-RADS categories (1~6, 0)
7. Management recommendations

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1. CLINICAL HISTORY: COMPARISON to prior studies
  2. FINDING(S)
  3. ASSESSMENT
  4. MANAGEMENT RECOMMENDATIONS
- 

### 참 고 문 헌

1. American College of Radiology, Breast imaging reporting and data system (BI-RADS) 4th edition: American college of Radiology. 2003.

## ACR BI-RADS®-US Lexicon Classification Form

For each of the following categories, select the term that best describes the dominant lesion feature. Wherever possible, definitions and descriptors used in BI-RADS® for mammography will be applied to ultrasound.

A. Masses: A mass occupies space and should be seen in two different projections.**Shape** (select one)

- ☐ Oval
- ☐ Round
- ☐ Irregular

**Description**

Elliptical or egg-shaped (may include 2 or 3 undulations, i.e. "gently lobulated" or "macrolobulated")

Spherical, ball-shaped, circular, or globular

Neither round nor oval in shape

**Orientation** (select one)

- ☐ Parallel
- ☐ Not parallel

**Description**

Long axis of lesion parallels the skin line ("wider than tall" or horizontal)

Long axis, not oriented along the skin line ("taller than wide" or vertical, includes round)

**Margin** (select one)

- ☐ Circumscribed
- ☐ Not circumscribed\*
- ☐ Indistinct
- ☐ Angular
- ☐ Microlobulated
- ☐ Spiculated

**Description**

A margin that is well defined or sharp, with an abrupt transition between the lesion and surrounding tissue

The mass has one or more of the following features: indistinct, angular, microlobulated or spiculated

No clear demarcation between a mass and its surrounding tissue

Some or all of the margin has sharp corners, often forming acute angles

Short cycle undulations impart a scalloped appearance to the margin of the mass

Margin is formed or characterized by sharp lines projecting from the mass

**Lesion Boundary** (select one)

- ☐ Abrupt interface
- ☐ Echogenic halo

**Description**

The sharp demarcation between the lesion and surrounding tissue can be imperceptible or a distinct well-defined echogenic rim of any thickness

No sharp demarcation between the mass and surrounding tissue, which is bridged by an echogenic transition zone

**Echo Pattern** (select one)

- ☐ Anechoic
- ☐ Hyperechoic
- ☐ Complex
- ☐ Hypoechoic
- ☐ Isoechoic

**Description**

Without internal echoes

Having increased echogenicity relative to fat or equal to fibroglandular tissue

Mass contains both anechoic and echogenic components

Defined relative to fat; masses are characterized by low-level echoes throughout (e.g. appearance of a complicated cyst or fibroadenoma)

Having the same echogenicity as fat (a complicated cyst or fibroadenoma may be isoechoic or hypoechoic)

**Posterior Acoustic Features** (select one)

- ☐ No posterior acoustic features
- ☐ Enhancement
- ☐ Shadowing
- ☐ Combined pattern

**Description**

No posterior shadowing or enhancement

Increased posterior echoes

Decreased posterior echoes; edge shadows are excluded

More than one pattern of posterior attenuation, both shadowing and enhancement

**Surrounding Tissue**

Identifiable effect (select all that apply)

- ☐ Duct changes
- ☐ Cooper's ligament changes
- ☐ Edema
- ☐ Architectural distortion
- ☐ Skin thickening
- ☐ Skin retraction/irregularity

**Description**

Abnormal caliber and/or arborization

Straightening or thickening of Cooper's ligaments

Increased echogenicity of surrounding tissue; reticulated pattern of angular, hypoechoic lines

Disruption of normal anatomic planes

Focal or diffuse skin thickening (Normal skin is 2 mm or less in thickness except in the periareolar area and lower breasts)

Skin surface is concave or ill-defined, and appears pulled in

\* Note: Irregular is used as descriptor of shape rather than margin

**B. Calcifications: Calcifications are poorly characterized with ultrasound but can be recognized particularly in a mass.**

| Calcifications                                           | Description                                                                                                                        |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| If present ( <i>select all that apply</i> )              |                                                                                                                                    |
| <input type="checkbox"/> Macrocalcifications             | Greater than or equal to 0.5 mm in size                                                                                            |
| <input type="checkbox"/> Microcalcifications out of mass | Echogenic foci that do not occupy the entire acoustic beam and do not shadow. Less than 0.5 mm in diameter                         |
| <input type="checkbox"/> Microcalcifications in mass     | Embedded in a mass, microcalcifications are well depicted. The punctate, hyperechoic foci will be conspicuous in a hypoechoic mass |

**C. Special Cases: Special cases are those with a unique diagnosis or finding.**

| Special Cases ( <i>select all that apply</i> )      | Description                                                                                                                                                                                   |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Clustered microcysts       | A cluster of tiny anechoic foci each smaller than 2-3 mm in diameter with thin (less than 0.5 mm) intervening septations and no discrete solid components                                     |
| <input type="checkbox"/> Complicated cysts          | Most commonly characterized by homogeneous low-level internal echoes<br>Complicated cysts may also have fluid-fluid, or fluid-debris levels that may shift with changes in patient's position |
| <input type="checkbox"/> Mass in or on skin         | These masses are clinically apparent and may include sebaceous or epidermal inclusion cysts, keloids, moles and neurofibromas                                                                 |
| <input type="checkbox"/> Foreign body               | May include marker clips, coil, wire, catheter sleeves, silicone, and metal or glass related to trauma                                                                                        |
| <input type="checkbox"/> Lymph nodes - intramammary | Lymph nodes resemble small kidneys with an echogenic hilus and hypoechoic surrounding cortex. Found in the breast, including axilla                                                           |
| <input type="checkbox"/> Lymph nodes - axillary     | Lymph nodes resemble small kidneys with an echogenic hilus and hypoechoic surrounding cortex. Found in the breast, including axilla                                                           |

**D. Vascularity**

|                                                                                |
|--------------------------------------------------------------------------------|
| <b>Vascularity</b> ( <i>select one</i> )                                       |
| <input type="checkbox"/> Not Present or not assessed                           |
| <input type="checkbox"/> Present in lesion                                     |
| <input type="checkbox"/> Present immediately adjacent to lesion                |
| <input type="checkbox"/> Diffusely increased vascularity in surrounding tissue |

**E. Assessment Category (*select one*)**

| Assessment Category ( <i>select one</i> )                                    | Description                                                                         |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <input type="checkbox"/> <b>Category 0</b> – Incomplete                      | Additional imaging evaluation needed before final assessment                        |
| <b>Final Assessment</b>                                                      |                                                                                     |
| <input type="checkbox"/> <b>Category 1</b> – Negative                        | No lesion found (routine follow-up)                                                 |
| <input type="checkbox"/> <b>Category 2</b> – Benign finding                  | No malignant features; e.g. cyst (routine follow-up for age, clinical management)   |
| <input type="checkbox"/> <b>Category 3</b> – Probably benign finding         | Malignancy is highly unlikely, e.g. fibroadenoma (initial short interval follow-up) |
| <input type="checkbox"/> <b>Category 4</b> – Suspicious abnormality          | Low to moderate probability of cancer, biopsy should be considered                  |
| <input type="checkbox"/> <b>Category 5</b> – Highly suggestive of malignancy | Almost certainly cancer, appropriate action should be taken                         |
| <input type="checkbox"/> <b>Category 6</b> – Known cancer                    | Biopsy proven malignancy, prior to institution of therapy                           |

This US lexicon classification form is for data collection and does not constitute a written US report.