HCC CASE REPORT

COMPLETE REMISSION AFTER YTTRIUM-90 SIRT FOR UNRESECTABLE HEPATOCELLULAR CARCINOMA WITH PORTAL VEIN THROMBOSIS

Portal vein thrombosis (PVT) is a late stage complication of infiltrative hepatocellular carcinoma (HCC) and negatively affects the prognosis (1). Selective internal radiation therapy (SIRT) with yttrium-90 (Y-90) resin microspheres (SIR-Spheres®) is one of the most promising tools for treatment of HCC with PVT. We report a case of complete remission of advanced unresectable HCC with PVT treated with Y-90 SIRT.

A 55 year-old male with unresectable HCC and PVT due to hepatitis C virus-related cirrhosis was referred to our clinic. He was a non-smoker and did not drink alcohol.

The patient underwent multiple conventional chemoembolisation treatments to treat his right hepatic lobe tumours in the two years preceding his referral. The computed tomography (CT) scan after the last chemoembolisation session showed multifocal tumours in the right hepatic lobe consistent with infiltrative HCC and invasion of the right branch of the portal vein extending into the main portal vein (Figure 1). Chest CT and bone scans were negative for metastasis. The patient was classified as Barcelona Clinic Liver Cancer stage C, with a good Eastern Cooperative Oncology Group (ECOG) status 0. He had no signs of encephalopathy or ascites, a well-compensated liver cirrhosis and Child-Pugh class A (bilirubin = 0.6 mg/dl). The model for end-stage liver disease score (MELD) was 8. Upper endoscopy showed mild oesophageal varices. The patient's baseline α-fetoprotein was low (8.9 µg/l).

He was not eligible for surgery, percutaneous ablative procedures, or further chemoembolisation due to the extent of the PVT. The decision made by the multidisciplinary team (MDT) was to proceed with SIRT. During the preparatory session, the common hepatic angiogram revealed multiple hypervascular tumours in the right hepatic lobe supplied by the right and the middle (segment IV) hepatic arteries as well as the hypervascular portal tumour thrombus (Figure 2). Coil embolisation of the middle hepatic and gastroduodenal arteries were performed (2). The activity of resin microsphere was calculated according to modified body surface area method. Extended right hepatic lobe SIRT was performed without complication with the total activity delivered of 1.5 GBq. A full dose of sorafenib (400 mg bid) was started one week after SIRT and reduced to 400 mg/d 1 week later due to side effects.

Regular clinical and laboratory follow-up revealed no grade 3 or 4 toxicity according to Common Terminology Criteria for Adverse Events of the National Cancer Institute (CTCAE-NCI). A CT scan performed 3 months after SIRT showed complete response of the intrahepatic tumours as well as the PVT according to modified Response Evaluation Criteria in Solid Tumors (mRECIST) with complete recanalisation of the main and right portal vein and compensatory left lobe hypertrophy (Figure 3). The patient developed large hypervascular tumours in the left hepatic lobe (segment IV) as well as the right lobe (segment V) invading the left portal vein 26 months later (Figure 4). He was still ECOG 0 and Child-Pugh class A (bilirubin = 1.2 mg/dl). Due to the previous excellent response to SIRT, the MDT decided to apply the same treatment. During the preparatory session, the right gastric and cystic arteries were coil embolised (Figure 5). At the treatment session, resin microspheres were infused selectively from three different vessels feeding the tumours with total delivered activity of 1.85 GBq without complications.

Author:
Mohamed H K Abdelmaksoud
Radiology Department, Theodor Bilharz Research Institute, Giza, Egypt

SIRTeX

No clinical or laboratory toxicities were experienced according to CTCAE-NCI and 3 months' follow-up CT imaging revealed absence of any enhancing tumours and complete response according to mRECIST with complete resolution of the PVT. Regular follow-up was performed, which showed the persistence of complete tumour regression. The patient was alive without evidence of tumour recurrence 1 year after the second SIRT.

We report a case of a patient with unresectable HCC and PVT who showed complete remission after Y-90 SIRT and survived more than 3 years. It appears feasible, safe and effective to treat this type of patients with Y-90 SIRT.

