

# BREAST OPEN SURGERY WITHOUT PRIOR BIOPSY AVAILABLE?



Rapport des anatomopathologistes groupe de travail « dépistage du cancer du sein » de l'UE.  
Recommandations européennes pour l'assurance qualité dans le cadre du dépistage  
mammographique du cancer du sein Ann Pathol 1996;16:315-333

O'Higgins N, Linos DA, Blichert-Toft M, Cataliotti L, de Wolf C, Rochard F et al  
European guidelines for quality assurance in the surgical management of  
mammographically detected lesions  
Ann Chir Gynaecol 1998;87:110-2



Journées Francophones  
d'Imagerie Médicale

15th edition MUMBAI November 2016

Dr Thierry POUSSE Clinical Center  
SOYAUX



# BREAST LESION

- Reference biopsy is it absolutely necessary before take care of breast lesion?
- Relevance sampling: minimum number of samples required for the diagnosis based on the lesion (type of biopsy /guidance mode )
- The radiologist has he pre-per-post biopsy arguments to conclude the consistent and contributory of levies ?

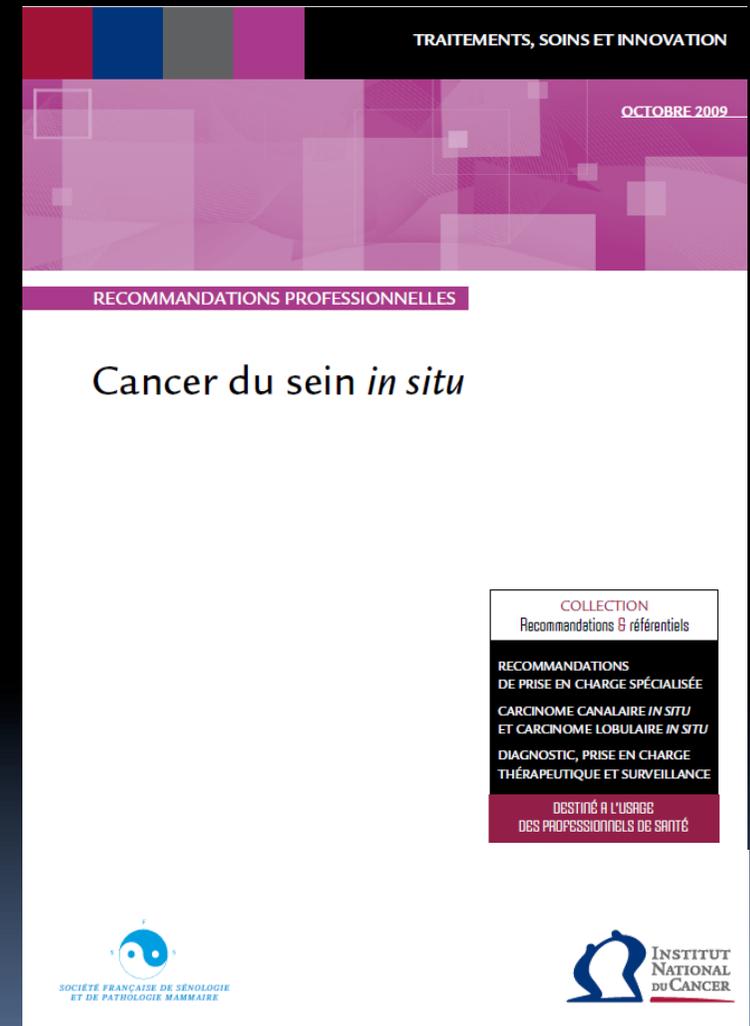


# LEVEL OF EVIDENCE

- The level of evidence is the listing of the literature data on which recommendations are made. It depends on the type and quality of the available studies and the consistency or not of their results; it is specified for each of the methods / interventions considered under the following headings:
  - A/B/C/D

Reference biopsy: is it absolutely  
necessary before take care of  
breast lesion?

# INCA RECOMMANDATION S



# BREAST LESION IMAGING

## Screening or diagnosis

- Mammography: full digital mammography , 3D digital breast tomosynthesis
- Sonography: high frequency probe, doppler , elastography
- MRI : 1.5/3T morphology , perfusion, diffusion, spectroscopy

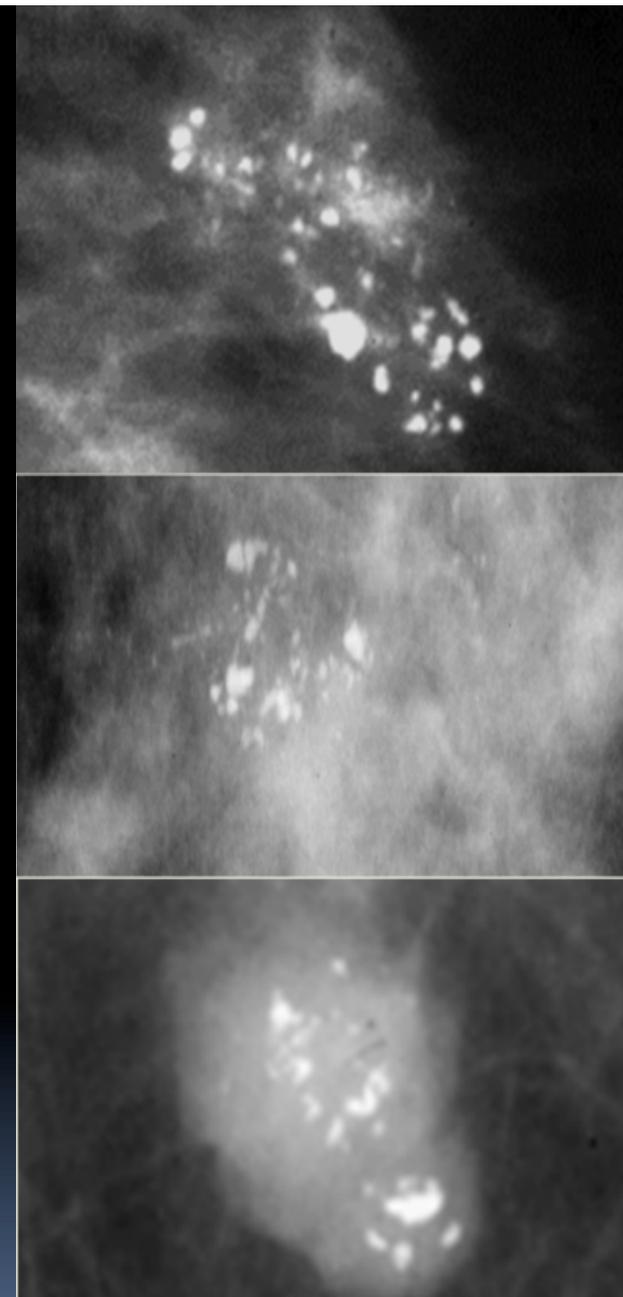
**GOAL : Evaluation of the risk BIRADS**  
**Classification**

Histological diagnosis by pathologist always mandatory!

No histological diagnosis on imaging but diagnosis hypothesis and therapeutic strategy....

# BIRADS III

- Probably benign:  
malignancy=0.2-5%
- Follow up :4- 6 months
- No biopsy indication except
  - \*high risk patient BRCA mutation
  - \*synchronous cancer
  - \* impossible follow up,  
cancerophobia



**Assessment and Management of Challenging BIRADS Category 3 Mammographic lesions**

A Y Michaels ,RobinL Birdwell, Chris SungWonChung, Elizabeth P Frost, Catherine G Giess

Radiographics sept 2016; 1261-1272

BI-RADS category 3 lesions should be carefully scrutinized during follow-up, as many of these lesions represent diagnostically challenging case.

