BREAST OPEN SURGERY WITHOUT PRIOR BIOPSY AVAILABLE?


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 the pre-per-post biopsy arguments to conclude the consistent and contributory of levies?
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 taking care of breast lesion?

INCA
RECOMMANDATIONS

Cancer du sein in situ
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
<table>
<thead>
<tr>
<th>Birads</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>screening</td>
</tr>
<tr>
<td>2</td>
<td>screening</td>
</tr>
<tr>
<td>3</td>
<td>Follow up except high risk</td>
</tr>
<tr>
<td>4 a</td>
<td>Follow up except progressive or high risk</td>
</tr>
<tr>
<td>4 b,c</td>
<td>LCB or VABB diagnosis</td>
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<tr>
<td>5/6</td>
<td>LCB or VABB diagnosis ou strategical</td>
</tr>
<tr>
<td>Procedure</td>
<td>BI-RADS 3</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>No. of Lesions</td>
</tr>
<tr>
<td>Stereotactically guided</td>
<td>16</td>
</tr>
<tr>
<td>Sonographically guided</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
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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 micro biopsy if macro biopsy not possible

Palpables masses and / mammo-echo

* percutaneous micro biopsy

Percutaneous biopsy not possible

* surgical biopsy

Imaging – guided percutaneous breast sampling
C Chaveron, F Bachelle, 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
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.

Interventionnal methods: Fine Needle Aspiration cytology (FNAC)

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

FNAC is inadvisable as a standard method

Atypic Cysts with thick content: hypoechogenicity posterior enforcement
LARGE CORE NEEDLE BIOPSY/US

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.


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

STEREOTACIC GUIDANCE

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

<table>
<thead>
<tr>
<th>14 G</th>
<th>11 G</th>
<th>10 G</th>
<th>8 G</th>
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<tr>
<td>17 mg</td>
<td>95 mg</td>
<td>160 mg</td>
<td>300 mg</td>
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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 5mmΦ≤
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

<table>
<thead>
<tr>
<th>auteur</th>
<th>année</th>
<th>type</th>
<th>Num. lesions (nombre patients)</th>
<th>Temps moyen</th>
<th>unique</th>
<th>multiple</th>
<th>% complication</th>
<th>% succès</th>
<th>% cancer</th>
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<tbody>
<tr>
<td>Liberman et al.</td>
<td>2003</td>
<td>VA</td>
<td>27 (20)</td>
<td>49</td>
<td>35</td>
<td>69</td>
<td>1 (4)</td>
<td>26/27 (96)</td>
<td>8/27 (30)</td>
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<tr>
<td>Lehman et al</td>
<td>2005</td>
<td>VA</td>
<td>38 (28)</td>
<td>50</td>
<td>39</td>
<td>61</td>
<td>38/38 (100)</td>
<td>15/38 (40)</td>
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<tr>
<td>Orel et al</td>
<td>2005</td>
<td>VA</td>
<td>85 (75)</td>
<td>30-60</td>
<td>0</td>
<td></td>
<td>85/85 (100)</td>
<td>52/85 (61)</td>
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</tbody>
</table>

**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

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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 + µ 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 -> CCl 1 HR+
Formol > 12h < 24h: fixation +++
Histology, RH, Her2
clinical findings, report
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
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
CCI + clinical N1 + Axillary US+ = no sentinel node
CCI + 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 treatements

Chemoth grade HR Her2Neu / PAC if chemo post op
Management support, appointment
Organisation/validation MDCM

MDCM Clinical Center Angouleme 2016
TAKE HOME MESSAGE

• No imaging specificity for breast lesion
• Biopsy histology correlation for all Birads 4 and 5 lesions
• LCNB: 16 or 14 G ≥ 4 samples
• Under-estimation rate for premalignant lesion
  • ≈ 10 % VABB
  • ≈ 20 % LCNB
  • PML referred for surgical excision

• VABB under stereotactic guidance
  • 11G ≥ 10 samples
  • 7 G ≥ 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