References:

1. Senthilnathan S, Memon K, Lewandowski RJ, Kulik L, Mulcahy MF, Riaz A, *et al.* Extrahepatic metastases occur in a minority of hepatocellular carcinoma patients treated with locoregional therapies: analyzing patterns of progression in 285 patients. *Hepatology.* 2012 May; **55**(5): 1432–1442. PubMed PMID: 22109811. Pubmed Central PMCID: 3322252.
2. Abdelmaksoud MH, Louie JD, Kothary N, Hwang GL, Kuo WT, Hofmann LV, *et al.* Consolidation of hepatic arterial inflow by embolization of variant hepatic arteries in preparation for yttrium-90 radioembolization. Journal of vascular and interventional radiology : *JVIR.* 2011 Oct; **22**(10): 1364–1371 e1. PubMed PMID: 21961981.

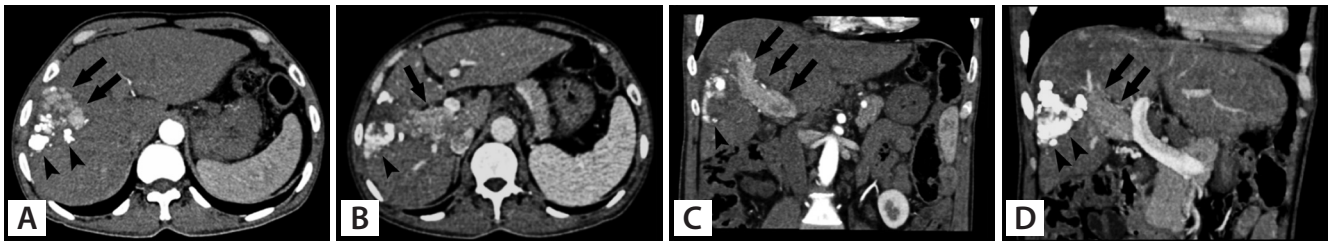

Figure 1.
Baseline diagnostic CT scan in axial (A,B) and coronal reconstruction (C,D) views showed multiple hypervascular tumours in the right hepatic lobe invading the right and main portal vein (black arrows).
Note hyperdense lipiodol deposition from previous chemoembolisation treatments (arrowheads).

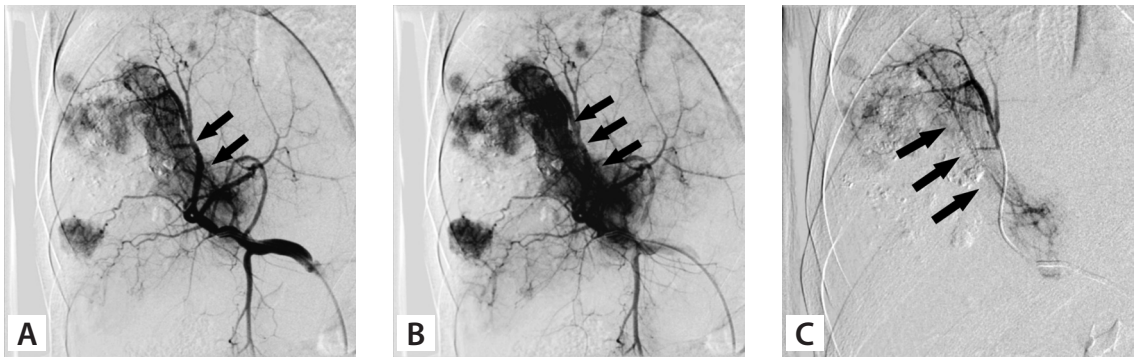

Figure 2.
Common hepatic angiogram in right anterior oblique 30º view (A,B) showed numerous hypervascular tumours in the right hepatic lobe with large hypervascular malignant portal vein tumoural thrombus (arrows). (C) Selective injection of the vessels feeding the tumoural thrombus.

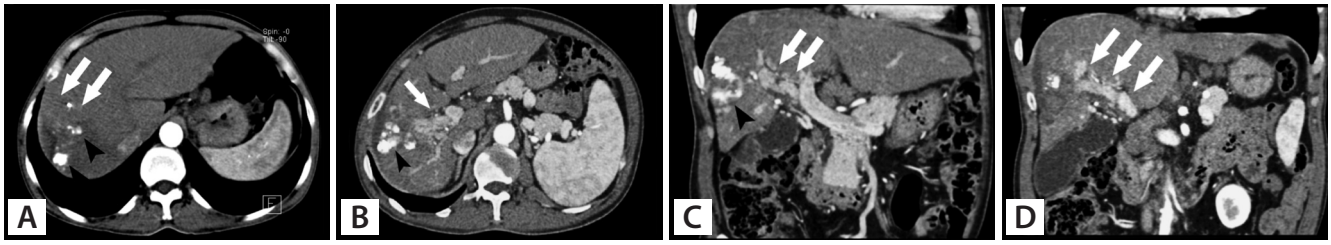

Figure 3.
Follow-up CT scan after 3 months in axial (A,B) and coronal reconstruction (C,D) views showed apparent complete necrosis of the tumours with recanalisation of the right and main portal vein (white arrows).
Note hyperdense lipiodol deposition from previous chemoembolization treatments (black arrowheads).

