

Open Access

Abstract

Published 04/02/2023

Copyright

© Copyright 2023

Knybel et al. This is an open access abstract distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under

Creative Commons CC-BY 4.0

Secondary CT Series for Recurrent Oligometastatic Radiosurgery – Proof of Concept Case Report

Lukas Knybel ¹, Jakub Cvek ²

¹. Department of Oncology, University Hospital Ostrava, CZECH REPUBLIC, Ostrava, CZE ². Department of Oncology, University Hospital Ostrava, Ostrava, CZE

Corresponding author: Lukas Knybel, lukas.knybel@fno.cz

Categories: Medical Physics, Radiation Oncology

Keywords: radiosurgery treatment planning, treatment of brain metastases, reirradiation

How to cite this abstract

Knybel L, Cvek J (April 02, 2023) Secondary CT Series for Recurrent Oligometastatic Radiosurgery – Proof of Concept Case Report. Cureus 15(4): a961

Abstract

Objectives:

In case of reirradiation in the same area, it is necessary to identify the previously treated targets. In our experience, not all systems allow the original contours to be transferred in a new planning CT or it may be problematic to display them when another treatment system is used. The reason for this work was a patient undergoing the 5th brain reirradiation over a period of three years. A total of 18 lesions were irradiated earlier. With software available in our department it was not possible to use previous contour sets, contouring to the original sequences would be extremely time consuming. The purpose of this work is to demonstrate a simple method to display previously irradiated targets on secondary CT (only primary is used for dose calculation).

Methods:

We used the 3D Slicer software which allows to display and work with DICOM files used in radiotherapy. Previous planning CT series with structures sets were loaded and fused. Using the Radiotherapy module, the previous targets were summed into one contour set. Using the Mask Volume function, we changed the density (2000HU) of the previous targets directly in the CT and exported it.

Results:

Modified CT was used as a secondary CT for preparation of the 5th re-radiation. The modified density allows very fast contouring of the previous targets using automated "Magic Wand" tools in our Multiplan treatment planning system. The whole CT modification process took 10min.

Conclusion(s):

Delineating previous targets by changing the density directly in the CT is a very fast alternative to multiple re-contour process when using multiple previous radiotherapy contour sets is complicated or impossible.