



Contents lists available at ScienceDirect

## The Egyptian Journal of Radiology and Nuclear Medicine

journal homepage: [www.elsevier.com/locate/ejrm](http://www.elsevier.com/locate/ejrm)

## Original Article

## Dual input computed tomography perfusion in evaluating the therapeutic response of transarterial chemoembolization for hepatocellular carcinoma

Logain Nabil Salem<sup>a,\*</sup>, Dina Moghazy Mohammed<sup>a</sup>, Dina Hazem Ziada<sup>b</sup>, M.H. Elshafey<sup>a</sup><sup>a</sup> Radiodiagnosis & Medical Imaging Department, Faculty of Medicine, Tanta University, Egypt<sup>b</sup> Tropical Medicine & Infectious Disease Department, Faculty of Medicine, Tanta University, Egypt

## ARTICLE INFO

## Keywords:

Hepatocellular carcinoma  
Therapeutic response  
Transarterial chemoembolization  
Arterial flow perfusion  
Hepatic perfusion index

## ABSTRACT

**Objective:** To assess diagnostic role of multi-detector computed tomographic perfusion in evaluating the therapeutic response of trans-arterial chemo-embolization in hepatocellular carcinoma.

**Patients & methods:** Post trans-arterial chemoembolization HCC patients underwent follow up by hepatic CT perfusion, CT attenuation value and perfusion parameters {arterial flow perfusion (AFP), portal venous perfusion (PVP) & hepatic perfusion index (HPI)} were measured in hypervascular area of treated lesion at perfusion color map suspected as residual disease and adjacent hepatic parenchyma to assess therapeutic efficacy. Parameters distribution were described by their quartile values and statistically analyzed.

**Results:** This study included 31(86%) male and 5(14%) female HCC patients with mean age (54 years). The residual lesion was observed in 25 patients of the 36 patients with increased CT attenuation value(HU), AFP (ml/min/100 ml), HPI (%) and decreased PVP (ml/min/100 ml) in the residual disease compared to surrounding cirrhotic liver parenchyma with P value < 0.05. The calculated parameters in the residual disease: CT attenuation value was 145.50 ± 25.26, AFP was 124.68 ± 19.69, PVP was 30.89 ± 11.52 & HPI was 78.07 ± 6.25. The calculated parameters in surrounding liver parenchyma: CT attenuation value was 99.53 ± 25.09, AFP was 37.12 ± 8.99, PVP was 56.38 ± 15.60 & HPI was 32.78 ± 8.55.

**Conclusion:** CT perfusion evaluates treatment response in TACE treated HCC patients by providing a quantitative assessment of vascularization of residual tumour.

## 1. Introduction

Hepatocellular carcinoma (HCC) is considered worldwide as the seventh most common cancer and the third cancer which ultimately leads to death [1,2]. It arises usually on top of cirrhotic liver and has high incidence rate above 40 years with men to women ratio about 8:1 [3,4]. In HCC, there is a relationship between differentiation of the tumor and values of perfusion parameters [5].

Trans-catheter arterial chemo-embolization (TACE) is considered the most worldwide used therapy for HCC patients who are unfit for surgical resection of tumor at time of diagnosis [6]. The target of TACE treatment is to induce necrosis of the tumor & also to limit its growth while preserving functional liver tissue as much as possible [7]. After TACE, early detection of recurrent or residual viable tumor is important as it facilitates successful early retreatment. Usually this is assessed using triphasic CT scanning, but quantitative assessment can't be provided & this approach can be affected by artifacts induced by the high concentrations of lipiodol, thus turn it difficult to accurately judge the

lesion characteristics and subsequent the treatment response [6].

Alternatively, computed tomographic (CT) perfusion of the liver allows to give functional information regarding the microcirculation of the normal liver parenchyma and focal liver lesions and it is also a promising procedure for monitoring the treatment response of various anticancer treatments and for evaluating tumor recurrence after therapy [8]. Based on the dynamic CT data, a map of quantitative tissue perfusion is obtained and then displayed using a perfusion color-coded scale allowing hepatic tissue perfusion quantification in absolute units at high spatial resolution [9].

