Brachytherapy as Effective for Local Breast Cancer Control as Whole Breast Irradiation According to New Study

Findings Contradict Research Published in May JAMA

May 1, 2012, Columbia, MD-- Accelerated Partial Breast Irradiation (APBI) also known as brachytherapy, is equally effective—if not more effective—in preventing local breast cancer recurrence than Whole Breast Irradiation (WBI), according to a study to be presented this week at the American Society of Breast Surgeons (ASBrS) Annual Meeting. Brachytherapy treats only the lumpectomy site, while WBI treats the entire breast. The findings of the ASBrS study contrast with a study from the University of Texas MD Anderson Cancer Center appearing in the May issue of the Journal of the American Medical Association (JAMA).

Researchers will report on data from the ASBrS MammoSite Registry Trial comprising 1449 breast cancer patients treated with APBI brachytherapy at 97 institutions between May 2002 and July 2004. Eighty-seven percent of these patients were diagnosed with invasive breast cancer and 13% with DCIS, with a median follow up of 60 months.

In the ASBrS study, 50 patients treated with brachytherapy (3.5%) developed an ipsilateral breast tumor recurrence (IBTR), 14 (1.1%) at the initial tumor site and 36 (2.6%) elsewhere in the breast. For invasive cancers, IBTR was associated with estrogen receptor (ER) negative disease. For DCIS, IBTR was associated with age <50 or close/positive surgical margins.

“Prior studies have demonstrated that the risk of cancer recurrence in the conserved breast is similar for WBI or APBI. Following WBI, most breast recurrences are at the initial tumor site, and relatively few are elsewhere in the breast,” says Dr. Peter Beitsch, Director of the Dallas Breast Center, Co-Principal...
Investigator for the ASBrS MammoSite Registry and lead author on the ASBrS study. “This study demonstrated that for patients treated with APBI, this ratio was reversed: most breast recurrences were elsewhere in the breast and only a minority were at the initial tumor site. These data suggest that although tumor control in the breast appears to be similar for APBI and WBI, disease control at the initial tumor site may be better with APBI.”

The findings of the ASBrS study contrast with the MD Anderson Cancer Center JAMA study, which also compared APBI to WBI. That study compared the results of breast brachytherapy to WBI in 92,735 women 67 or older, 7% treated with brachytherapy and 93% with WBI. At 5 years of follow-up, compared to WBI, survival was the same (87.6% vs. 87%) but the brachytherapy patients had higher rates of subsequent mastectomy (4% vs. 2%), infectious complications (16% vs. 10%), non-infectious complications (16% vs. 9%), pain (15% vs. 12%), fat necrosis (8% vs. 4%) and rib fracture (4.5% vs. 3.6%).

Dr. Beitsch notes that the limitations of the MD Anderson study are that 1) it is based on Medicare claims data, which often does not provide an accurate clinical picture, 2) many endpoints are “soft”, poorly defined and difficult to quantify, 3) reported complication rates after breast surgery and radiotherapy vary widely, and depending on study design are subject to under- or over-reporting, and 4) the authors’ inferences of harm to patients from breast brachytherapy are at best speculative.

An extensive body of literature, drawing on the ASBrS Registry and other sources, suggests that for APBI 1) local control is comparable to WBI, 2) local control is similar for women younger vs. older than age 70, 3) infectious complications are similar, 4) non-infectious complications including fat necrosis are similar, 5) pain is comparable, 6) cosmesis is excellent, and 7) survival, including overall, disease-free, and disease-specific survival, is similar to WBI.

Standard treatment for early stage breast cancer often involves breast conserving surgery (lumpectomy) and WBI. Clinical trial data clearly demonstrate the need for some form of radiation therapy following lumpectomy to reduce the rate of tumor recurrence. APBI may offer advantages such as reduced treatment time, reduced radiation dose to normal tissue such as lungs, ribs and heart, increased utilization of postoperative radiation therapy leading to lower recurrence rates, and an increased rate of lumpectomy compared to mastectomy in areas with limited patient access to WBI centers.

Dr. Beitsch also notes: “We radiate the breast to control undetectable cancer cells left behind around the lumpectomy cavity. Common sense would say internally targeted radiation would be the best
method to kill these cells. We now have strong data to support that, and that the complication rate is very low from this form of therapy.

