

# P-07 – Dr. Nora Meggyeshazi, et al - Clinical studies and evidences of modulated RF conductive heating (oncothermia) method

## Clinical studies and evidences of modulated RF-conductive heating (oncothermia) method (Review)

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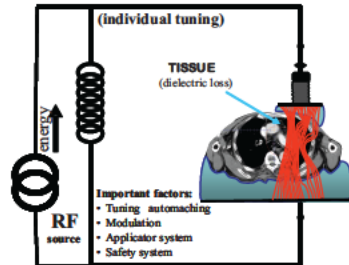


### Objective

Modulated RF conductive heating (oncothermia) has twenty years experience in the clinical practices. The presently working more than 100 devices produce enormous number of treatments and collect a strong experience forming a consensus in the treatment. Present a comprehensive summary of clinical studies made by oncothermia. Compare the data and make possible statistically significant statements.

### Method

The treatment method is capacitive coupled at 13.56 MHz carrier frequency modulated RF current, (Oncotherm, EHY2000+) [1]. The applied protocol was unified step up heating, 60-150 W RF power with water bolus cooling. (The technique is described elsewhere [1]). Treatment is applied in combination with chemo and/or radiotherapy or used as monotherapy if the conventional therapies fail. These lines of treatments are mostly determined by the individual, personalized treatment decisions, usually without having help from any evidence based statistical approvals. Present data are collected from observational studies, except some of brain and colorectal cancer trials.

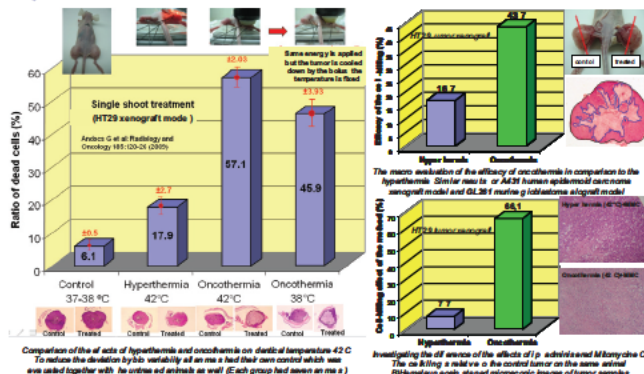


We compared the collected data of the same localizations and same protocols from various clinics. Their common significant difference from the databases is a kind of statistical evidence.

To make objective evaluation we had special considerations:

- Evaluate the available data also by parametric statistical methods (Weibull distribution), mining the information in long treatment processes, where oncothermia was only a fraction of the overall treatment time.
- Compare the first year survival rates with the large international databases.
- Compare results of clinics in the same patient groups and same oncothermia protocol.

### Specialties of oncothermia



### Possibility to treat sensitive areas

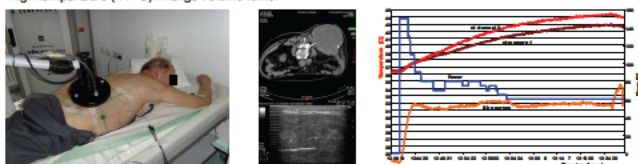
It is effective on low temperatures also. Consequence: applicable for brain [16] or other sensitive organs.

Inoperable carcinoma of a nose sphenoidal. Case from Prof. Dr. Helmut Renner, Nürnberg, Germany. Non Hodgkin lymphoma. Case from Prof. Dr. Alexander Heitwig, Bad Säckingen, Germany.



### Temperature

Intratumoral in situ temperature (Klinikum Nord, Nürnberg, Germany), Prof. Dr. H. Renner. Patient: FP, male, 87y; Tumor: Weichiel sarcoma on the right side of the back. **Primer diagnosis:** 12/07 CT guided biopsy; **Histology:** Malignant fibrous histiocytoma G3; **Therapy:** curative, Radio Thermo Therapy (Double modality); first Oncothermia, afterwards radiotherapy, Dosis 22 Gy, 6 Fractions, Result: Reaching high temperature (44 °C) in large volume tumor.



