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Toxicity and Cosmesis Outcomes for Single Fraction Intra-Operative Electron Radiotherapy (IOERT) for Breast Cancer

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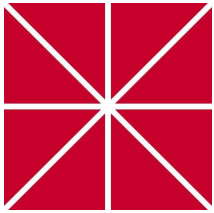
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Toxicity and Cosmesis Outcomes for Single Fraction Intra-Operative Electron Radiotherapy (IOERT) for Breast Cancer

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TOXICITY AND COSMESIS OUTCOMES FOR SINGLE FRACTION INTRA-OPERATIVE ELECTRON RADIOTHERAPY (IOERT) FOR BREAST CANCER

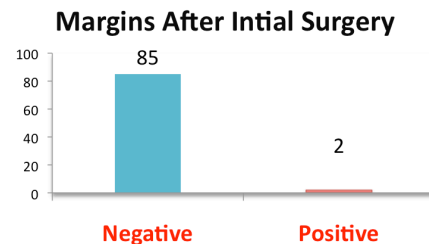
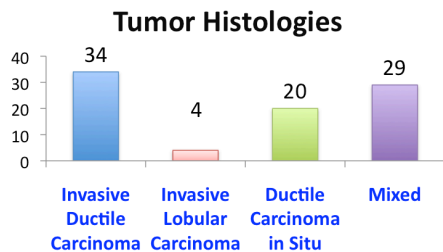
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BACKGROUND: Adjuvant radiation therapy is proven to reduce local recurrence in patients with early stage breast cancer. The major toxicity of standard external beam radiation therapy is sunburn like acute effects, long term tanning of the skin, and changes in breast size. After the completion of surgery and closure of the surgical incision, the precise location of the tumor is difficult to access. Currently the standard of external beam radiation therapy is 3-6 weeks often accompanied by an additional one-week boost. To reduce toxicity by delivering the dose only to the area with breast cancer, to improve geographic accuracy by delivering radiation to the tumor bed prior to incision closure, and to reduce treatment time to approximately 30 minutes, IOERT was utilized as an alternative to external beam radiation therapy.

PRIMARY OBJECTIVE: The study's objective was to determine the short term toxicity and cosmesis profile of single fraction IOERT given as definitive treatment in a community setting.

STUDY POPULATION: From Mar 2012 to Jul 2014, 84 patients (3 bilateral), ages 45-91 y.o. with stage 0-II were treated with IOERT.

TREATMENT DETAILS: At the time of breast conservation surgery, a single 21 Gy fraction was administered to the tumor bed after resection. IOERT was delivered using 4.5-6 cm applicators (cylindrical shaped tube) with electron energies from 6-12 MeV. The median pathologic tumor size was 13 mm (4 tumors >25mm). Median follow up was 57.1 weeks.



Sentinel Lymph Node Biopsies



IOERT TOXICITY AND COSMESIS MEASUREMENT: At 2w, 6mo and 12mo, toxicity was assessed according to CTCAE Version 4.0 (range 0-4) and cosmesis based on a scale derived for national trials.

RESULTS:

	Scale	2 Week (%)	6 Month (%)	12 Month (%)
Toxicity Grade	0	49	69	62
	1	44	29	35
	2	7	2	3
Cosmesis Appearance	Excellent	71	86	79
	Good	28	14	21
	Fair	1	0	0

CONCLUSION: Single fraction IOERT was well tolerated by all patients with no grade 3+ toxicity up to 12 months. At one year, 97% of patients had 0-1 grade toxicity and 100% of patients had excellent or good cosmesis. This treatment, consistent with current reports, meets critical criteria for incorporation into practice. It reduces treatment by 3-6 weeks by including the surgical procedure and radiation treatment at a single episode. This single fraction IOERT combined with surgery is completed in approximately two hours. This is a vast improvement upon separate surgical and radiation procedures done at different times which lasts almost 3 months to accomplish both. SF IOERT, in addition to yielding low toxicity and high cosmesis, improves compliance and cost to the patient and the healthcare system.

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