ABSTRACT

Background
Positive surgical margins following breast-conserving surgery have been associated with a significantly increased risk of local recurrence, and optimum management frequently requires operative re-excision. The SSO/ASTRO consensus statement set forth in May 2014 was the first professional guideline to declare the adequacy of no ink on tumor as a negative margin in patients with Stage I/II invasive breast cancer undergoing whole breast irradiation. We sought to analyze the patients affected by this guideline at our institution and to extrapolate the financial impact on a historic cohort.

Methods
From a prospectively maintained institutional database, a review was conducted of all women undergoing breast re-excision procedures for ductal carcinoma in situ (DCIS) or invasive breast cancer between January 2010 and December 2013. Clinical and pathological data were recorded from the electronic medical record, and billing data were abstracted from institutional and physician administrative resources based on CPT codes. Patients whose index procedure was performed at a referring institution or who underwent index mastectomy were excluded from analysis. The guideline definition of a positive margin [i.e., ink on invasive cancer or DCIS] was utilized. Descriptive statistics were used to analyze clinical factors and associations with margin status.

Results
Of 384 women who underwent re-excision over this three-year period, 252 (65.6%) had invasive disease and 132 (34.4%) had DCIS alone. A total of 119 women (31%) had one or more positive margins, and the anterior (56, 47.1%) and inferior (52, 43.7%) margins were the most commonly involved. On re-excision, 266 (69.3%) had negative histology on pathological exam – of these patients, 70 (26.3%) initially had positive margins following the index procedure. Odds of positive margins increased with tumor size greater than 2 cm (OR 2.37, 95% CI 1.51–3.46). Under the consensus guideline, 87 patients (22.6%) would have been spared 91 additional procedures, accounting for approximately 88 hours of operative time. Considering institutional fees and primary surgeon billing alone, the total estimated cost savings would have been $199,657.

Conclusions
Implementation of the SSO/ASTRO consensus guideline holds great potential to decrease the rate of re-excision for margin status following breast-conserving surgery and to optimize resource utilization in the surgical management of early-stage breast cancer. Limitations of the current study included lack of granularity of cost data. Further analysis of cost-effectiveness, patient outcomes, and margin assessment methods are needed to define the impact of the consensus guideline on long-term changes in surgical practice.

INTRODUCTION

- Positive surgical margins following breast-conserving surgery associated with significantly increased risk of local recurrence.
- Management of close margins poorly defined prior to 2014, resulting in widely variable rates of re-excision for margin status.
- Society of Surgical Oncology (SSO)/American Society for Radiation Oncology (ASTRO) consensus statement published in May 2014.
- “No ink on tumor” standard for adequate margins in breast-conserving surgery for Stage I/II invasive breast cancer in women undergoing adjacent whole breast radiation therapy.

Study Aims
- To analyze the effect of the consensus guideline on surgical practice at a single institution.
- To extrapolate the financial impact and potential cost savings of the consensus guideline utilizing a historic cohort.

METHODS

- Biopsy-diagnosed invasive breast cancer or ductal carcinoma in situ (DCIS).
- Exclusion criteria: primary procedure performed at another facility, recurrent invasive breast cancer.
- Statistical analysis: Comparison of demographic variables - Chi square, Fisher’s exact test.
- Univariate analysis, cost analysis.

RESULTS

- Prior to the release of the SSO/ASTRO consensus statement, our institutional re-excision rate for margin status was 25.5%, which would have been decreased by 22.6% with the guideline in place.
- Over three years, 87 patients would have been spared 91 additional procedures, which accounts for 88 hours of operative time.
- The majority of patients in our historic cohort who would have been affected by the guideline had margins widths ≤ 1 mm for invasive disease or DCIS.
- More than three quarters of these patients had negative histology on re-excision, but a substantial minority were found to have invasive cancer, DCIS, or high-risk lesions.
- Considering facility fees and primary surgeon billing alone, the total estimated cost savings would have been $199,657.
- Limitations: underestimation of cost due to unaccounted additional physician fees (e.g., radiology, pathology, anesthesiology), lack of granularity regarding facility fees.

CONCLUSIONS

- Biopsy-diagnosed invasive breast cancer or ductal carcinoma in situ (DCIS).
- Exclusion criteria: primary procedure performed at another facility, recurrent invasive breast cancer.
- Statistical analysis: Comparison of demographic variables - Chi square, Fisher’s exact test.
- Univariate analysis, cost analysis.

REFERENCES