Core Biopsy and Open Biopsy : Pro And Cons

M-ID-00002045-09-2025

Introduction

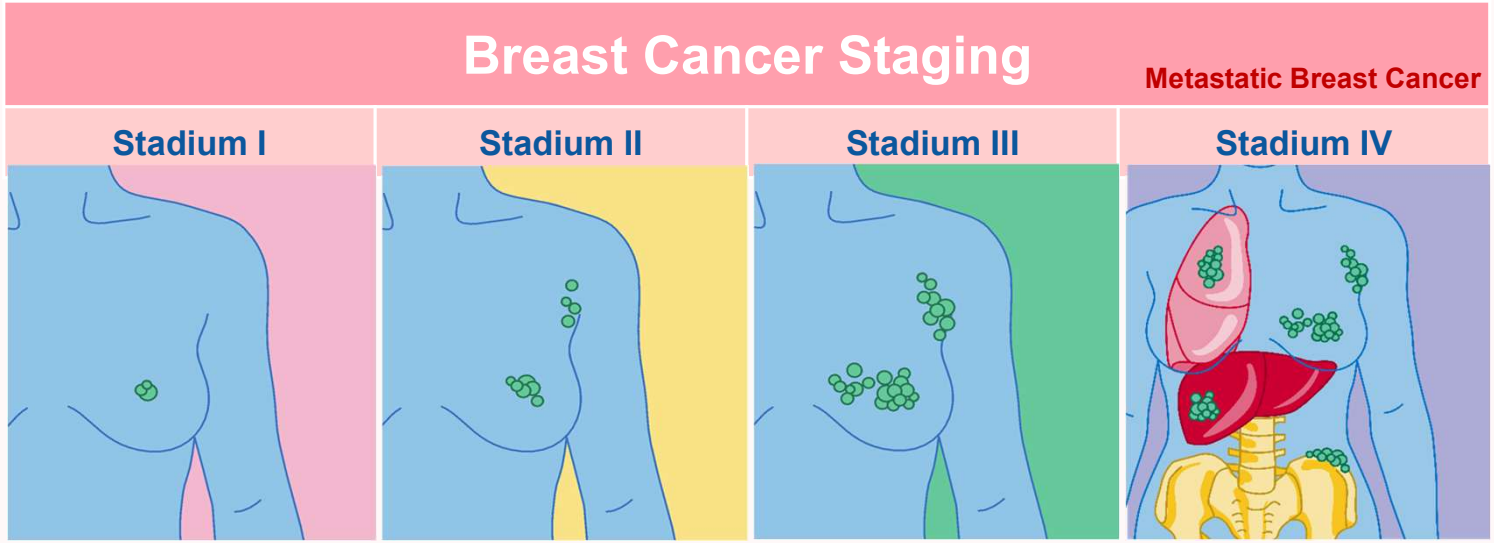
Treatment and type of definitive surgery for malignant breast tumor should have been discussed with the patient preoperatively

- Stage
- Biological characteristics of tumour
- Patient's preferences

S. Loibl, et al. Early Breast Cancer: ESMO Clinical Practice Guideline for Diagnosis, Treatment and Follow Up. Annals of Oncology. 2024

Breast Cancer Staging

Breast cancer can be classified by the stage of cancer at diagnosis and their biological characteristics.
Understanding the stage of the cancer is important to understand the prognosis and the treatment recommendation.



Tumor size ≤ 2 cm and hasn't spread to lymph node

Tumor size 2-5 cm and has spread to lymph node in axilla or normal tissue around tumor

Tumor has spread far to other organ such as lungs, liver, and bone

The TNM staging system is based on:

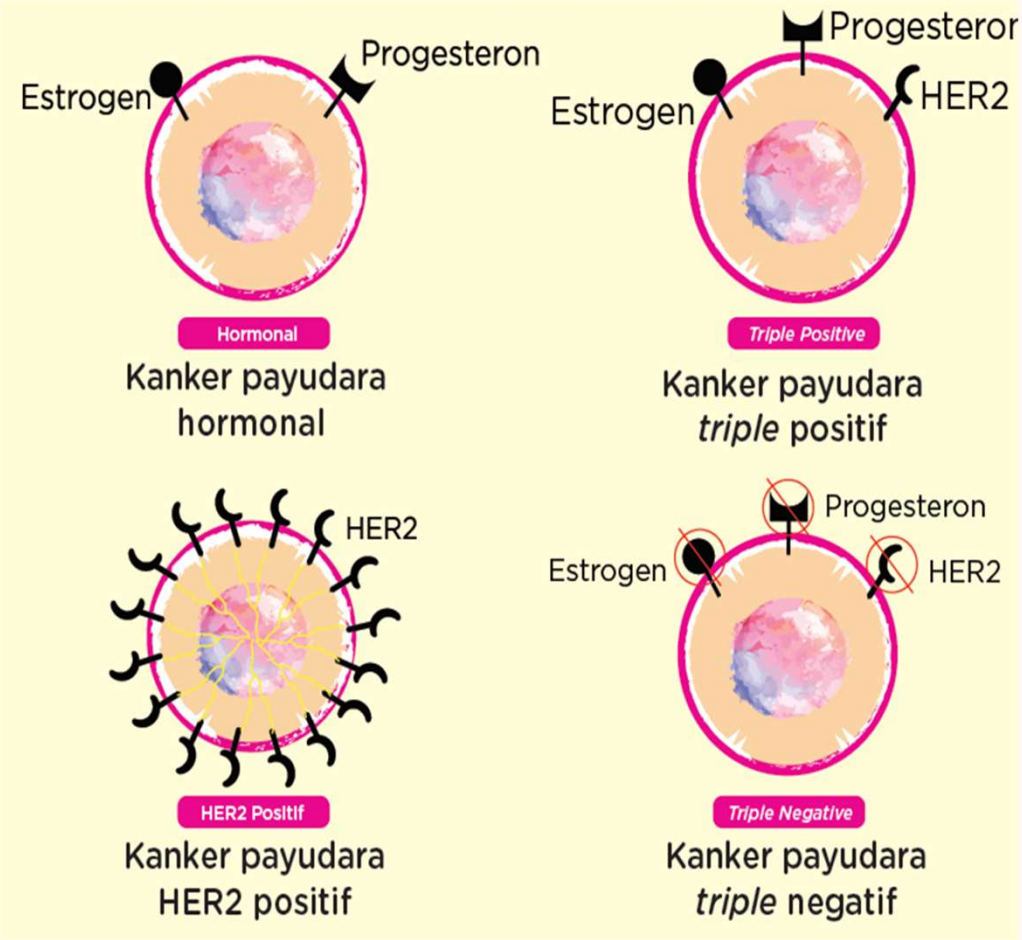
T: Size of the tumour
N: Lymph node involvement
M: Metastasis when cancer has spread to other organs like the lung, liver and bone

Cancers treated in earlier stages have better outcomes, more advanced cancers will need more aggressive treatment.

1. American College of Surgeon. https://www.facs.org/for-patients/the-day-of-your-surgery/breast-cancer-surgery/breast-cancer-types/breast-cancer-staging/ [last accessed July 2024].

Tumour Biology

4 sub types of breast cancer based on tumor biology

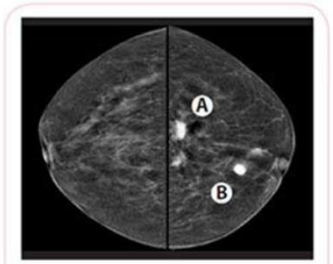


- Breast cancers are also differentiated by the presence of special receptors on the surface of the cancer cells, such as the
  - Oestrogen receptor
  - Progesterone receptor
  - HER2 (Human Epidermal Growth Factor 2) receptor
- This is associated with the aggressiveness of the cancer and affects the prognosis of the patient.
- More importantly, there are drugs to target these changes, and hence directed treatment for them will improve the outcome.

1. American Cancer Society. Breast Cancer HER2 Status. https://www.cancer.org/cancer/types/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-hormone-receptor-status.html Diakses pada 12 July 2024
2. WebMD. Types of Breast Cancer. https://www.webmd.com/breast-cancer/breast-cancer-types-er-positive-her2-positive Diakses pada 23 September 2020

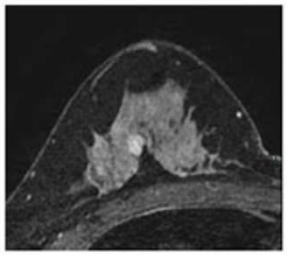
Breast Cancer Diagnosis

1. Imaging:
    1. Mammogram
    2. Ultrasound
    3. MRI (Magnetic Resonance Imaging)
    4. Tomosynthesis
2. Biopsy
    1. Core Needle Biopsy
    2. Vacuum Assisted Core Needle Breast Biopsy
    3. Fine Needle Aspiration
    4. Excision Biopsy

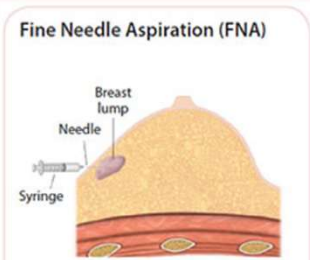


▲ Mammograms of the right and left breast in the cranial-caudal view showing (A) a cancer in the left breast and (B) a benign calcification.

