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HYPOFRACTIONATION WITH SIMULTANEOUS INTEGRATED BOOST FOR EARLY BREAST CANCER USING VMAT: ACUTE TOXICITY AND COSMESIS IN 1025 PATIENTS

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Hypofractionated WBI

Literature data

Phase III randomized trials test that in-breast cancer recurrence at 10 years in the hypofractionated arms was not inferior to that achieved by standard fractionated WBI

Whelan TJ, Pignol JP, Levine MN, et al. Long-term results of hypofractionated radiation therapy for breast cancer. N Engl J Med 2010;362:513–520.

Haviland JS, Owen JR, Dewar JA, Agrawal RK, Barrett J, Barrett-Lee PJ, et al. The UK Standardisation of Breast Radiotherapy (START) trials of radiotherapy hypofractionation for treatment of early breast cancer: 10-year follow-up results of two randomised controlled trials. Lancet Oncol. 2013;14:1086–94.

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Hypofractionated WBI

International Guidelines

NCCN National Comprehensive Cancer Network®

NCCN Guidelines Version 2.2016
Breast Cancer

NCCN Guidelines Index
Breast Cancer Table of Contents
Discussion

Dose and Fractionation

Four randomized clinical trials have investigated hypofractionated whole breast radiation schedules (39–42.9 Gy in single fractions of 2.6–3.3 Gy) compared to standard 50 Gy in single fractions of 2 Gy.[181-184] The 10-year follow-up data from the START trials[185] are consistent with the 10-year results of the Canadian trial,[184] which reported that local tumor control and breast cosmesis were similar with a regimen of 42.5 Gy in 16 fractions over 3.2 weeks compared with 50 Gy in 25 fractions over 5 weeks.[184] The START trials reported radiation-related effects to normal breast tissue such as breast shrinkage, telangiectasia, and breast edema as less common with the hypofractionated fraction regimen.[185]

The NCCN Panel recommends whole breast irradiation, a dose of 46 to 50 Gy in 23 to 25 fractions, or a dose of 40 to 42.5 Gy in 15 to 16 fractions. Based on convenience and the data from the START trials,[185] the short course of radiation therapy (40–42.5 Gy in 15–16 fractions) is the NCCN-preferred option for treatment of patients receiving radiation therapy to the whole breast only. A boost to the tumor bed is recommended in patients with higher risk characteristics (such as age <50, high-grade disease, or patients with focally positive margins) in order to reduce local relapse.[177,185-189] Typical boost doses are 10 to 16 Gy in 4 to 8 fractions.

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Hypofractionated WBI

Open issues

- Sequential or concomitant Boost
- Young patients
- Sistemic therapy

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Scorsetti *et al. Radiation Oncology* 2012, 7:145
http://www.ro-journal.com/content/7/1/145

De Rose *et al. Radiation Oncology* (2016) 11:120
DOI 10.1186/s13014-016-0701-z

RADIATION
Radiation Oncology

RESEARCH Open Access

Phase II trial of hypofractionated VMAT-based treatment for early stage breast cancer: 2-year toxicity and clinical results

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Carlos García-Etienne[1], Alessandro Clivio[1], Luca Cozzi[1], Pietro Mancosu[1], Giorgia Nicolini[1], Eugenio Vanetti[1], Marco Eboli[3], Carlo Rossetti[3], Arianna Rubino[3], Andrea Sagona[3], Stefano Arcangeli[1], Wolfgang Gatzemeier[3], Giovanna Masci[4], Rosalba Torrisi[4], Alberto Testori[5], Marco Alloisio[5], Armando Santoro[4] and Corrado Tinterri[3]

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Characteristics of the Study

INCLUSION CRITERIA

- age >18 years
- invasive cancer or DCIS
- Stage I - II (T <3 cm and N ≤ 3)
- breast-conserving surgery
- any systemic therapy