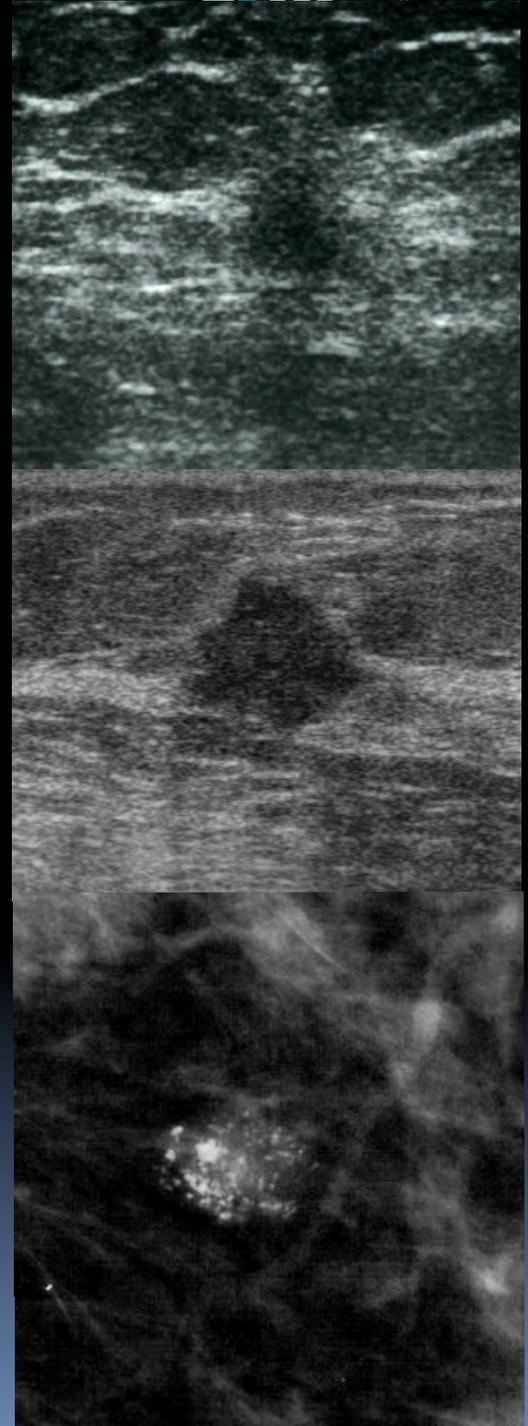
An initial assessment of probable benignity should not bias the subsequent radiologist's assessment; a complete diagnostic evaluation and an objective approach are critical in these evaluation. The radiologist performing the follow-up diagnostic evaluation for a lesion previously assessed as BI-RADS category 3 should objectively determine whether the lesion truly merits a probably benign categorization. Although the original definition of a BI-RADS category 3 lesion assumed there was no prior image for comparison, in clinical practice, many lesions with available prior images are placed into BI-RADS category 3. In the correct clinical context, this practice can avert many unnecessary biopsies when probably benign causes are suspected. Although interval change is an important feature of malignancy, many benign lesions also change over time. Imaging change may be balanced against morphology, clinical history, and clinical experience in lesion assessment and management.

## **Assessment and Management of Challenging BIRADS Category 3 Mammographic lesions**

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Radiographics sept 2016; 1261-1272

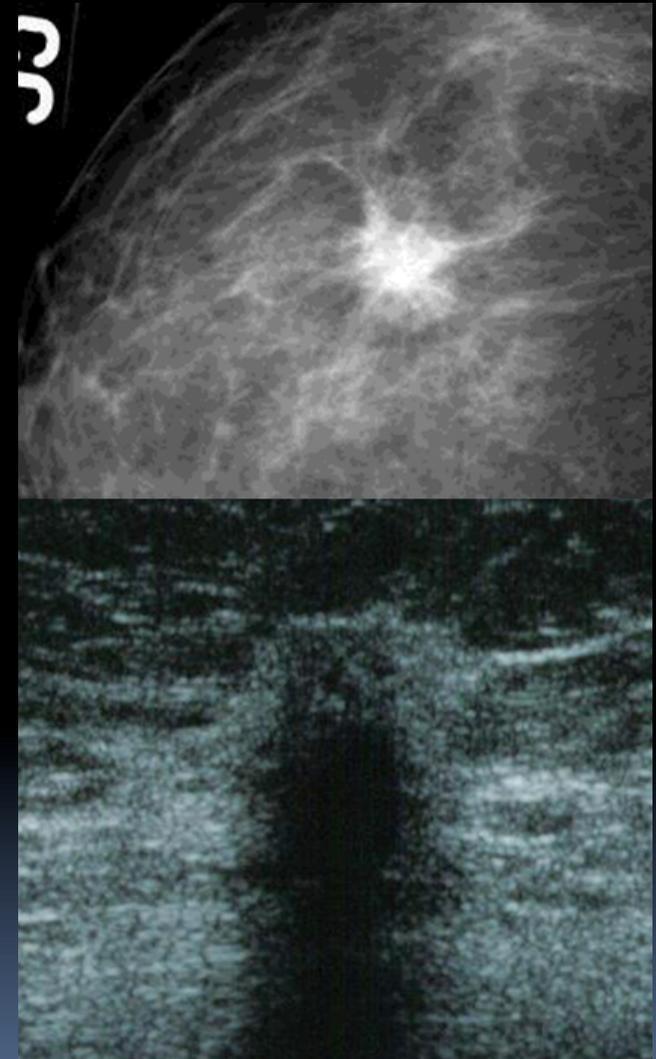
# BIRADS 4

- Suspicious lesion of malignancy  
5-95%
- Biopsy indication
- 4a?



# BIRADS 5-6

- Very suspicious of malignancy
- Fine needle aspiration  
no more or sentinel lymph node
- Core biopsy :16- 14 G  
histology HR- Her- 2
- Suspicious of recidive after  
surgery or radiotherapy



Birads 1	screening
Birads 2	screening
Birads 3	<u>Follow up except high risk</u>
Birads 4 a	<u>Follow up except progressive or high risk</u>
Birads 4 <u>b,c</u>	LCB or VABB <u>diagnosis</u>
Birads 5/6	LCB or VABB <u>diagnosis ou stategical</u>

**TABLE 2 Breast Imaging Reporting and Data System (BI-RADS) Assessment and Malignant Core Biopsy Results in 1027 Lesions**

Procedure	BI-RADS 3		BI-RADS 4		BI-RADS 5	
	No. of Lesions	No. (%) Lesions Found Malignant	No. of Lesions	No. (%) Lesions Found Malignant	No. of Lesions	No. (%) Lesions Found Malignant
Stereotactically guided	16	1 (6)	299	39 (13)	6	5 (83)
Sonographically guided	18	0 (0)	668	61 (9)	20	19 (95)
<b>Total</b>	<b>34</b>	<b>1 (3)</b>	<b>967</b>	<b>100 (10)</b>	<b>26</b>	<b>24 (92)</b>

Frederick R Margolin J W T Leung Richard P Jacobs Suzan R Denny  
 Percutaneous Imaging guided core breast biopsy  
 5 years experience in a community hospital AJR : 177,  
 sept2001

# BIOPSY MODALITIES

## Calcifications

- \* Percutaneous macrobiopsy (aspiration)
- \* Percutaneous microbiopsy if macrobiopsy not possible

## Palpable masses and / mammo-echo

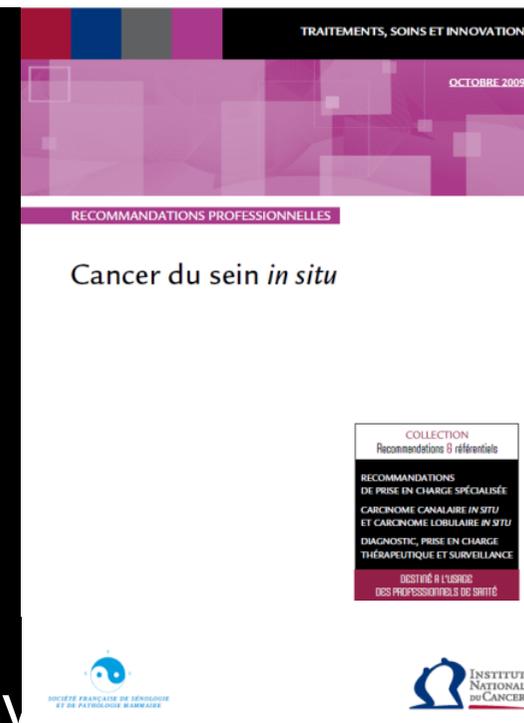
- \* percutaneous microbiopsy

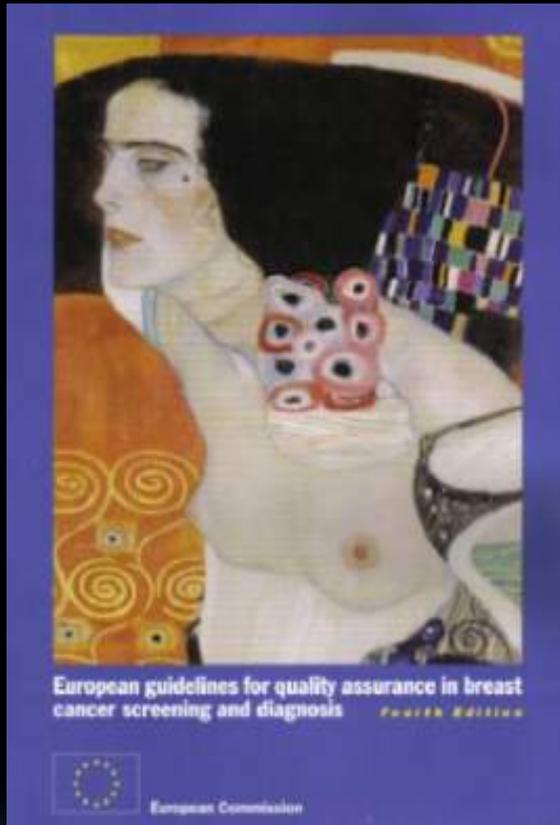
## Percutaneous biopsy not possible

- \* surgical biopsy

## Imaging –guided percutaneous breast sampling

C Chaveron, F Bachellet, L Ceugnart, L Deschildre, I Fauquet, G Hurtevent-Labrot 28èmes journées SFSPM Lille nov.





