

Supplementary A. Answers on a questionnaire regarding the infrastructural information

Case #1: 45y/0 woman presented with cT2 (2.5 cm) N1 (single small LN), G3 IDC in the UIQ. ER-, PR-, HER2-, Underwent MRM and reconstruction (Tissue expander subpectoralis insertion): pT2 (2.5cm) with 3/12+LN (LVI, no ECE)

Q1. Check all the target range that would treated with radiotherapy. (Repetition allowed)

- Tissue expander Skin surface Pectoralis muscles Intercostal muscles Ribs
 AXL Lv 1-2 AXL Lv 3 SCL IMN

Q2. Dose prescription (Repetition allowed)

- 50 Gy in 25-28 Gy fractions 40.05 Gy in 15 fractions 42.56-43.2 Gy in 16 fractions
 45.9 Gy in 17 fractions 48 Gy in 20 fractions Others (Please specify:)

Q3. Use of bolus?

- No Yes (Around scar only) Yes (Whole reconstructed breast) Yes, Others (Please specify:)

Q4. Please perform target volume contouring and radiotherapy planning on the simulation CT that was provided.

Case #2: 40y/0 woman presented with cT3 (5.5 cm) N2 (multiple fixed LN), G2 IDC in the UOQ. ER+, PR-, HER2-, Underwent MRM and reconstruction (Tissue expander subpectoralis insertion): pT3 (5.5 cm) with 7/22+LN in level I (LVI+, ECE+)

Q5. Check all the target range that would be treated with radiotherapy. (Repetition allowed)

- Tissue expander Skin surface Pectoralis muscles Intercostal muscles Ribs
 AXL Lv 1-2 AXL Lv 3 SCL IMN

Q6. Dose prescription (Repetition allowed)

- 50 Gy in 25-28 Gy fractions 40.05 Gy in 15 fractions 42.56-43.2 Gy in 16 fractions
 45.9 Gy in 17 fractions 48 Gy in 20 fractions Others (Please specify:)

Q7. Use of bolus?

- No Yes (Around scar only) Yes (Whole reconstructed breast) Yes, Others (Please specify:)

Q8. Please perform target volume contouring and radiotherapy planning on the simulation CT that was provided.

Case #3: 35y/0 woman presented with cT2 (2.5 cm) N3 (multiple LN+ in IMN, AXL), G3 IDC in the LIQ. ER-, PR-, HER2-, Underwent neoadjuvant chemo, then MRM and reconstruction (Tissue expander subpectoralis insertion): ypT2 (2.5 cm) with 5/15+LN in level I (LVI+, ECE+), no IMN surgery (normalized LN in IMN after neoadj. chemo).

Q9. Check all the target range that would treated with radiotherapy. (Repetition allowed)

- Tissue expander Skin surface Pectoralis muscles Intercostal muscles Ribs
 AXL Lv 1-2 AXL Lv 3 SCL IMN

Q10. Dose prescription (Repetition allowed)

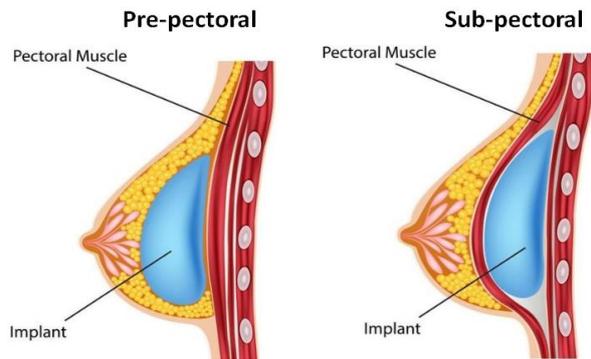
- 50 Gy in 25-28 Gy fractions 40.05 Gy in 15 fractions 42.56-43.2 Gy in 16 fractions
 45.9 Gy in 17 fractions 48 Gy in 20 fractions Others (Please specify:)

Q11. Use of bolus?

- No Yes (Around scar only) Yes (Whole reconstructed breast) Yes, Others (Please specify:)

Q12. Please perform target volume contouring and radiotherapy planning on the simulation CT that was provided.

Case#4: 40y/0 woman presented with cT2 (2.5cm) N2 (multiple fixed LN), G2 IDC in the UOQ. ER+, PR-, HER2-, Underwent MRM and reconstruction (Tissue expander pre-pectoralis insertion): pT2 (2.5cm) with 5/22+LN in level I (LVI+, ECE+)



Q13. Check all the target range that would be treated with radiotherapy. (Repetition allowed)

- Tissue expander Skin surface Pectoralis muscles Intercostal muscles Ribs
 AXL Lv 1-2 AXL Lv 3 SCL IMN

Q14. Dose prescription (Repetition allowed)

- 50 Gy in 25-28 Gy fractions 40.05 Gy in 15 fractions 42.56-43.2 Gy in 16 fractions
 45.9 Gy in 17 fractions 48 Gy in 20 fractions Others (Please specify:)

Q15. Use of bolus?

- No Yes (Around scar only) Yes (Whole reconstructed breast) Yes, Others (Please specify:)

Q16. Please perform target volume contouring and radiotherapy planning on the simulation CT that was provided.

