Investigating the Use of MarginProbe® and Savi Scout® in Breast Conserving Surgery: A Single Institution Study

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Introduction

- Breast conserving surgery (BCS) with radiation therapy is considered standard therapy for low-grade breast cancer. Ensuring negative margins2 and localization of breast lesions are two of the most important aspects of the procedure.
- The MarginProbe® is an intraoperative device used to identify positive margins on the lumpectomy specimen using radio-frequency electrical fields.
- The Savi Scout® is a wire-free localizing device, using a small reflector that can be placed at any time prior to surgery.
- Our study aims to evaluate two main objectives:
  - Do the MarginProbe® and Savi Scout® lower re-excision rates?
  - Does the replacement of wire localization with the Savi Scout® device affect the overall specimen volume of breast tissue excised?

Methods

- A retrospective study reviewing 417 cases of adult females undergoing BCS for low-grade invasive ductal carcinoma, invasive lobular carcinoma, or DCIS from September 2015 to June 2019.
- All surgeries were performed at a single institution by two surgeons.
- Exclusion criteria included any patient who had undergone preoperative chemotherapy or hormone therapy.
- The control group included 120 consecutive patients using standard wire localization and palpation techniques (N=120).
- Study group #1 included 211 patients using standard wire localization and MarginProbe® (N=211).
- Study group #2 included 86 patients using Savi Scout® localization and MarginProbe® (N=86).

Results

- The addition of MarginProbe® (study group #1) decreased the frequency of positive margins from 18.3% in the control group to 9.5% (p = 0.01).
- The use of Savi Scout® localization in addition to MarginProbe® (study group #2) decreased the frequency of positive margins from 18.3% in the control group to 5.8% (p = 0.01).
- The total volume of the breast tissue (specimen + shavings) was evaluated in all groups and there was found to be no significant difference (p = 0.13).

Conclusion

- Several previous studies have evaluated these two devices and their usefulness in the operating room to decrease re-excision rates in breast conserving surgery1-4.
- Our study evaluates a larger patient group than many previous studies and reaffirms the benefits of MarginProbe® by demonstrating the decrease in re-excision rates by 48%.
- We also demonstrated that the additional use of Savi Scout®, along with MarginProbe®, can further decrease re-excision rates by 68% when compared with standard localization.
- Our study is the first of its kind to evaluate both the MarginProbe® and Savi Scout® devices together.
- Based on our findings, the combined use of the MarginProbe® and Savi Scout® devices has utility in improving patient outcomes after BCS with fewer returns to the operating room.
- Although this study did not show a significant change in the total volume of tissue removed in BCS with the use of these two devices, it would be beneficial to evaluate this in a larger randomized control trial.

Table 1. Comparison of outcomes between the three groups: (1) control, (2) standard localization + MarginProbe®, and (3) Savi Scout® + MarginProbe®.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control (N = 120)</th>
<th>Standard loc + MarginProbe® (N = 211)</th>
<th>Savi Scout® + MarginProbe® (N = 86)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive margins after initial BCS, n (%)</td>
<td>22 (18.3%)</td>
<td>20 (9.5%)</td>
<td>5 (5.8%)</td>
<td>0.01</td>
</tr>
<tr>
<td>Positive margins on main specimen, n (%)</td>
<td>25 (20.8%)</td>
<td>58 (27.5%)</td>
<td>15 (17.4%)</td>
<td>0.13</td>
</tr>
<tr>
<td>Positive margins cleared by shaves, n (%)</td>
<td>4 (10%)</td>
<td>39 (67.2%)</td>
<td>10 (66.7%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Negative margins on specimen, positive shave, n (%)</td>
<td>3 (2.5%)</td>
<td>16 (7.6%)</td>
<td>1 (1.2%)</td>
<td>0.02</td>
</tr>
<tr>
<td>Number of shavings, mean (SD)</td>
<td>0.5 (0.6)</td>
<td>1.8 (1.4)</td>
<td>1.9 (1.3)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Volume of breast tissue b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main surgical specimen, mL, mean (SD)</td>
<td>50.2 (37.0)</td>
<td>47.7 (33.7)</td>
<td>43.4 (25.3)</td>
<td>0.34</td>
</tr>
<tr>
<td>Total (main specimen + shavings), mL, mean (SD)</td>
<td>53.6 (38.5)</td>
<td>61.2 (41.4)</td>
<td>53.7 (30.3)</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Group comparisons evaluated using chi-square tests. Numeric outcomes compared using ANOVA. Abbreviation: BCS (breast-conserving surgery)

a) Percent out of above number of specimens with positive margins after BCS
b) Specimen volume calculated using the ellipsoid formula \( \frac{4}{3} \pi a \times b \times c \)

References


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