



András, Kedves ; Tímea, Vecsera ; Dávid, Sipos ; Miklós, Emri ; Zoltán, Tóth ; Viktor, Koczka ; Kelemen, Kornél ; Janaki, Hadjiev ; Imre, Repa ; Árpád, Kovács

PET/CT based target volume definition in the modern 3D based radiotherapy

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PET/CT based target volume definition in the modern 3D based radiotherapy

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Introduction: The aim of our study was to compare the manual and PET SUV (Standard Uptake Value) based autosegmentational methods in BTV (Biological Target Volume) definition for patients receiving radiotherapy.

Methods: 70 patients diagnosed with head and neck cancer and receiving PET/CT based radiotherapy in the Kaposvár University Dept. of Oncoradiology were enrolled to our retrospective study. For all the patients manual and autosegmentation methods were also applied for BTV definition in the ARIA Eclipse Treatment Planning System (TPS) segmentation module. 5 independent observer visually defined BTV and autosegmentation were also performed in all cases. We applied intra- and interobserver analysis to define the reliability and accuracy of the different contouring methods. For statistical analysis descriptive volume analysis, and Friedman multivariate test were used.

Results: The correlation between the measured BTV volume definitions (each observers, mean of observers, autosegmentational algorithm, referring physician) shown a few ($n = 216$) statistically significant differences ($p < 0,05$). The 4th observer made the largest amount of mistakes compared to other observers based on Friedman analysis. Measured volumes of the referring physician significantly correlated with the autosegmentational module ($p = 0,76$).

Conclusions: Integrating the modern hybrid imaging methods into the 3D based radiotherapy has become a standard method. Based on our results the use of autosegmentation technique in BTV definition in a modern TP Systems is a reliable method, but verification of these results is essential. Our interobserver variability data have shown differences in the contoured volumes, but standardization of these results should be a valuable option of BTV definition. Further evaluation is essential to justify these methods.

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