Oral Abstract

Radiographic Film Dosimetry as Predictor of Skin Toxicity from Intraoperative Radiotherapy

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Radiographic Film Dosimetry as Predictor of Skin Toxicity from Intraoperative Radiotherapy

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No conflicts of interest declared

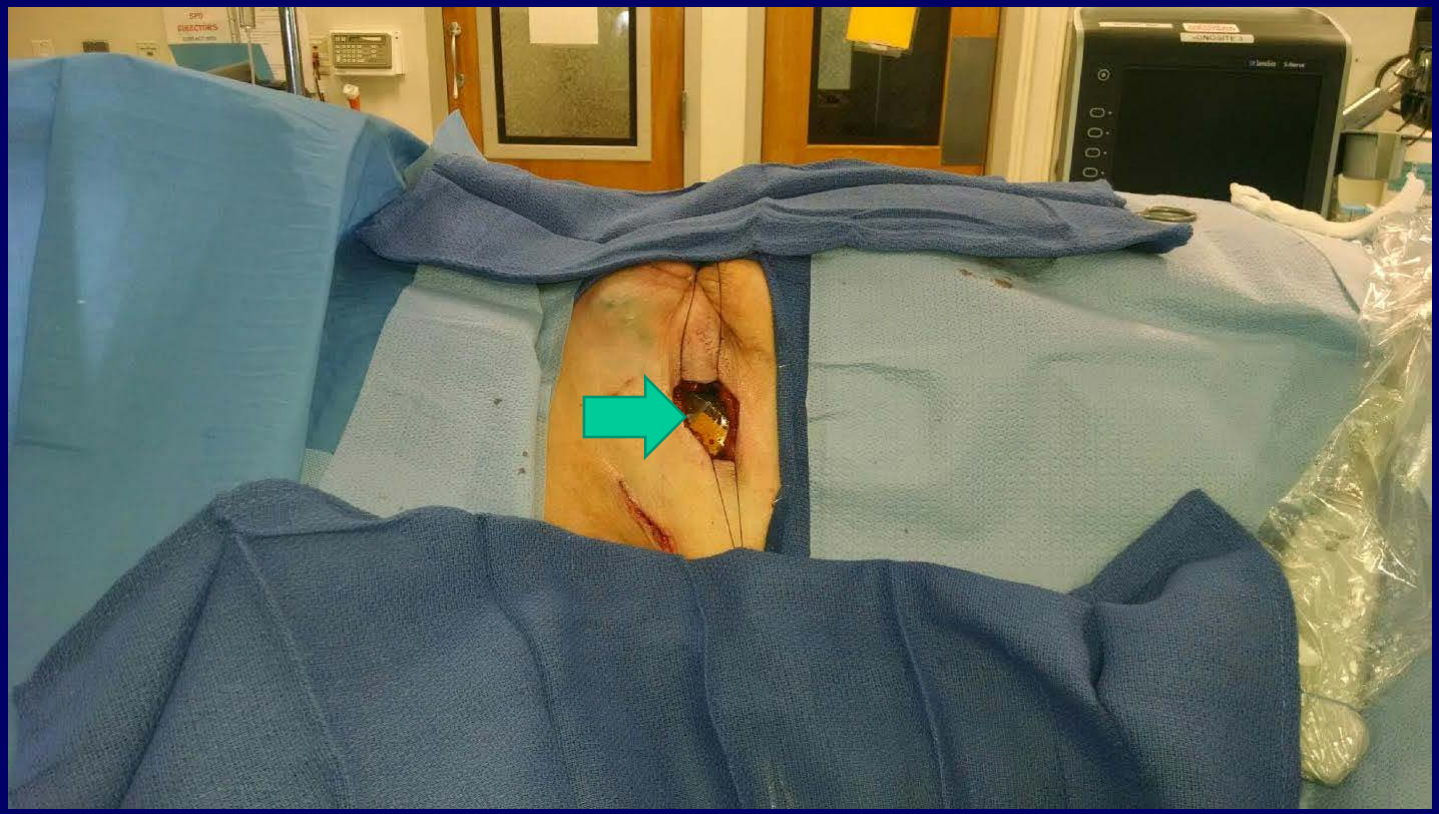
Purpose

- Measurements of lumpectomy cavity with RTQA2 radiochromic film is used to verify accurate delivery of Intraoperative Radiotherapy (IORT)
- Measurements of lumpectomy skin dose with RTQA2 radiochromic film is used to predict which patients may be at risk of skin toxicity

