

PATIENT HISTORY

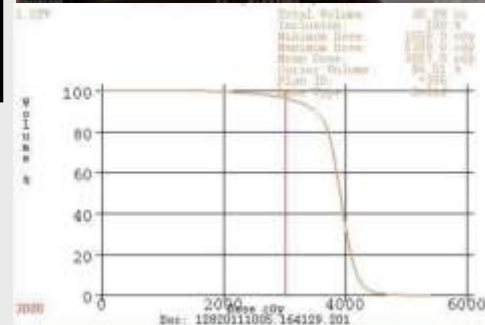
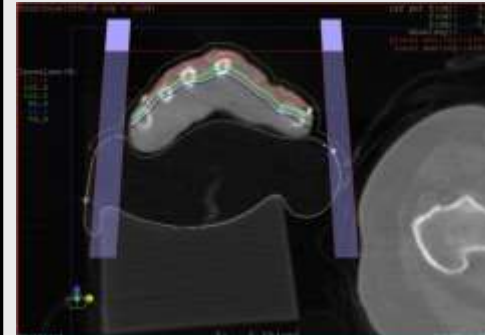
- Patient is a 88 year old male with recurrent squamous cell carcinoma
- Case history of lesions dating back 40+ years
- Two separate surgeries to remove lesions found metastatic disease near underlying tendons
- Due to advanced age & large skin reconstruction area, patient referred to radiation oncology

DOSE PRESCRIPTION

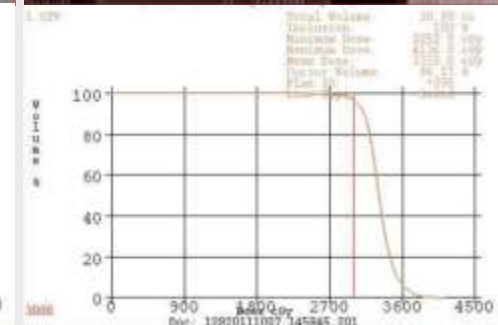
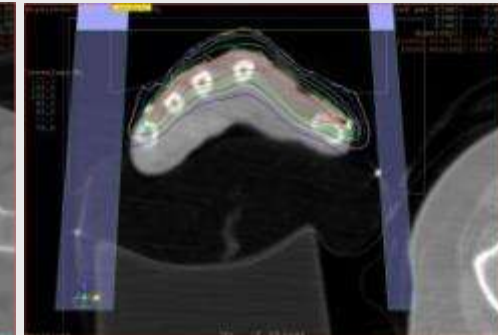
- 3,500 cGy to the dorsal side of the Rt. Hand in 7 fractions, 2 fractions a week.
- Field data: 9 MeV, 110 cm SSD, 15 by 15 cone, 90% isodose line, 680 MU.
- One additional fraction of 500 cGy was delivered to a small lesion, leading to a total dose of 4,000 cGy to that area

DOSE PLANNING

6 MeV w/ 0.5 cm Bolus



9 MeV w/ ECT Bolus



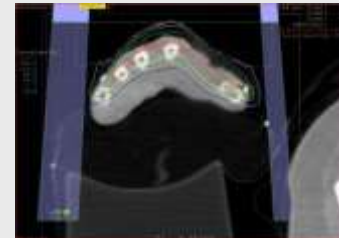
Initial CT Positioning



2nd CT scan



Virtual ECT Bolus



Actual ECT Bolus



SUMMARY

- Patient is almost 1 year post irradiation with no recurrence of disease
- Patient, at 6 month follow-up, reported no pain or discomfort in the hand with full functionality.

Prior to Treatment



After 1,000 cGy



3 months post treatment



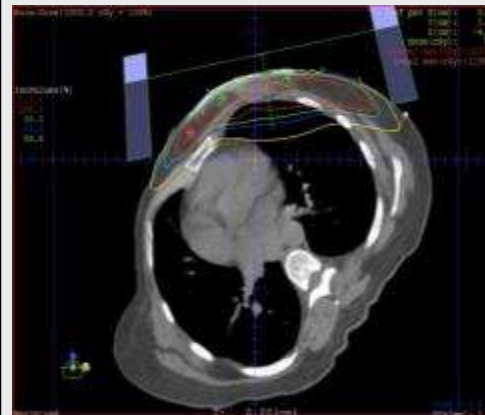
PATIENT HISTORY

- 41 yr old female good health
- Presented with left breast mass in Dec 08
- Pathological Stage T2, N1, M0 (stage III-A), poorly differentiated invasive ductal carcinoma of the left breast, receptor negative, HER-2/ neu negative
- Feb 09 the patient underwent left modified radical mastectomy with axillary dissection (and prophylactic right mastectomy).