According to the guidelines of European Society of Breast Imaging( EUSOBI ) up to 90% of suspicious breast lesions BIRADS 4- 5 should undergo most effective percutaneous biopsy before further treatment

Directive européenne sur l' interventionnel mammaire EUSOBI  
K. KINKEL A. TARDIVON Imagerie de la femme 2008 vol 18  
p83-88



## Effective Health Care Program

Comparative Effectiveness Review  
Number 139

# Core Needle and Open Surgical Biopsy for Diagnosis of Breast Lesions:

## An Update to the 2009 Report

### Conclusions

A large body of evidence indicates that ultrasound and stereotactically guided core needle biopsy procedures have sensitivity and specificity close to that of open biopsy procedures, and are associated with fewer adverse events. The strength of the evidence on the test performance of these methods is deemed moderate because studies are at medium to high risk of bias, but provide precise results and exhibit low heterogeneity. Freehand procedures have lower sensitivity than imaging-guided methods. The strength of conclusions about the comparative test performance of automated and vacuum-assisted devices (when using the same imaging guidance) is deemed low, because of concerns about the risk of bias of included studies and the reliance on indirect comparisons. There were insufficient data to draw conclusions for MRI-guided biopsy or women at high baseline risk of cancer. Harms were reported inconsistently, raising concerns about selective outcome and analysis reporting. There is low strength of evidence that vacuum-assisted procedures appear to have a higher risk of bleeding than automated methods. There is moderate strength of evidence that women diagnosed with breast cancer by core needle biopsy are more likely to have their cancer treated with a single surgical procedure, compared with women diagnosed by open surgical biopsy.

**Suggested citation:** Dahabreh IJ, Wieland LS, Adam GP, Halladay C, Lau J, Trikalinos TA. Core Needle and Open Surgical Biopsy for Diagnosis of Breast Lesions: An Update to the 2009 Report. Comparative Effectiveness Review No. 139. (Prepared by the Brown Evidence-based Practice Center under Contract 290-2012-00012-I.) AHRQ Publication No. 14-EHC040-EF. Rockville, MD: Agency for Healthcare Research and Quality. September 2014.  
[www.effectivehealthcare.ahrq.gov/reports/final.cfm](http://www.effectivehealthcare.ahrq.gov/reports/final.cfm).

# Interventionnal methods : Fine Needle Aspiration cytology FNAC

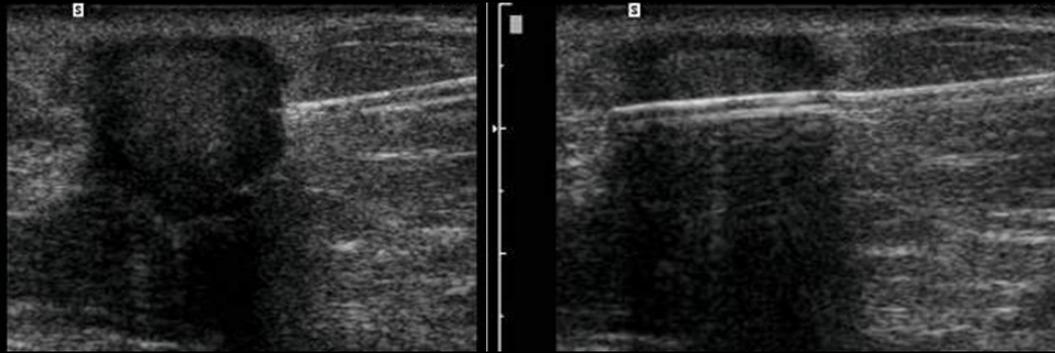
BRITTON PD The BREAST 1999; 8-15 meta analysis 31  
studies 17108 cases

	Sonography	
	FNAC	CNB
N =	2,673	1,851
<u>Sensitivity</u>	83,1	96,7
<u>Specificity</u>	84,0	98,7

**FNAC is inadvisable as a standard method**

Atypic Cysts with thick content: hypoechogenicity posterior enforcement

# LARGE CORE NEEDLE BIOPSY/ US



Author	Year	Sensitivity	Specificity
Parker	1991	100 %	100 %
Schulz-Wendtland	1994 / 1998	98 %	100 %
Britton	1997	89 %	89 %
Heywang-Köbrunner	1997 / 1998	98 %	100 %
Taki	1997	89 %	95 %
Fornage	1999	100 %	100 %

„ The False Rate of 2.6 ( 8 / 307 maligne Diagnosis)LCNB with a high sensitivity (97%) and specificity (94%) is an excellent alternative in contrast to the wire marking.“

Verkooijen HM, Peeters PH, Buskens E et al. Br J Cancer 2000; 82: 1017-1021

Plantade R Hammou JC Gerard F &al Macrobiopsies assistées par le vide sous échographie  
À propos de 382 cas J Radiol2005;86:1003-15