### Toxicity

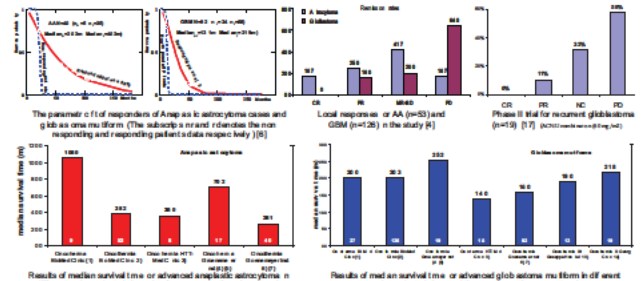
A well designed Phase I study shows the safety of the method [2]. The dose escalation has no extra hazard even in very frequent applications for such sensitive organs like brain gliomas.

### Clinical results

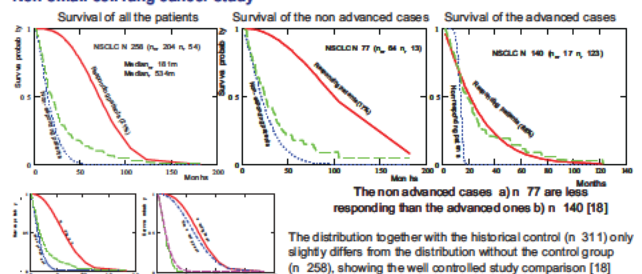
We summarize only the localizations, which results are pure with conventional methods.

#### Brain studies

- ASCO (2003) [3] the MST for AA 106m (n 9) and 20m (n 27) for GBM patients,
- ASCO (2008) [4] 38.2m (n 53) and 20.3m (n 126) for AA and GBM respectively,
- Witten Herdecke University published [5] 70.2m (n 17) and 25.2m (n 19) as well as [6] 26.1m (n 40) and 16m (n 92) data for AA and GBM MST, respectively
- HTT Med MST results [5] were 36m (n 8) and 14m (n 10) for AA and GBM, respectively
- Empoli Hospital shown in very advanced relapsed cases [7] 9m MST (n 12) for GBM



#### Non-small-cell lung cancer study



#### Pancreas studies

- ASCO (2002), [8], the first year survival (1yS) 41.7%, while the subsequent years are: 20.6%, 13.5%, 9.4%, 4%, with MST 10.8m
- ESHO (2003), DEGRO (2004) [9], [10], the 1yS in HTT Med (n 73) 52.1% (MST 12.7m), and in Paterly Hospital (n 28) 46.2% (MST 12.0m). In the subsequent years were 31.5% & 15.4%, 15.4% & 11.5%, 9.6% & 3.8% and 2.7% & 3.8%, which data are higher than expected from the large databases.
- Results were repeated in six different clinics in two countries significantly improving the achievements of the conventional treatments shown in summary [11]. In addition to the above two more clinic showed its 1yS: Verarm (n 42) 52.4% and Numberg Nord (n 13) 46.2%

#### Metastatic liver studies

- The colorectal liver metastasis was the topic of four different studies on liver [12],
- ASCO (2007) [13], MST was 20.5w, 50% presented evidence for increase well being
- ICACT [14], had shown definite benefit for 25 patients (n 30) by oncothermia
- ESHO (2005) [15], had shown in second line treatment 80% response rate

### Conclusion

The results are strongly indicating the feasibility and the benefit of the oncothermia showing a valid treatment potential and safe application. Our results conclude the feasibility of the oncothermia and despite of the high line treatments shows evidences by the parallel studies in the various clinics. Performing prospective, randomized clinical trials in the future is mandatory. A well designed Phase I study is shown in our other. We concentrate on the results of anyway complicated diseases, like brain gliomas, pancreas carcinoma, metastatic liver from colorectal carcinoma. In glioma cases a prospective study (Regensburg University, [2]) had shown the safety of the oncothermia treatment. The efficacy results are everywhere significantly better than any of the data in public databases (SEER, Eurocare): paper [8].

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### Abbreviations

Databases: SEER (Surveillance, Epidemiology, and End Results) by the National Cancer Institute USA, April 2000; EURO-CARE Statistical database of cancer in the European Union;

Evaluation: CR Complete Remission, PR Partial Remission, NC No Change, SD Stable Disease, PD Progressive Disease; MR Major Response (CR+PR); MST Median Survival Time;

Diseases: AA Anaplastic astrocytoma, GBM Glioblastoma Multiforme, NSCLC Non small cell Lung Carcinoma,

Subscripts: 'r' Responders; 'nr' No Responders

Societies with their common abbreviations: ASCO, ESHO, DEGRO, ICACT,