Although, Histological examination is considered the gold standard for assessing the therapeutic efficacy of loco-regional therapy using percutaneous needle biopsy, it is an invasive procedure and prone to sampling errors as specimen taken from the neoplastic tissue does not always represent the entire lesion [10].

Evaluation of tumor response after interventional procedures for HCC is sometimes challenging as tumor necrosis may not always be paralleled by a reduction in tumor size as well as high attenuation of

Peer review under responsibility of The Egyptian Society of Radiology and Nuclear Medicine.

\* Corresponding author.

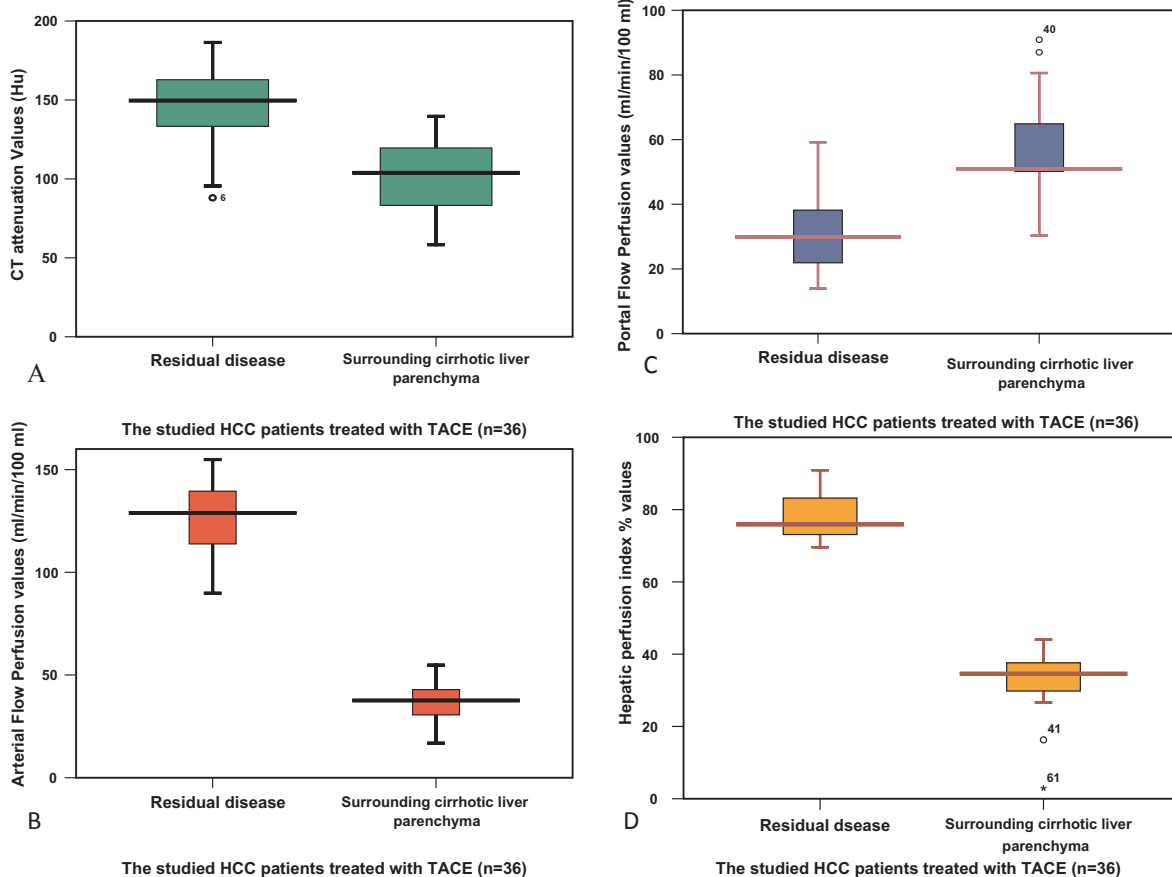
E-mail address: [logain\\_nabil85@hotmail.com](mailto:logain_nabil85@hotmail.com) (L.N. Salem).

