

methods should depend on the availability of resources in the radiotherapy department and the tolerance on the treatment accuracy.

PO-1114 Organ motion characterization by a novel fiducial marker in esophageal cancer radiotherapy

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Purpose or Objective

A novel fiducial marker was explored for use in image-guided radiotherapy (IGRT) of esophageal cancer patients by characterizing inter- and intra-fractional organ motion.

Material and Methods

Twelve esophageal cancer patients proposed for radiotherapy participated in this pilot-study. Markers (1-6 per patient) were implanted EUS- guided prior to radiotherapy planning CT (CT_p) with additional 4DCT, and the patients received IGRT (23-33 fractions, 41.4-66.0 Gy) with daily cone beam computed tomography (CBCT, n=302) and/or orthogonal planar images (2D/2D, n=61) and a repeated CT- and 4DCT the last treatment week. Marker presence, planning target volume (PTV) coverage, centroid position and extreme positions on CBCT were recorded per patient and -treatment fraction. Inter- and intra-fractional motion were characterized, in all patients and grouped according to marker location.

Results

At treatment end, 92% of markers visible at CT_p were still present. The PTV accounted for marker variation in >95% of treatment fractions for 92% of the patients. Overall 3D inter-fractional variation was >1cm in 23% and >0.5cm in 58% of the markers. Median (IQR) intra-fractional motion of all markers was 1.2 cm (0.4 cm) in the longitudinal, 0.11 cm (0.51 cm) in the ventral and 0.0 cm (0.13 cm) in the lateral direction.

Conclusion

The use of the investigated fiducial marker may be beneficial for IGRT in esophageal cancer as the marker loss during radiotherapy was limited. Inter- and intra-fractional variation was substantial with largest motion in the longitudinal direction and more pronounced in the caudal part of esophagus.

PO-1115 The UK lung SABR survey on behalf of the Advanced Radiotherapy Technologies Network

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Purpose or Objective

SABR has become the standard of care for patients with medically inoperable early stage non-small cell lung cancer or for patients who decline surgical resection. In the UK a limited number of centres are commissioned by the NHS to provide this treatment. The delivery of large

doses of radiotherapy is potentially associated with serious toxicity. Therefore strict image guidance protocols are required to ensure its safe delivery.

To build a comprehensive national picture of SABR provision, and the barriers faced by centres attempting to implement SABR, a survey was conducted on behalf of the UK Advanced Radiotherapy Technologies Network (ART-NET). In particular this focused on image guidance and the management of anatomical changes.

The aim was to identify any variation in current practice and areas where guidance may require updating. This work will inform the development of adaptive protocols for novel treatment platforms.

Material and Methods

An online survey was created and piloted amongst ART-NET member centres. This was then disseminated electronically to radiotherapy service managers in all UK NHS centres.

Results

100% of NHS centres responded to the survey. 36/62 UK centres deliver lung SABR. Of these, 6 English centres provide SABR despite not being commissioned to do so. 56% of SABR centres treat 20-100 patients per year, and 19% treat fewer than 20 patients per year. Lack of national commissioning was cited as the most common barrier to implementation by non-SABR centres (86%). These centres will refer appropriate patients to a SABR centre, although 62% also provide conventionally fractionated radiotherapy as a local alternative.

Most variation was seen in the frequency of cone-beam computed-tomography (CBCT); 8 different CBCT workflows were reported. Only 52% of centres have a protocol for addressing the impact of anatomical changes. Overall, 67% of centres planning to develop a service in the next year believe image guidance protocols require updating. The most commonly suggested topic was the frequency of image guidance including the necessity of pre or post-treatment scans.

Conclusion

Eligible patients may face difficulty accessing SABR due to a lack of commissioning in some centres. This issue should be investigated further to ensure there is equitable access to lung SABR in the UK. There is a need to update existing guidelines, as evidenced by the heterogeneity in image guidance practice across the UK. These should also incorporate advice on the management of anatomical changes and will inform future adaptive IGRT protocols on novel radiotherapy platforms such as the MR-linac.

PO-1116 Set-up in locoregional breast irradiation: reduced margins for subclavicular and axillar lymph nodes.

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Purpose or Objective

For locoregional irradiation of the breast, tangential fields to the breast were combined with VMAT to achieve steep dose falloff around the lymph node levels I-IV. After introduction of this new planning technique, setup instructions were adapted with additional focus on these lymph node regions. This allowed for reduction of the CTV-PTV margin in the lymph nodes, from 8mm to 5mm in all directions.

Material and Methods

21 breast cancer patients with 47 sessions were included in this study. Treatment plans consisted of tangential, ventrally open fields which delivered most of the dose to the breast and VMAT which delivered most of the dose to the nodal area.

Setup was performed based on 2 orthogonal 2D kV images. Instructions for this setup defined a maximum misalignment of 5mm in the bony anatomy in the lymph node regions, and 8mm in the humeral head and the