“APBI appears to be safe and effective treatment for properly selected breast conservation patients,” says Dr. Hiram S. Cody III, Attending Surgeon, Breast Service Department of Surgery, Memorial Sloan-Kettering Cancer Center and Professor of Clinical Surgery, Weil Cornell Medical College. Dr. Cody, who is also a member of the Executive Committee and Board of Directors for ASBrS, notes that the ASBrS continues to support its Consensus Statement on APBI and guidelines for patient selection (August 15, 2011 revision): (http://www.breastsurgeons.org/statements/PDF_Statements/APBI.pdf).

However, Dr. Cody also states, “We wish to emphasize that although the six year results of APBI are encouraging, they do not conclusively establish equivalence with WBI, for which the supporting data include multiple randomized trials with follow-up exceeding 20 years, and meta-analyses that conclusively link local control and survival. APBI must ultimately be held to the same standard, and a randomized trial, NSABP B-39, directly compares partial breast irradiation (by interstitial catheters, balloon devices, strut-based devices, or external beam) with WBI and promises to better define the ultimate role of APBI.”
0058 Improved Tumor Bed Control with MammoSite® Accelerated Partial Breast Irradiation

Peter Beitsch1, Frank Vicini2, Pat Whitworth3, Richard Fine4, Vic Zannis5, Henry Kuerer6, Bruce Haffty7, Maureen Lyden8

1Dallas Breast Center, Dallas, TX, USA, 221st Century Oncology, Detroit, MI, USA, 3Nashville Breast Center, Nashville, TN, USA, 4Advanced Breast Care, Marietta, GA, USA, 5Breast Care Center of the Southwest, Phoenix, AZ, USA, 6M.D. Anderson Cancer Center, Houston, TX, USA, 7Robert Wood Johnson School of Medicine, New Brunswick, NJ, USA, 8BioStat Incorporated, Tampa, FL, USA

Objectives: Randomized trials demonstrate that lumpectomy with whole-breast irradiation (WBI) yields survival equivalent to mastectomy. These trials also show that WBI has no impact on the ipsilateral appearance of new "elsewhere" cancers in quadrants away from the primary tumor quadrant. To date, all such trials report tumor bed recurrence rates higher than the rates of ipsilateral "elsewhere" cancers. We hypothesize that the focused radiation to the tumor bed of accelerated partial breast radiation (APBI) results in a tumor bed recurrence rate that is lower than the rate of "elsewhere" cancers, demonstrating that APBI controls the tumor bed better than WBI.

Method: One thousand four hundred forty patients (1449 cases) with early-stage breast cancer undergoing breast-conserving therapy were treated with the MammoSite® device to deliver accelerated partial breast irradiation (APBI) (34 Gy in 3.4 Gy fractions). One thousand two hundred fifty-five cases (87%) had invasive breast cancer (IBC) (median size = 10 mm) and 194 cases (13%) had DCIS (median size = 8 mm). Median follow-up was 60 months for all surviving patients.

Results: Fifty cases (3.5%) developed an ipsilateral breast tumor recurrence (IBTR). The 5-year actuarial rate of IBTR was 3.61% (3.65 % for IBC and 3.36 % for DCIS). Fourteen IBTRs (1.0%) were considered tumor bed failures and 36 (2.5%) elsewhere failures (72% of all IBTRs). There were no variables other than ER negativity (p = 0.0004) associated with IBTR, including patient age < 50 (p = 0.8872), close/positive margins (p = 0.3756), tumor size (p = 0.7663), or positive nodes (p = 1.000) in the invasive group. However, in the DCIS group both age <50 (p = 0.0431) and close/positive margins (p = 0.0551) were associated with increased IBTR.

Conclusions: Ipsilateral recurrence rate in patients treated with APBI using the MammoSite® device is very good and similar to that reported with whole-breast irradiation. However, unlike WBI, APBI had proportionally fewer tumor bed recurrences (presumably initial cancer recurrences) than elsewhere recurrences (presumably new primaries), which is contrary to WBI studies that have more tumor bed recurrences than ipsilateral elsewhere recurrences. This finding suggests that APBI with MammoSite® brachytherapy may be more efficacious at tumor bed control than WBI. However, phase III trials will be needed to validate this intriguing observation.