

# بسم الله الرحمن الرحيم





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Faculty of Medicine  
Topical Medicine Department

# **Hypertonic Saline Enhanced Radiofrequency Versus Chemoembolization Sequential Radiofrequency In Medium And Large Sized Hepatocellular Carcinoma**

## **Thesis**

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The M.D Degree  
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**BY**

**Waleed Ahmed Mohamed El-Agawy**

MSc in Tropical Medicine,  
National Institute of Hepatology & Tropical Medicine Research

## **Supervisors**

*Prof.*

***Nabeel Moustafa El-Kady***

Professor of Tropical Medicine  
Faculty of Medicine  
Cairo University

*Prof.*

***Gamal El-Din Esmat***

Professor of Tropical Medicine  
Faculty of Medicine  
Cairo University

*Prof.*

***Ekram Hamed Hamed***

Professor of Radiology,  
National Institute of Cancer  
Faculty of Medicine  
Cairo University

*Dr.*

***Sherif Hamdy Mahmoud***

Lecturer of Tropical Medicine  
Faculty of Medicine  
Cairo University

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# **HYPERTONIC SALINE ENHANCED RADIOFREQUENCYE VERSUS CHEMOEMBOLIZATION SEQUENTIAL RADIOFREQUENCY IN TREATMENT OF MEDIUM AND LARGE NODULAR HEPATOCELLULAR**

**CARCINOMA El-Kady NM<sup>a</sup> ESMAT GD<sup>a</sup>, MAHMOUD EH<sup>a</sup>,  
MAHMOUD SHH<sup>a</sup>,ELAGAWY WA<sup>b</sup>**

<sup>a</sup>Tropical Medicine Dept., Faculty of Medicine, Cairo University

<sup>b</sup>National Hepatology and Tropical Medicine Research Institute, Cairo.

**Background:** Hepatocellular carcinoma (HCC) is currently the fifth most common solid tumor worldwide and the third leading cause of cancer-related death. Large tumor size appear to be a major obstacle for RFA, so attempts to increase the volume of coagulation by injecting hypertonic saline before,during or both before and during RFA application.Trans arterial chemoembolization(TACE) combines the effect of targeted chemotherapy with that of ischemic necrosis induced by arterial embolization and eliminate heat loss mediated by tissue perfusion if combined with RFA.For nodular, HCC larger than 5cm combined therapy of RFA and TACE has an effective therapeutic effect on nodular lesion but larger infiltrative lesions are still a challenging problem. .

**Aim of the work:** The aim of this study was to compare the efficacy of hypertonic saline enhanced radiofrequencye and chemoembolization sequential radiofrequency in treatment of medium and large nodular hepatocellular carcinoma

**Patients and methods:** This prospective study was conducted on 40 patients with 40 focal HCCs between 2008 and 2011. They were divided into 2 groups, the first group included 20 patient underwent hypertonic saline enhanced radiofrequency(RFA+HS), the second group included 20 patients underwent chemoembolization followed by RFA. Effectiveness was compared between medium (3.1-5.0 cm) and large (5.1-7.0 cm) HCC by triphasic CT after one month and 6 months and cases with partial ablation underwent additional sessions of the same technique.Complete laboratory investigations were done before and after the procedures and complications were recorded. Survival analysis was conducted for 6 month duration following the last session of ablation.

**Results: After one month:**The triphasic spiral CT done one month after the procedure in both group showed that, 85% of patients (34 patients) had complete ablation in both groups (17 patients in each group) while 15% (6 patients) had partial ablation (3 patients in each group), 4 patients were re-ablated using the same technique and 2 patients underwent no further therapy due to development of PV thrombosis. As regard the diameter of ablated lesions, 20/21 (95%) of medium HCC lesions and 14/19 (73%) of large HCC lesions were successfully ablated. In RFA+S group 12/13 (92%) of medium HCC were successfully ablated, and 5/7 (71%) of large HCC lesions were ablated. In the TACE+RFA group 8/8 (100%) medium HCC were ablated and (9/12) (75%) of large lesions were ablated successfully.**After six months**In 29 patients (78.4%) showed maintained ablation (73.7% in group 1 and 83.3% in group 2) (p=0.86) while 8 patients (21.6%) showed residual enhancement.Fever,abdominal pain and ascites were the main complications with 3 cases developed haematemesis caused by rupture oesophageal varices.

