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

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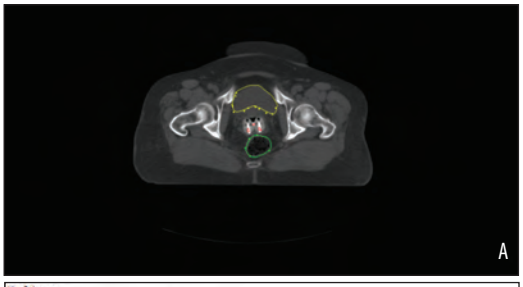
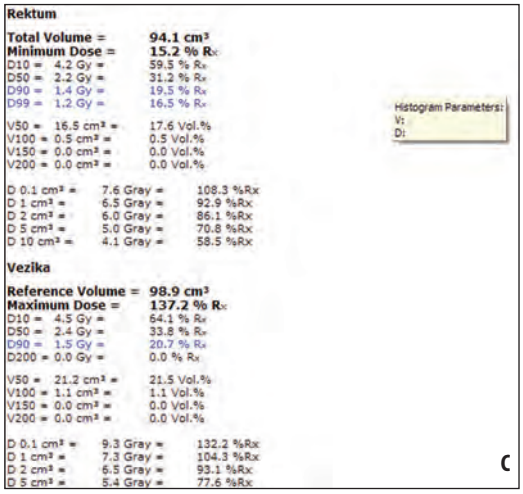
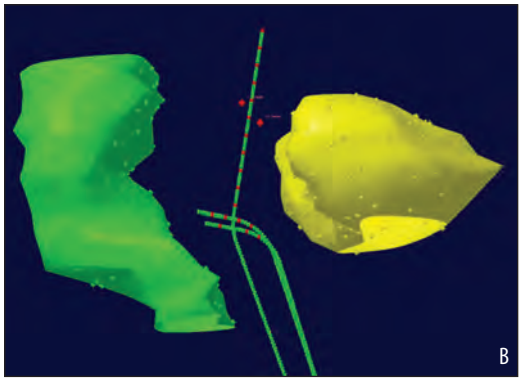
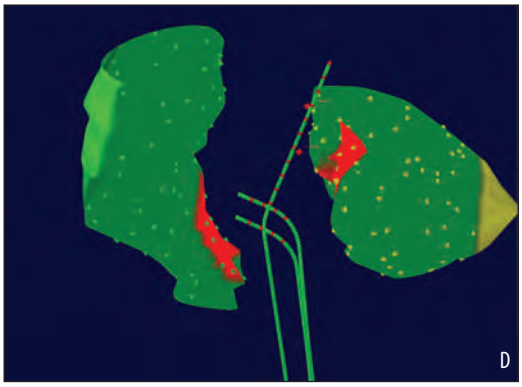
As recommended by the GEC-ESTRO work group, it is important for the 3D image guided CT, or MRI based brachytherapy of cervical cancer to verify what dose is received by 0.1 cm^3, 1 cm^3 and 2 cm^3 ($D_{0,1cc}$, D_{1cc} and D_{2cc}, respectively) of the bladder and rectum volume (1). Intracavitary brachytherapy 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.

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