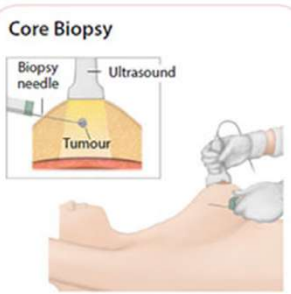
▲ Ultrasound image of a cancer in the upper outer quadrant of the left breast.



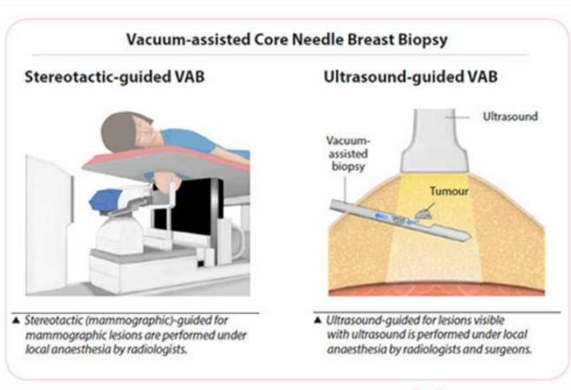
▲ Magnetic Resonance Image (MRI) of a cancer in the right breast.



▲ Fine needle aspiration: A fine needle will withdraw fluid or cells from the breast lump.



▲ Core needle biopsy is performed under local anaesthesia, with or without ultrasound guidance.



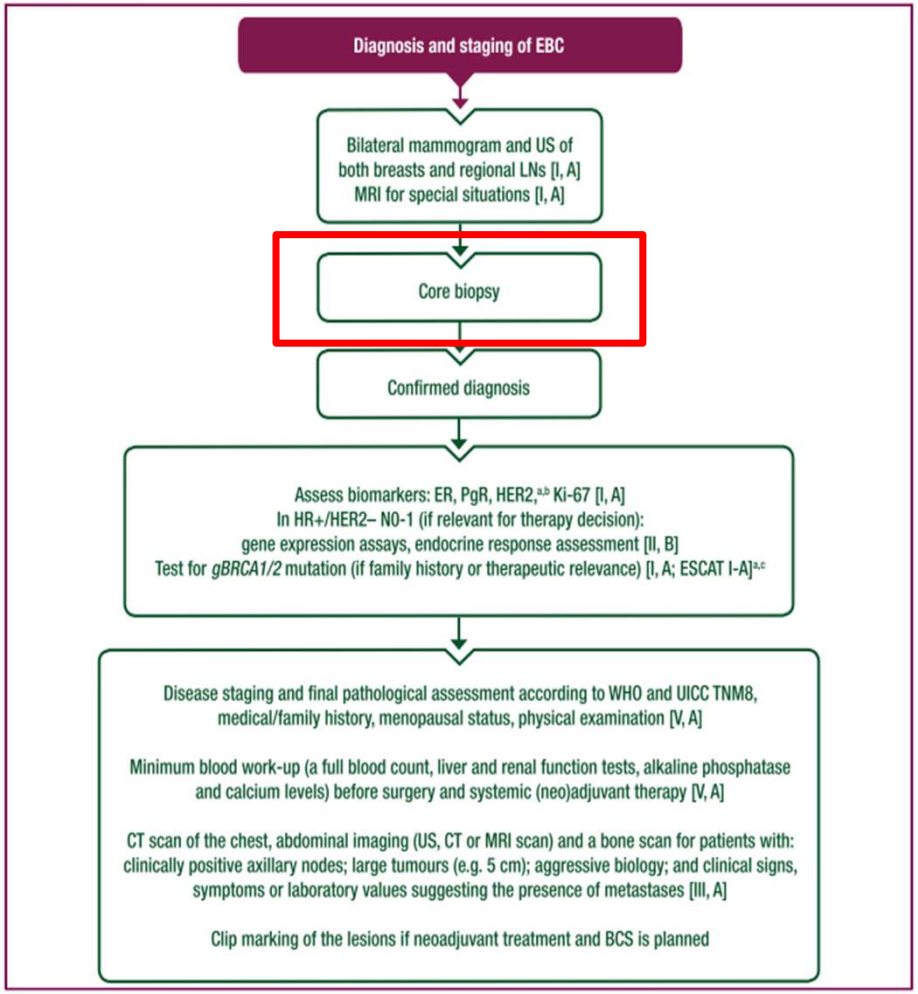
▲ Stereotactic (mammographic)-guided for mammographic lesions are performed under local anaesthesia by radiologists.

▲ Ultrasound-guided for lesions visible with ultrasound is performed under local anaesthesia by radiologists and surgeons.

https://www.singhealth.com.sg/patient-care/conditions-treatments/breast-cancer-diagnosis-treatment

Early breast cancer ESMO Clinical Practice Guideline: for diagnosis, treatment and follow-up 2024

- **Mammography and ultrasound (US) of both breasts and regional lymph nodes (LNs)** or two-dimensional digital mammography in the symptomatic setting **[I, A]**
- Digital breast tomosynthesis (with or without synthetic mammography) and contrast-enhanced mammography can be considered as alternatives, where available and appropriate [II, B]
- Magnetic resonance imaging (MRI) of the breasts is recommended in case of uncertainties following standard imaging and in special clinical situations
- **Assessment should include histological type, grade and immunohistochemistry (IHC)** evaluation of estrogen receptor (ER), progesterone receptor (PgR) and human epidermal growth factor receptor 2 (HER2) biomarkers and a proliferation marker such as Ki-67 **[I, A]**. FISH testing should be carried out in cases of an equivocal
- HER2 IHC score (HER2 2þ) [I, A; ESMO Scale for Clinical Action ability of molecular Targets (ESCAT) score: I-A]



1. Loibl S, et al. Early breast cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. Ann Oncol. 2024;35(2):159-182

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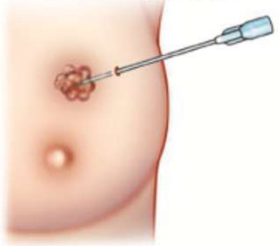
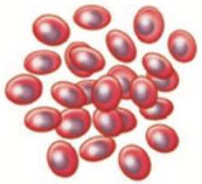
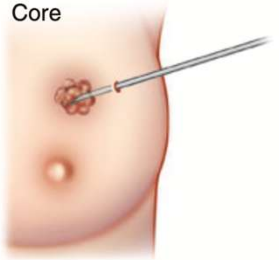
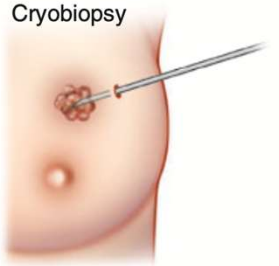
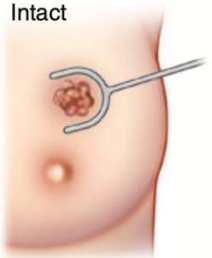
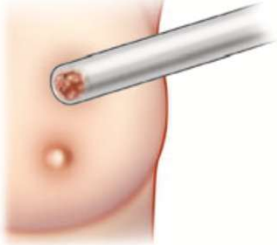
The Choice of Non operative diagnostic methods

TYPES OF NEEDLE BIOPSIES		
Type of needle biopsy	**Shape of specimen**	**Comments**
Fine needle aspiration 		Single cell aspiration does not distinguish in situ carcinoma from invasive carcinoma. Best technique to document lymph node metastases prior to neoadjuvant treatment.
Core 		Standard cutting technique for breast lesions. Requires multiple passes.
Cryobiopsy 		Freezes tissue potentially introducing morphologic artifacts and altering biomolecules.
Vacuum-assisted core 		Removes large cores of tissue with only one needle insertion.
Intact 		Heats tissue potentially introducing morphologic artifacts and potentially altering biomolecules.
Very large core 		Removes a large amount of benign tissue including subcutaneous tissue – cosmetic results may be poor and complication rate higher.

