

## Evaluation of Clinician Contouring for Pancreatic Stereotactic Ablative Radiotherapy During a Contouring Workshop Organised by the Royal College of Radiologists

F.Slevin\* M.Beasley† R.Speight† J.Lilley† L.Murray\* M.Hawkins‡ G.Radhakrishna§ A.Henry\*

Madam — Variation in clinician contouring is well recognised and several objective metrics may be used to compare contours [1,2]. Methods to minimise variation include trial protocols, atlases, peer review, autocontours and teaching [[3], [4], [5]]. Incorrect delineation is associated with inferior survival in clinical trials [6].

We evaluated the impact of teaching on contouring variation during a pancreatic stereotactic ablative radiotherapy workshop at RCR19. Participants produced gross tumour volume (GTV), duodenum and stomach contours in AQUILAB (AQUILAB, Loos, France) for the same case pre-workshop, during the workshop after teaching and post-workshop. The workshop organisers produced a reference dataset. Only seven participants could be reliably identified as having produced paired pre- and during workshop contours. Of these, only three produced post-workshop contours.

Paired contouring DICOM data from AQUILAB was exported into MICE Toolkit (NONPI Medical, Umeå, Sweden). Contours were compared with the reference dataset for structure volume, minimum distance between contours (Hausdorff distance) and overlap (DICE similarity coefficient). The extent of variation was evaluated using Wilcoxon signed ranks test in SPSS (IBM, New York, USA).

Modest improvements in contouring after teaching were observed, but these were not statistically significant and were not maintained post-workshop. Considerable variation remained, especially concerning GTV (only visible on two 6 mm computed tomography slices). The median Hausdorff distance between GTV and duodenum for all participants both before and during the workshop was 6 mm, compared with 12 mm for the reference dataset (see Figure 1). Such discrepancies might potentially impact patient outcomes.

Fig. 1. Axial simulation computed tomography image showing reference gross tumour volume (GTV; red) and duodenum (blue) and pre-workshop participant contours for GTV (green) and duodenum (yellow). A shorter GTV to duodenum distance was seen for participant contours than the reference contour.

We have several recommendations for future workshops:

(i)

Reviewable diagnostic imaging

(ii)

Minimum computed tomography slice thickness of 3 mm

(iii)

Clearer identification of paired participant contours

(iv)

Greater encouragement to complete post-workshop contours, perhaps by provision of individual feedback, to permit evaluation of maintenance of competencies

(v)

Trial of qualitative feedback on performance instead of quantitative metrics – workshops could mirror the peer-review process used in clinical practice [3].

#### Conflicts of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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