Materials and Methods

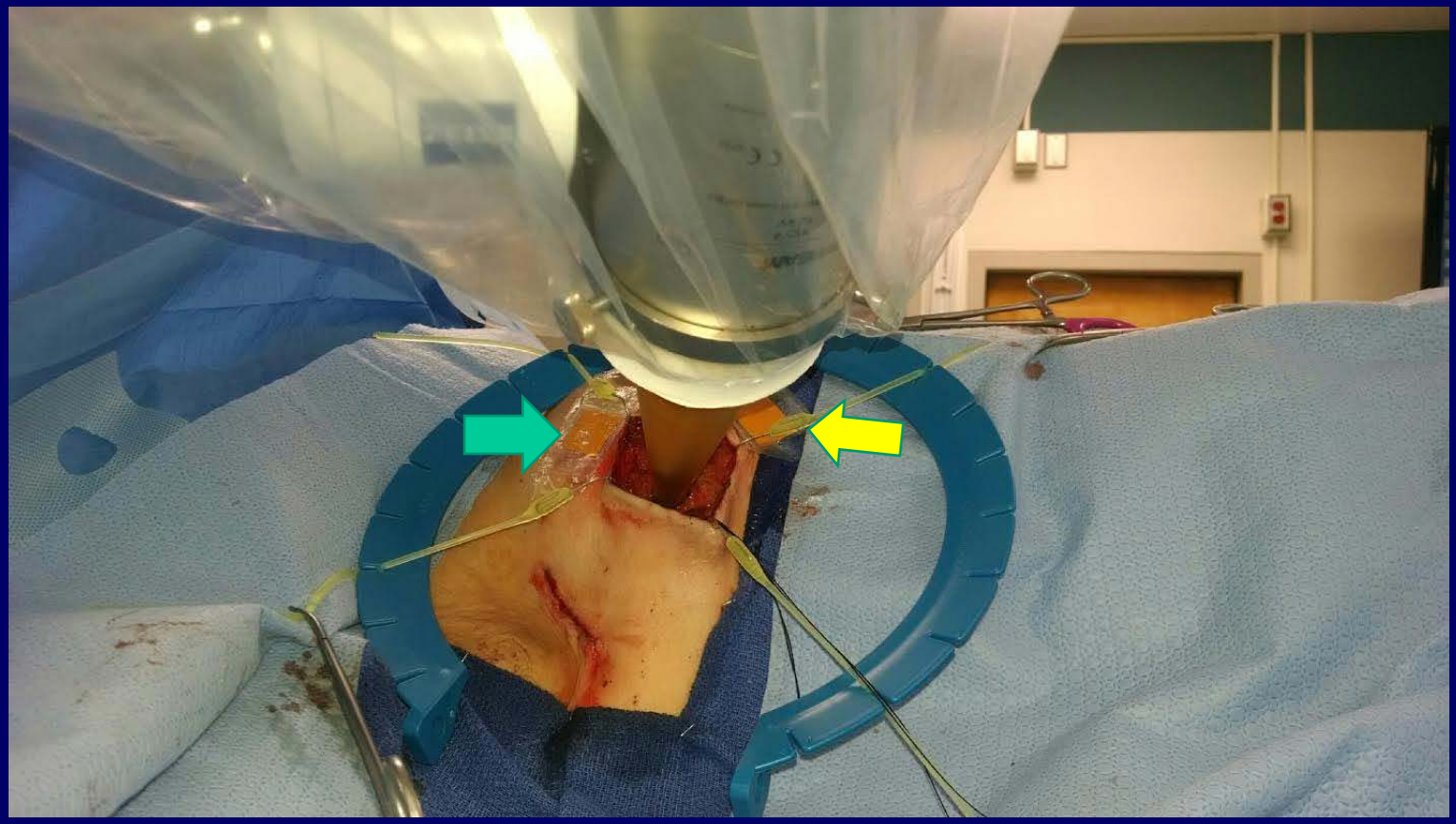
- Prospective dose measurement using *in vivo* dosimeters has been performed on all patients undergoing IORT since the inception of the program.
- All breast cancer patients were prescribed 20 Gy to the lumpectomy cavity surface using standard 3, 3.5, 4, 4.5, and 5 cm spherical applicators with a 50 kV, 40 mA x-ray beam.
- Film dosimeters were placed within the lumpectomy cavity and anterior to the superior and inferior skin surfaces.