Slide 7

PAT1 tambahan saya

Arga Patrianagara, 2025-10-03T00:09:56.873

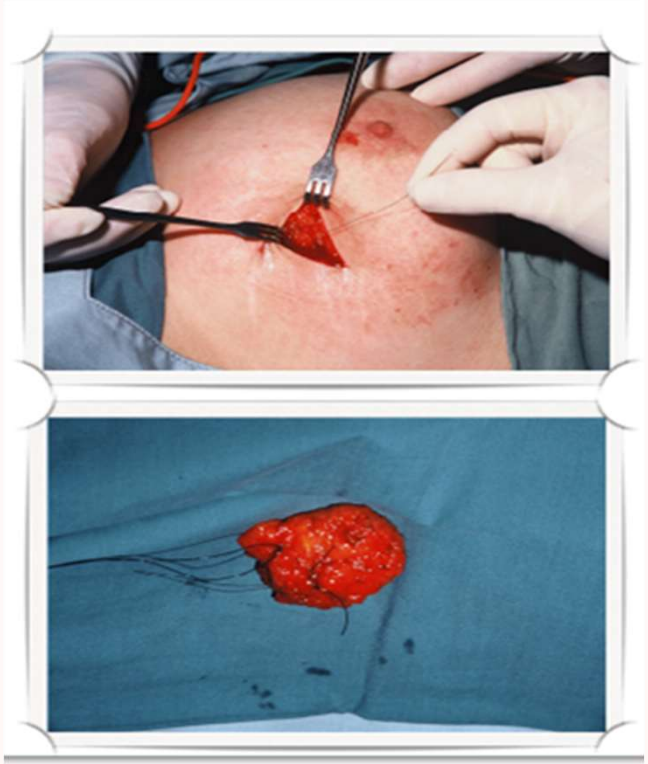
The Choice of Non operative diagnostic methods

The choice of sampling method in any should be determined by:

- Sensitivity and specificity of biopsy technique
- Information needed for certain malignant lesion
- Patient comfort
- Cost
- Availability of experienced and trained staff

Non-operative Diagnosis Subgroup of the National Coordinating Group for Breast Screening Pathology. Guidelines for non-operative diagnostic procedures and reporting in breast cancer screening. NHS Cancer Screening Programmes, editor. Sheffield, UK: NHS Cancer Screening Programmes; 2001

Open Surgical Biopsy/ Excisional Biopsy



- Until 1990 : gold standard diagnosis
- Open surgical biopsy is highly accurate; however, CNB is associated with a much lower incidence of harms and morbidity
- Often required more than 1 surgical procedure than CNB
- Greater safety and less invasive nature of CNB is worth the very small sacrifice in accuracy

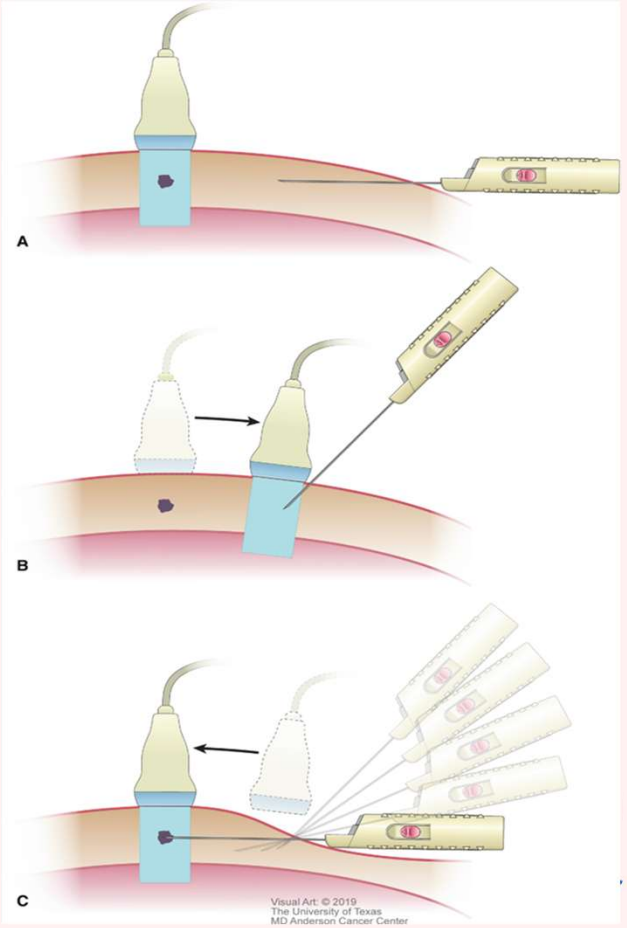
Need to consider

- ❑ Further increasing the procedure
- ❑ Cost burden of diagnosis
- ❑ Re-excision rates of 10% to 60%
- ❑ Incremental medical expenditures

Bruening W, et al. Systematic Review: Comparative Effectiveness of Core-Needle and Open Surgical Biopsy to Diagnose Breast Lesions. Annals of Internal Medicine. Volume 152, number 4. 2010

Core Needle Biopsy

- **Since the late 1990s**, **Core Needle Biopsy** (CNB) has been firmly established as the **gold standard method** in the **initial evaluation of mammary nodules**
- Provides a more **definitive histological diagnosis** and an **adequate tissue** → preoperative axillary staging, prognostic, and predictive markers
- CNB may be used in palpable and in non-palpable masses, attached to mammographic stereotactic units, ultrasound guidance, or Magnetic Resonance Imaging (MRI)
- CNB can use 14-, 12-, 11-, or 8-gauge needles
- Two main types of CNBs are in use: the cutting type and the vacuum assisted type



Cadavid-Fernández N, Carretero-Barrio I, Moreno-Moreno E, Rodríguez-Villena A, Palacios J, Pérez-Mies B. The role of core needle biopsy in diagnostic breast pathology. Rev Senol Patol Mamar. 2022;35(S3):S3–S12.

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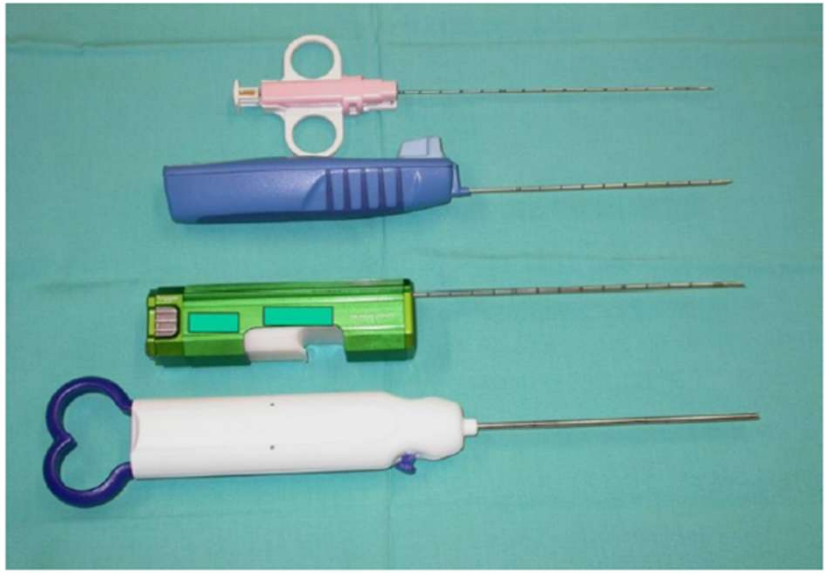
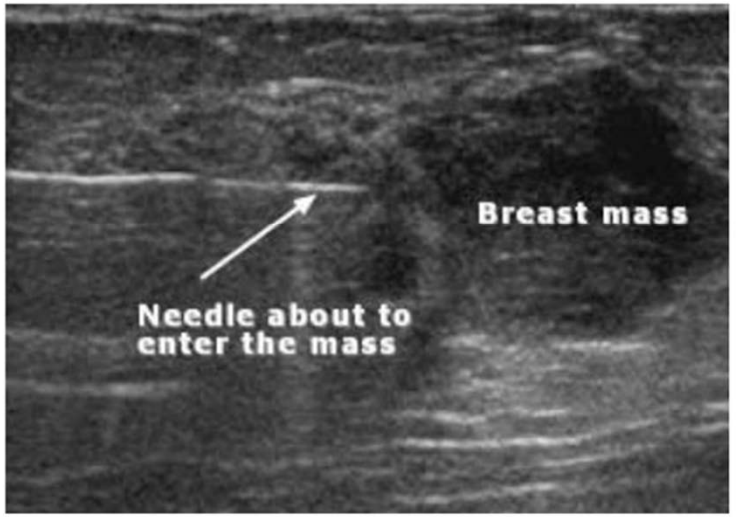
Core Needle Biopsy/ Percutaneous Breast Biopsy