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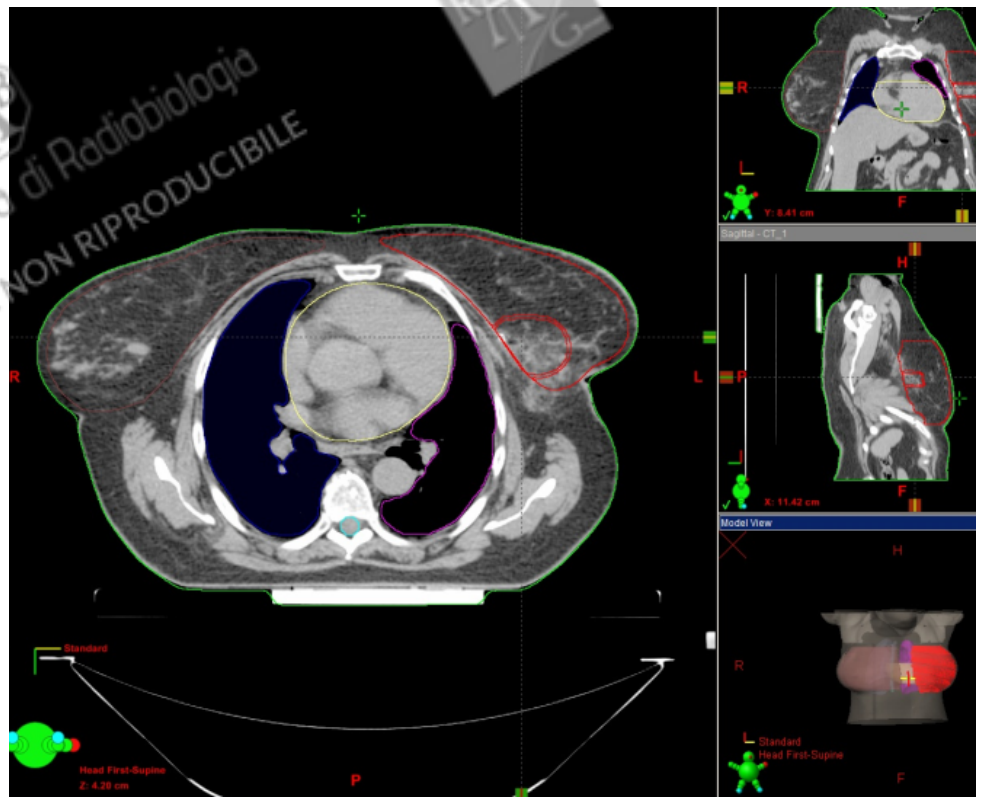
Characteristics of the Study

Simulation and Contouring



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Characteristics of the Study

Planning

- WBI: 40,5 Gy
- SIB: 48 Gy

(15 fractions)

Dose constraints

- Heart

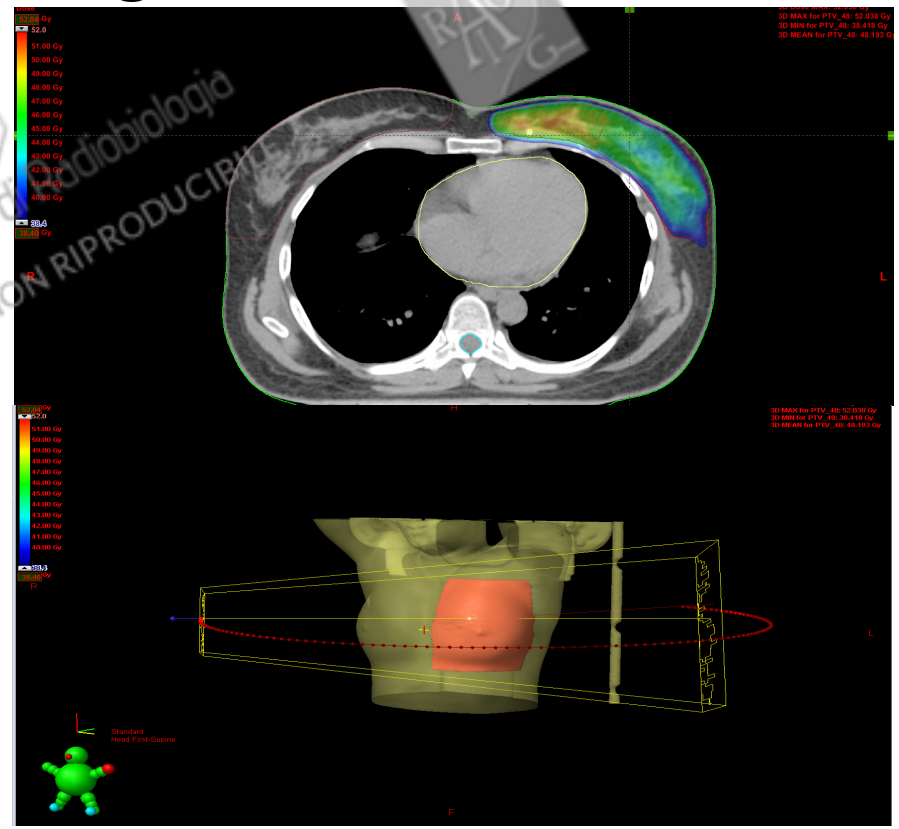
  D mean < 4 Gy; V18 < 5%

- Lung

  V20 < 10%; D mean < 10 Gy

- Contralateral breast

  D mean ≤ 3 Gy



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Results

From August 2010 to March 2016
1025 patients were treated according to the protocol

