

The Added Value of CT Angiography Prior To Transarterial Chemoembolization of Hepatocellular Carcinoma

Reda Mohamed Darwish, AbdElAziz Mohamed Elnekidy, Omar Sameh El-Aassar, Nour AbdelRahman Mahmoud AbdelRahman

Department of Radiodiagnosis and Intervention, Faculty of Medicine, Alexandria University

Introduction

Hepatocellular carcinoma (HCC) accounts for 85–90% of primary liver cancers. Globally, it is the fifth most common cancer in men and the seventh in women. Radiofrequency ablation (RFA), liver resection, and liver transplantation are the only curative options for patients with early-stage hepatocellular carcinoma (HCC). For those with intermediate-stage HCC (BCLC group B) who are not candidates for resection or ablation, trans-arterial chemoembolization (TACE) serves as the standard palliative treatment. In recent years, TACE has also emerged as a feasible treatment for certain advanced-stage HCC patients (BCLC group C). To successfully perform trans-arterial chemoembolization (TACE), interventional radiologists must accurately map the feeding arteries of hepatocellular carcinoma (HCC), including hepatic artery variations and accessory or parasitic peri-hepatic arteries. Without proper mapping, the procedure can be technically difficult and incomplete. Extrahepatic collateral arteries supplying HCC are present in 17% to 27% of cases. Multidetector computed tomography angiography (MDCTA), a noninvasive technique, is used to visualize hepatic and perihepatic vessels and identify tumor-feeding arteries before TACE.

Aim of the work

The aim of this study is to detect the added value of CT angiography prior to transarterial chemoembolization (TACE) of hepatocellular carcinoma as compared to DSA, 3D rotational angiography and cone beam CT Emboguide in detecting the vascular feeders of hepatocellular carcinoma.

Patients and Methods

This study was conducted on 30 patients with hepatocellular carcinoma who were referred to the Radiology Department for management by TACE. The patients underwent CT angiography and transarterial chemoembolization (TACE), involving 3D angiography, cone beam CT, and, in some cases, Emboguide mapping. The CTA study analysis focused on key diagnostic criteria, including the location, size, and number of HCC lesions, their enhancement pattern, the angulation of the celiac artery for optimal catheter selection, hepatic arterial anatomy, any anatomical variants, and the presence of extrahepatic collaterals providing parasitic blood supply to the HCC lesions.

Results

The number of patients with classical hepatic arterial supply for the HCC lesions was 12 (40%). Fourteen patients (46.7%) had extrahepatic parasitic supply, while four patients (13.3%) had anatomical vascular variants.

Table (1) Distribution of the studied patients according to the type of vascular supply. (no. 30)

	No.	%
Type of the vascular supply		
Classical hepatic arterial supply	12	40.0
Parasitic extrahepatic blood supply	14	46.7
Anatomical vascular variant	4	13.3