DOSE PRESCRIPTION

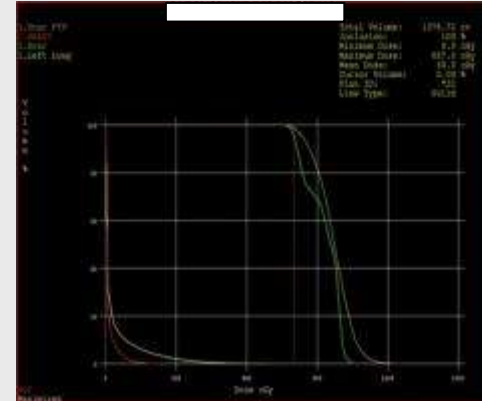
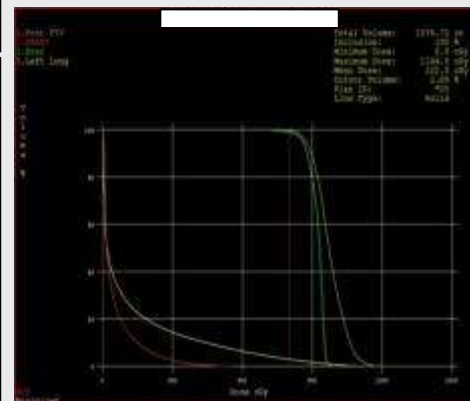
- 5040cGy/28 fx to left chest wall and peripheral lymphatics
 - Left chest wall treated with photon tangents fields, with sufficient SuperFlab bolus material to insure the development of satisfactory skin dose.
- Boost to left chest tumor bed using 9MeV electrons with Bolus ECT for additional 1000cGy/5 fx

DOSE PLANNING

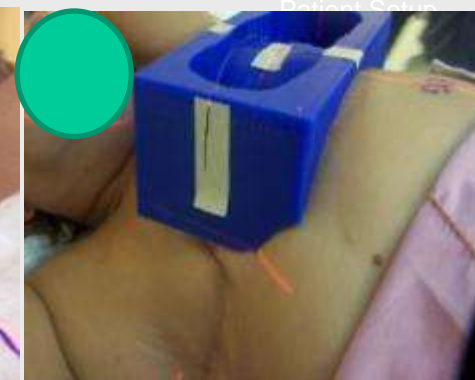
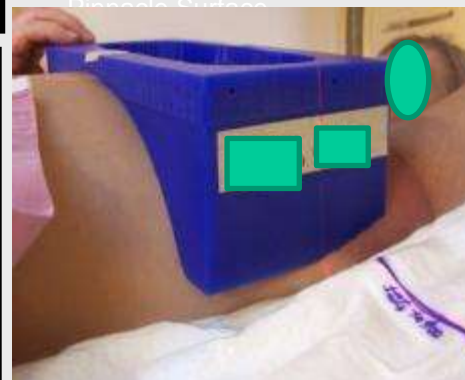


Planning Process

- Imported Data Set into RTP
- Contoured PTV and critical structures
- Created beam and centered on PTV.
- Tumor Bed PTV was defined as Scar plus a 2cm margin while clipping inside the patient skin surface 1mm and the entire thickness of the chest wall, avoiding the ribs along the chest wall.
- Used 105cm SSD and a 9MeV. This was an energy that covered the max extent of the PTV within the 90% isodose.



BOLUS SETUP



FOLLOW UP (17 Months)

- Patient tolerated treatment well, acutely developing RTOG Grade 2 skin reaction. Effects on skin healed nicely
- At 17 months post-radiation therapy, chest wall skin is intact and well-healed, no evidence of chest wall recurrence

SUMMARY

- Initial simulation is much more critical and technical than a typical chest wall boost.
- Reproducibility of set-up is much more important.
- Skin dose can be higher, but is well tolerated
- Isodoses are much more conformal than without ECT bolus, also allowing better sparing of underlying heart and lung.