# VABB Directional Vacuum - Assisted Breast Biopsy

## STEREOTACTIC GUIDANCE

- local anesthesia
- external procedure
- Explanation +++
- Time 15 to 40 mn

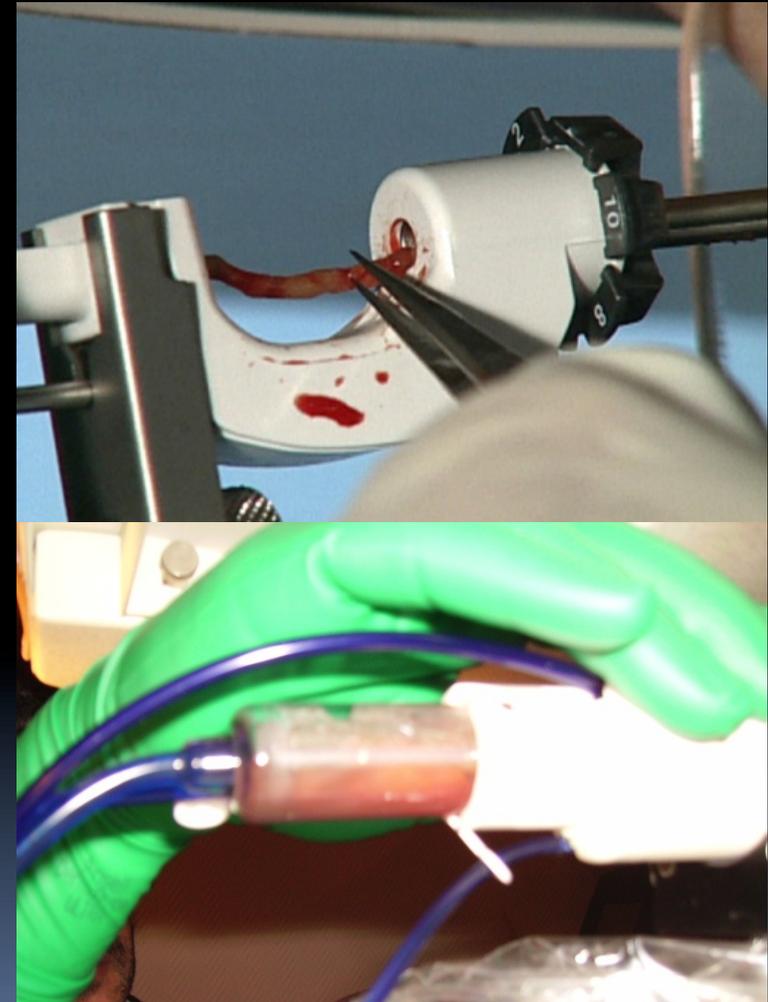


14 G  
17 mg

11 G  
95 mg

10 G  
160 mg

8 G  
300 mg



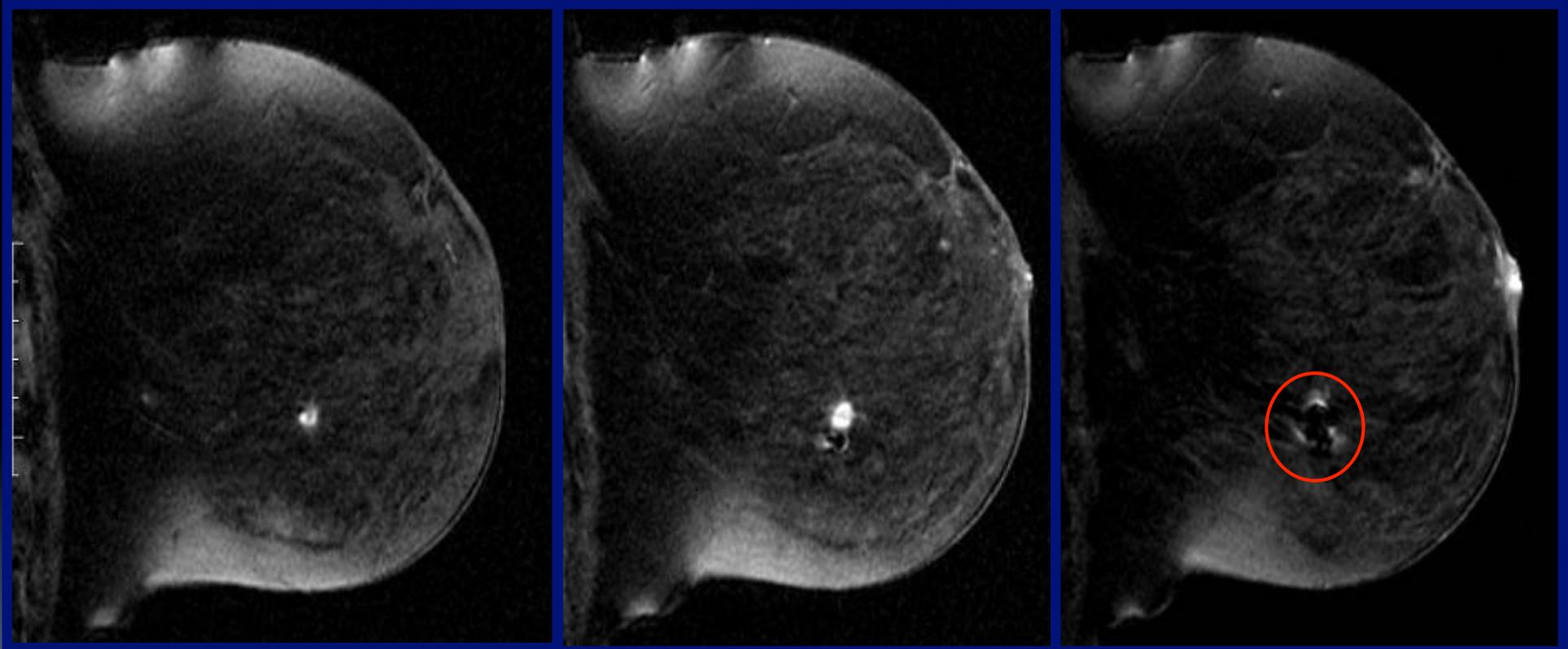
## Indications for diagnosis representative of ablative vacuum biopsy

### US GUIDANCE

1. After Large core needle biopsy(LCNB) and suspicion of breast cancer BIRADS 4c-5 , mismatch, discordance of results of diagnostic imaging and histology
2. Suspicious lesions BIRADS 4 -5 diameter  $5\text{mm} \Phi \leq$
3. Resection of definitely benign but symptomatic finding or high risk patients
  - \*symptomatic fibroadenomas
  - \* recurrent symptomatic cyst
4. Intraductal/intracystical proliferations: singulary papilloma, complex cyst
5. Suspicious of local recurrence
6. Neoadjuvant Chemotherapy
7. Hazardous or dangerous location: deep superficial , implants

# VABB Directional Vacuum - Assisted Breast Biopsy

## MRI GUIDANCE



Post contrast image of lesion

Confirmation of obturateur  
location near lesion

Post biopsy control  
image

# Macrobiopsy / MRI

auteur	année	type	Mri lésions (nbre patients)	Temps moyen	unique	multiple	% complication	% succès	% cancer
Liberman et al.	2003	VA	27 (20)	49	35	69	1 (4)	26/27 (96)	8/27 (30)
Lehman et al	2005	VA	38 (28)	50	39	61		38/38 (100)	15/38 (40)
Orel et al	2005	VA	85 (75)	30-60			0	85/85 (100)	52/85 (61)

Fast MRI Guided Vacuum assisted Breast Biopsy : initial experience Laura

Liberman & al

Dept of radiology breast imaging Memorial Sloan Kettering Cancer Center AJR 2003; 181:1283-1293

Clinical Experience with MRI Guided Vacuum Assisted Breast Biopsy C D Lehman & al

Dept of radiology University of Washington Medical Center 1959 NE Seattle WA Mayo Clinic san pablo rd Jacksonville FL ajr 2005;184:1782-1778

MRI guided 9G vacuum assisted core needle breast biopsy: initial experience S G Orel & al

Dept Radiology and Pathology Lab Med University of Pennsylvania University Spruce street PA Radiology 2005;10:1148

MRI Guided Vacuum Breast Biopsy Perlet C , Heywan Kobrunner S , Heinig A & al

Cancer 2006;106:982-90

# BIOPSY MATCHING and CONTRIBUTORY

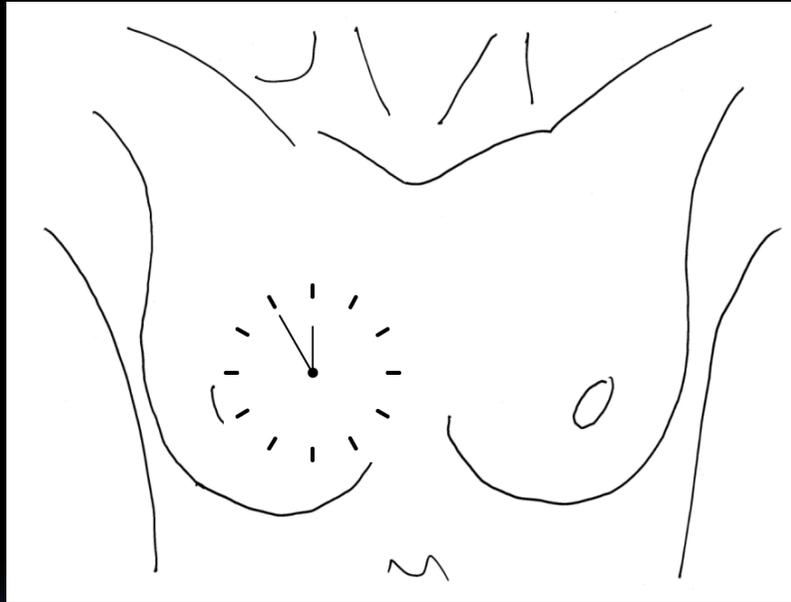
- **BEFORE** consultation of feasibility, written informed consent
- **MEANWHILE** technical , sampling , formalin fixation
- **AFTER** checking J8-J15( +/- imaging ) radiological-pathological concordance , multidisciplinary consulting meeting

