Brachytherapy dose received by bladder and rectum in patients with inoperable cervical cancer: CT-based 3D view

Goran Marošević¹, Hasan Osmić², Semir Fazlić², Dušan Mileusnić³, Jovan Babić¹

¹Center for radiotherapy, International Medical Centers, Banja Luka, Bosnia and Herzegovina
²Department for Radiotherapy, University Clinical Center Tuzla, Tuzla, Bosnia and Herzegovina
³Department for Radiotherapy, Military Medical Academy, Belgrade, Serbia

As recommended by the GEC-ESTRO work group, it is important for the 3D image guided CT, or MRI based brachytherapy of cervical cancer to verify what dose is received by 0.1 cm³, 1 cm³ and 2 cm³ (D₀₋₁₀, D₁₀ and D₂₀, respectively) of the bladder and rectum volume (1). Intracavitary brachytherapy was applied with applicators type Fletcher tandem and ovoids, once a week on a HDR regime (high dose rate). Delineation of organs at risk (bladder and rectum) was made after each computer tomography (Panel A). The bladder and rectum were delineated on each...
CT slice: the rectum was delineated at 1 cm from the anus to the recto-sigmoid transition through the entire thickness of the organ wall, and the bladder was delineated following the outer contour of the entire organ volume (Panel B). The therapy dose of (5 x 7 Gy) was prescribed according to the Manchester system, to the A point. Brachytherapy $D_{0.1cc}$, $D_{1cc}$ and $D_{2cc}$ doses for the bladder and rectum were established for each application (Panel C). The EQD$_2$ (total biologically equivalent dose in 2 Gy) for bladder and rectum were 76.7 Gy and 81 Gy, respectively. Also, we could see the position (three-dimensional view) of the brachytherapy dose received by bladder and rectum (Panel D).

In planning brachytherapy, CT does not give us the possibility to precisely delineate the tumor and plan the distribution of the therapy dose to the tumor (as is the case with MR planning). However, it is possible to obtain precise data on the contribution of the brachytherapy dose to the organs at risk (2).

**Key words**: D2cc, Brachytherapy, Cervical cancer.

**Authors’ contributions**: Conception and design: GM; Acquisition, analysis and interpretation of data: GM and SF; Drafting the article: GM and HO; Revising it critically for important intellectual content: JB and DM.

**Conflict of interest**: The authors declare that they have no conflict of interest.

**Corresponding author**: Goran Marošević
International Medical Centers
78000 Banja Luka
Bosnia and Herzegovina
goran.marosevic@euromedic.ba
Tel.: + 387 63 116 431; Fax.: + 387 51 340 510
Received: 11 November 2012; Accepted: 11 April 2013

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