How to avoid unnecessary SLNB in patients with DCIS

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Background

Today we perform SLNB in more than 50% of DCIS cases in our region. Morbidity due to SLNB has to be related to the risk of having to perform a second operation. Also, the detection rate of SLN is lower at a second stage operation and is even considered impossible after a mastectomy. We assessed the possibility to use a pre-operative Sienna+ (SPIO) injection for identification of the SLN in patients with a pre-operative diagnosis of DCIS and then, to perform a SLNB only in those with a post-operative diagnosis of invasive cancer.

Methods

In a pilot study, SPIO was injected 3 to 15 days before surgery in 12 breast cancer patients planned for SLNB. Technetium and blue dye were used in parallel as in clinical routine. A volunteer was injected with SPIO in order to follow the decline of the magnetic signal in the SLN over time.

Summary

The use of preoperative super-paramagnetic iron oxide (SPIO) is a promising technique in order to avoid unnecessary sentinel lymph node biopsies (SLNB) in patients with a diagnosis of ductal breast carcinoma in situ (DCIS). Morbidity related to SLNB will be reduced and potentially costs will be reduced. A larger study (SentiNot) will be performed to evaluate the number of SLNBs avoided in relation to the number of re-operations needed in patients where the preoperative diagnosis of DCIS is upgraded to invasive cancer.

Results

In all 12 patients there was a good signal detected by the magnetometer (SentiMag®) at operation. In nine patients the SLN was detected with all three methods, in two with SentiMag® only and finally, in one with SentiMag® and Tc99 but not ink. No adverse effects were noted from the SPIO injection except a brownish discoloration of the skin. A strong signal was detected transcutaneously in the axilla in the volunteer for more than four weeks (Table 1.).

In patients sent for preoperative mammographic localization there was no disturbance of the visualization of the lesions and no artefacts were present. The histopathological examination was not disturbed by the SPIO, neither in the tumour nor in the SLN. On the contrary, it seemed like the examination of frozen sections of SLNs was even easier as the SPIO was not accumulated in metastatic cells. As show in Figure 2, there was no problem to discriminate CKMNF-reactive cell from iron-filled histiocytes.

Conclusion

The SPIO stays in the SLN for about 4 weeks. SLN is easily detected by SentiMag® 3-15 days after injection. The SPIO does not affect tumour localization, postoperative X-ray or the histopathological examination.

Table 1. In a volunteer, the counts stayed high for more than four weeks in the axilla (SLN) after the Sienna+ injection.

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<th>Days after Injection</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>7</th>
<th>14</th>
<th>18</th>
<th>21</th>
<th>28</th>
<th>30</th>
<th>34</th>
<th>36</th>
<th>43</th>
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<tbody>
<tr>
<td>Counts in Axilla (transcutaneously)</td>
<td>140</td>
<td>461</td>
<td>485</td>
<td>555</td>
<td>583</td>
<td>467</td>
<td>833*</td>
<td>234</td>
<td>242</td>
<td>14</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>Counts at Injection Site</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>Probe Version</td>
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