## Percutaneous Breast Biopsy: Effect on Short-term Quality of Life

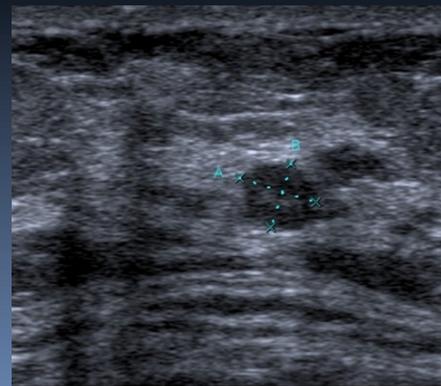
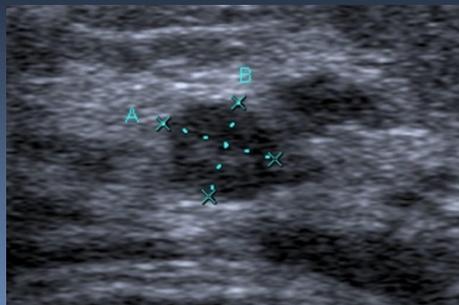
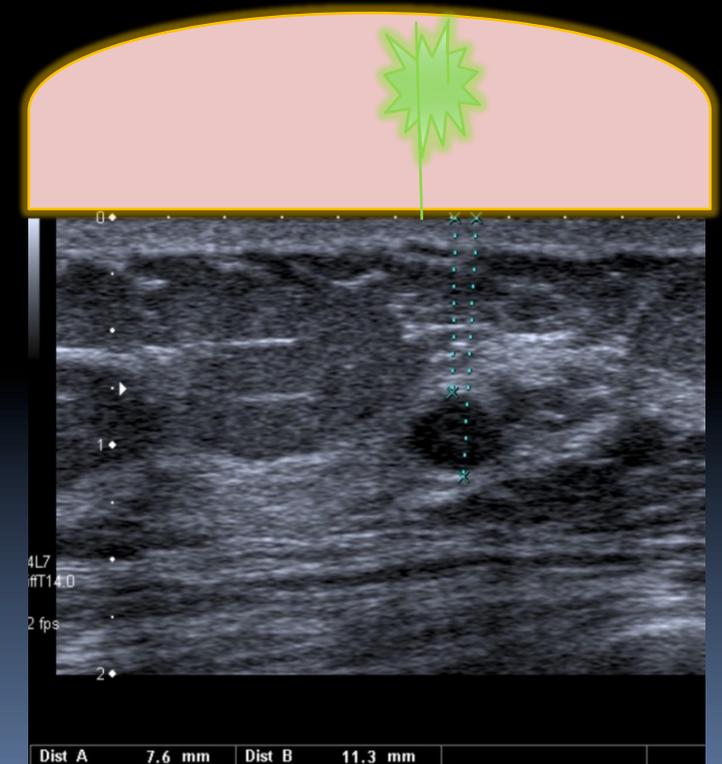
Kathryn L. Humphrey; Janie M. Lee; Karen Donelan; Chung Y. Kong; Olubunmi Williams; Omosalewa Itauma; Elkan F. Halpern; Beverly J. Gerade; Elizabeth A. Rafferty; J. Shannon Swan;  
MIT MGH , Boston, *Radiology* 2013, 10.1148/radiol.13130865

# Balistic target tracking

US /RX /MRI



Side  
Size L x l x h  
Location  
Depth/ skin  
surface



## BIOPSY RESULTS ...in line with the expectations

- Written informed patient absolutely required before all breast procedure
- Risks explained to the patient : bleeding, infection ( stop anticoagulation for a short period before biopsy)
- Patient should be informed of potential disadvantages and benefits of biopsy
  - benign -> contribution to avoid surgery
  - confirmation of malignancy -> therapeutic strategy
- Multidisciplinary consultation meeting
- Impact on younger patients : tailored prebiopsy counseling

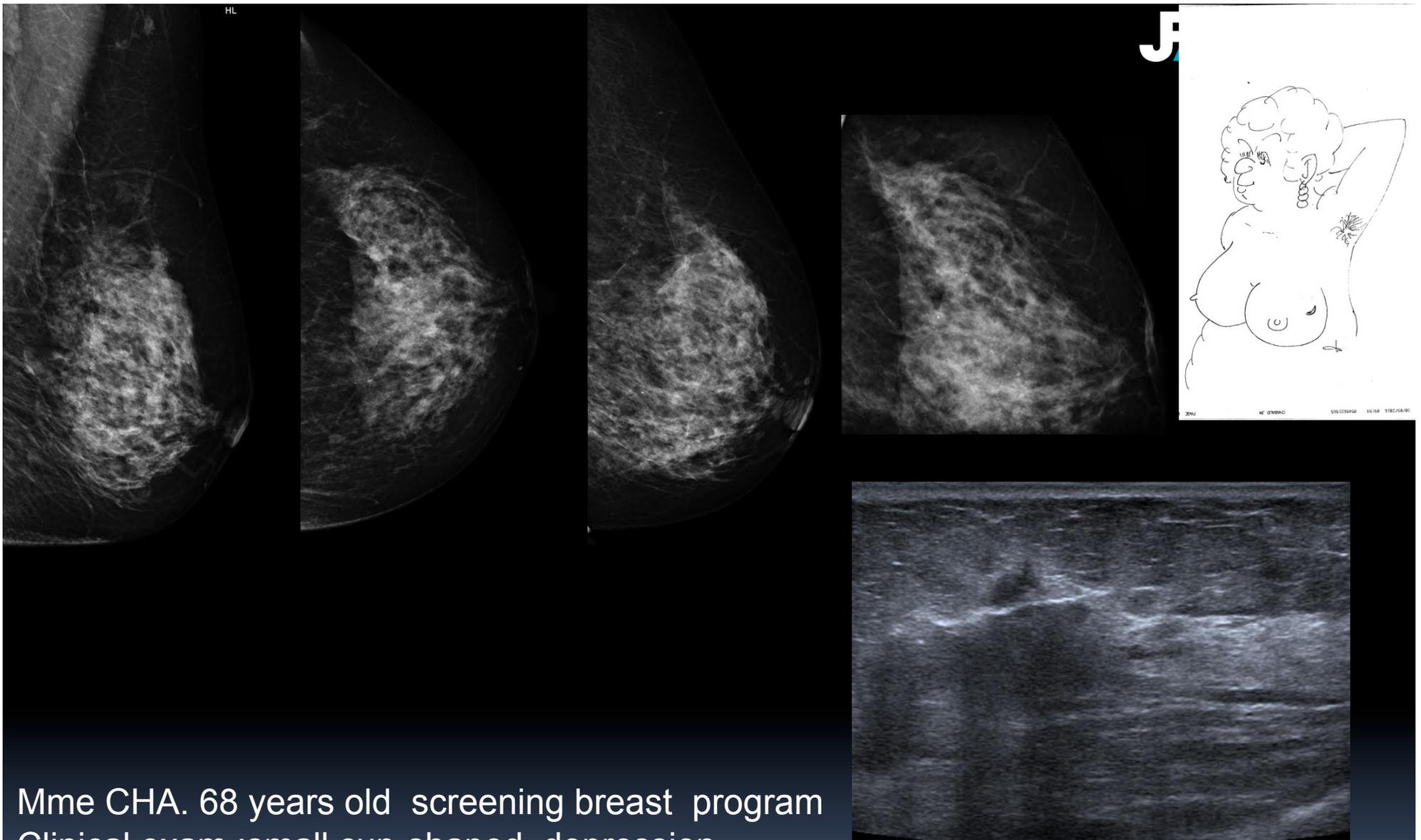
### Percutaneous Breast Biopsy: Effect on Short-term Quality of Life

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### Breast Intervention: How I Do It

Mary C. Mahoney, Mary S. Newell, Cincinnati, Atlanta Radiology, 2013, Vol.268: 12-24, 10.1148/radiol.13120985

