The volume of organs at risk and lymph node levels in the head and neck cases, as well as the clinical target volume CTV in the breast cases was compared with the manual contouring performed by an experienced radiation oncologist. The Dice similarity coefficient (DSC) was used to quantify the amount of similarity. Craniocaudal deviations of the individual structures were analysed.
Time of auto segmentation and subsequent manual correction of all structures was compared with manual contouring time of an experienced physician and correlated with recent published papers.

Results

DSCs were between 0.2261 (lymph node level V right) and 0.99 (outer contour). Mean craniocaudal deviations for CTV breast, heart, lungs, lymphatic levels II, III and IV were 7.29 mm, 5.58 mm, 1.59 mm, 3.27 mm, 9.55 mm, and 8.35 mm, respectively. Practically all of the segmented volumes needed a revision. Mean time for contouring of ABAS software was 2.01 min. The specialist of radiotherapy, however, needed 95,67 min for contouring head and neck cases without using ABAS as compared to 126 min with ABAS. Similar results were found for breast cancer. 27 minutes were needed for correcting the structure set. The DSCs for the average breast was 84%.

Conclusion

The exact recognition of target volumes, the organs at risk and the external contour as well as time saving - the two most important demands on the software - are not fulfilled. Employment of ABAS (solely based on included reference cases) had no benefit compared to manual contouring. A significant improvement of the software is necessary before it could be recommended for routine clinical work.

EP-1149 Clinical Evaluation of attenuation correction in FDG-PET/MRI in a head and neck radiotherapy setup

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Purpose or Objective

Hybrid PET/MRI is an exciting development, yet to find its place in oncology practice. It could be useful in sites, like head and neck, where functional information from PET and superior MRI soft tissue contrast can be used to adapt treatment. Dedicated equipment is required to perform PET/MR scans in the radiotherapy (RT) treatment position, which can affect attenuation correction (AC). The study aim was to compare the effect of CT vs MR AC on PET image quality and primary tumour delineation.

Material and Methods

Six patients were recruited with Stage III-IV head and neck cancer, where RT+/-chemotherapy (neoadjuvant and/or concurrent) was the primary treatment. Simultaneous PET/MR images were acquired on a Siemens Biograph mMR®. The dedicated RT set up included a PET and MR compatible flat table overlay (Mediboard®) and a custom-made coil holder that attaches to the table to support a pair of 6 channel body coils. Six patients had a PET/MR scan prior to RT. Four had a residual FDG-avid primary on the baseline scan and had a second scan in the 3rd week of RT. Two sets of PET data were created for each of the 10 scans: one with CT-AC and one with MR-AC. CT-AC was done using a non-contrast CT acquired at RT planning. MR-AC was done as standard using the Biograph mMR®, with attenuation maps of MR-visible objects (μ-map) based on a Dixon-VIBE sequence. Two reviewers, blinded to the AC method, qualitatively assessed all 20 sets and, where applicable manually outlined the FDG-avid primary, using Hermes Hybrid Viewer®. Qualitative scores were: 1-non-diagnostic; 2-poor; 3-adequate; 4-good; 5-excellent.

Results

All datasets received a score of at least 3 (adequate) by both observers. Inter-observer variability was assessed: 12/20 received the same score (60%). In 8 scans with discordant scores, the difference was across 1 category. An FDG-avid primary was identified and outlined on 14 data sets by both observers. The inter-observer variability, defined as the mean absolute volume difference, was 0.53cm^3 (Range 0.12-1.49cm^3). Mean percentage volume difference was 12.88% (Range 2.97-38.28%). Differences between CT-AC and MR-AC were assessed on 5 pairs with a contemporaneous non-contrast CT (within 1 week). All scans were given a qualitative score of either 3 or 4 by both observers. 4/5 paired scans (80%) received the same score on the CT-AC and MR-AC datasets by both observers. The FDG-avid volume outlines on 3 paired scans where a primary was visible were analysed jointly for the 2 observers. The mean absolute volume difference was 0.52cm^3 (Range 0.13-1.3cm^3) and mean percentage volume difference was 14.26% (Range 2.38–39.23%).

Conclusion

Qualitative scores were comparable using CT or MR attenuation correction. Inter-observer variability for outlining the FDG-avid volume was similar to the variability observed between paired CT-AC and MR-AC scans. We conclude that MR-AC using the Biograph mMR® is adequate for the delineation of FDG-avid primary tumours for RT planning purposes.

EP-1150 Reducing late dysphagia for head and neck cancer patients with oral gel: A feasibility study

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Purpose or Objective

Radiation-induced xerostomia and late dysphagia in head and neck cancer patients (HNC) can result in persistent nutrition and eating difficulties as well as reduced quality of life. The purpose of this study was to evaluate the ability of a newly developed tasteless and edible oral gel to ensure better lubrication and reduction of friction in the oral cavity and pharynx, potentially reducing discomfort and dysphagia when eating standardized food items.

Material and Methods

During a two-month period, 19 HNC patients with self-reported xerostomia and late dysphagia were recruited from the follow-up clinic. All patients had received primary or postoperative curative intended radiotherapy. Unstimulated sialometry was performed prior to testing to evaluate salivary flow and xerostomia. A test meal including six standardized food items ranging from creamy, gratin, soft to solid/unmodified food was tested with and without the use of oral gel. The food items were served as small and large bites respectively. The test meal (with gel) was repeated at the clinic after testing the gel at home for one week. A NRS scale for subjective assessment of eating difficulties regarding each food item was used to evaluate dysphagia. The highest score was ten, indicating no eating difficulties.

Results

The median age of the included patients was 60 years (range 46-80), and 16 out of 19 patients were treated with 66-68 Gy for locally advanced oropharynx cancer. Median time after radiotherapy was 19 months (range 6-50). Unstimulated sialometry revealed that 3 patients (16%) had light xerostomia (> 0.2 ml/min), 6 patients