Bolus Electron Conformal Therapy: Scalp

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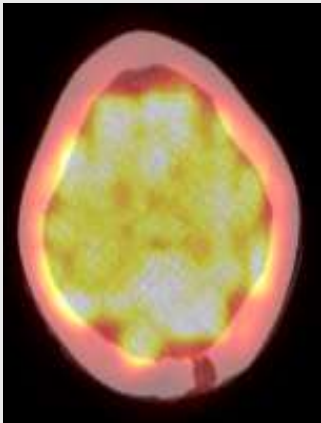


PATIENT HISTORY / PRESCRIPTION

- 52 year old female
- Stage IV Diffuse large B cell lymphoma
- Lesion eroded through skull
- Post-chemo radiotherapy
- Energy: 9 e-
- Rx: 30 Gy / 15 fractions
- Dose spec: 90%



DOSE PLANNING



ALTERNATIVE PLAN

- Skull concave not optimal for superflab
- Brain receiving higher dose
- Physician opted to use custom electron bolus

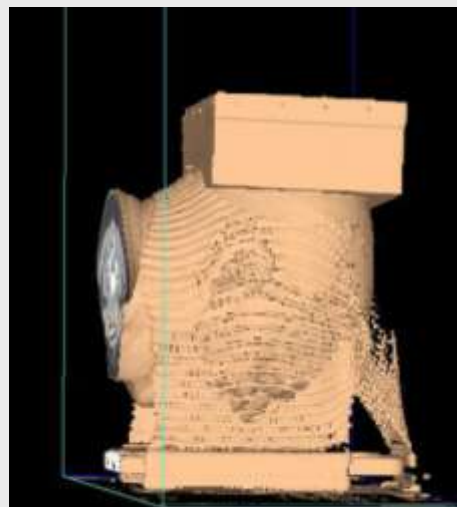
BOLUS SETUP

FOLLOWUP (18 months post treatment)

- Treatment successful, patient in remission since Tx
- However, patient has had permanent hair loss since the skin dose was high due to electrons plus bolus
- Dose above 25 Gy gray is usually associated with possible permanent hair loss

SUMMARY

- Customized bolus device delivered highly conformal dose distribution.
- Dose distribution for skin dose very accurate and increased for customized bolus treatment technique.



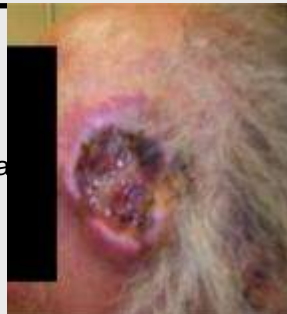
Pinnacle Surface Rendering



Patient Setup

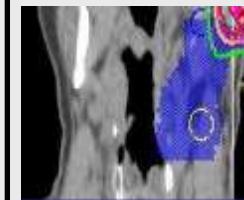
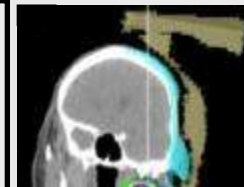
PATIENT HISTORY

- 66 year old white male
- September 2008
 - 3.8 cm squamous cell CA skin resected from L temple. Margins close and focal +
- May 2009
 - 7-8 cm tumor recurrence in L temple
 - Biopsy showed differentiated squamous cell CA
- May 2009
 - Resection with 10 cm defect repaired with flap. Margins close and focal +
- Treatment Options
 - TomoTherapy (not available locally)
 - BolusECT® + IMXT to upper neck

