Can breast cancer biopsy influence sentinel lymph node status?

Poster No.: C-2149
Congress: ECR 2016
Type: Scientific Exhibit
Authors: F. Patrolecco, M. Giuliani, R. Rella, F. Petta, G. Carlino, P. Rinaldi, M. Romani, P. Belli, L. Bonomo; Rome/IT
Keywords: Breast, Ultrasound, Biopsy, Cancer, Metastases
DOI: 10.1594/ecr2016/C-2149

Any information contained in this pdf file is automatically generated from digital material submitted to EPOS by third parties in the form of scientific presentations. References to any names, marks, products, or services of third parties or hypertext links to third-party sites or information are provided solely as a convenience to you and do not in any way constitute or imply ECR's endorsement, sponsorship or recommendation of the third party, information, product or service. ECR is not responsible for the content of these pages and does not make any representations regarding the content or accuracy of material in this file.

As per copyright regulations, any unauthorised use of the material or parts thereof as well as commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method ist strictly prohibited.

You agree to defend, indemnify, and hold ECR harmless from and against any and all claims, damages, costs, and expenses, including attorneys' fees, arising from or related to your use of these pages.

Please note: Links to movies, ppt slideshows and any other multimedia files are not available in the pdf version of presentations.

www.myESR.org
Aims and objectives

Spreading neoplastically altered cells from a tumour during biopsy or simple procedure like needle aspiration is a possibility because they lack cohesiveness, and they attain the capacity to migrate and colonize [1, 2]. Considering the fact that every tumour cell is bathed in interstitial fluid, which drains into the lymphatic system, inserting a needle into a tumour, we have to consider the risk of spreading a loose tumour cell into either the circulation or into the tissue fluid. According to the literature, Breast Cancer (BC) is a high risk of dissemination tumour during breast biopsy [1, 3]. Tumour cell displacement rates to the needle tract have been reported in many studies [4-7] by evaluation of different types of biopsies such as fine-needle aspiration cytology (FNAC), large-gauge needle core biopsy, excisional breast biopsy and incisional breast biopsy. Many studies have evaluated the impact of different techniques for preoperative BC biopsy among prognostic factors of metastases occurrence in SLN and they have shown that because of core biopsy, malignant cells can spread locally in the stroma and in the surrounding lymphatics, simulating, as artifact, an invasion. Specifically, the studies of Diaz et al [4] and Youngson et al [5] have reported tumour cell displacement rates to the needle tract of up to 30%. It therefore seems legitimate to question whether the use of needles with increasing gauge may increase the risk of SLN metastases. In this regard, Hansen et al [8], in their study of 663 patients (including also patients treated with neoadjuvant therapy), had shown that manipulation of an intact tumour by FNAC or large-gauge needle core biopsy is associated with an increase in the incidence of SLN metastases, then in excisional biopsy, perhaps due in part to the mechanical disruption of the tumour by the needle. They also found that the majority of metastases to a sentinel node were macrometastasis, even in patients who had a needle biopsy procedure [8]. On the other hand, Chagpar et al [9], have studied a large population of 3853 patients and they found that the choice of biopsy technique is correlated with a number of other clinicopathologic factors that influence nodal status, like tumour size, palpability, histologic subtype, tumour location, and surgery type. They have also suggested, that the increased incidence of macrometastases in Hansen's study [8], showed that metastases observed were not related to the needle biopsy procedure, but rather true metastases related to the underlying tumour itself. Likewise, several recent studies [2, 6, 10] have shown that the occurrence of positive SLN does not correlate significantly with BC biotic technique used, without difference between SLN micrometastases and macrometastases, according to the biotic technique (FNAC or core needle biopsy).

To our knowledge, no study has investigated the rate of breast cancer cell seeding to the axillary nodes for ultrasound-guided core needle biopsy (US-CNB) with different size needles.
The purpose of this study was to evaluate the impact of preoperative US-CNB using smaller needles (16G and 18G) versus 14 G needles on the rate of metastasis to the Sentinel Lymph Node (SLN) of patients with primary BC.
Methods and materials

A consecutive series of 2676 US-CNB performed in our Institution, from January 2011 to January 2015, were retrospectively reviewed.

A total of 377 BC were included on the basis of the following criteria:

1) Percutaneous biopsy-proven BC with clinical stage T1-2, N0. Patients were divided into two groups (14G versus 16G/18G) and a comparison between 14G needle biopsy and smaller needle biopsy was performed. All biopsies were carried out by 5 experienced breast radiologists, with a 14G semi-automated needle and 16G or 18G automated needles, using only one needle size for lesion and following the subsequent technical steps: 5-10 ml of local anaesthetic were intradermally administered on the access site (when smaller needle are used, it can be avoided); 3 to 5 core samples were obtained; the punctures were compressed for 5-10 min to obtain bleeding control when 14G needle used. The choice of needle size is predominantly determined by radiologist's preference.

2) SLN dissection with histopathological examination was performed after lymphatic mapping by using blue dye.