Placement



One film dosimeter (blue arrow) is placed within lumpectomy cavity prior to applicator insertion

Typical Placement



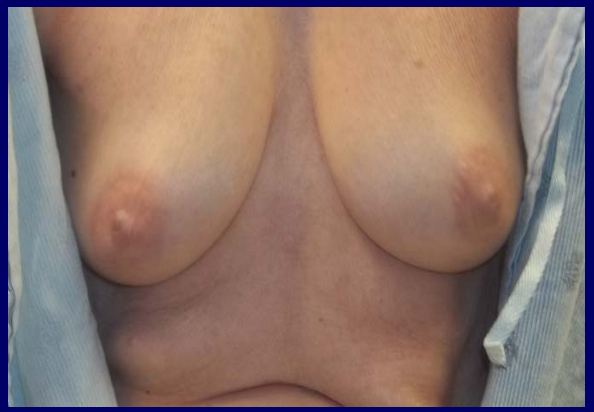
Typical arrangement of film dosimeters placed prior to initiation of IORT showing superior (blue arrow) and inferior (yellow arrow) skin placement.

Results

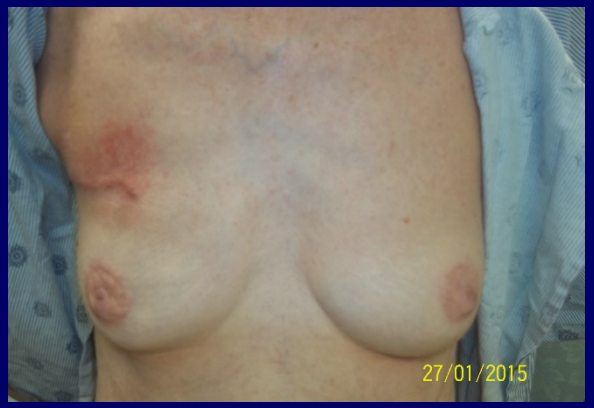
- Between 11/2012 and 10/2015, 262 consecutive patients received IORT with *in vivo* film dosimetry.
- Average lumpectomy cavity dose was 19.1 ± 2.8 Gy.
- Measured skin dose was 3.1 ± 1.7 Gy (superior) and 2.8 ± 1.6 Gy (inferior).
- There were two skin dose measurements > 10 Gy

Skin Dose 14.8Gy

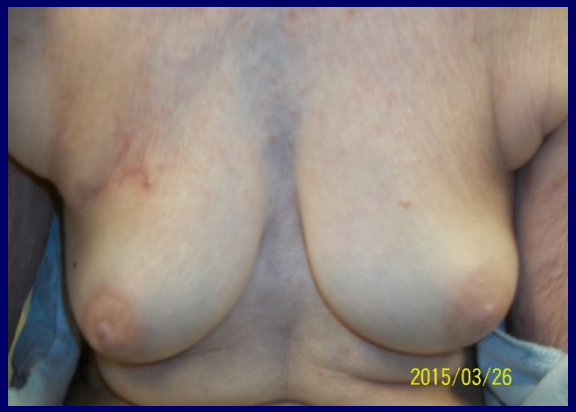
- A patient received 14.8Gy skin dose causing moist desquamation (Grade 3) that healed by 3 months and later developed moderate fibrosis with telangiectasia