- 14 G needle with long throw (excursion > 15 mm)
- Sensitivity 98-100%; Specificity 98-100%

Courtesy of dr Gunawan Slide of Core Biopsy

Slide 11

PAT1 foto dan gambar akan saya ganti

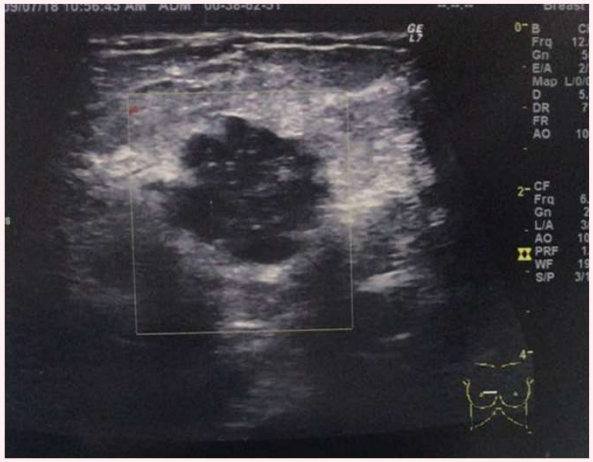
Arga Patrianagara, 2025-10-03T00:10:10.437

Core Needle Biopsy/ Percutaneous Breast Biopsy

Sensitivity of image-guided core biopsy is higher than palpation guided core biopsy

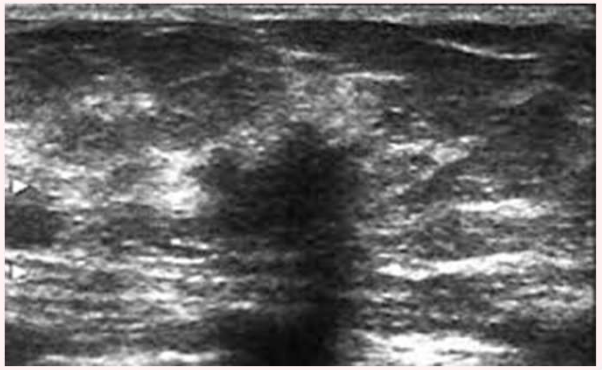
A core needle biopsy, also called percutaneous core breast biopsy, is a procedure that typically involves obtaining multiple cores of solid tissue using standard techniques.

- It can be performed under imaging guidance (eg, stereotactic [mammographic], ultrasound, MRI



Palpation guided vs image guided (USG, stereotactic mammography, MRI)

- Sensitivity of image-guided > palpation-guided needle biopsy (94,5%–100% vs 65%–87%)
- sampling error due to tissue changes around the mass
- peritumoural infiltration
- desmoplasia
- inflammation reaction
- lymphatic edema



Hari S, et al. Image guided versus palpation guided core needle biopsy of palpable breast masses: a prospective study. Indian J Med Res 143, May 2016, pp 597-604. 2013

Core Needle Biopsy

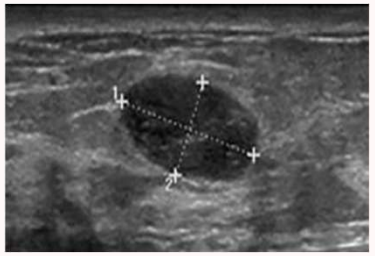
Core biopsy is indicated start from Birads 4

Image guided percutaneous biopsy is indicated for :

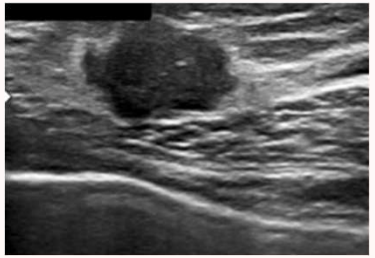
- BI-RADS 5 (95%)
- BI-RADS 4 (20%-40%)
- BI-RADS 3 (< 2%)
  - patient and/or doctor preferences
  - psychological factors of patient
  - limitation of short term follow-up
  - patient with multiple breast cancer risk factors
  - necessity of diagnostic anticipation

Birads 2

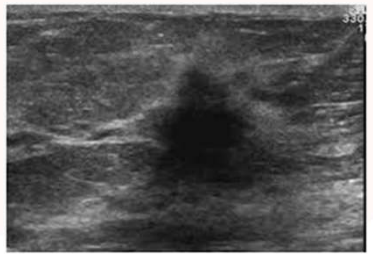
Birads 3



Birads 4



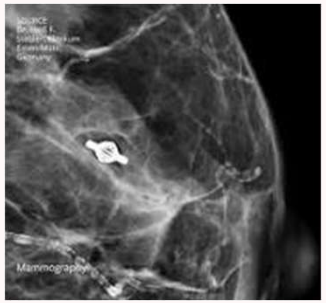
Birads 5



Rocha RD, Pinto RR, Tavares DPB, Goncalves CS. Step-by-step of ultrasound-guided core-needle biopsy of the breast: review and technique. Radiol Bras 2013;46(4):234-41

The Advantage of Core Needle Biopsy

- Increased accuracy over FNA when the procedure is performed in situations where no mass is palpable;
- An ability to obtain tissue samples of sufficient size so as to eliminate the need for a follow-up biopsy to confirm malignancy.
- In some situations, the core needle biopsy is performed under vacuum assistance, which can facilitate collection of adequate tissue from a breast lesion without the need for multiple needle insertions.
- **Sensitivity for core needle biopsy directed by ultrasound or stereotaxis is 97% to 99%**.



Marker clip placement is done at the time of core needle biopsy so that the radiologist can identify the location of the lesion in the event that it is entirely removed with the core needle biopsy or disappears during neoadjuvant treatment of a breast cancer

Limitation of Core Needle Biopsy

Not appropriate in cystic lesion

Difficult for nodule < 5 mm

Require a repeat biopsy in several cases with inconclusive results

Cases with breast implant

Limitation of core biopsy to detect malignancy

- ADH and DCIS. (miss rate 8–12% dan underestimation rate 3,4–40%)
- Phylloides tumour, radial scar, papillary lesion with or without atypical cell, and LCIS

Rocha RD, Pinto RR, Tavares DPB, Goncalves CS. Step-by-step of ultrasound-guided core-needle biopsy of the breast: review and technique. Radiol Bras 2013;46(4):234-41

Palpation guided vs image guided Core Needle Biopsy

- A prospective study conducted from October 2008 to April 2010 at the All India Institute of Medical Sciences (AIIMS) in New Delhi, India, compared the accuracy of image-guided core needle biopsy versus palpation-guided core needle biopsy for palpable breast masses

Parameter	Image Guided	Palpation Guided
Sensitivity Rate	96.3%	46.7%
False Negative Rates	0.03%	44.4%
Fewer Repeat Biopsies	there were no cases of inadequate samples or imaging-histologic discordance	required a high rate of repeat biopsies (52.8%) due to inconclusive samples or imaging-histologic discordance
Diagnostic Accuracy	97.2%	55.6%

Hari S, et al. Image guided versus palpation guided core needle biopsy of palpable breast masses: a prospective study. India J Med Res 2016;143:597-604.

When to choose excisional biopsy/ Core Needle Biopsy/ FNA?

Excisional Biopsy	Core Needle Biopsy	FNA
Excisional biopsy is recommended **if the diagnosis by core needle biopsy is an indeterminate lesion, a benign lesion that is not concordant with imaging**, or other specific histologies that **require additional tissue** other histologies of concern to the pathologist	core needle biopsy **is preferred** in the NCCN Guidelines over surgical excision when **tissue biopsy is required**	The NCCN Panel only recommends use of FNA for **symptomatic relief** of a **cyst** or **possible abscess**.

CORE NEEDLE BIOPSY is the type of biopsy recommended by guidelines

ESMO GOOD SCIENCE BETTER MEDICINE BEST PRACTICE [1]

1. A core needle biopsy (if not possible, at least a FNA) **must be obtained before ANY type of treatment** is initiated.
2. Pathological diagnosis **should be based** on a **core needle biopsy**, preferably with **US** or stereotactic guidance.
3. An **excisional biopsy** should not be carried out, except in **rare cases** of **repeated negative core biopsies**.

NCCN National Comprehensive Cancer Network® [2]

1. For BI-RADS 4/5 or suspicious of malignancy, **core needle biopsy is preferred**.
2. Surgical excision is recommended when there's a **repeated discordant finding** between pathology results with imaging.

