

Abstract

Radiotherapy is a method of treatment aimed at delivering a therapeutic dose to the irradiated volume, while at the same time sparing the critical organs as much as possible. In order to avoid committing an geographic error, image verification is performed (two orthogonal kV or CBCT images), thanks to which the current position of the isocenter can be assessed. There are several methods of correcting the patient's position, which are divided into real-time methods (on-line) and predictive methods (off-line). Depending on the location of the neoplastic lesion and the procedures used in a radiotherapy unit, the effectiveness of individual methods varies. However, even when a very high repeatability of the patient's positioning is achieved, the source of treatment failures may be the patient's anatomical changes. Tracking and analyzing anatomical changes enabling the implementation of adaptive techniques allows to minimize this factor.

The main goal of my work is to assess the effectiveness of off-line methods of monitoring the patient's position and the validity of using the adaptive technique in patients with prostate and head and neck cancer.

In my work, I showed that none of the commonly used off-line methods of patient position correction provides sufficient and expected quality of radiotherapy. The obtained results indicate the legitimacy of the application of the adaptive technique implemented by me for clinical application.

Keywords: radiotherapy, positioning control, adaptive radiotherapy, CTV-PTV margin

Aleksandra
Sobczyk