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The Use of Surface Guided Radiotherapy for Stereotactic Ablative Body Radiotherapy for Lung, Bone, and Nodes, & a Review of the Outcomes of the First 18 primary Lung Patients treated from 2021 to 2023

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Abstract

Objectives:

SABR implementation by 31st March 2021 was a National Health Service England (NHSE) requirement in the UK.
The Berkshire Cancer Centre (BCC) in Reading UK was already using Surface Guided Radiotherapy (SGRT) for all sites (except Head and Neck).
The aim of this presentation is to provide a review of the implementation of SGRT for SABR and its clinical patient outcomes, further evidenced using clinical case studies.
It will describe the implementation of VisionRTs AlignRT for SABR , the accuracy of SGRT to set-up the patient and then monitoring during treatment based on pre mid and post treatment Cone Beam Computed Tomography (CBCT) using Elekta XVI.
To report on clinical use of gated captures to prevent beam hold due to respiration during beam delivery.
To review the use of oral contrast for SABR node patients and use with CBCT
Finally to discuss the treatment outcomes and concordance to UK national SABR guidelines for Primary Lung cancer and report any significant treatment related toxicities as this was a new technique to the department and delivered without the use of permanent skin markers.

Methods:

A review of set-ups with SGRT for SABR using the electronic imaging record within Mosaiq.
A review of the RTD data held within AlignRT to investigate if this can indicate changes in patient breathing/position during treatment delivery where the CBCT shows discrepancy in tumour position.
To review treatment machine practice implementing changes seen on pre and mid treatment CBCT
For the primary lung cancer patient evaluation A review of the electronic patient record for 18 patients with data collection including age, gender, performance status, local control and biopsy/ HERDER score, clinical follow up notes

Results:

SGRT can be used effectively for rapid set up of patients with arms up or down. Monitoring the stability of the set up via pre and mid arc imaging has shown increased accuracy with decreased CBCT shifts
SABR lungs are all treated tattoo less
Review of RTD data is time consuming but gives valuable insight into patient respiratory motion during treatment delivery which can be implemented for further fractions for the relevant patients.
Patient review showed that all patients were compliant with UK nation guidelines for SABR treatment.
These patients completed their treatment within the planned time frame without any interruptions in care.
Only 1 out of the 18 patients had grade 3 toxicity where the patient required admission but this patient also has mid stage dementia so could be related to poor post treatment care.

Conclusion(s):

SGRT and CBCT work hand in hand to provide a quick and reproducible treatment for SABR primary lung patients
Clinical practice now modified to ensure patient allowed to acclimatise to the room temperature, breathing returns to normal rest breaths and data will be interrogated should consistent imaging discrepancies be found.
Patients can move hands and feet without affecting treatment position.

A re-plan is not always the first port of call.
After patient follow up Departmental local control rate 90%. 83% have disease in remission
Treatment at the BCC is safe with low incidence of serious adverse events (6%) with high compliance to SABR consortium Guidelines