A Comparison of Intra-operative Versus Traditional Specimen Radiography in Patients Undergoing Breast Conserving Surgery for Non-palpable Breast Lesions

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Introduction

The current standard of care for specimen evaluation in breast conserving surgery (BCS) for non-palpable breast lesions is specimen radiography in the mammography suite. Transferring the specimen from the operating room to radiology prolongs operative time and precludes the surgeon from orienting and evaluating the specimen X-ray. By using an intra-operative specimen radiograph device, image acquisition occurs within seconds and the surgeon can orient the specimen and evaluate the specimen X-ray.

Aim

To assess whether the use of an intra-operative specimen radiograph device, such as the KUBTEC™, results in fewer positive margins and decreased re-excision rates compared to traditional specimen radiography.

Methods

An IRB approved retrospective chart review was conducted between November 2009 and August 2010.

- 100 patients with high risk or malignant breast lesions diagnosed by minimally invasive biopsy were identified.
- Each patient underwent BCS with pre-operative needle localization of the lesion.
- 50 patients had intra-operative specimen radiographs performed using the KUBTEC™ system.
- 50 patients had specimen radiographs performed in radiology (standard).

Primary endpoints of the study were comparison of margin status and re-excision rates between the 2 groups.

Results

- In the 39/52 (75%) procedures performed using the KUBTEC™ for which time was recorded, **median time to image acquisition was 80 seconds** (range, 40-1140 sec).
- Of the 52 procedures, the number of malignant and high risk lesions were equally matched between the 2 groups: 12 ductal carcinoma in situ, 24 invasive ductal carcinoma, 16 high risk lesions.

Results *(cont'd)*

Table 1. Comparison of Margin Status and Re-excision Rates between the KUBTEC™ and Standard Groups

	KUBTEC™	Standard	p-value
No. of positive margins	11/52 (21.2%)	12/52 (23.1%)	0.81
No. of additional margins taken at 1st operation	26	32	0.23
No. of re-excisions*	5.8%	19.2%	0.03

*The lower re-excision rate was related to a fewer number of positive radial margins in the KUBTEC™ group (n = 9) compared to the standard group (n = 17).

Conclusion

Intra-operative specimen radiography permits the surgeon to orient and visualize the specimen X-ray in the operating room which allows for more selective margin excision at the first operation. Specimen evaluation in the operating room leads to fewer positive radial margins and ultimately fewer re-excisions compared to standard specimen radiography performed in the mammography suite. This, coupled with improved operative efficiency, makes intra-operative specimen radiography a new standard for specimen evaluation.