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Cosmetic outcome after hypofractionated, normofractionated and intraoperative breast radiotherapy: A photographic evaluation study of patients from prospective trials; KOSIMA, TARGIT-A and TARGIT-E

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Purpose/Objective: Photographic documentation of breast changes after breast radiotherapy (RT) is a helpful tool to both subjectively and objectively evaluate cosmesis. This study aimed to evaluate cosmesis in breast cancer patients after receiving hypofractionated whole breast RT (HF-WBRT), normofractionated (NF-WBRT), intraoperative RT (IORT) or combined WBRT/IORT within prospective studies. Methods and Material: After excluding files with missing or inadequate photos from three prospective clinical trials (KOSIMA, TARGIT-A & TARGIT-E) 155 and 205 patients were included in subjective analysis while 132 and 185 patients were included in objective analysis postoperatively and 2 years after RT respectively. Subjective evaluation was done using the Harvard scale. Objective evaluation was done by assessing percentage breast retraction. Based on the treatment received, patients were divided into 5 groups: 1.HF-WBRT 40.05Gy/2.67Gy±Boost, 2.NF-WBRT 50Gy/2Gy±Boost, 3.NF-WBRT 56Gy/2Gy, 4.IORT 20Gy, 5.IORT 20Gy +WBRT 46Gy/2Gy. Results: Subjectively, the rate of acceptable cosmesis was 92% postoperatively and 84% after 2 years while objectively it was around 56% at both time points. At 2 years, there was no significant difference in cosmesis between the 5 treatment groups neither subjectively ($p=0.55$) nor objectively ($p=0.88$). Regarding possible factors affecting cosmesis at 2 years, there were no differences concerning age, smoking, body mass index, chemotherapy, hormone therapy or type of axillary surgery. Significantly better cosmesis was observed in patients with tumor location in the upper outer quadrant ($p<0.001$) and with percentage of excised to total breast volume <10% ($p<0.0294$). Conclusions: After two years of follow-up, adjuvant radiotherapy caused only minor cosmetic deterioration based on subjective and objective assessment of photographic documentation. The influence of the treatment dose, technique and fractionation is minimal. Hypofractionated WBRT and IORT as a single treatment or as a boost were not cosmetically inferior to normofractionated WBRT. Tumor location and excised breast volume were the only factors significantly affecting cosmetic outcome.