

Study Case : Adaptive Radiotherapy for Breast Cancer using AdaptBox



Key figures

- 5 Radiation Oncologists
- 6 Medical Physicists
- 5 Dosimetrists
- 29 Radiation Therapists
- 5 Linacs (3TB+2HCY)
- 1700 Patients treated annually

LENA ALBERT DUFROIS, MD
Radiation Oncologist

The Challenge: During the first radiotherapy session the patient presented with mild edema on the chest wall and arm pain, which were alleviated with physiotherapy. This improvement relaxed the patient but required a slightly different positioning. The first session's CBCT image was validated by the physician.

As sessions progressed, notably during the fourth session, the patient's right shoulder pain lessened, resulting in a repositioning that would have necessitated a new CT scan and recontouring without AdaptBox, posing logistical challenges for the team.

Patient Profile

Gender: Female, **Age:** 52 years.

Medical History: Nothing notable

Disease History: Diagnosed in December 2023 with an infiltrating ductal carcinoma (IDC) of the right breast, confirmed by biopsy (HER2+) with initial lymph node involvement. The Patient underwent initial chemotherapy, followed by a lumpectomy and mastectomy.

Radiotherapy Protocol

Treatment Type: VMAT radiotherapy on Halcyon, planned using TPS Eclipse V16.1 Acuros XB.

Administrated Dose: 52.2 Gy in 29 fractions to the right chest wall; 49.3 Gy to the supraclavicular, infraclavicular, and internal mammary lymph node areas. Axillary irradiation was not indicated as dissection had already been performed.

Start Date: September 19, 2024

Time and Resource Savings: Reduced delays for teams and improved service organization.
Approximately 3 hours saved* (Radiation oncology team)

Precision and Safety: Maintained the prescribed dose with proper positioning, without compromising dosimetric constraints.

Optimized Patient Experience: The patient received continuous treatment without stress from last minute adjustments and was exposed to less imaging dose by avoiding an additional CT scan.

CONCLUSION

This clinical case demonstrates the efficiency of AdaptBox in optimizing clinical resources and offering a seamless care experience. By automatically generating precise synthetic CBCT scans and associated contours, the dose was quickly validated.

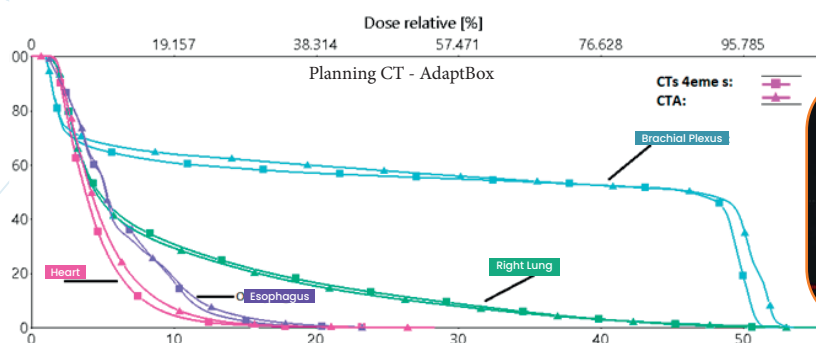
The simple integration into routine workflows and existing tools confirms that **AdaptBox is an essential asset for effective, stress-free adaptive radiotherapy, simplifying patient management.**



AdaptBox made it possible to quickly validate the dose using the CBCT

AdaptBox generated a **synthetic CBCT**, enabling precise evaluation of dosimetric coverage in the lymph node areas and the chest wall, as well as compliance with OAR constraints. In addition, there was no interruption of the treatment continuity, sparing the teams from performing a new treatment plan and the patient from undergoing an additional CT scan.

DVH-OAR



TIME SAVINGS WITH ADAPTBOX*

Medical staff: 45 minutes to 1 hour (eliminating an additional CT, eliminating an additional treatment plan: contouring, dose calculation, QA and data exchange with OIS system.)

Radiation Therapists: 20 minutes (patient handling and performing the scan).

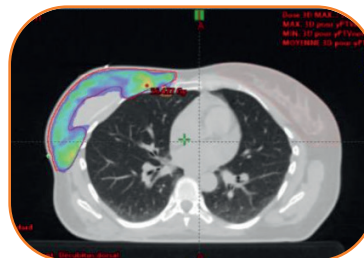
Dosimetrists & Physicists: 2 hours to produce another treatment plan and perform QA.

Dosimetry Check

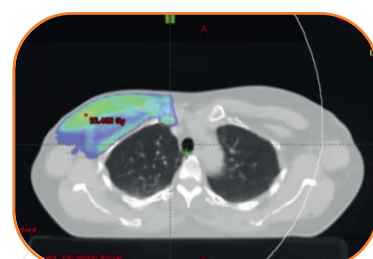
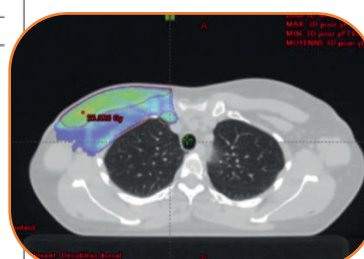
1 Planning CT

2 Synthetic CBCT - AdaptBox

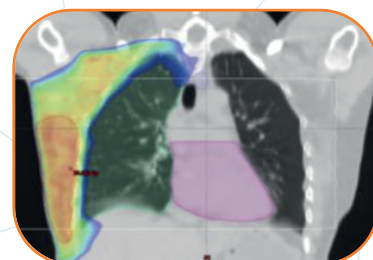
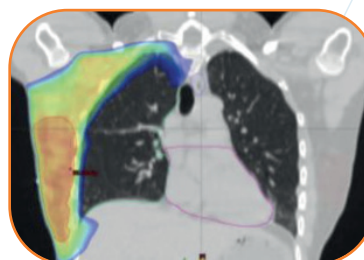
RIGHT CHEST WALL 52.2 GY



SUPRACLAV & IMN NODES



ISODOSE 20 GY



Comparison

AFFECTED CLINICAL WORKFLOW	WITH ADAPTBOX	WITHOUT ADAPTBOX
Dosimetry Validation	Directly validated from the CBCT using the synthetic CBCT.	Required a new planning CT , associated recontouring and a new treatment plan .
Continuity of Care	Treatment continuity maintained without stress for the patient .	Delayed sessions, leading to interruptions in patient care.
Impact on Teams	No additional workload or delays for the clinical team.	Approximately 3 hours* of additional work for the team.
Patient Imaging Dose	Avoided an additional CT scan.	Increased imaging dose due to a new CT scan.

*(AdaptBox time deducted)