

CLINICAL RADIOBIOLOGY OF HDR Cf-252 BRACHYTHERAPY FOR CERVIX UTERINE CARCINOMA

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Introduction

Cf-252 neutron brachytherapy is advantageous to use for treatment of radioresistant tumors.

Material and methods

45 pts. (I) with cervix carcinoma received combined radiation therapy: external Co-60 gamma therapy (37.3 Gy) for pelvis and HDR Cf-252 brachytherapy (point A-35.4 Gy-eq).

Results

The treatment results were compared with historical similar group - 64 pts (II) treated by external Co-60 gamma therapy (39.7 Gy) and

HDR Co-60 brachytherapy (point A-47.4 Gy). There were no significant difference in 4 year survival: 73.3% (I) vs 79.7% (II). Local failure was observed in 22.2% (I) and 10.9% (II) cases. The rate of late radiation complications was similar - 4.4% (I) vs 1.6% (II). Acute reactions were brachytherapy dose dependent with ED50:80.1 Gy-eq and 74.5 Gy in I and II groups respectively.

Conclusions

Radiobiological analysis of obtained data show some possibilities to improve treatment results in HDR Cf-252 brachytherapy group.

OPTIMISATION IN HDR BRACHYTHERAPY

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New HDR machines supplied with stepping source systems give us an additional opportunity to optimise source distribution by modeling source dwell time. Different optimization algorithms are implemented in the commercial planning systems connected with HDR machines. The choice of proper optimization procedures is basic for Quality Assurance in brachytherapy planning.

The main ideas of optimization algorithms implemented in PLATO system are presented.

Some examples of gynaecological, intraluminal and interstitial brachytherapy are analyzed. Nonoptimised and "geometrically" optimized interstitial implants are compared. The advantages of optimization are discussed on the basis of dose-volume histograms. The danger of wrong optimization is also discussed.

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