Conclusion: When using KV-CBCT for set-up verification in stereotactic treatment a large inter-observer variability can be seen in a significant proportion of scans, particularly in extracranial treatment. Such a difference may have an impact on target coverage or organ at risk irradiation, thus requiring a proper margin. Further evaluation is needed, particularly focusing on methods to decrease such inter-observer variability.

EP-2112
Intrafraction setup errors in single fraction stereotactic radiosurgery with Elekta Fraxion system
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Purpose or Objective: Frame-based stereotactic radiosurgery (SRS) using rigid immobilization with head ring continues to be the standard treatment when it comes to intracranial SRS. We wanted to assess setup accuracy and intrafraction errors of patients treated with single fraction intracranial stereotactic radiosurgery using the Elekta Fraxion® immobilization system (Frameless SRS) and HexaPOD® positioning platform (translational and rotational set up error).

Material and Methods: 5 patients with a diagnosis of brain metastasis were treated with single fraction frameless stereotactic radiosurgery (SRS) at our institution between April 2015 and September 2015. Patients were initially immobilized using Fraxion® immobilization system (Fraxion comprises a head frame with a mouth-bite, thermoplastic mask and vacuum occipital cushions) and HexaPOD couch platform (HexaPOD™ is a robotic patient positioning platform providing six degrees of positioning freedom). Cone-Beam computed tomography (CBCT) were acquired before and after treatment to assess for intrafraction set up errors. Translational and rotational set up errors were obtained in Right/Left (R.L.), Postero/Anterior (P.A.), Inferior/Superior (I.S.) directions. Means and one standard deviation of the intrafractional errors in all six directions were analyzed.

Results: A total of 10 images were analyzed. A summary of the means and one standard deviation of the intrafractional errors (in mm for translation and degrees for rotation) were 0.01 ± 0.10 (RL), 0.00 ± 0.20 (PA), 0.04 ± 0.10 (IS), -0.76 ± 0.80 (RL rot.), -0.02 ± 0.81 (PA rot.), 0.58 ± 0.97 (IS rot) All of the patients were within the intrafractional errors described as for frame-based SRS.

Conclusion: Single fraction intracranial stereotactic radiosurgery utilizing frameless immobilization system like Elekta Fraxion® and HexaPOD®platform it’s a secure, precise and reproducible technique. Comparable results with Frame-based SRS were obtained, keeping between 1 mm and 1 degree margin range.

EP-2113
Clinical implementation of an optical surface monitoring system(OSMS®) in breast irradiation
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Purpose or Objective: The optical surface monitoring system (OSMS®) was implemented in our clinic to improve our daily radiation therapy workflow, to avoid frequent repositioning and unnecessary skin marks on breast cancer patients.

Material and Methods: 6 breast cancer patients were positioned with OSMS® and the set-up was then compared with MV imaging. The patients were treated using 3D tangential fields with free breathing and were positioned on the breast board. The OSMS cameras acquired the patient’s positioning in 2D and a computer algorithm reconstructed the image in 3D. Prior to that, the patient’s reference surface was imported from the planning CT scan and the region of interest within the treated area was selected. For the positioning with OSMS® the breast, hips and part of the upper arm on the treated side were used as a region of interest (ROI). After aligning the patient, MV imaging and bone match on the chest wall was used to correct for positioning error. 2 patients were aligned according to the CT skin reference marks previous to positioning with OSMS®. The other 4 patients were directly set up with OSMS. We compared this data with previously collected data on the difference between positioning, based on the skin marks of the patient using a laser system and MV imaging.

Results: The most suitable ROI was found to be the irradiated breast itself, excluding the shoulder and clavicular region, but including a 2 cm margin of chest wall surrounding the breast. Positioning based on OSMS® was in good agreement with the positioning based on MV imaging. The mean deviation between the two techniques was 1.3 +/- 1.6 mm, 1.3 +/- 1.8mm and 0.8 +/- 0.8mm in vertical, longitudinal and lateral directions for the all 6 patients. This was superior to positioning based on patient skin marks alone (1.4+/- 1.4, 1.8+/ -2.8 and 1.7 +/- 1.1 mm). The corrections of patient rotations were difficult to perform with OSMS®. Out of 112 treated fractions, 15 fractions showed on the MV image a rotation which was out of clinical tolerance and the patients had to be repositioned.

Conclusion: According to our preliminary data-patient positioning based on OSMS® is easy, time efficient and reproducible. Additionally, patient skin marks can be avoided. More data will be collected to confirm these findings. In the future we plan to use the OSMS® system for deep inspiration breath hold techniques and the set-up of extremities and bolus.

EP-2114
3D-Transabdominal Ultrasound and ConeBeam-CT: comparison of prostate positioning
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Purpose or Objective: External beam radiotherapy (EBRT) is a mainstay therapeutic option for prostate cancer and hypofractionated schedules were proposed as a suitable approach. Image guidance procedures are strongly needed to provide adequate accuracy precision, minimize geometric uncertainties and further diminishing unintended normal tissue irradiation. The Elekta ClarityTM platform allows the acquisition of three-dimensional ultrasound scans (3DUS) of the pelvic regions to perform image-guided radiotherapy. In our department, 3DUS is the reference IGRT modality and is used into daily clinical practice for prostate cancer radiotherapy (since from 2009) with optimal clinical results in terms of biochemical control and a good toxicity profile on 160 patients. Moreover 3DUS is a non invasive method with avoidance of extra radiation. In this study 3DUS was compared to grey-based positioning in kilovoltage Cone-Beam Computed Tomography (CBCT) during radiotherapy sessions.

Material and Methods: 10 patients affected with organ-confined prostate cancer were included. All patients should have a reliable ultrasound visualization of the prostate gland within the Clarity Platform. All patients received 61.1 Gy/26 fractions to the prostate gland and seminal vesicles and 70.2 Gy/26 fractions to the only prostate gland. The prostate positioning was controlled by 3DUS and CBCT. Patients were aligned to skin marks before all of the 26 treatment sessions. Control of the remaining inter-fractional setup error by 3DUS was successfully employed 147 times. During the