1. Loibl S, et al. Early breast cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. Ann Oncol. 2024;35(2):159-182. 2. NCCN. Breast Cancer Screening and Diagnosis v2. 2024. https://www.nccn.org/professionals/physician_gls/pdf/breast_screening.pdf (accessed 15 Sept 2025)

PAT1

The journey to implement core biopsy in Indonesia[1,2,3]

Why Core Biopsy?		The Challenge	How Can We Start Implementing?
High accuracy	98-100%	Require training/experience for surgeon & pathologist	Getting familiar/trained with core needle biopsy. Discussion with pathologist on the implementation
Cost effective	67 – 75% lower than surgical biopsy	Currently Covered by by JKN despite limited reimbursement	Limted reimbursement warrant for consideration of rising the coverage by JKN,
Less invasive	bruising, bleeding or infection <1%	Patient might worry about needle track seeding despite the very low incidence (<3%)	Explain the risk & benefit of each type of biopsy
Time saving	5-15 minutes, no need for general anesthesia	Might require surgical biopsy if discordant patient might undergo multiple procedures	Perform core biopsy with US or sterotactic guidance to increase accuracy (98-100%)

1. Dahabreh IJ. Core needle and open surgical biopsy for diagnosis of breast lesions: an update to the 2009 report. Rockville (MD): Agency for Healthcare Research and Quality (US); 2014. Available from URL: https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/breast- biopsy-update_research.pdf [Accessed 4 January 2022]
2. Sobri FB, Bachtiar A, Panigoro SS, Rahmaania JC, Yuswar PW, Krisnuhoni E, Tandiari N. Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal). 2021; 16 (3): 151-157
3. American Cancer Society. https://www.cancer.org/cancer/types/breast-cancer/screening-tests-and-early-detection/breast-biopsy/core-needle-biopsy-of-the-breast.html. [Accessed 12 July 2024]

Slide 19

PAT1 saya edit

Arga Patrianagara, 2025-10-03T00:09:23.605

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Case Experience

Slide 20

PAT1 tambahan saya

Arga Patrianagara, 2025-10-03T00:09:36.826

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Case 1

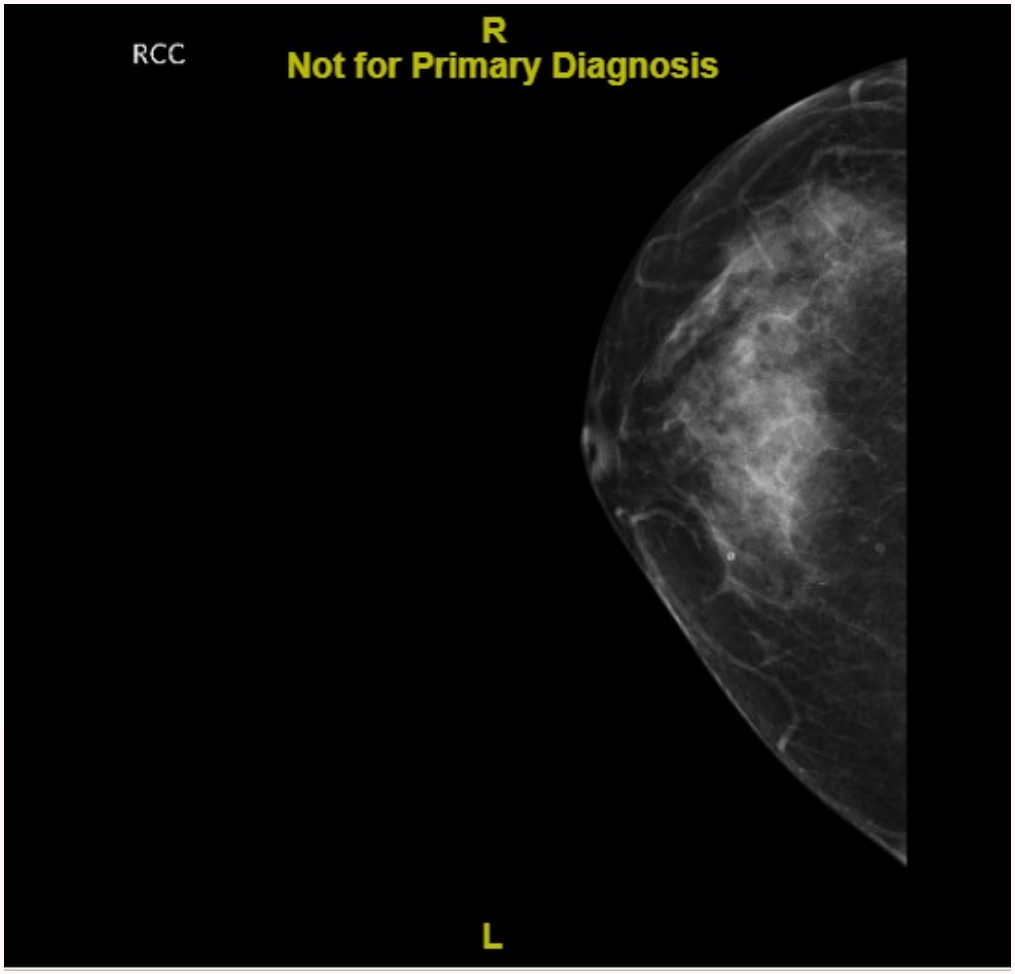
- 55-year-old morbidly obese female with a history of hypertension, diabetes mellitus, and smoking, who presented with severe dyspnea.
- Mass on her left breast.
- Right Pleural Effusion

