Toxicity and cosmetic outcome after Intraoperative Radiotherapy with Electrons (IOERT) to the partial breast during breast conserving surgery of breast cancer patients in early stages: First results of a prospective single-center registry trial (415-E/2464/5-2019)

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Background and purpose:
Partial breast irradiation (PBI) has been established as an effective de-escalation strategy for the treatment of early stage breast cancer. The aim of this single-center, registry base, observational study is to assess the effect of intraoperative electron radiation (IOERT) as a full dose treatment to the partial breast during breast conserving surgery (BCS), in terms of acute/late toxicity and cosmetic outcome.
Material and methods:
Recruitment for this prospective trial (415-E/2464/5-2019) began in November 2018 and consists of BCS patients who received a full dose IOERT with 21 Gy (90% isodose) to the partial breast. Only low risk breast cancer patients (age ≥ 50 years, unifocal tumors < 2cm, no grading 3, R0, Luminal A, KI 67 ≤ 25%, N0) were considered. Acute/late toxicity and cosmesis were evaluated by validated scorings systems.
Results:
257 eligible patients were screened, of which 31 were excluded and the remaining 226 analyzed in November 2023. After a median follow-up (FUP) of 25 months (range 0.7-61), for acute effects CTCAE-score 0/1 was noted in 98.5% in week 1 and 98% in week 4, respectively. Late toxicity Grading 0/1 (mean values of all qualities, ranges) by LENT-SOMA criteria was observed in 96.5% (85.5-100) at 4/5 months and remained unaltered with 96.1 % (81-100) at 4 years. Baseline cosmesis (week 1) after wound healing was scored as excellent/good in 91 % of cases by subjective (patient) and in 84 % by objective assessment by a radiation oncologist, with no impairment thereafter. Thus far, no locoregional recurrence has been detected, 2 patients developed metastases and 2 died.
Conclusions:
Acute and late treatment ttolerance of full dose IOERT to the partial breast in early breast cancer stages is excellent in short-term assessment and comparable to the current literature. Postoperative cosmetic appearance is not impaired after 4 years FUP.