DEEP INSPIRATION BREATH HOLD USING VITALHOLD™ ON THE RADIXACT® SYSTEM

A 45-year-old female patient was diagnosed with pT2N1M0 invasive ductal carcinoma of the left breast. The patient underwent breast conservation surgery with axillary dissection, followed by chemotherapy and radiation therapy. Radiation therapy was delivered by the Radixact® System, the latest generation of the TomoTherapy® Platform with surface guided radiotherapy (SGRT) enabled by VitalHold™.

FACTS AT-A-GLANCE

Sahyadri Hospitals

FACILITY NAME
Sahyadri Super Speciality Hospital

LOCATION
Hadapsar, Pune, Maharashtra, India

INDICATION
Breast cancer

TREATMENT SYSTEM EXPERIENCE
The Radixact System was installed in July 2024 with no previous experience of this technology

TECHNOLOGY SOLUTIONS
VitalHold: C-RAD SGRT technology integrated with the Radixact System

CASE MIX ON THE RADIXACT SYSTEM
Predominantly breast cancer but also all types of cancer including head and neck, prostate, lung, pancreas, liver, total body irradiation (TBI) and craniospinal irradiation (CSI)

NUMBER OF PATIENTS TREATED DAILY
Approximately 40 patients treated per day

TOTAL TREATMENT DELIVERY TIME
10-15 minutes for DIBH using VitalHold

Case Challenge:

In left sided-breast cancer patients the heart can lie within or in close proximity of the radiation treatment fields. To help minimize radiation dose to the heart it was decided that the best treatment approach was deep inspiration breath hold (DIBH) with SGRT using VitalHold on the Radixact System. The ability to continuously monitor patient movement is crucial during DIBH, where even slight changes in breathing can affect treatment accuracy.

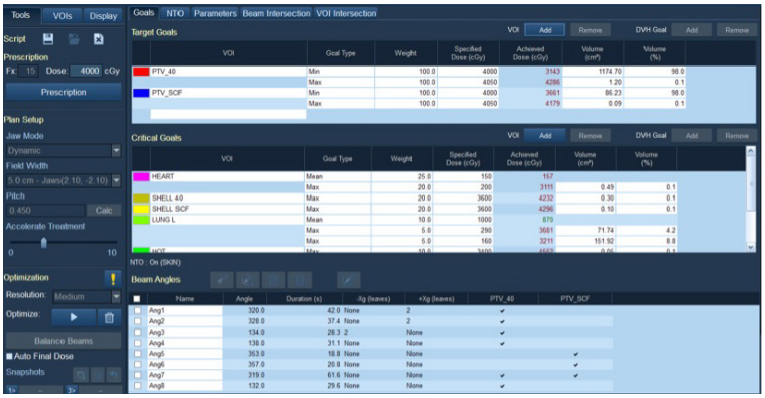
Treatment Planning:

The patient was positioned supine with arms raised and chin straight. A CT scan was taken while the patient was in DIBH mode, aided by the C-RAD Sentinel SGRT. The use of SGRT eliminates the need for permanent markers, enabling the Sahyadri medical team to offer a tattoo-free treatment experience, greatly reducing patient anxiety associated with set-up.

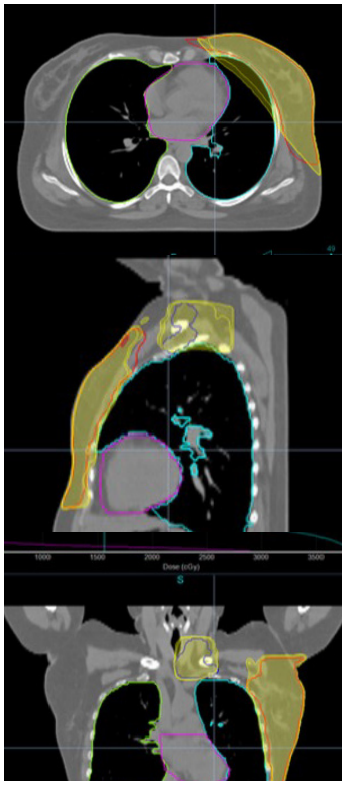
The treatment plan was developed for a prescribed dose of 40 Gy delivered in 15 fractions to the left breast PTV and PTV supraclavicular fossa (SCF) using TomoDirect™ Treatment Delivery mode with VOLO® Ultra optimizer. Eight beams (3 beams for SCF, 5 for the left breast and 1 common) were planned. After the final calculation, the PTV dose was 93% for PTV left breast, covering 95% of the prescribed dose and 95% for PTV SCF, covering 95% of the prescribed dose. The Radixact System excels at delivering a uniform dose across the treatment area, which can be challenging in some conventional treatment systems. The speed of treatment planning with VOLO Ultra was excellent, enabling quicker adaptations for DIBH which is a significant advantage in a busy clinical setting.

Organ at risk (OAR)	Dmean
Heart	1.57 Gy
Left Lung	8.7 Gy (V20 = 16.9%, V5 = 40.6%)
Contralateral Breast	1.3 Gy
Spinal Cord	25.1 Gy

Received doses to OARs



Prescription and treatment delivery information



Isodoses of left breast treatment in axial, sagittal and coronal planes

Treatment Delivery:

The patient tolerated the treatment well and maintained a good breath hold throughout the treatment course. One of the key benefits of the Radixact® System is the auto beam hold feature. With minimal beam-off latency it ensures that radiation is only delivered when the patient is in the ideal position. This minimizes the risk of misalignment and safeguards against unnecessary radiation exposure, enhancing the effectiveness. With reliable positioning and real-time feedback the patient found it easier to maintain their breath-hold, leading to a more comfortable experience. Interactive visual coaching empowered the patient to actively participate in their care. Treatment beam on time was achieved in only 4.5 minutes. The patient experienced no complications during treatment.

Outcome:

Treatment was completed successfully and the patient is now on follow up. Treatment was conducted with the Radixact X9 System using SGRT with VitalHold™, which helped meet dose requirements. Meticulous planning with VOLO™ Ultra and the use of VitalHold helped us minimize the dose to the heart.

"The Radixact System not only improves accuracy and safety but also prioritizes patient comfort and experience. This makes it a compelling choice for DIBH treatment, setting higher standards in radiation therapy."

Dr. Sanjay, M.H. Lead Consultant Radiation Oncologist, Sahyadri Hospitals, Pune, India

Important Safety Information:
Most side effects of radiotherapy, including radiotherapy delivered with Accuray systems, are mild and temporary, often involving fatigue, nausea, and skin irritation. Side effects can be severe, however, leading to pain, alterations in normal body functions (for example, urinary or salivary function), deterioration of quality of life, permanent injury, and even death. Side effects can occur during or shortly after radiation treatment or in the months and years following radiation. The nature and severity of side effects depend on many factors, including the size and location of the treated tumor, the treatment technique (for example, the radiation dose), and the patient's general medical condition, to name a few. For more details about the side effects of your radiation therapy, and to see if treatment with an Accuray product is right for you, ask your doctor. Accuray Incorporated as a medical device manufacturer cannot and does not recommend specific treatment approaches. Individual results may vary..

Radixact®