

Use of (68)Ga-Dotatate PET/CT Imaging for Stereotactic Radiosurgery Treatment Planning for Patients with Meningiomas

Malgorzata Stapor-Fudzinska ¹

1. Radiotherapy Treatment Planning, MSC Memorial Cancer Center and Institute of Oncology Gliwice Branch

✉ **Corresponding author:** Malgorzata Stapor-Fudzinska, malgorzata.stapor-fudzinska@io.gliwice.pl

Categories: Radiation Oncology

Keywords: meningioma, srs, stereotactic radiosurgery

How to cite this abstract

Stapor-Fudzinska M (November 02, 2017) Use of (68)Ga-Dotatate PET/CT Imaging for Stereotactic Radiosurgery Treatment Planning for Patients with Meningiomas. Cureus 9(11): a231

Abstract

Objectives: The aim of this study is to analyze precision and usefulness of (68)Ga-DOTATATE PET/CT images compared with CT/MR for contouring tumor margins of meningiomas treated by stereotactic radiosurgery.

Methods: Clinical material consists of 74 meningioma tumors in 59 patients treated in a single institution by stereotactic radiosurgery using CyberKnife during 2012-2016. Tumor margins were delineated twice by four independent planners. At first using CT/MF fusion, and by (68)Ga-DOTATATE PET/CT fusion thereafter. Final contours were defined as a sum of both products (Boolean OR operator). For PET/CT contouring the threshold SUV limit values of 0-100%, 25-100%, 50-100% and 75-100% of the maximum SUV were tested. Correlation between tumor volumes defined by CT/MR and CT/PET (for each SUV limit) and Conformity Indexes were estimated and compared. Radiotherapy Treatment Planning (TPS) was performed on MultiPlan CyberKnife System.

Results: Correlation coefficient for CT/MR vs. CT/PET target margins drawn by physicist was $r=0.75$ for SUV limit 0-100%, and 0.91, 0.82, 0.51 for SUV limit of 25-100%, 50-100% and 75-100% respectively. Use of PET/CT imaging with SUV limit 25-100% is characterized by the highest Correlation Coefficient of $r=0.91$ and Conformity Index of $CI=0.52\pm 0.16$.

Conclusions: Among four tested values of the SUV limit, correlation between margins estimates and the SUV limits was the highest for 25-100% SUVmax. It means that the contour drawn with 25% threshold value of the SUV give the best fit compared with MR/CT contours. Therefore this threshold seems to be optimal for contouring the meningiomas using (68)Ga-DOTATATE PET/CT images.

Open Access

Abstract

Published 11/02/2017

Copyright

© Copyright 2017

Stapor-Fudzinska. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 3.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under

Creative Commons CC-BY 3.0