

## **PREDICTION MODEL OF ASYMMETRY IN BREAST CANCER CONSERVATIVE TREATMENT (CT)**

Susy Costa<sup>1</sup>, André Magalhães<sup>1</sup>, Ricardo Sousa<sup>2</sup>, Jaime S. Cardoso<sup>2</sup>, Maria João Cardoso<sup>1,2</sup>

<sup>1</sup> Porto Faculty of Medicine, Porto, Portugal

<sup>2</sup> INESC Porto, Porto

**Background:** The prediction of a fair or bad result after conventional BCCT could lead to the choice of an alternative surgical option. Using an ongoing study on BCCT (*BCCT.prediction*) we tried to predict the aesthetic outcome of classic BCCT based on the analysis of pre and post-operative patients' photographs.

**Material and Methods:** Face-view digital photographs of 33 patients, taken before and 30 days after surgery, were objectively assessed with the software BCCT.core to extract asymmetry measures: Breast Compliance Evaluation (BCE); Breast Retraction Assessment (BRA); Upward Nipple Retraction (UNR); Breast Contour Difference (BCD); Lower Breast Contour (LBC); Breast Overlap Difference (BOD). Clinical data of these patients were retrieved from the database and included: 1) patient height, weight, thoracic perimeter and bra size; 2) tumour size, location, specimen size and weight; 3) surgeon expertise, incision size and location and flap rotation. A regression model using asymmetry measures combined with clinical data was applied (Support Vector Regression) to predict asymmetry on the 30<sup>th</sup> postoperative day. Agreement between predicted and real asymmetries was calculated using the Linear Coefficient Correlation ( $\rho$  [0: no agreement to 1: highest agreement]).

**Results:** A moderate performance was obtained with BCE ( $\rho=0.55$ ), BRA ( $\rho=0.65$ ), UNR ( $\rho=0.65$ ), BCD ( $\rho=0.73$ ), BOD ( $\rho=0.81$ ) and LBC ( $\rho=0.85$ ).

**Conclusions:** The algorithm was capable, with moderate agreement, to predict the 30<sup>th</sup> postoperative day asymmetry measures. A larger number of patients will be needed to validate this model.