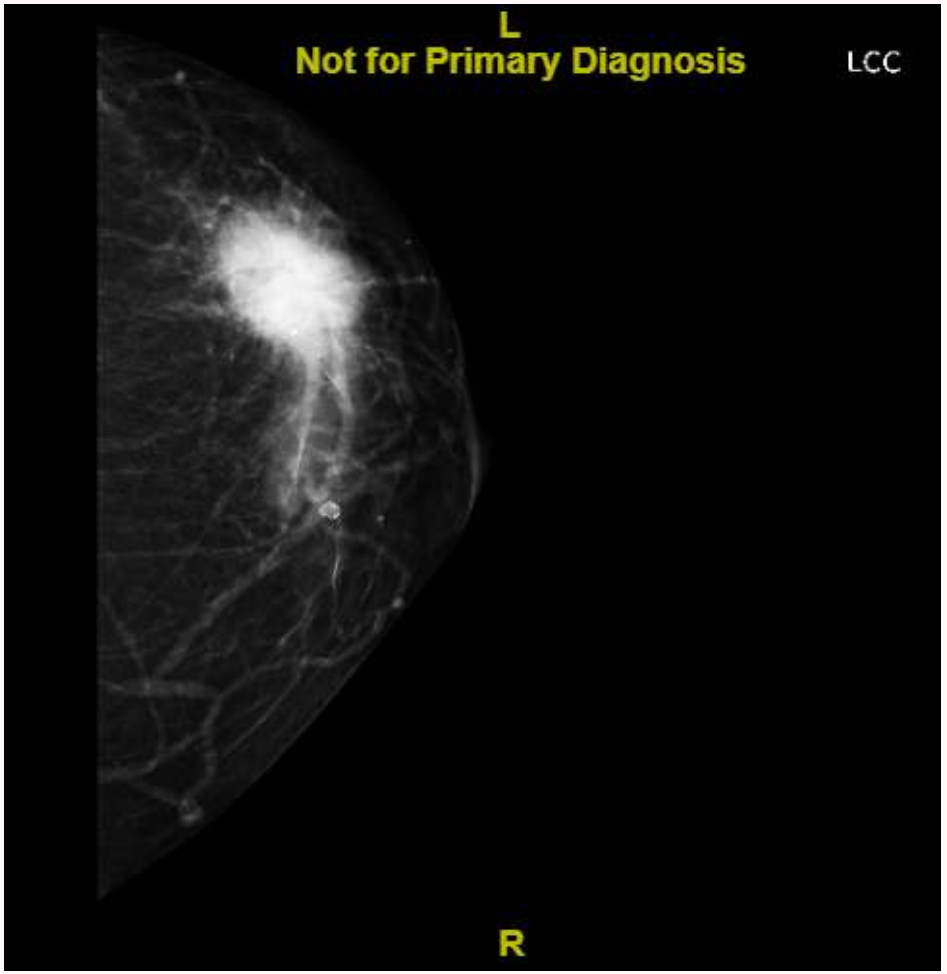
Slide 21

PAT1 tambahan saya

Arga Patrianagara, 2025-10-03T00:09:36.826

Mammografi


RCC
R
Not for Primary Diagnosis
L


L
Not for Primary Diagnosis
LCC
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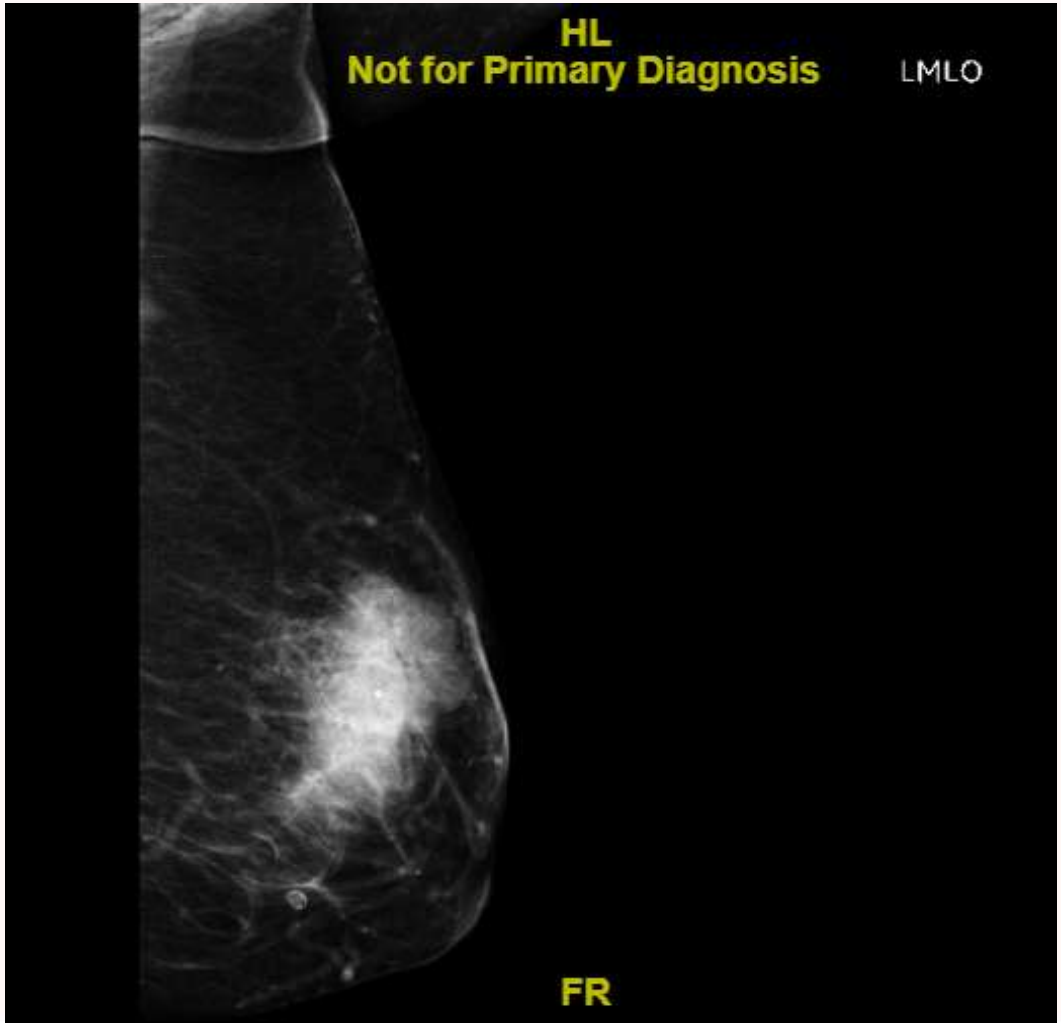
HL
Not for Primary Diagnosis
LMLO
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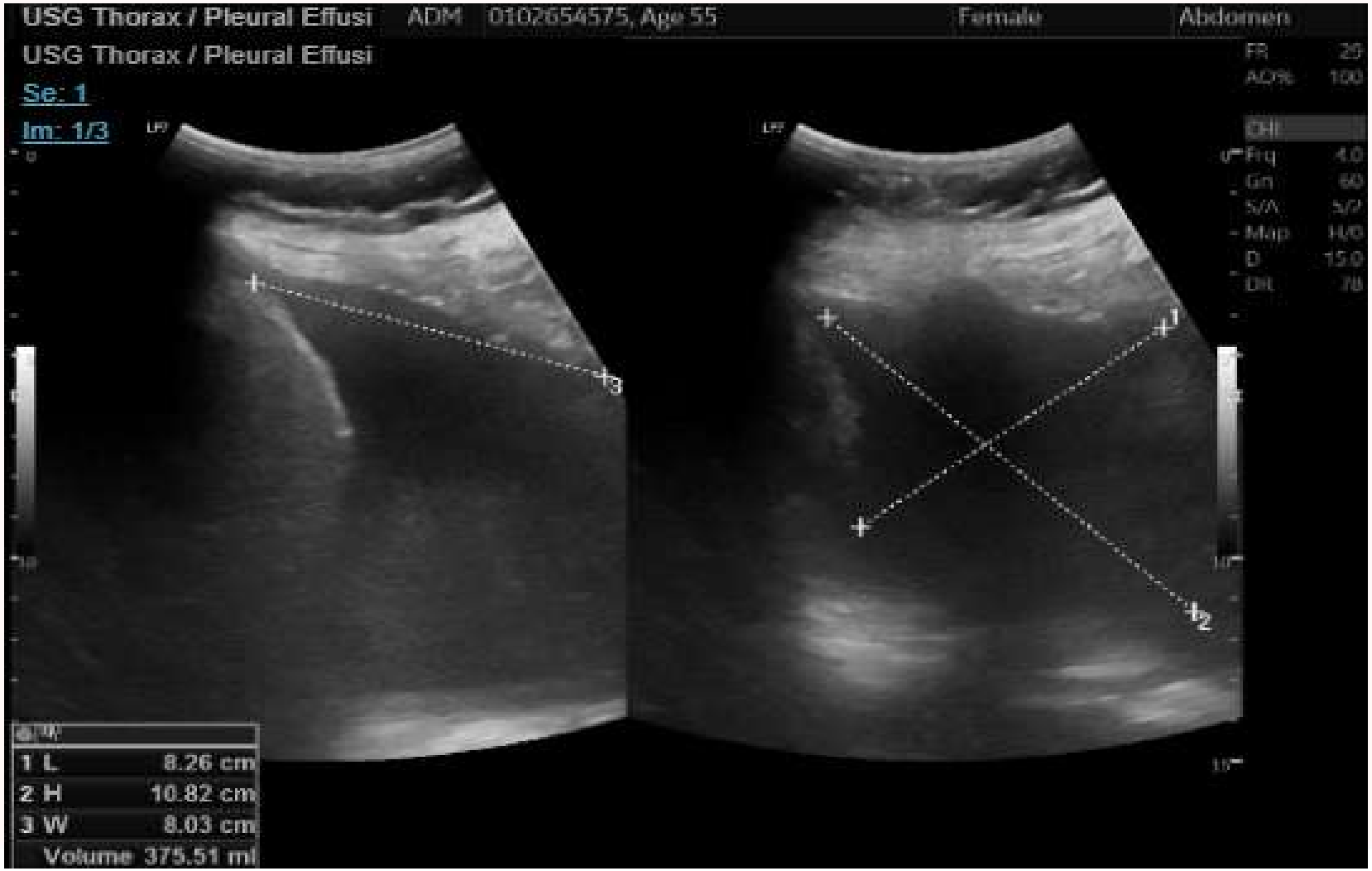
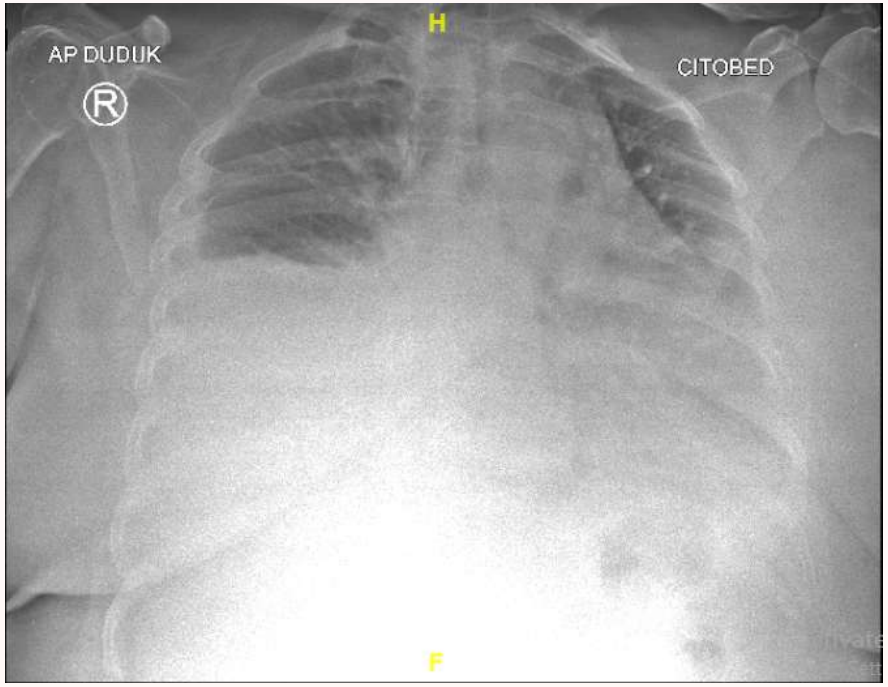
Chest US

