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 margins[1] and localization of breast lesions[2] 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).

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

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

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 $\frac{\pi}{6} \times L \times W \times D$.

Conclusion

- Several previous studies have evaluated these two devices and their usefulness in the operating room to decrease re-excision rates in breast conserving surgery[3,4].
- 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.

References

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