Extended outcomes from APBI show tumor control, breast cosmesis and minimal late toxicity

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Long-term (five-year) outcomes of breast cancer patients receiving adjuvant accelerated partial breast irradiation (APBI) after breast-conserving surgery show excellent tumor control and breast cosmesis (cosmetic outcomes) with minimal late toxicity, according to a study published in the February 1, 2014 print edition of the *International Journal of Radiation Oncology, Biology, Physics* (Red Journal), the official scientific journal of the American Society for Radiation Oncology (ASTRO).

APBI delivers highly conformal radiation therapy, during a period of one to two weeks, to the site where the cancer was removed. APBI has seen a 10-fold increase in use from 2002 to 2007 and is currently the focus of several ongoing phase III trials.

The University of Pittsburgh Cancer Institute study examines the long-term outcomes, tumor control and breast cosmesis of a cohort of early-stage and ductal carcinoma in situ (DCIS) breast cancer patients who received a five-day treatment of APBI at the University of Pittsburgh from 2002 to 2007.

The study is a retrospective review of 157 patients with localized breast cancer treated with adjuvant MammoSite, single-lumen balloon-based brachytherapy after breast-conserving surgery from June 1, 2002 to December 31, 2007. For all patients, at least five years had passed since

receiving brachytherapy. Patients were all age 40 or older, with 88.5 percent over age 50, and had stage T1-T2 breast cancer, with 82.4 percent in stage T1A-C, 12.2 percent with DCIS, 4.7 percent in stage T2 and 0.7 percent in stage T1mic. Patients were also categorized by demographics and tumor characteristics into suitable, cautionary and unsuitable groups based on recommendations from ASTRO's APBI Consensus Statement.

APBI was delivered to a median dose of 34 Gy in 10 fractions over a five-day period. In addition, 89 percent of patients received additional adjuvant systemic therapy, with 66.9 percent receiving hormonal therapy, 13.4 percent chemotherapy and 8.3 percent chemotherapy with hormonal therapy. Follow-up was conducted every three to four months for the first two years post-treatment, and every six months thereafter at the discretion of the patient's breast surgeon and radiation oncologist. Baseline mammograms were performed three to six months after treatment, and annually thereafter. In addition, cosmetic outcomes were documented via photography at each visit, and toxicity was assessed during the final follow-up visit.

At a median follow-up of 5.5 years post-treatment, the five-year and seven-year actuarial ipsilateral breast control were 98 percent/98 percent, the lymph nodal control were 99 percent/98 percent and the distant control were 99 percent/99 percent. The breast cancer specific survival was 100 percent at five years and 99 percent at seven years. The overall survival was 89 percent at five years and 86 percent at seven years. There were no significant differences in tumor recurrence or survival rates in the appropriateness subgroups based on ASTRO's consensus statement. Good to excellent breast cosmesis was reported in 93.4 percent of patients. Overall toxicity rates were low, and the most common toxicity was telangiectasia, small, dilated blood vessels near the surface of the skin, which was reported in 27 percent of study participants. The study correlated telangiectasia development and the

maximum radiation dose to the skin. The study institution practice is to keep maximum skin dose ≤ 100 percent and at maximum ≤ 125 percent to limit the risk of telangiectasia.

"These results may encourage women to choose this convenient five-day treatment and also help radiation oncologists use techniques that can reduce skin dose further, thus further reducing the long-term effects of partial breast radiation therapy on skin changes and breast cosmesis," said Sushil Beriwal, MD, a co-author of the study and a radiation oncologist at the University of Pittsburgh Cancer Center. "The promising outcomes seen across subgroups, as defined by prior consensus definitions for appropriate patient selection, suggest that the current metrics for selecting patients for APBI may need to be redefined such that more women may be candidates for less radiation over a shorter time via APBI."

The February 1 print edition of the Red Journal also contains two editorials addressing breast brachytherapy and examining the data from this study. Peter Y. Chen, MD, a radiation oncologist at William Beaumont Health System in Royal Oak, Mich., emphasizes the need to ensure guidelines keep up with changing data. Robert R. Kuske, MD, a radiation oncologist at Arizona Breast Cancer Specialists in Scottsdale, Ariz., and S. Stanley Young, PhD, the assistant director for bioinformatics at the National Institute of Statistical Sciences, explore the reported differences between breast brachytherapy and whole breast irradiation from the statistical and clinical implications.

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