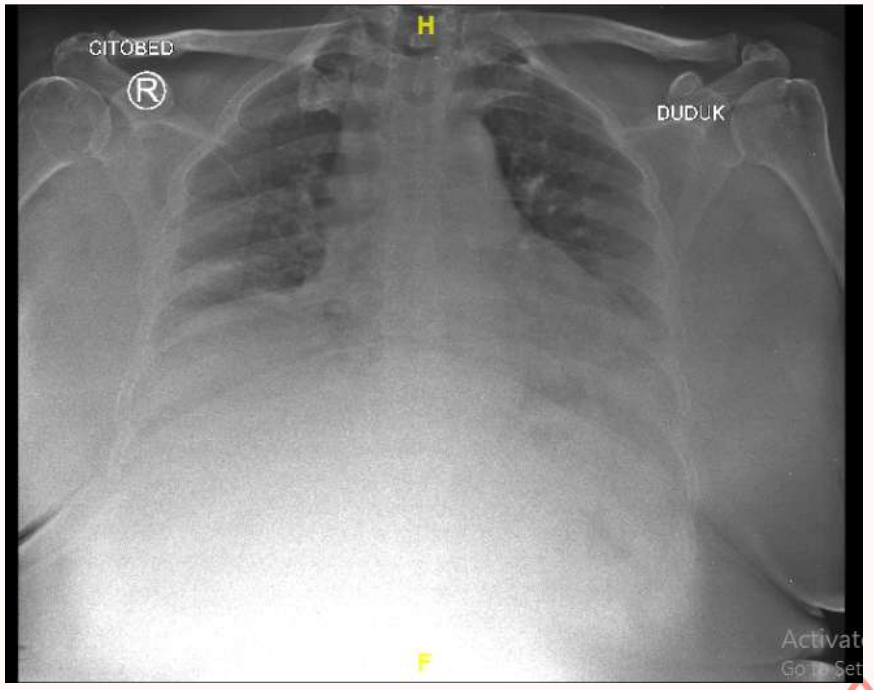

USG Thorax / Pleural Effusi ADM 0102654575, Age 55 Female Abdomen
USG Thorax / Pleural Effusi
Se: 1
Im: 1/3
1 L 8.26 cm
2 H 10.82 cm
3 W 8.03 cm
Volume 375.51 ml

Chest X-Ray

Initial



After Chest tube (Pigtail) Insertion



- **Breast USG** : highly suggestive malignant mass in left breast
- **CEA** : 10,56
- **CA-15-3** : 16 U/mL
- **Echocardiografi** : EF 30%

- **Core Needle Biopsy** diagnosis revealed a high-grade Invasive Carcinoma of No Special Type (IDC, NOS), WHO Grade III.
- **Immunohistochemistry (IHC)** and a confirmatory CISH/FISH test classified the tumor as ER/PR positive and HER2 amplified.
- **Pleural fluid cytology** confirmed metastatic adenocarcinoma, and a PET-CT identified uptake in the left breast and a large abdominal adnexal mass.

- The patient was started on a neoadjuvant regimen of dual-blocker (Pertuzumab, Trastuzumab) and taxane chemotherapy.
- During her course of chemotherapy, a breast tumor clip was inserted.
- After 8 series of Primary systemic therapy, She underwent Hysterectomy, continued in a month later for Breast Conserving Surgery (BCS) and Axillary Lymph Node Dissection (ALND).

- Final surgical pathology confirmed negative lymph nodes (0/14), clear surgical margins, a pathological response of Miller Payne Score 3, and a post-therapy IHC showing a shift to **HER2 negative (+1)** status.
- This case highlights a remarkable response to neoadjuvant therapy, the management of complex comorbidities, and the crucial role of a multidisciplinary team in navigating a complex case with
conflicting pathological findings and a successful shift from palliative to curative-intent treatment.

Core Needle Biopsy / Tru-cut Percutaneous Breast Biopsy

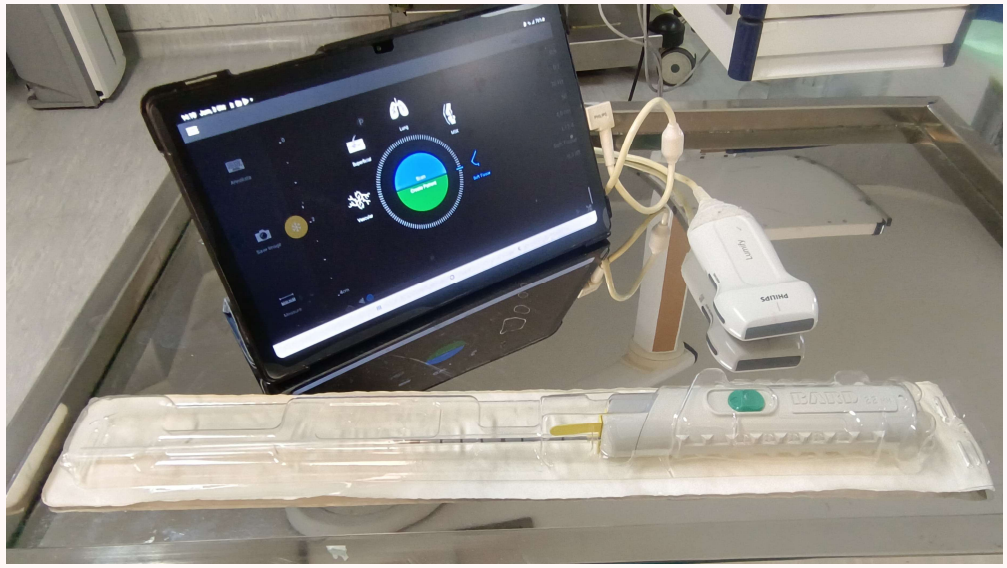
Needle gauge and size of cores :

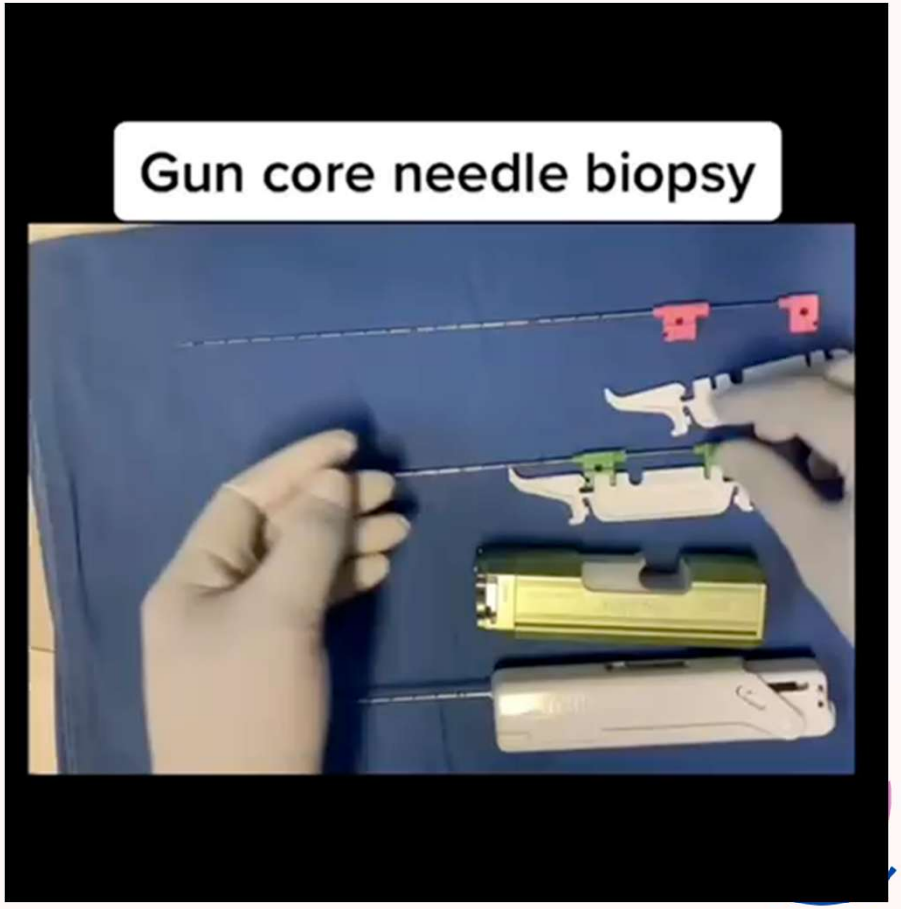
Gauge	~Diameter size, mm
22 or smaller	0.7 (single cells)
14	1.6
12	2
11	2.3
9_a	2.9
8	3.2
7	3.5