**Conclusions:** The results of this study show that RFA+HS and TACE+RFA are safe and equally effective treatment for HCCs 3.1 up to 7.0 cm in diameter, even for patients with cirrhosis with suboptimal hepatic function. However, studies with long-term follow-up data are awaited to further clarify their role in the treatment of this group of patients, and prospective randomized trials are needed to compare its effectiveness with that of other currently available treatments for HCC

**Key words:** Hepatocellular carcinoma – Chemoembolization – Radiofrequency ablation – Hypertonic saline - local ablation.

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## LIST OF ABBREVIATIONS

|                                                  |                 |
|--------------------------------------------------|-----------------|
| Two dimensional ultrasound                       | <b>2DUS</b>     |
| Three dimensional ultrasound                     | <b>3DUS</b>     |
| Five fluorouracil                                | <b>5FU</b>      |
| American association of study of liver disease   | <b>AASLD</b>    |
| Aflatoxin B 1                                    | <b>AFB1</b>     |
| Aflatoxin M1                                     | <b>AFM1</b>     |
| Alpha fetoprotein                                | <b>AFP</b>      |
| Fucosylated AFP (Lens culinaris agglutinin)      | <b>AFP-L3</b>   |
| Adenomatous hyperplasia                          | <b>AH</b>       |
| Alkaline phosphatase                             | <b>ALP</b>      |
| Alanine transaminase                             | <b>ALT</b>      |
| Hepatitis C virus antibody                       | <b>Anti HCV</b> |
| American Society of Clinical Oncology            | <b>ASCO</b>     |
| Aspartate transaminase                           | <b>AST</b>      |
| Bacelona clinic liver center                     | <b>BCLC</b>     |
| Biological focal region                          | <b>BFR</b>      |
| Contrast enhanced CT                             | <b>CECT</b>     |
| Common hepatic artery                            | <b>CHA</b>      |
| Cancer of the liver Italian program              | <b>CLIP</b>     |
| Centimeter                                       | <b>cm</b>       |
| Computed tomography                              | <b>CT</b>       |
| CT angioportography                              | <b>CTAP</b>     |
| CT hepatic angiography                           | <b>CTHA</b>     |
| Des gamma carboxy prothrombin                    | <b>DCP</b>      |
| Desoxyribo nucleic acid                          | <b>DNA</b>      |
| Epidermal growth factor                          | <b>EGF</b>      |
| Food and drug administration                     | <b>FDA</b>      |
| Fluoro-deoxy-glucose                             | <b>FDG</b>      |
| Fine needle aspiration cytology                  | <b>FNAC</b>     |
| Focal nodular hyperplasia                        | <b>FNH</b>      |
| Gastrodudenal artery                             | <b>GDA</b>      |
| Gadolinium-diethylene-triamine-penta-acetic acid | <b>Gd-DTPA</b>  |
| Golgi protein 73                                 | <b>GP73</b>     |
| Hepatic arterial phase                           | <b>HAP</b>      |
| Hepatitis B surface antigen                      | <b>HBsAg</b>    |
| Hepatitis B virus                                | <b>HBV</b>      |

