



Characterization of a Deep Hyperthermic Oncological System.



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INTRODUCTION: The aim of this work is to characterize a deep hyperthermic oncological system. These measurements are mandatory for clinical treatments. Some physical aspects and some parameters have been studied.

MATERIALS and METHODS:

The characterization consists on the study of:

2. Temperature probes calibration
3. Verification of the kcal table (preliminary tests)
4. Efficiency of the independent system of the skin refrigeration

The Hyperthermic Oncological equipment is a capacitive system, operating at 13,56 MHz, which various types of electrodes.

The types of electrodes have different dimensions and therefore the area and the depth that can be treated.

The electrodes provided to us have the following diameter :

- 120 mm
- 180 mm
- 260 mm

Measurements were performed on the heat deposition by using an equivalent AGAR-AGAR phantom, according to the principal guidelines of the European Society Hyperthermia Oncology (E.S.H.O).

The operating modes of the cooling lines have been evaluated and also

their capacity to disperse the heat in the superficial part, between the electrode and the skin.

The tests on the AGAR-AGAR phantom were carried out to various powers, from 200 W to 500 W, inside the phantom, placing both the digital thermometer and the thermometric probes.

Executed tests were on all the types of electrodes provided by the DUE.R. and for such electrodes various power range were used.

RESULTS: Fig.1 shows the LCD after 10 min with $P = 300$ W, in a muscle equivalent phantom at 10 cm depth. Fig. 2 shows TC temperatures with $P=300$ W, treatment time = 75 min and 260 mm applicator. The same measurements has been made for $P=100$ W to 500 W and for all applicators.

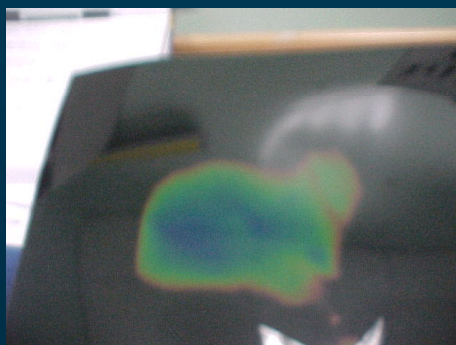


Fig.1 LCD after 10 min at 300 W

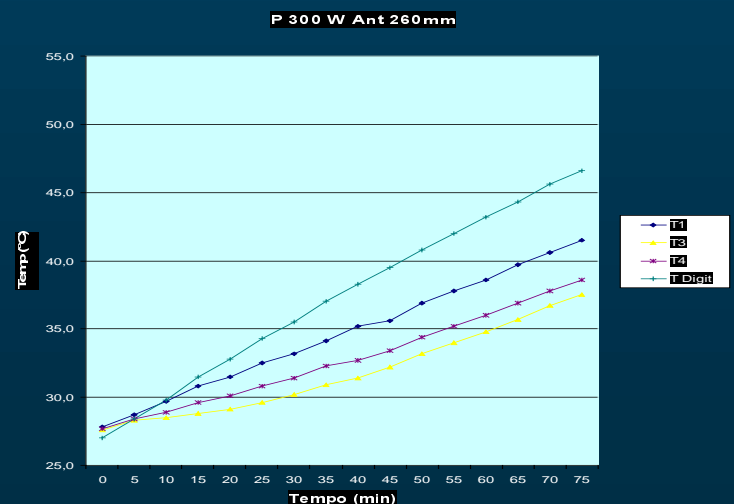


Fig.2 TC temperatures into AGAR-AGAR phantom in a 75 min treatment