Preparation :

Core Needle Biopsy / Tru-cut Percutaneous Breast Biopsy

Setting:

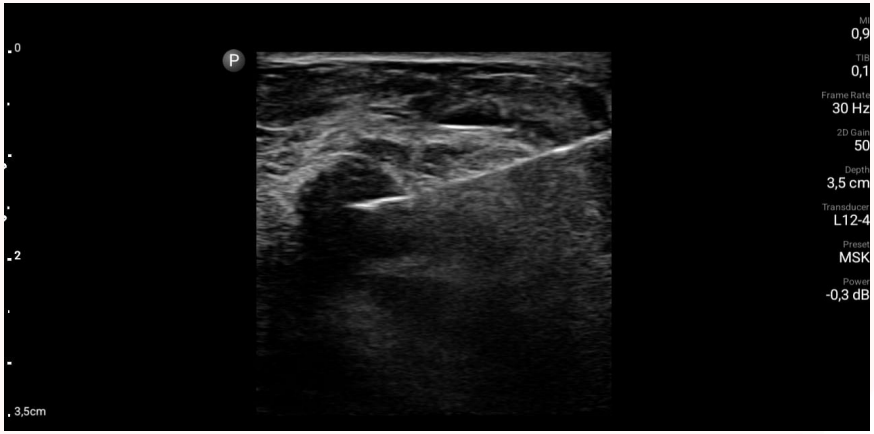




Core Needle Biopsies for Palpable Masses

Should we do it without image guiding?

- CNBs can be performed for palpable masses without imaging guidance.
- However, masses may be pushed rather than penetrated due to the pliability of the surrounding breast tissue.
- There is a high rate of false- negative results.
- In one study, 2/3 of the false-negative CNBs had been performed without image guidance, although this type of biopsy accounted for only half of the cases.



Shah VI, Raju U, Chitale D, Deshpande V, Gregory N, Strand V. False-negative core needle biopsies of the breast: an analysis of clinical, radiologic, and pathologic findings in 27 consecutive cases of missed breast cancer. Cancer. 2003;97:1824–31.

In the JKN Settings

MENTERI KESEHATAN
REPUBLIK INDONESIA

PERATURAN MENTERI KESEHATAN REPUBLIK INDONESIA
NOMOR 3 TAHUN 2023
TENTANG
STANDAR TARIF PELAYANAN KESEHATAN DALAM
PENYELENGGARAAN PROGRAM JAMINAN KESEHATAN

In the JKN Settings

TARIF INA-CBG
REGIONAL 1
RUMAH SAKIT KELAS A PEMERINTAH
RAWAT JALAN

NO	KODE INA-CBG	DESKRIPSI KODE INA-CBG	TARIF INA-CBG
127	L-2-41-0	PROSEDUR BEDAH PLASTIK	2.011.400
128	L-2-42-0	PROSEDUR LAIN-LAIN PADA KULIT DAN JARINGAN BAWAH KULIT	619.800
129	L-2-51-0	PROSEDUR PENGANGKATAN PAYUDARA	2.615.200
130	L-2-52-0	PROSEDUR BESAR PADA PAYUDARA TANPA PENGANGKATAN PAYUDARA	1.965.200
131	L-2-53-0	PROSEDUR KECIL PADA PAYUDARA TANPA PENGANGKATAN PAYUDARA	1.007.900
132	L-3-10-0	PROSEDUR KECIL LAIN-LAIN PADA PAYUDARA	696.400
133	L-3-11-0	PROSEDUR BESAR PADA KULIT	570.100
134	L-3-12-0	PROSEDUR KECIL PADA KULIT	442.400

In the JKN Settings

TARIF INA-CBG
REGIONAL 1
RUMAH SAKIT KELAS A SWASTA
RAWAT JALAN

NO	KODE INA-CBG	DESKRIPSI KODE INA-CBG	TARIF INA-CBG
80	L-2-41-0	PROSEDUR ELEKTROFISIOLOGIK	4.740.300
128	L-2-42-0	PROSEDUR LAIN-LAIN PADA KULIT DAN JARINGAN BAWAH KULIT	650.800
129	L-2-51-0	PROSEDUR PENGANGKATAN PAYUDARA	2.746.000
130	L-2-52-0	PROSEDUR BESAR PADA PAYUDARA TANPA PENGANGKATAN PAYUDARA	2.063.500
131	L-2-53-0	PROSEDUR KECIL PADA PAYUDARA TANPA PENGANGKATAN PAYUDARA	1.058.300
132	L-3-10-0	PROSEDUR KECIL LAIN-LAIN PADA PAYUDARA	731.200
133	L-3-11-0	PROSEDUR BESAR PADA KULIT	598.600
134	L-3-12-0	PROSEDUR KECIL PADA KULIT	464.600
135	M-2-10-0	PROSEDUR REKONTRUKSI TULANG KRANIAL DAN WAJAH	2.248.300
136	M-2-21-0	PROSEDUR BESAR PADA SENDI PANGGUL DAN PAHA	2.471.200

In the JKN Settings

TARIF INA-CBG
REGIONAL 5
RUMAH SAKIT KELAS D PEMERINTAH
RAWAT JALAN

NO	KODE INA-CBG	DESKRIPSI KODE INA-CBG	TARIF INA-CBG
126	L-2-41-0	PROSEDUR ELEKTROFISIOLOGIK [illegible]	3.751.500
127	L-2-41-0	PROSEDUR BEDAH PLASTIK	1.375.900
128	L-2-42-0	PROSEDUR LAIN-LAIN PADA KULIT DAN JARINGAN BAWAH KULIT	515.000
129	L-2-51-0	PROSEDUR PENGANGKATAN PAYUDARA	2.173.300
130	L-2-52-0	PROSEDUR BESAR PADA PAYUDARA TANPA PENGANGKATAN PAYUDARA	1.382.800
131	L-2-53-0	PROSEDUR KECIL PADA PAYUDARA TANPA PENGANGKATAN PAYUDARA	881.600
132	L-3-10-0	PROSEDUR KECIL LAIN-LAIN PADA PAYUDARA	578.700
133	L-3-11-0	PROSEDUR BESAR PADA KULIT	399.900

Core Needle Biopsy Pricing

TSK ACECUT BIOPSY NEEDLE 14G X 115MM; 16MM NEEDLE PENETRATION

4815000088-AK1-001323628

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Verified Vendor

Rp 448.440,00

Summary

Treatment and type of definitive surgery for malignant breast tumor should have been discussed with the patient preoperatively, include the stage, biological characteristics of tumor, patient's preferences[1].

CORE NEEDLE BIOPSY is the type of biopsy recommended by guidelines.[1,2]

Core biopsy is standard of choice : complete histological info, accuracy > 90%

Minimally invasive biopsy offers better patient comfort, cosmetic outcomes, lower morbidity, and reduced costs.[3,4]

Accurate diagnosis requires strong radiology–pathology concordance and careful handling of sampling limitations[5].

1. Loibl S, et al. Early breast cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. Ann Oncol. 2024;35(2):159-182. **2**. NCCN. Breast Cancer Screening and Diagnosis v2. 2024. https://www.nccn.org/professionals/physician_gls/pdf/breast-screening.pdf (accessed 15 Sept 2025). **3.** Holmes, D & Silverstein, M., 2006; 4. Vargas. H, Agbunag. R, & Khalkhali.I. Diagnosis of Palpable Breast Masses:Ultrasound-Guided Large Core Biopsy in a Multidisciplinary Setting. THE AMERICAN SURGEON. Oct 2000; https://doi.org/10.1177/000313480407001008 5. Cadavid-Fernández N, Carretero-Barrio I, Moreno-Moreno E, Rodríguez-Villena A, Palacios J, Pérez-Mies B. The role of core needle biopsy in diagnostic breast pathology. Rev Senol Patol Mamar. 2022;35(S3):S3–S12.

THANK YOU