|                                                        |              |
|--------------------------------------------------------|--------------|
| hepatitis B X protein                                  | <b>HBx</b>   |
| hepatocellular adenoma                                 | <b>HCA</b>   |
| Hepatocellular carcinoma                               | <b>HCC</b>   |
| Hepatitis C virus                                      | <b>HCV</b>   |
| Human hepatocyte growth factor                         | <b>HHGF</b>  |
| Hepatic intra arterial                                 | <b>HIA</b>   |
| High intensity focused ultrasound                      | <b>HIFU</b>  |
| Human immunodeficiency virus                           | <b>HIV</b>   |
| Interferon                                             | <b>IFN</b>   |
| Insulin like growth factor                             | <b>IGF</b>   |
| Insulin growth factor binding protein                  | <b>IGFBP</b> |
| Interstitial laser photocoagulation                    | <b>ILP</b>   |
| International normalization ratio                      | <b>INR</b>   |
| Inferior Vena cava                                     | <b>IVC</b>   |
| Japan integrated scoring system                        | <b>JIS</b>   |
| Left hepatic artery                                    | <b>LHA</b>   |
| Millimeter                                             | <b>mm</b>    |
| Magnetic resonance imaging                             | <b>MRI</b>   |
| Messenger RNA                                          | <b>mRNA</b>  |
| Non-alcoholic fatty liver disease                      | <b>NAFLD</b> |
| Non-alcoholic steatohepatitis                          | <b>NASH</b>  |
| Non contrast enhanced CT                               | <b>NCECT</b> |
| Nuclear factor kappa B                                 | <b>NFκB</b>  |
| Orthotopic liver transplantation                       | <b>OLT</b>   |
| Osteopontin                                            | <b>OPN</b>   |
| Percutaneous acetic acid injection                     | <b>PAI</b>   |
| Percutaneous acetic acid injection                     | <b>PAI</b>   |
| Periodic acid Schiff                                   | <b>PAS</b>   |
| Primary biliary cirrhosis                              | <b>PBC</b>   |
| Platelet derived growth factor receptor                | <b>PDGFR</b> |
| Protein disulfide isomerase                            | <b>PDIA3</b> |
| Percutaneous ethanol injection                         | <b>PEI</b>   |
| Percutaneous ethanol lipiodol injection therapy        | <b>PELIT</b> |
| Positron emission tomography                           | <b>PET</b>   |
| Prothrombin induced by vitamin K absence or antagonism | <b>PIVKA</b> |
| Percutaneous saline injection                          | <b>PSI</b>   |
| percutaneous saline injection                          | <b>PSI</b>   |
| Prothrombin                                            | <b>PT</b>    |

|                                                    |              |
|----------------------------------------------------|--------------|
| Partial thromboplastin time                        | <b>PTT</b>   |
| Portal vein                                        | <b>PV</b>    |
| Portal venous phase                                | <b>PVP</b>   |
| Radiofrequency                                     | <b>RF</b>    |
| Radiofrequency ablation                            | <b>RFA</b>   |
| Right hepatic artery                               | <b>RHA</b>   |
| Radiofrequency interstitial thermal ablation       | <b>RITA</b>  |
| Ribonucleic acid                                   | <b>RNA</b>   |
| Squamous cellular carcinoma antigen                | <b>SCCA</b>  |
| Study sorafenib HCC assessment randomized protocol | <b>SHARP</b> |
| Selective internal radiation therapy               | <b>SIRT</b>  |
| Superior mesenteric artery                         | <b>SMA</b>   |
| Transarterial chemo embolization                   | <b>TACE</b>  |
| Transcatheter arterial embolization                | <b>TAE</b>   |
| transarterial radioembolization                    | <b>TARE</b>  |
| Transforming growth factor                         | <b>TGF</b>   |
| Tumour node metastasis                             | <b>TNM</b>   |
| University of California San Francisco             | <b>UCSF</b>  |
| United network for organ sharing                   | <b>UNOS</b>  |
| Ultrasound                                         | <b>US</b>    |
| Vascular endothelial growth factor                 | <b>VEGF</b>  |
| Vascular endothelial growth factor receptor        | <b>VEGFR</b> |
| World health organization                          | <b>WHO</b>   |