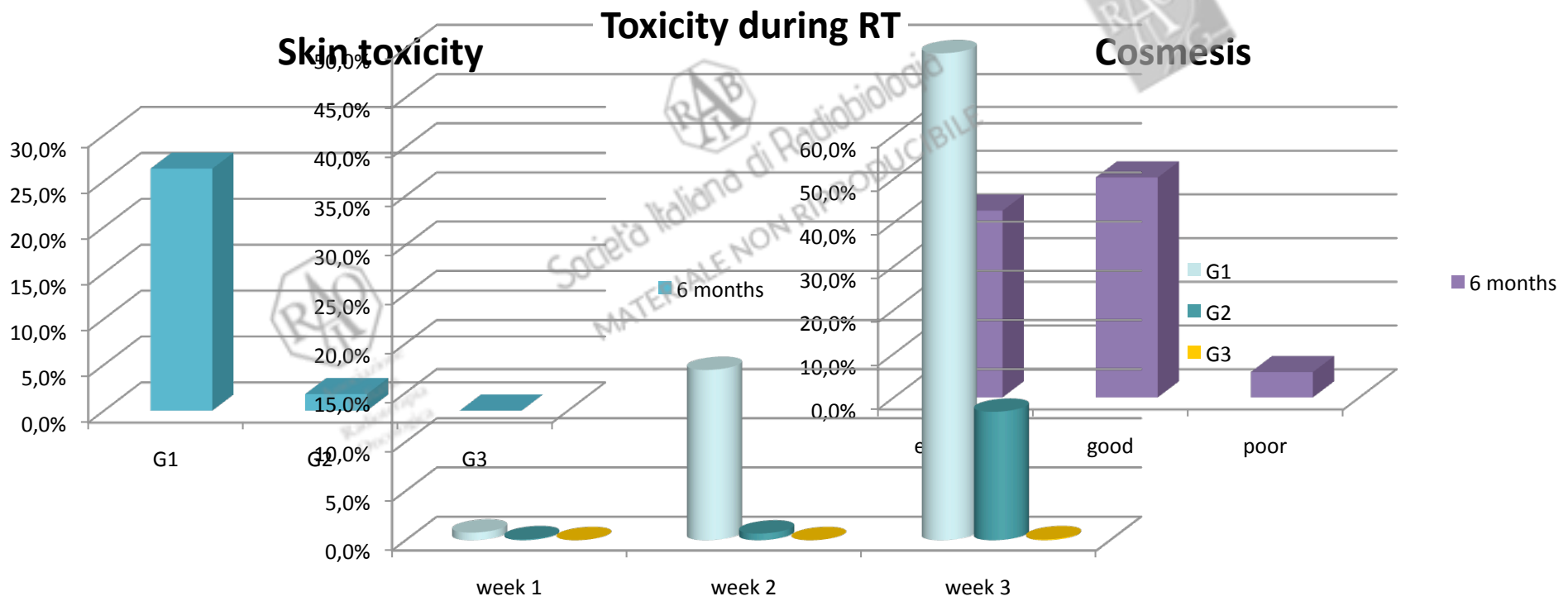
Median follow up 23,6 months (range 6,4 – 63,7)

202 patients (20%) underwent chemotherapy

14 cases of recurrences (1,3 %), one of them was an IBR

Age (years)	Median Range	60 27 - 89
Disease Stage	I II	70% 30%
Histology	IDC ILC Other Invasive	82% 13% 5%
Grading	I II III	12% 58% 30%
ER	Positive Negative	83% 17%
PgR	Positive Negative	72% 28%
C erb-B2	Positive Negative	18% 82%

Results



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Conclusions

- The 3-week course of postoperative radiation using VMAT with SIB showed to be well tolerated in acute setting

- Long-term follow-up data are needed to assess late toxicity and clinical outcomes.