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The Use of Breast Cup Immobilization in Radiation Therapy and Patient Reported Outcomes on Cosmesis and Pain

PURPOSE: Breast cosmesis and pain are among the most reported outcomes in patients undergoing breast irradiation. There is variability in the degree of adverse reactions based on different patient specific characteristics. It has been found that women with large body habitus, African American race, and larger breast size tend to have an increased chance of experiencing worse toxicity from treatment. Attempts to improve cosmesis and pain have been highly explored. We explore here whether the use of a breast cup for treatment leads to worse cosmesis and pain when compared to those treated without a breast cup. This is an important topic as it is felt that the use of a breast cup would provide a significant dosimetric advantage (i.e. organ at risk dosing) during treatment. We now explore this treatment option through a retrospective analysis of patient reported outcomes experienced during and after completing post-operative radiation therapy to the breast.

MATERIALS/METHODS: 645 patients undergoing adjuvant breast irradiation were evaluated from 2011 through 2019. 79 patients were treated using a breast cup. Mean heart dose was analyzed and compared between the two treatment groups and was found to be comparable in each arm. Additionally, patient reported outcomes among the entire cohort were collected via survey documentation forms during treatment, at 1 month post treatment, and at 1 year after treatment. These results were collected using the Michigan Radiation Oncology Quality Consortium (MROQC) database as each patient was consented to enroll in MROQC prior to starting treatment. The outcomes of skin changes, lymphedema, and breast pain among the two treatment groups were then compared for statistically significant differences via a logistic regression analysis.

RESULTS: Patients were evaluated at 3 time points; during treatment, 1 month post-treatment and at 1 year after treatment. Of the 79 patients treated with a breast cup, when compared to the no cup patients, grade 2 pruritus and grade 1 alteration in skin texture were not significantly different at any time point ($p > 0.05$). With regards to lymphedema, no statistically significant difference was seen between the two groups of patients outside of the 1 month after treatment survey time point; all p-values greater than 0.05 except for the 1-month mark (p-value 0.03). Lastly, breast pain survey remarks at the pre-specified time points failed to show a significant difference in the symptom between the two analyzed treatment groups ($p> 0.05$).

CONCLUSIONS: From our patient's perspective, the use of a breast cup during radiation therapy did not negatively impact breast cosmesis or pain when compared to patients treated without a cup. Breast cup use was also found to produce similar dosimetric coverage to the heart as non-cup patients, even in left sided breast cancers.