<https://doi.org/10.1016/j.ejrm.2018.01.017>

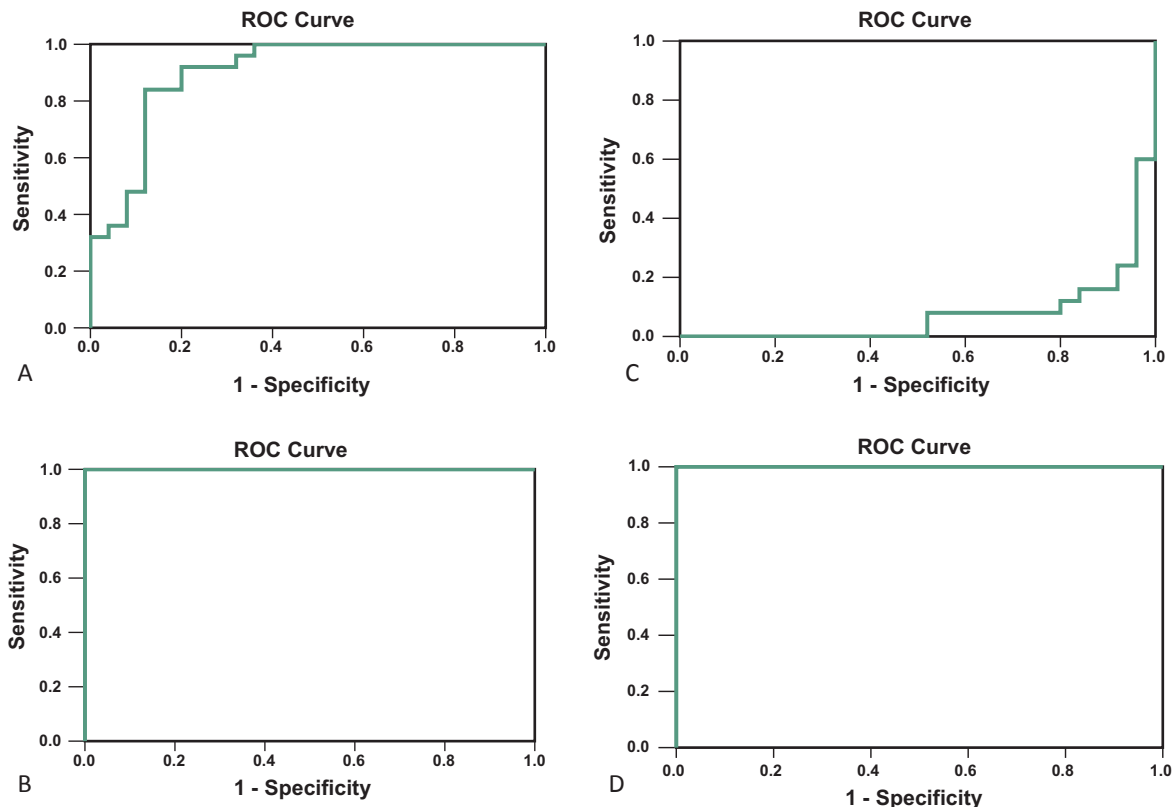
Received 21 November 2017; Accepted 31 January 2018

0378-603X/ copyright 2018 The Egyptian Society of Radiology and Nuclear Medicine. Production and hosting by Elsevier. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Please cite this article as: Salem, L.N., The Egyptian Journal of Radiology and Nuclear Medicine (2018), <https://doi.org/10.1016/j.ejrm.2018.01.017>



**Fig. 1.** Boxplots of CT attenuation values (A) & perfusion parameters, AFP (B), PVP (C) & HPI (D) in residual disease and in the adjacent cirrhotic liver parenchyma among TACE treated HCC patients with lower boundary represent the 25th percentile, line within the boxes represents the median, and the higher boundary represents the 75th percentile. Below & above boxes, there is error bars which represent minimal and maximum values.



**Fig. 2.** ROC curve of CT attenuation value (A) & perfusion parameters, AFP (B), PVP (C) & HPI (D) between residual disease and Surrounding cirrhotic liver parenchyma in TACE treated patients.

Download English Version:

<https://daneshyari.com/en/article/8952776>

Download Persian Version:

<https://daneshyari.com/article/8952776>

[Daneshyari.com](https://daneshyari.com)