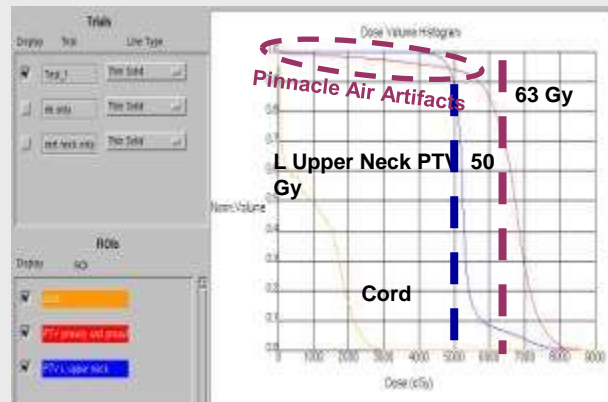
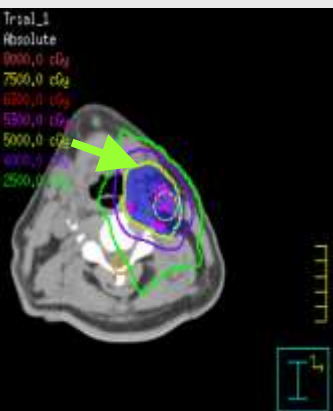
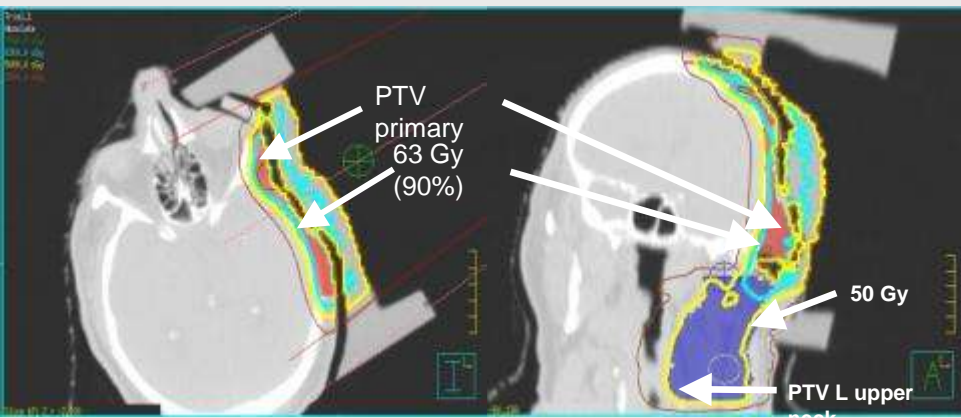


DOSE PRESCRIPTION

- L Temple
 - 63 Gy at 2.25 Gy /Fx (28 Fx)
 - BolusECT® using L oblique 9-MeV electron field
- L Upper Neck
 - 50 Gy at 2.0 Gy /Fx (25 Fx)
 - IMXT using 5-fields of 6-MV x-rays with matching edge without electron bolus
 - Optimized on top of electron dose distribution



DOSE PLANNING



BOLUS SETUP



FOLLOW-UP

(7 months post treatment)

- No recurrence at scalp or neck
- Small persistent unhealed area of skin at the area of the previous skin graft (Severe diabetes and new skin graft has been delayed because of severe unhealed diabetic foot)

SUMMARY

- BolusECT® conformed well to PTV sparing underlying brain tissue.
- IMXT optimized on top of bolus ECT dose distribution provided a good dose distribution in region of abutment.
- BolusECT® + IMXT is a viable substitute for helical TomoTherapy that we have often used to treat similar lesions.

Acknowledgements: Medical physicists Connel Chu, MS and Kenneth Hogstrom, PhD participated in the implementation of bolusECT® at Mary Bird Perkins Cancer Center and in bolusECT® treatment planning for this patient.

Conflict of Interest: MBPCC has a research agreement with .decimal, Inc.

PATIENT HISTORY

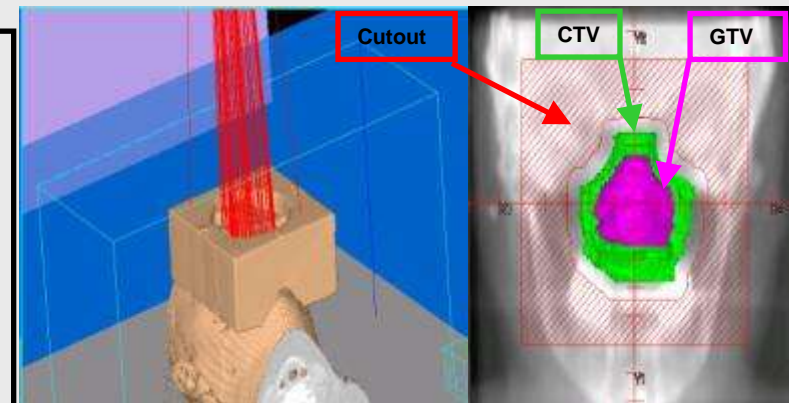
- 81 year old white female
- July 2008
 - Mohs resection for squamous cell CA nose
 - clear margins; reconstruction
- Sept 2009
 - 4-5 cm recurrence of entire nose with deep cartilage involvement
- Treatment Options
 - complete rhinectomy
 - IMXT vs. flat-bolus EB vs. BolusECT®