**Quelles indications stratégiques des prélèvements percutanés avant la chirurgie et les traitements adjuvants**



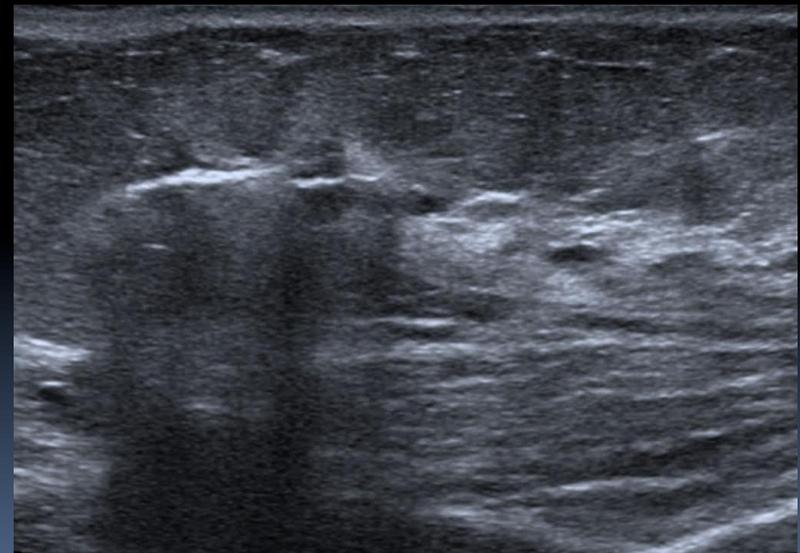
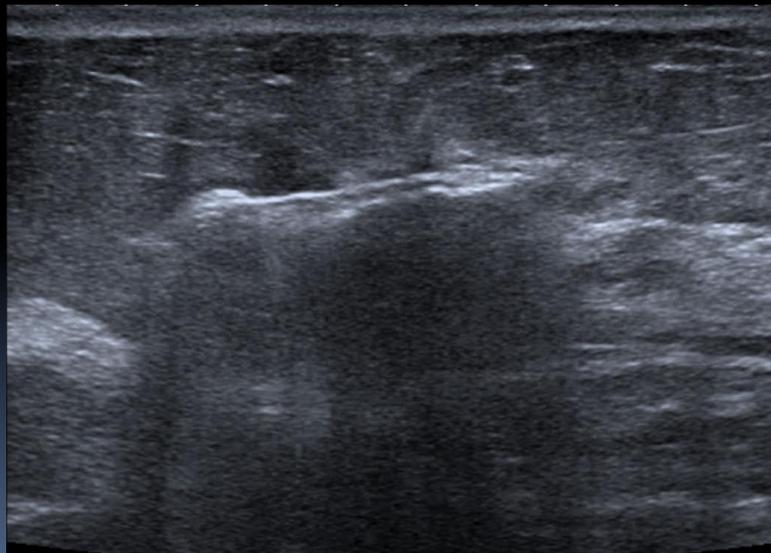
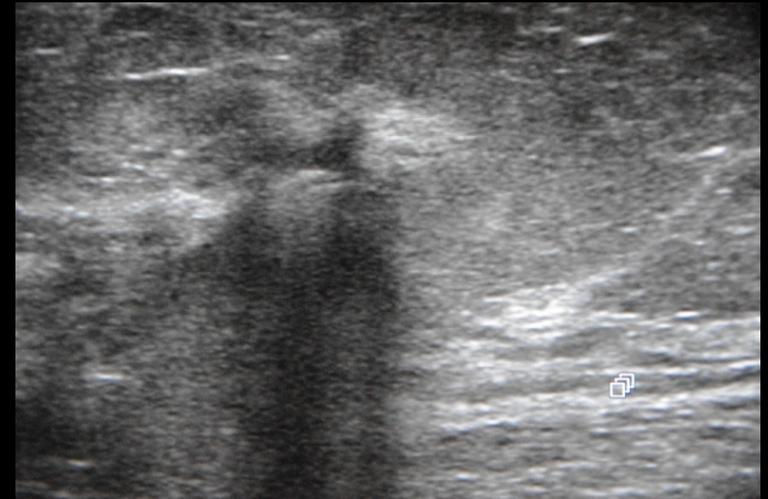
Mme CHA. 68 years old screening breast program

Clinical exam :small cup-shaped depression

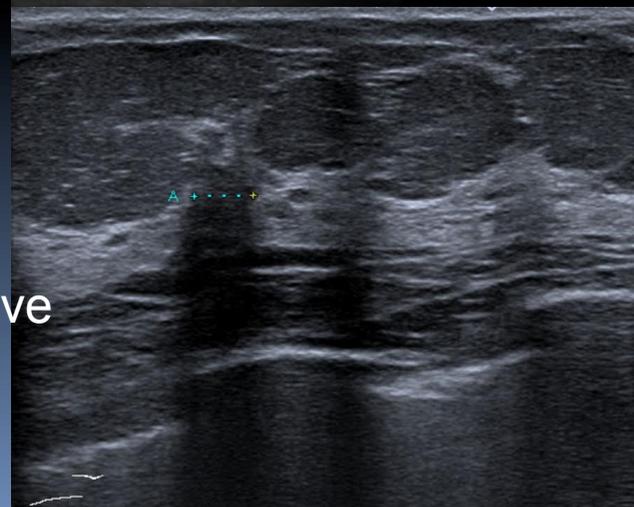
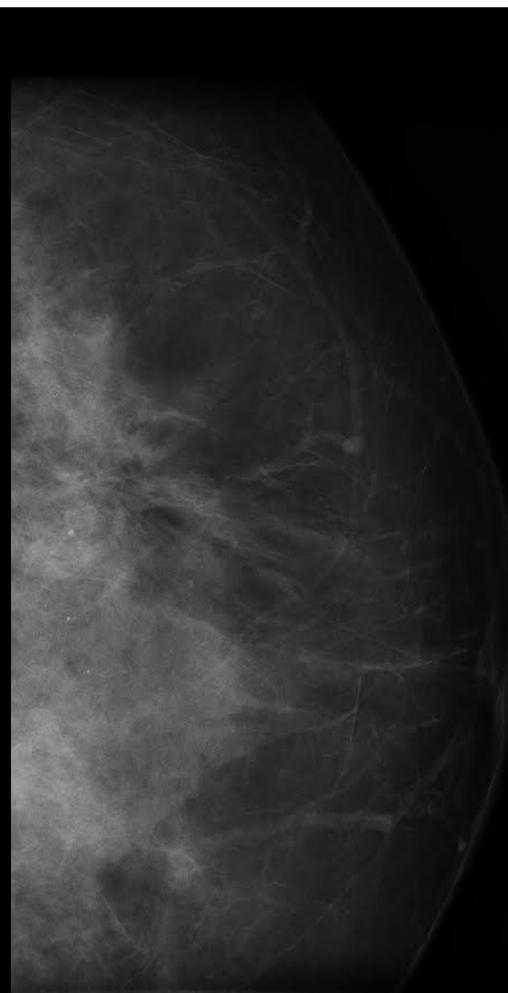
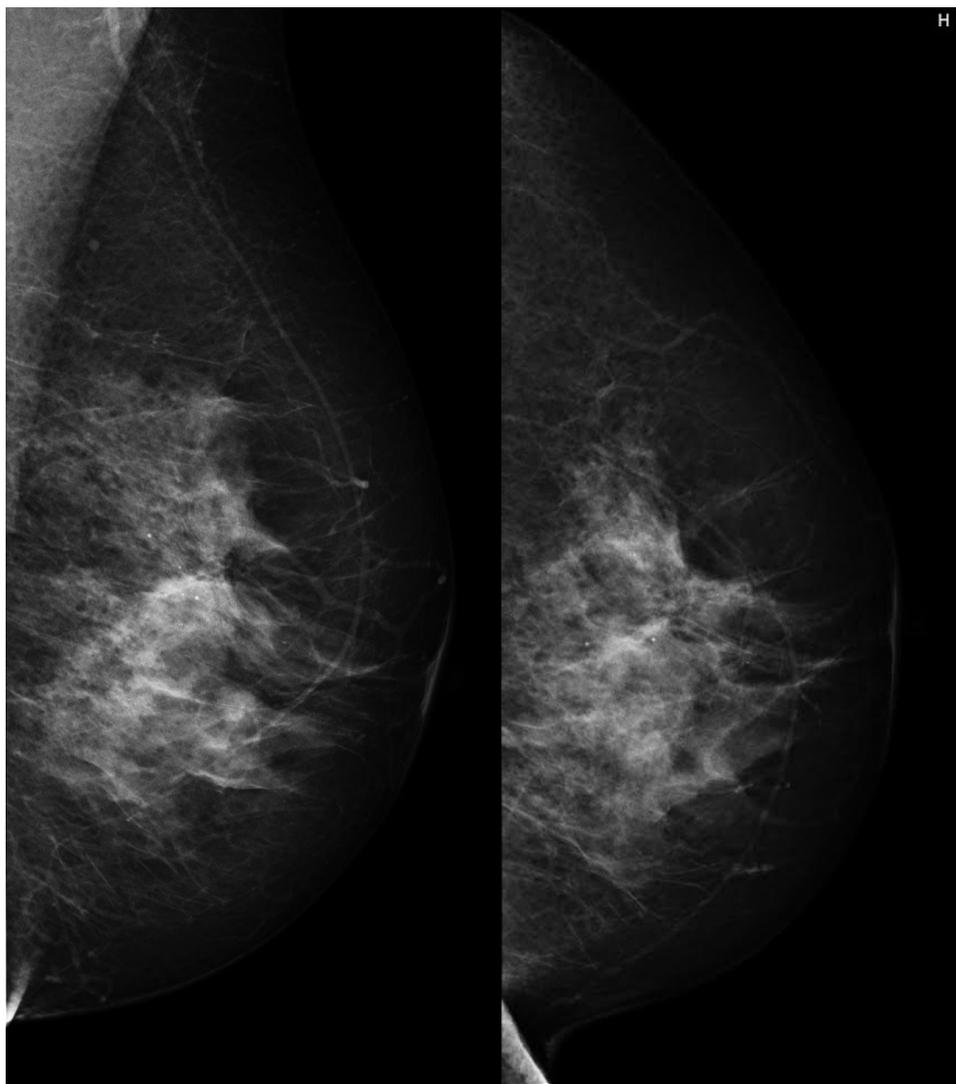
Asymmetrical density gradient left SEQ