Women who have undergone preoperative neoadjuvant therapy were excluded, to avoid cases of false negatives.

SLN metastases classification followed the 7th American Joint Committee on Cancer (2010) TNM pathological staging: macrometastases, micrometastases, isolated tumour cells or negative [11]. Only macrometastases and micrometastases were considered positive and the positivity and negativity rates was calculated for the overall BC and for both needle size groups. At last, within of positive SLN, it was compared the micrometastases and the macrometastases rate in both groups.

Statistical analysis

Statistical analysis was performed with a dedicated software program (MedCalc) using C² test. A P value of .05 or less was considered a statistically significant result.
Results

Among the 377 BC included, 268 US-CNB were performed with 14G and 109 with 16G or 18G needle (43 with 16G and 66 with 18G needle), respectively. A positive SLN was found in 20% of all cases in the extemporaneous examination and 30% in the final analysis, respectively.

The positivity rate in extemporaneous examination was 23.1% (62/268) in 14G needle group and 11% (12/109) in 16G/18G needle group, respectively (p<0.05). In the definitive analysis, we found 35.5% (95/268) of positivity for 14G and 18.3% (20/109) for 16/18G needle groups, respectively (p<0.05).

Likewise, also SLN negativity rate was statistically related with the needle size, with a greater prevalence in 16/18G group in both extemporaneous analysis that in the definitive: the SNL negativity rate was 76.9% (206/268) and 64.6% (173/268) for 14G, 89% (97/109) and 81.7% (89/109) for 16G/18G needle in extemporaneous and final examination respectively (Table 1 and Table 2).

Within of positive SLN, the macrometastases rate was found greater in 14G group (23.5%, 63/268) compared to 16/18G groups (11%, 12/109) (p<.01) (Table 3).

Micrometastases rates were 11.9% (32/268) for 14G and 7.3% (8/109) for 16G/18G needle, respectively. Because only 8 cases of micrometastases were found in the 16G/18G group, the sample was not homogeneous; therefore, it was not possible to compare the micrometastases rate between the groups.
### Table 1: Sentinel Lymph Node (SLN) status in the extemporaneous examination.

SLN0 = number of negative sentinel lymph node in the extemporaneous examination  
SLN1 = number of positive sentinel lymph node in the extemporaneous examination  
* p value = 0.0072

<table>
<thead>
<tr>
<th>Needle</th>
<th>14 G</th>
<th>16/18 G</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLN0</td>
<td>206</td>
<td>97</td>
<td>303</td>
</tr>
<tr>
<td>SLN1</td>
<td>62</td>
<td>12</td>
<td>74</td>
</tr>
<tr>
<td>Total</td>
<td>268</td>
<td>109</td>
<td>377</td>
</tr>
</tbody>
</table>

### Table 2: Sentinel Lymph Node (SLN) status in the final examination.

SLN0 = number of negative sentinel lymph node in the final examination  
SLN1 = number of positive sentinel lymph node in the final examination  
* p value = 0.0011

<table>
<thead>
<tr>
<th>Needle</th>
<th>14 G</th>
<th>16/18 G</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLN0</td>
<td>173</td>
<td>89</td>
<td>262</td>
</tr>
<tr>
<td>SLN1</td>
<td>95</td>
<td>20</td>
<td>115</td>
</tr>
<tr>
<td>Total</td>
<td>268</td>
<td>109</td>
<td>377</td>
</tr>
</tbody>
</table>
Table 3: Number of macrometastases in the final examination.

© Radiology, Catholic University of Sacred Heart - Rome/IT
Conclusion

Long-term survival in patients affected by BC is predominantly influenced by the occurrence of distant metastases [12]. The technique of SN is now widely used and could largely replace ALND, especially when the SN is negative [13]. In this context it is very important to understand which factors are important in determining a lymph node metastasis [6, 12, 14].

The results of our retrospective study suggest that the choice of needle size seems to influence SN status in BC biopsy examination, with a greater prevalence in 14G group in both extemporaneous and in the definitive analysis. The difference in terms of positive SLN between extemporaneous examination and final analysis is probably related to the fact that some SLN were negative for macrometastases at extemporaneous examination, but were found positive for micrometastases at final analysis.

Moreover, we also found that, within of positive SLN, the macrometastases rate was statistically related with the needle size, with a greater prevalence in 14G group compared to 16/18G group. However, this difference is probably correlated to radiologists' preference of 14G needle when radiological cancer suspect is high, not to the use of a larger gauge needle itself.

In conclusion, our preliminary results underline that the use of a larger size needle in CNB seems to be correlated with an increased incidence of SN metastases. On the other hand, it's necessary a multiparametric evaluation of all SN positivity predictors (such as lesion size, nuclear grade, site of the primary tumour) to better understand if the use of a needle of a larger gauge could really influence SN status.
Personal information

Dr. Michela Giuliani

Department of Radiological Sciences

Institute of Radiology, Foundation University Hospital "A. Gemelli"

"Catholic University of Sacred Heart" - Rome

Email: michela.giuliani@policlinicogemelli.it
References