Pre-op



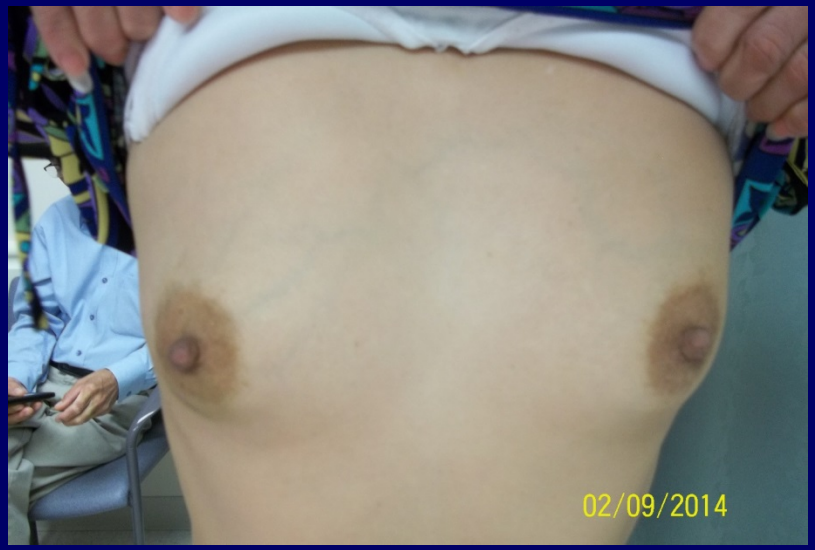
1 month post-op



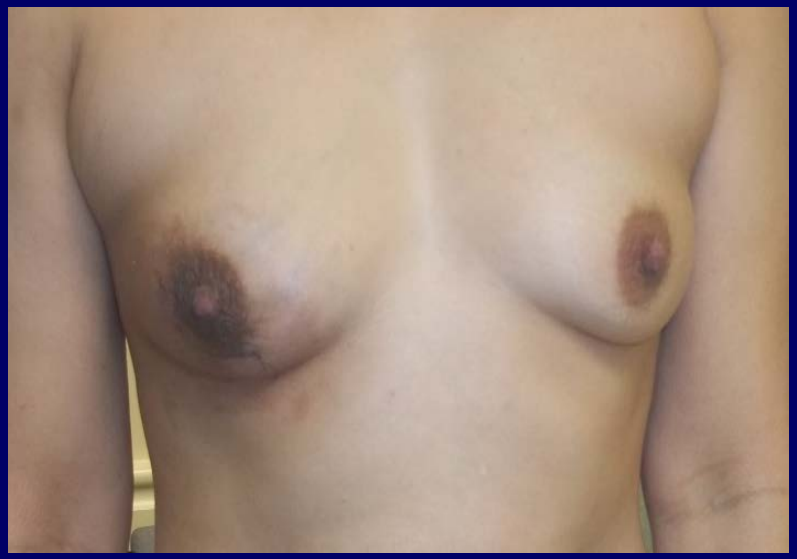
3 months post-op

Skin Dose 10.5Gy

- A patient received 10.5Gy skin dose with erythema and dry desquamation



Pre-op



1 month post-op

Skin Dose Distribution

Skin Dose (Gy)	Number (%)
>10	2 (<1%)
8-10	3 (1%)
6-8	22 (8%)
4-6	56 (21%)
2-4	146 (55%)
<2	34 (12%)

Future Directions

- Ultrasound used to verify conformity of lumpectomy cavity about applicator
  - Applicator repositioned if skin to applicator distance <5mm
  - One case aborted due to concern of high skin dose

Thank You

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