

## **ABSTRACT**

It is demonstrated by the EORTC boost trial that an additional boost dose to the tumor bed significantly improves local control, as this area represents a region with the highest probability of local tumor recurrence. Particularly, younger patients represent the category who largely benefit from a supplemental higher dose of irradiation; however, according to current guidelines, a specific contraindication in this peculiar age group is partial breast irradiation, since limiting the irradiated area to the surgical alone is not considered adequate to ensure good tumor control. Several trials focused on the role of IORT technique as boost for the treatment of early-stage breast cancer: a high single dose radiation of electrons is delivered in a single fraction intraoperatively to the tumor bed, prior to WBI. The aim of this research project was to evaluate the long-term side effects and the efficacy of an unconventional adjuvant radiation treatment, which has the advantage of being intensive and shortened at the same time. At the European Oncology Institute (IEO, Milan) we retrospectively analyzed 518 premenopausal women with early-stage breast cancer who, from June 2004 to December 2014, after breast conserving surgery, received an anticipated electron intraoperative boost with a dose of 12Gy, followed by hypofractionated whole breast irradiation (13 fractions of 2.85Gy over 2.5 weeks, to a total dose of 37.05Gy). Our study provided long-term good results of this treatment regimen regarding efficacy, especially displaying excellent local control rates, but also both acute and chronic toxicity and cosmesis outcome. In conclusion, after 10 years, boost IOERT and hypofractionated WBI showed to be effective and safe in this premenopausal population so it is a feasible option for early-stage breast cancer treatment in young women.