Case #5: 48y/0 woman presented with cT2 (4 cm) N1 (single small LN), G3 IDC in the UIQ. ER-, PR-, HER2-, Underwent MRM and reconstruction (Tissue expander subpectoralis insertion): pT2 (2.5 cm) with 3/16+LN (LVI, no ECE), RM positive at underlying skin

Q17. Check all the target range that would be treated with radiotherapy. (Repetition allowed)

- Tissue expander Skin surface Pectoralis muscles Intercostal muscles Ribs
 AXL Lv 1-2 AXL Lv 3 SCL IMN

Q18. Dose prescription (Repetition allowed)

- 50 Gy in 25-28 Gy fractions 40.05 Gy in 15 fractions 42.56-43.2 Gy in 16 fractions
 45.9 Gy in 17 fractions 48 Gy in 20 fractions Others (Please specify:)

Q19. Use of bolus?

- No Yes (Around scar only) Yes (Whole reconstructed breast) Yes, Others (Please specify:)

Q20. Use of boost RT?

- No Yes (Please specify:)

Q21. Please perform target volume contouring and radiotherapy planning on the simulation CT that was provided.

Q. Acquisition of CT images at simulation

(1) Manufacturer and the model of the CT scanner

(2) Thickness of CT slices

1 mm 2 mm 2.5 mm 3 mm 5 mm Others: mm

(3) Use of contrast agent in CT scan

Yes No

(4) Patient positioning (Repetition allowed)

Supine Ipsilateral arm up Both arms up

Tilt the patient's chestwall upwards

Chin up Turn the head to the contralateral direction

Others (Please specify:)

(5) Immobilization devices used (Repetition allowed)

Vac-Lok Alpha cradle (MeV-Green) Breast board Arm rest Wing board

Thermoplastic breast support Others: Thermoplastic mask to immobilize chin

(6) What is the diagnostic imaging technique that is used with simulation CT in target volume delineation?

CT PET/CT PET MRI Ultrasound Others:

(7) When contouring the target volume and OARs in a patient with tissue expander insertion, do you use CT scan that is applied with metal artifact reduction?

No Refer to CT scan applied with metal artifact reduction Refer to MVCT

(8) If so, which CT data set would you use for dose calculation?

Planning CT CT scan applied with metal artifact reduction MVCT

Others:

(9) Device used to reduce respiratory motion

4DCT Gating Abdominal Compression Automatic Breathing Control

Breath Hold Not Applicable Others:

Q. Linear accelerator information

(1) Please specify the manufacturer and the machine that is used for the treatment of the patient who had breast reconstruction.

VARIAN ELEKTA TOMOTHERAPY Others:

(2) Please check all the beam energy that is used for treatment.

6 MV 10 MV 12 MV 15 MV Others:

(3) Multi leaf collimator (MLC) thickness

2.5 mm 5 mm 10 mm Others: mm

Q. Details of radiotherapy planning

(1) What is the treatment planning system (software) that is used?

RayStation Pinnacle eclipse MONACO 기타:

* What is the version of TPS used?

(2) Which techniques would you use for planning?

2D (tangential) 3D Conformal Forward IMRT Step-and-shoot (SMLC) IMRT
Sliding window (DMLC) IMRT Helical Tomotherapy VMAT Others:

(3) Dose calculation algorithm

(4) Dose calculation

Heterogeneity Corrected Heterogeneity Uncorrected

(5) If IMRT (VMAT) is used in treatment planning, please specify the information below.

(a) Minimum MU numbers:

(b) Minimum segment size in the TPS:

(c) Grid size for dose calculation in the TPS:

(d) Gantry-angle spacing for VMAT delivery:

(6) Would you apply density override to the tissue expander and surrounding artifact in treatment planning?

Not of concern Only to the tissue expander Only to the surrounding artifact Tissue expander and surrounding artifact

(7) Planning target volume (PTV) margin

(a) Use of PTV?

Yes No (Dose prescription target volume:),

Do use PTV but prescribe at CTV Others:

Q. Radiotherapy treatment details

(1) What is the available modality for image-guided radiotherapy (IGRT) before beam delivery?

- MV planar imaging (EPID or linac-gram) 2D kV imaging (e.g., OBI) kV CBCT
 MVCT Others: _____

(2) How often is MVCT or KVCT performed for setup verification?

- Daily Weekly
 On the first day of beam delivery only Others: _____

(3) Respiratory motion control technique

- Gating Abdominal Compression Automatic Breathing Control
 Breath Hold Not Applicable Others: _____

(4) If bolus is applied, is it applied on a daily basis?

- Daily Every other day Not applied Others: _____

Q. Patient specific QA

(1) Is patient specific QA performed?

- Yes No Others: _____

(2) For absolute dose calculation, which measurement method is used?

- Ion Chamber Diode array Ion chamber array Film Portal dosimetry
 Others:

* Please specify the model and phantom for the measurement method.

(3) For relative dose calculation, which measurement method is used?

- Diode array Ion chamber array Film Portal dosimetry Others:

* Please specify the model and phantom for the measurement method.

(4) What is the criteria used for QA pass/fail?

A. Absolute dose:

B: Relative dose: (If Gamma index is used)

- Dose difference
- DTA (mm)
- Cut-off dose (low-dose limit) (%)
- Method used for normalization: Absolute Global Absolute Local Relative

- Criteria for passing rate

C. Others: