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Breast conserving therapy shows survival benefit compared to mastectomy in early-stage patients

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When factoring in what is now known about breast cancer biology and heterogeneity, breast conserving therapy (BCT) may offer a greater survival benefit over mastectomy to women with early stage, hormone-receptor positive disease, according to research from The University of Texas MD Anderson Cancer Center.

The study findings defy the conventional belief that the two treatment interventions offer equal survival, and show the need to revisit some standards of breast cancer practice in the modern era.

The research was presented at the 2014 Breast Cancer Symposium by Catherine Parker, MD, formerly a fellow at MD Anderson, now at the University of Alabama Birmingham.

In the 1980s, both US-based and international randomized clinical studies found that BCT and mastectomy offered women with early stage breast cancer equal survival benefit. However, those findings come from a period in time when very little was understood about breast cancer biology, explains Isabelle Bedrosian, M.D., associate professor, surgical oncology at MD Anderson.

"Forty years ago, very little was known about breast cancer disease biology – such as subtypes, differences in radio-sensitivities, radio-resistances, local recurrence and in metastatic potential," explains

Bedrosian, the study's senior author. "Since then, there's been a whole body of biology that's been learned – none of which has been incorporated into patient survival outcomes for women undergoing BCT or a mastectomy.

"We thought it was important to visit the issue of BCT versus mastectomy by tumor biology," Bedrosian continues.

The researchers hypothesized that they would find that patients' surgical choice would matter and impact survival with tumor biology considered.

For the retrospective, population-based study, the researchers used the National Cancer Database (NCDB), a nation-wide outcomes registry of the American College of Surgeons, the American Cancer Society and the Commission on Cancer that captures approximately 70 percent of newly-diagnosed cases of cancer in the country. They identified 16,646 women in 2004-2005 with Stage I disease that underwent mastectomy, breast conserving surgery followed by six weeks of radiation (BCT), or breast conserving surgery without radiation (BCS). Bedrosian notes that it was important that the study focused solely on women with Stage I disease in order to keep the study group homogenous and because in this cohort few would be ineligible for BCT.

Since estrogen receptor (ER) and progesterone receptor (PR) data were available and HER2 status was not, the researchers categorized the tumors as ER or PR positive (HR positive), or both ER and PR negative (HR negative). Patients were rigorously matched using propensity-score for a broad range of variables, including age, receiving hormone therapy and/or chemotherapy, as well as type of center where patients were treated and comorbidities.

Of the 16,646 women: 1,845 (11 percent) received BCS; 11,214 (67 percent) received BCT and 3,857 (22 percent) underwent a mastectomy.

Women that had BCT had superior survival to those that had a mastectomy or BCS – the five-year overall survival was 96 percent, 90 percent and 87 percent, respectively. After adjusting for other risk factors, the researchers again found an overall survival benefit for BCT compared to BCS and mastectomy. In a matched cohort of 1,706 patients in each arm, the researchers still found an overall survival benefit with BCT over mastectomy in the HR positive subset but not in the HR negative subset.

While provocative, Bedrosian cautions that the findings are not practice changing, as the study is retrospective. Still, the research complements other recent studies that showed BCT was associated with a survival benefit compared to mastectomy. Also, she points to the delivery of radiation therapy as the possible driver of the overall survival benefit.

"We've historically considered surgery and radiation therapy as tools to improve local control," says Bedrosian. Yet recent studies suggest that there are survival-related benefits to radiation in excess of local control benefits. Therefore, radiation may be doing something beyond just helping with local control. Also, we know hormone receptive positive tumors are much more sensitive to radiation, which could explain why we found the survival benefit in this group of patients."

As follow up, Bedrosian and her team hope to mine the randomized controlled trial findings from the 1980s, matching those cohorts to current NCDB patients to see if a similar survival benefit could be observed.

"While retrospective, I think our findings should give the breast cancer community pause. In the future, we may need to reconsider the paradigm that BCT and mastectomy are equivalent," she says. "When factoring in what we know about tumor biology, that paradigm may no longer hold true."