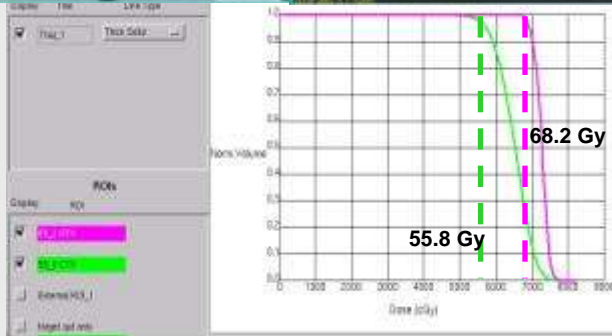
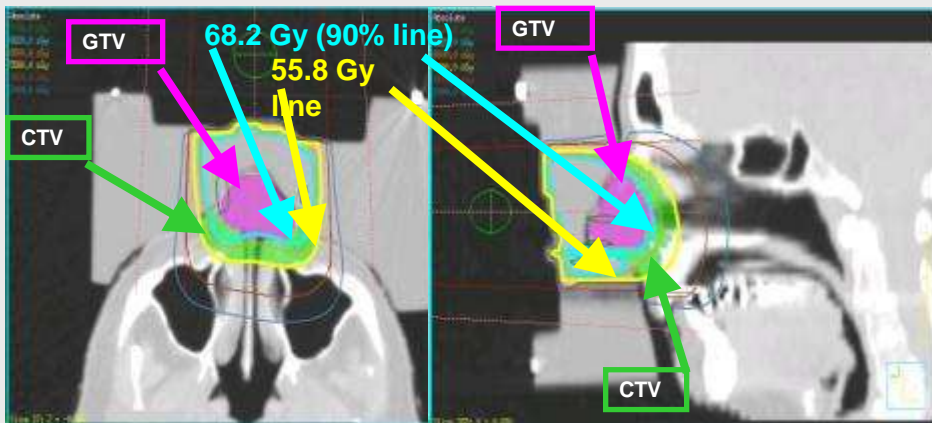
DOSE PRESCRIPTION

- Prescription Site
 - Skin of entire nose
- Prescription Dose
 - AP electron field (16 MeV) with bolusECT®
 - GTV: 68.2 Gy at 2.2 Gy /Fx (31 Fx) to 90% isodose line
 - Dose for subclinical: 55.8 Gy
 - Actual Tx was stopped at 66 Gy (30 Fx)

BOLUS SETUP and BEAMS-EYE-VIEW



DOSE PLANNING



FOLLOW-UP (4 months post treatment)

- No recurrence in skin or lymph nodes
- Good cosmetic result
- Future recurrence on nose or in the lymphatics, which were not irradiated, is possible.

SUMMARY

- BolusECT® conformed well to PTVs, sparing underlying brain tissue.
- .decimal-fabricated bolus, designed using CT scan data, is improvement over manually-fabricated bolus in that it:
 - fits patient surface better
 - allows thickness and shape of bolus to be optimized using p.d software

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PATIENT HISTORY

- Right Breast, Post-mastectomy.
- Tissue expander used to create a soft pocket to contain the permanent implant.
- Must maintain adequate dose coverage to skin tissue.
- Difficult to fit sheet bolus on patient without creating air gaps unless custom bolus used.

DOSE PRESCRIPTION

- Prescription for 50.4 Gy in 28 fractions
- Customized 1cm uniform wax bolus by .decimal used for first 14 fractions and then discontinued.
- Last 14 fractions done without bolus.

DOSE PLANNING



BOLUS CREATION

- Create Body and make copy
- Expand Copy to bolus thickness amount
- Remove original body
- contour
- Remove parts of bolus superior and inferior
- Calculated dose
- Order bolus from .decimal

No Bolus

Bolus

Bolus Creation

FOLLOWUP (7 months post treatment)

- Patient able to tolerate and completed course of therapy as planned without a break.
- Brisk skin erythema, uniformly over treatment area at discharge.
- 4 week FU revealed a decrease in hyper-pigmentation, a decrease in erythema with good skin healing.

SUMMARY

- Creation of bolus easily done with tools in treatment planning system.
- Manufacture of bolus easily done by .decimal.
- Fit for difficult contour shapes very well with .decimal bolus, no significant air gaps or folds that are seen with sheet bolus.

BOLUS SETUP