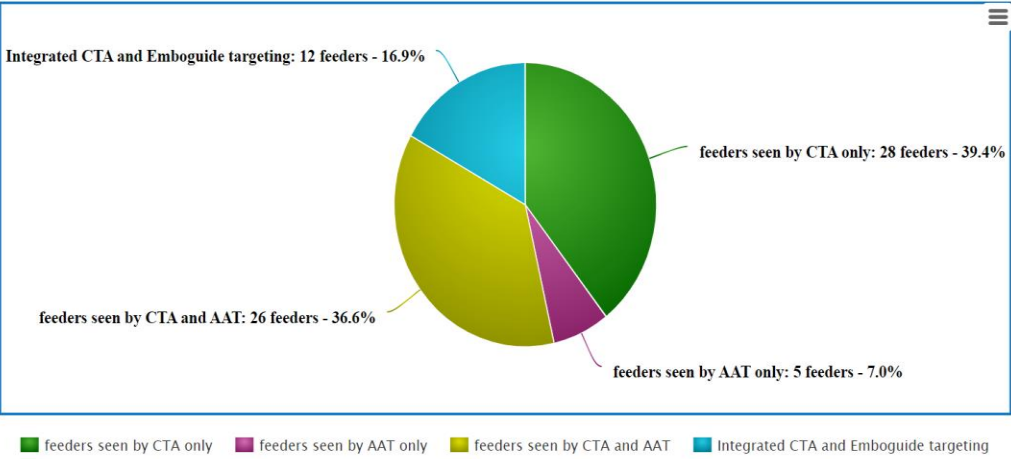


Figure (1) represents the number of feeders detected by each imaging modality.

During TACE sessions, 71 arterial branches were embolized as tumor feeders for 34 HCC lesions. Of these, 28 feeders (39.4%) were identified only via CTA, including 15 extrahepatic and 13 hepatic arterial branches, which were missed by angiographic tools.

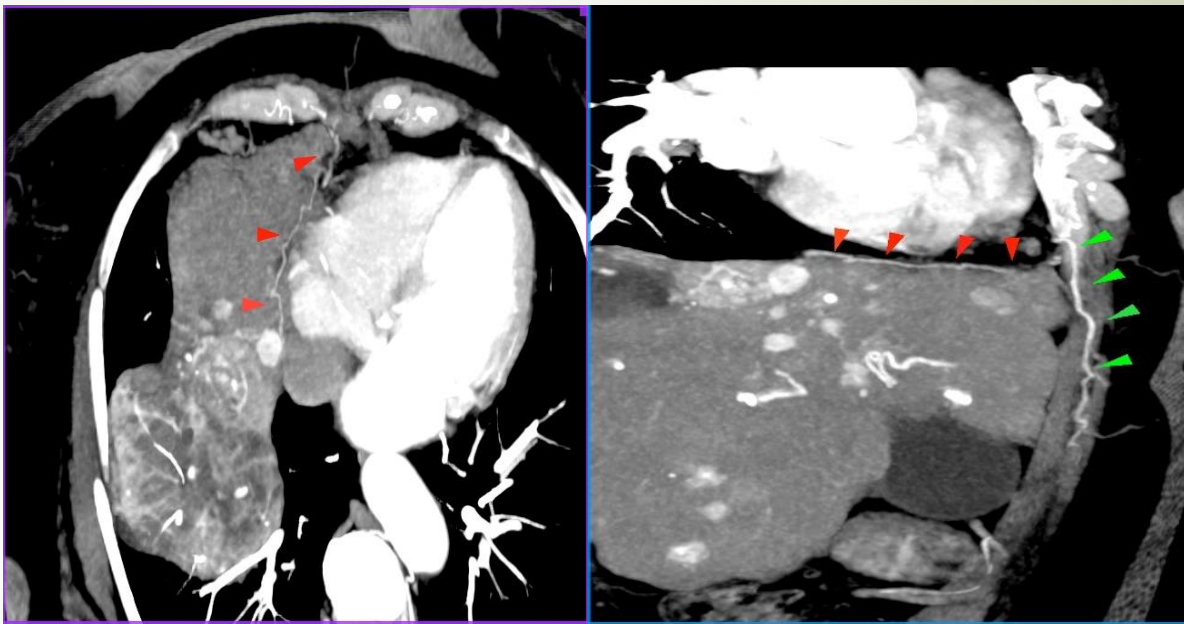


Figure (2) Axial and sagittal oblique views of CTA with MIP detecting the parasitic arterial feeder of the tumor “red arrow” arising from the right internal mammary artery “green arrow”

Conclusion

For successful TACE, interventional radiologists must carefully map the feeding arteries of HCC, including hepatic artery variants and accessory or parasitic perihepatic arteries, prior to the procedure. Hypovascular HCC feeders were identified by combining CTA and contrast-enhanced CBCT with Emboguide technology, as tumor feeders could not be detected by a single modality due to the absence of arterial blush.