

RANDOMISED STUDY ON EFFECT OF 3D SAR PLANNING ON TEMPERATURE IN TARGET VOLUME DURING DEEP HYPERTHERMIA TREATMENT IN PATIENTS WITH CERVICAL CANCER

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Introduction

In the Daniel den Hoed Cancer Center patients with primary locally advanced cervical carcinoma are treated with a combination of radiotherapy and hyperthermia since 1990. Presently optimal treatment settings are obtained by trial and error.

Deep regional hyperthermia treatment planning

The hyperthermia treatment planning is currently based on the CT-scan made for radiotherapy planning. It provides us with a choice of applicator, patient position in the hyperthermia system and a target for phase steering. Each treatment starts with the same settings for power, phase and amplitude and during treatment these settings are adjusted according to our empirical steering protocol using the temperatures measured and the patient's complaints.

By using a 3D SAR planning system in DHT as guidance for a treatment plan and steering actions, it is expected that the quality of the treatment can be improved; i.e. higher target temperatures can be obtained and hotspots can be avoided.⁽¹⁾

The aim of this study is to judge the feasibility and effectiveness of real time 3D-SAR planning during deep hyperthermia treatments and what its effect is on temperature distribution and side effects of deep hyperthermia.

The planning system we will test, Amira Hyperplan, has already been proven to be effective retrospectively.^(2;3)

Study design

36 patients undergoing combined radiotherapy and hyperthermia treatment for primary cervical carcinoma will be asked to participate in the study. After informed consent patients will be randomised in 2 study arms:

Arm A: 2nd and 4th treatment using treatment planning

Arm B: 3rd and 5th treatment using treatment planning

The first hyperthermia treatment will be excluded from statistical analysis.

Endpoints of the study will be:

- mean tumour indicative temperature; a difference of 0.3 is considered relevant
- % SAR-coverage
- power limiting hotspots and
- subjective evaluation by the patient on how well the treatment was tolerated

The study opened in December 2005. Logistically no problems have occurred with regard to obtaining and segmenting a CT in hyperthermia position. First experiences, limitations by the model and equipment and preliminary results will be presented.

Reference List

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