Microbiopsy : radial scar

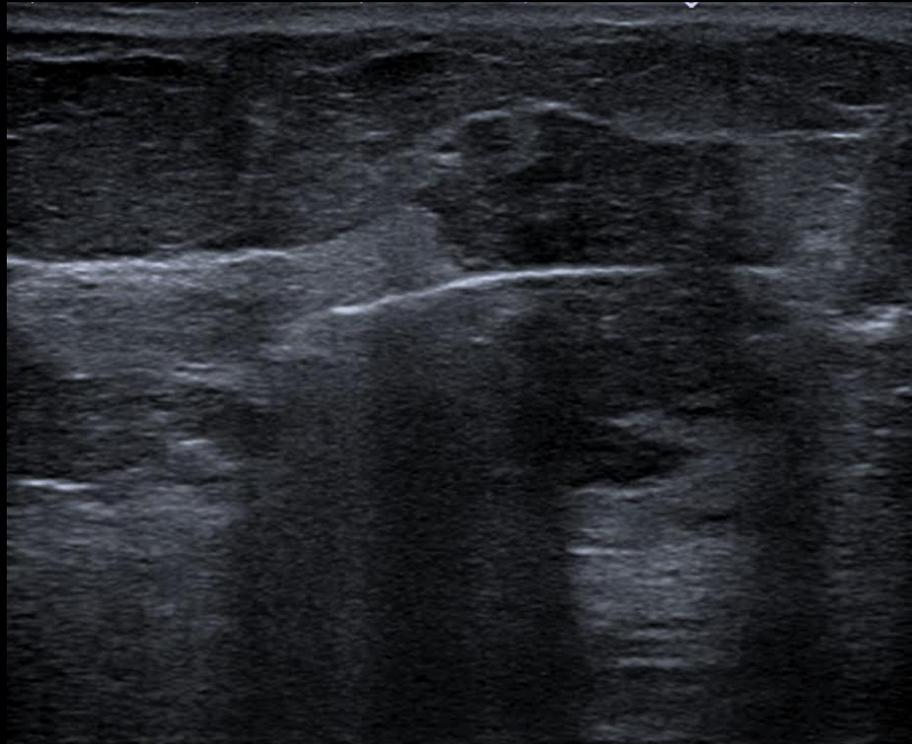
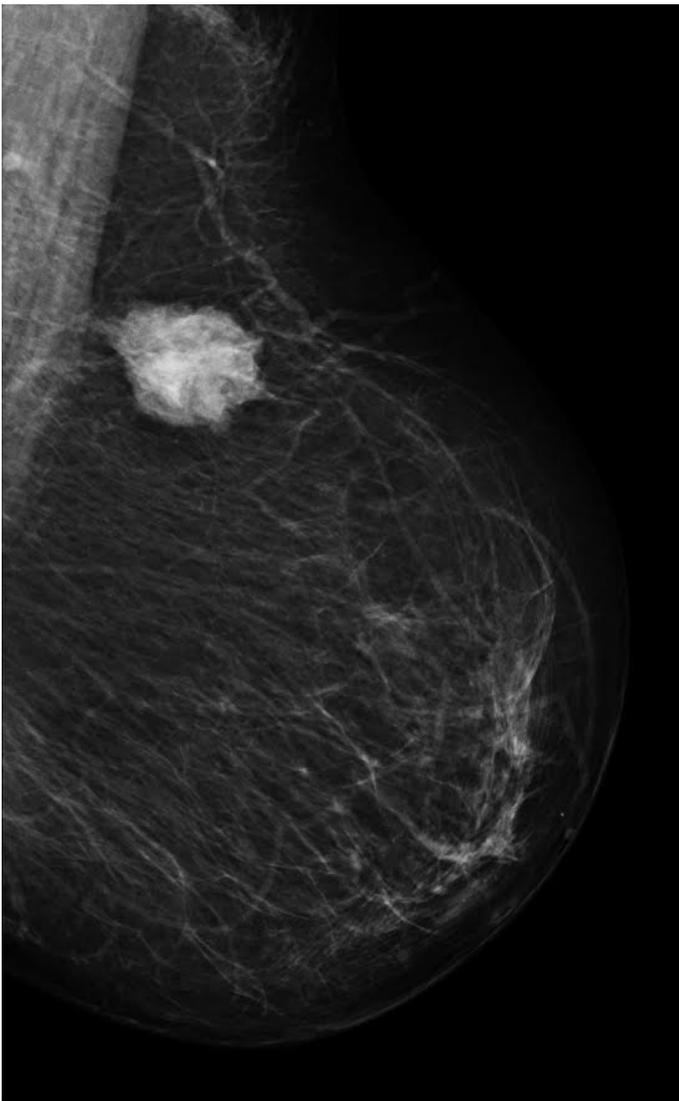
Multidisciplinary consult meeting : mismatch ? -> surgeon doubt



Macrobiopsy /US : radial scar + $\mu$  CLIS



Mme CHE. 44 years old  
 Swelling QSE G: microbiopsy -> negative  
 Mismatch clinical/ radiological/biopsy  
 Surgical biopsy : tubular carcinoma



Mme DUT. 88 years old  
Palpable mass left QSE  
Microbiopsy-> CCI | HR+

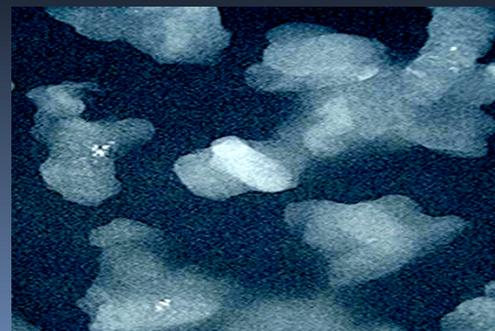
# BIOPSY /PATHOLOGY / REPORT

Formol > 12h < 24h : fixation +++  
 Histology, RH, Her2  
 clinical findings, report

Nom: Prénom: DN: <i>(Etiquette)</i>		Médecin(s) Chirurgien: Radiologue: Correspondant(s):	
Traitement(s) antérieur(s): NON <input type="checkbox"/> OUI <input type="checkbox"/> Chimiothérapie Radiothérapie Hormonothérapie Récidive			
Prélèvements Droit <input type="checkbox"/> Gauche <input type="checkbox"/>			
Lésion(s) Nombre: Taille(s):		Palpable Nodulaire- Localisation(s) Infra-clinique Microcalcifications <i>Numéroté(s) Repéré(s) sur schéma</i>	
Biopsies <input type="checkbox"/> Mastectomie partielle <input type="checkbox"/> Mastectomie <input type="checkbox"/> Curage <input type="checkbox"/> Ganglion sentinelle <input type="checkbox"/>			
Pièce(s) Biopsie(s) <input type="checkbox"/> Nombre: Radiologie per-opératoire Oui <input type="checkbox"/> Non <input type="checkbox"/>			
Repérage: Par fils <input type="checkbox"/> Agrafes <input type="checkbox"/>		Localisation des repères: 1 2 3	
Recoupe: Oui <input type="checkbox"/> Non <input type="checkbox"/>		Localisation: <i>Repère fils face tumorale</i>	
Ganglion sentinelle Nombre		Oui <input type="checkbox"/> Non <input type="checkbox"/>	
Traceur		Couleur	
1 Positif <input type="checkbox"/> Négatif <input type="checkbox"/>		Positif <input type="checkbox"/> Négatif <input type="checkbox"/>	
2 Positif <input type="checkbox"/> Négatif <input type="checkbox"/>		Positif <input type="checkbox"/> Négatif <input type="checkbox"/>	
3 Positif <input type="checkbox"/> Négatif <input type="checkbox"/>		Positif <input type="checkbox"/> Négatif <input type="checkbox"/>	
Curage axillaire Oui <input type="checkbox"/> Non <input type="checkbox"/> Nombre de prélèvement:			
Résultat(s) connu(s) Sein: CCI DCIS CLJ SBR: I II III Curage: G. Sentinelle Positif <input type="checkbox"/> Autre: Négatif <input type="checkbox"/>			
Examen: Examen extemporané <input type="checkbox"/> Anatomopathologie <input type="checkbox"/> Autre:		Récepteurs hormonaux <input type="checkbox"/> Her2Neu <input type="checkbox"/>	
Remarque(s)			
Date:		Signature:	



Representative samples  
 Rx of samples if µcal



## **To successfully perform a minimally invasive breast biopsy**

- it is important to not only be familiar with the technique
- but also with how to determine radiologic-pathologic concordance
- and the appropriate treatments for patients after the procedure

## **When reviewing pathologic results for concordance**

- it is important to ensure that microcalcifications are identified in the histologic specimen
- and the specific pathologic diagnosis is consistent
  - with the morphologic characteristics seen at mammography
  - and the pretest probability of malignancy.

