

**TITLE: Aesthetic Results Evaluation of Reduction Mammoplasties in Breast Cancer Treatment**

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**Background:** The Breast Cancer Conservative Treatment.cosmetic results (BCCT.core) is a software created for the objective evaluation of aesthetic results in Breast Cancer Conservative Treatment (BCCT). It compares both breasts after unilateral treatment comparing several parameters (asymmetry, colour differences and scar visibility). With the increasing use of oncoplastic surgical techniques in breast conserving surgery it is possible that adaptations to the algorithms of the BCCT.core software to evaluate cosmetic results may be needed. The purpose of this work is to compare aesthetic results of patients who have had Therapeutic Mammoplasties (TMamm), a technique where both breasts are reduced, one side to include wide excision of the cancer. Aesthetic outcome was assessed objectively using the BCCT.core and subjectively by a panel of expert observers.

**Material and methods:** Pictures from 60 patients with breast cancer from three centres were obtained. All cases were treated with TMamm and pictures were captured at least one year after the end of local treatment (surgery and radiotherapy). Subjective evaluation was undertaken by a panel of 5 expert observers (independent of treatment procedures), and for each case a classification of excellent, good, fair and poor was obtained (median of observers evaluation). Images were subsequently evaluated objectively by the BCCT.core. Agreement between observers, between each observer and the median classification, and between software and subjective classification was calculated using multiple kappa (k) and weighted kappa (wk) statistics. A kappa score of 0 was considered poor agreement; 0.01–0.20 slight agreement; 0.21–0.40 fair agreement; 0.41–0.60 moderate agreement; 0.61–0.80 substantial agreement; 0.81–0.99 almost perfect; and 1.00 perfect agreement.

**Results:** Regarding subjective assessment interobserver agreement was fair to moderate (k=0.21, wk=0.35). Expert agreement with the median classification varied from fair (k=0.27, wk=0.39) to substantial agreement (k=0.60, wk=0.68). Values of agreement between software and consensus classification were moderate (k=0.48, wk=0.50). Median subjective classification was excellent in 14 cases, good in 32, fair in 12 and poor in 2 cases. The BCCT.core software, using asymmetry as the most valued of the evaluated features gave, as expected, more favorable results (excellent-26; good-30 cases; fair-4)

**Conclusions:** Therapeutic mammoplasty for breast cancer is a new oncoplastic technique with a different standard for cosmetic evaluation when compared with the classic breast conservative treatment due to the surgical intervention in both breasts. This technique presents new challenges to the cosmetic evaluation of results. Overall, there was moderate agreement between subjective and objective assessments. This level of agreement is less than we have previously reported in evaluation of conventional breast conserving surgery. The methods used to evaluate the aesthetic results of these new techniques will need further development.