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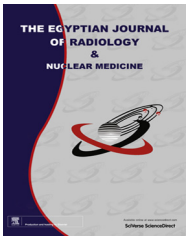

ORIGINAL ARTICLE

Combined versus single interventional therapies in treatment of hepatic malignant tumors

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KEYWORDS

Transarterial chemoembolization;
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TACE;
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HCC

Abstract *Aim of work:* To evaluate the effectiveness of transarterial chemoembolization (TACE) combined with radiofrequency ablation (RFA) in treatment of malignant hepatic focal lesions versus use of either TACE or RFA alone.
Material and methods: The study included 57 patients; 53 with hepatocellular carcinoma (HCC), 3 with hepatic metastases, and one case with cholangiocarcinoma.
They were divided into three groups according to the technique of treatment: the first group (25 patients) was treated by RF alone, the second group (17 patients) was treated by TACE alone and the third group (15 patients) was treated by combined RFA and TACE.
Results: In cases treated with RF only there was good response in 20% of hypervascular tumors and 28% of hypovascular tumors. In cases treated with TACE there was 47.06% good response in hypervascular tumors and 11.76% in hypovascular tumors. While in combined use of TACE and RF there was 60% good response in hypervascular tumors, and 26.66% in hypovascular tumors.
Conclusion: Combined interventional therapies are superior to any single therapy in treatment of either hypervascular or hypovascular hepatic malignant tumors.

1. Introduction

Primary and metastatic hepatic malignancies are leading causes of cancer death. Hepatocellular carcinoma (HCC) is one of the most common malignancies in the world, responsible for an estimated one million deaths annually. Liver resection or transplantation is considered as potentially curative treatments. However, the majority of cases are not candidates for these lines of therapy due to many factors such as multicentric tumors, extra hepatic metastases, early vascular invasion and poor hepatocellular reserve due to associated cirrhosis. Recently, over the last two

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decades the ability of abdomen imaging to detect HCC has improved dramatically by using cross sectional imaging that can detect even small lesions and replaced more invasive procedures as angiography, exploratory laparotomy and percutaneous biopsy. New hardware and software technology was introduced to improve CT and MRI sensitivity of both modalities (1).

Regional interventional therapies have led to a major breakthrough in the management of HCC, which include transarterial chemoembolization (TACE), percutaneous ethanol injection (PEI), radiofrequency ablation (RAF), and laser-induced thermotherapy (LITT). As a result of the technical development of loco-regional approaches for HCC during the recent decades, the range of combined interventional therapies has been continuously extended. Combined RFA and TACE can theoretically overcome the limitations of each when used alone. As the size of the tumor increased, particularly if it exceeds 3.5 cm, the efficacy of RFA is generally reduced, this is likely due to the incomplete ablation and increased blood flow in larger lesions resulting in heat loss (2).

Combined therapies for HCC, radiofrequency ablation (RFA) and hepatic transartery chemoembolization (TACE) prove to have clinical application either for local tumor destruction or to control tumor progress and recurrence rate, however different criteria have been put forward for the different techniques such as the type of enhancement of the tumor as depicted by arterial phase of spiral CT which was considered as an important factor in identifying the proper line of therapy, whether one procedure would probably be more successful than the other or if a combined line of therapy should be used (3).

1.1. Aim of the work

The aim of the present study is to evaluate the effectiveness of combined therapy of radiofrequency ablation and transarterial chemoembolization in treatment of hepatic malignancy lesions versus use of either TACE or RFA alone.

2. Patients and methods

This study was carried out in a cancer institute hospital over a period of three years in accordance with the guidelines of the local ethics committee. Written informed consent was obtained from all patients. 57 patients were included in this study; 53 with HCC, 3 with hepatic metastases, and one case with cholangiocarcinoma. 39 cases were males and 18 were females, their ages ranged from 38 to 73 years. Most of the patients were cirrhotic.

The patients were divided into 3 groups:

- The first group: included 25 patients with multiple tumors not more than 3 in numbers, size of the lesions not more than 3 cm and impaired liver functions, to whom only RFA was done (one to two sessions).
- The second group: included 17 patients with large sized tumors, hypervascular tumors, multifocal hepatocellular carcinomas and no portal vein thrombosis is present, to whom only TACE: was done (one to two sessions).
- The third group: included 15 patients with small to intermediate sized tumors, multiple foci and tumors with indistinct boundary, to whom transarterial chemo-embolization was done followed by radiofrequency ablation (RF) within 3 days.

All the patients were subjected to:

Laboratory studies: complete blood count, platelet count, prothrombin time and liver tumor marker mainly alpha-fetoprotein (AFP).

(1) Abdominal ultrasound and Doppler study for the liver, to detect the size, echo pattern and number of focal lesions, and to assess the portal vein and its branches to exclude thrombosis.
(2) Multiphasic computed tomography, to examine the liver on arterial phase 22–25 s, portal phase 70–90 s and delayed phase 5–10 min after the start of bolus injection of 100 ml of Ultravist using power injector (rate 3 ml/s). Slice thickness: 7 mm.
(3) Radiofrequency ablation was done under CT guidance for localization of the tumor and accurate insertion of the electrode. We use the cool tips RF systems.

2.1. RF procedure

Number of RF sessions was 1–3 sessions.

- At the site of needle puncture, local anesthesia was injected to all patients and small skin incision was made.
- Each application of RF energy lasted for 14 min; the entire treatment session was about one hour.
- Grounding was achieved by attaching 2 dispersive pads to patient's thighs.
- A peristaltic pump was used to infuse normal saline (0 °C) into lumen of the electrodes to maintain a tip temperature to 20–25 °C.

(1) Hepatic arterial embolization:
- Selective hepatic angiography through Transfemoral Seldinger Technique was conducted with a digital angiographic unit.

Patients were injected by a mixture of lipidol and cytotoxic drugs, through the catheter into the tumor vascular bed under screen, until the lipidol was densely accumulated into the tumor, this is followed by occlusion of the tumor vascular bed by gel foam particles before RF ablation.

(1) Most of the patients (53 patients) were referred to subject biopsy to confirm the diagnosis.

2.2. Data analysis

The patients were classified according to the arterial phase of spiral CT which was reviewed before treatment into: type I pattern = predominantly hypervascular lesions (>90% of the lesion enhances more than the adjacent liver parenchyma) and type II pattern = predominantly hypovascular lesions (less than 50% of the lesion enhances more than the adjacent liver parenchyma).

The response was evaluated by multiphasic CT and alpha fetoprotein. Multiphasic CT: the response was considered complete when CT scan showed the total disappearance of enhancement within the neoplastic tissue (the lesion showed