## **At the follow-up examination**

- both the histologic and imaging findings should be revisited
- and the mass should be assessed at mammography or US to ensure that it is stable

## **If it has grown in size or its morphologic characteristics have changed**

### **If calcifications increase in number or extent or the mass changes**

- Increases in size or its features become more suspicious
- appropriate action should be taken
- Excision is typically recommended

## **If the lesion is stable at follow-up examination**

- the patient may return to the general screening population

Interactive Case Review of Radiologic and Pathologic Findings from Breast Biopsy: Are They Concordant? How Do I Manage the Results?

Christopher P. Ho, MD, Jennifer E. Gillis, MD, Kristen A. Atkins, MD, Jennifer A. Harvey, MD, and , Brandi T. Nicholson, MD  
University of Virginia Health System, Charlottesville, Va. Radiographics, Volume 33-4 , 2013

## Imaging-Histologic Discordance After Sonographically Guided Percutaneous Breast Biopsy: A Prospective Observational Study

Eun Ju Son, Eun-Kyung Kim, Ji Hyun Youk, Min Jung Kim, Jin Young Kwak, Seon Hyeong Choi, August 22, 2011

From January 2005 to December 2006, US-guided 14-gauge automated CNB on 3339 breast lesions and obtained benign results in 2194 cases.

1588 lesions that were either excised ( $n = 658$ ) or followed up for at least 2 years ( $n = 930$ ) after CNB.

Imaging-histologic discordance was present in 103 of 1588 (6.5%) lesions.

The upgrade rate was

6.8% (7/103) in discordant lesions

0.4% (6/1485) in concordant lesions ( $p < 0.01$ )

Lesion size, Breast Imaging, Reporting and Data System (BI-RADS) category and the presence or absence of symptoms was statistically significant between the upgrade and non-upgrade groups in discordant cases ( $p < .05$ ).

Imaging-histologic discordance is an indication for excision because it has a higher upgrade rate than concordant lesions.

## **K Kuhl : false positive on breast MRI can be valuable**

**EUSOBI Paris**

**september 2016**

“Over recent years, the allegedly limited specificity of breast MRI has been refuted by data, which confirm that the positive predictive value of MRI is as high as that of mammography,”

While tissue changes that cause false-positive diagnoses in mammographic screening mainly represent regressive or simple fibrocystic changes, tissue changes that cause false-positive diagnoses in MRI tend to represent proliferative, and frequently even atypical, changes, she explained in an interview before the Paris meeting. As a result, the implications of false-positive diagnoses in MRI and mammography differ: In a woman at average risk undergoing screening, diagnosis of atypical tissue changes will change her future management.

"These women carry a greatly increased risk of subsequent breast cancer and should at least undergo intensified surveillance. Therefore, calling such findings 'false positive' is somewhat misleading,"

# Assistance Strategy Surgical Sentinel Node

How to manage surgical options axillary node

CCI + clinical N0 + Axillary US - = Sentinel node

CCIS small size = no sentinel node

CCI + clinical N1 + Axillary US+ + malignant cytology axillary node =  
lymphadenectomy

## Adaptation to surgical technics

Ablation of the lesion: the skin-muscle mapping

Adaptation size of ablation : indication of oncoplasty if large lesions  
or wide spread IS : biopsy

ends !

Adaptation to the of surgery: wide spread multifocal lesions  
immediate or second

oncoplasty **Adaptation to treatments**

Chemoth grade HR Her2Neu / PAC if chemo post op

Management support , appointment

Organisation /validation MDCM

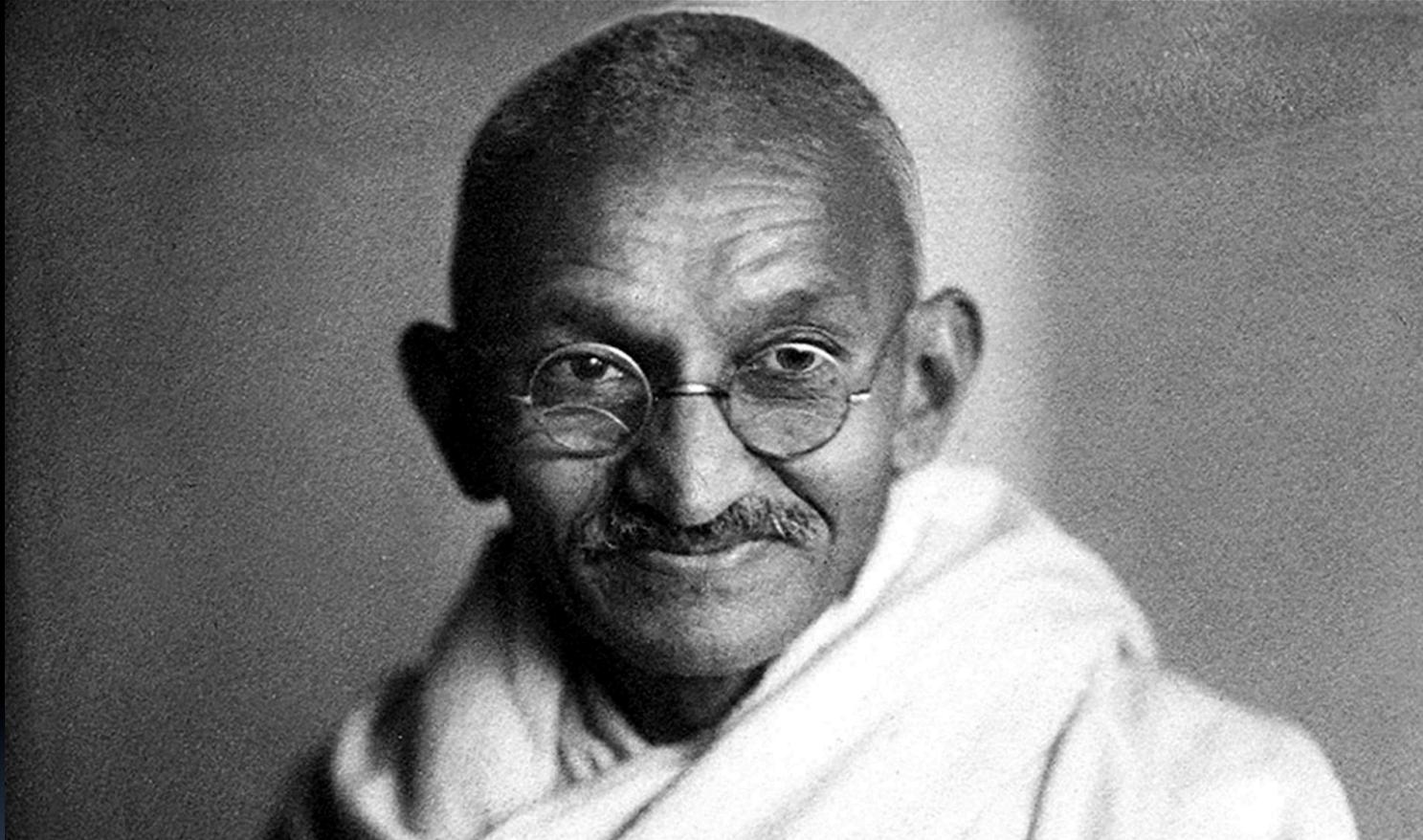
# TAKE HOME MESSAGE

- No imaging specificity for breast lesion
- Biopsy histology correlation for all Birads 4 and 5 lesions
- LCNB : 16 or 14 G  $\geq$  4 samples
- Under-estimation rate for premalignant lesion
  - $\approx$  10 % VABB
  - $\approx$  20 % LCNB
  - PML referred for surgical excision
- VABB under stereotactic guidance
  - 11G  $\geq$  10 samples
  - 7 G  $\geq$  6 samples
- VABB under US or MRI guidance
  - No guidelines : target excision or sampling
- Concordance
  - Balistic consultation
  - Sampling quality : guidance/biopsy device/samples
  - Birads/histological correlation
  - Follow up or surgical excision indication : RCP



Merci Luc

The future depends on what we do in the  
present



भविष्य क्या हम वर्तमान में क्या पर निर्भर करता है