Author:
Mohamed H K Abdelmaksoud
Radiology Department, Theodor Bilharz Research Institute, Giza, Egypt

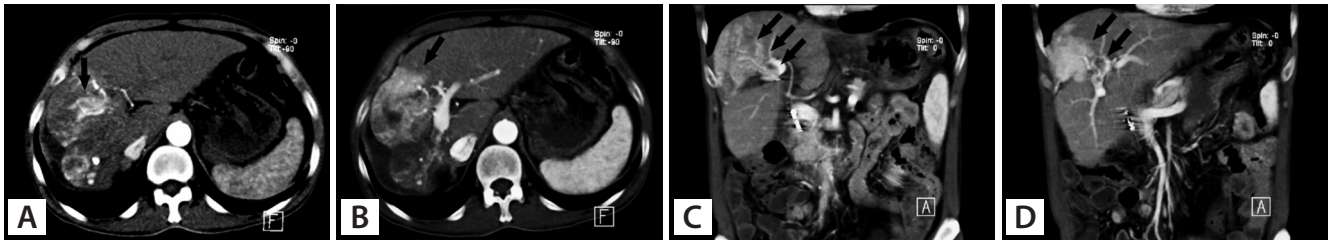

Figure 4.
26-months follow-up CT in axial (A,B) and coronal reconstruction (C,D) showed newly developed hypervascular tumours in the right (segment V) and left (segment IV) hepatic lobes with invasion of the left portal vein (black arrows).

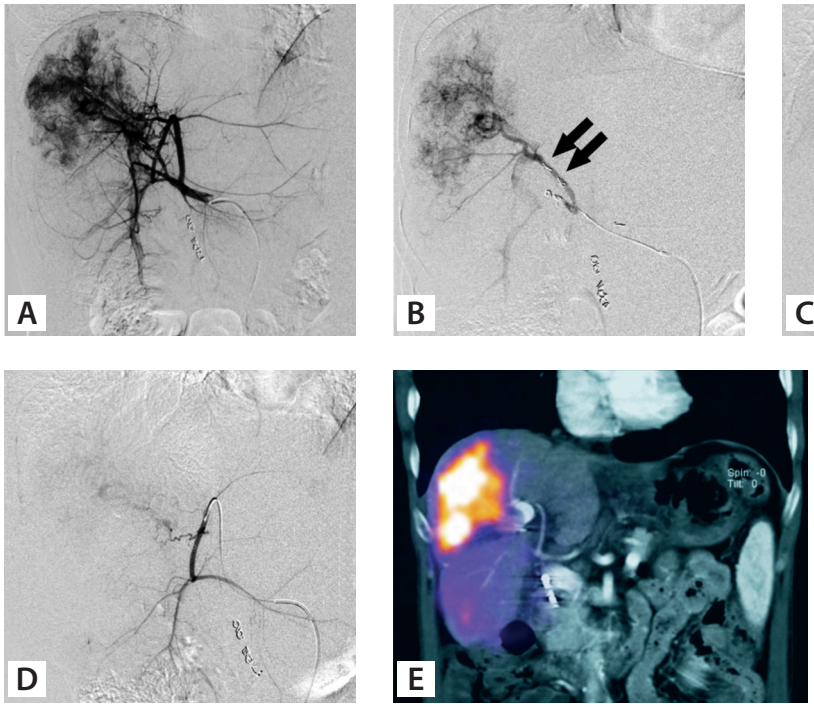

Figure 5.
(A) Common hepatic angiogram in AP view showed hypervascular tumours in the right and left hepatic lobes with large hypervascular malignant left portal vein tumoural thrombus, (B–D) selective angiogram from the feeding vessels to the tumour. Note flow of the contrast through the previously coil embolised middle hepatic lobe (arrows in B), in which all the three vessels were infused by yttrium-90 microspheres. (E) SPECT/CT fusion image showed the tumour with the left portal malignant thrombus.

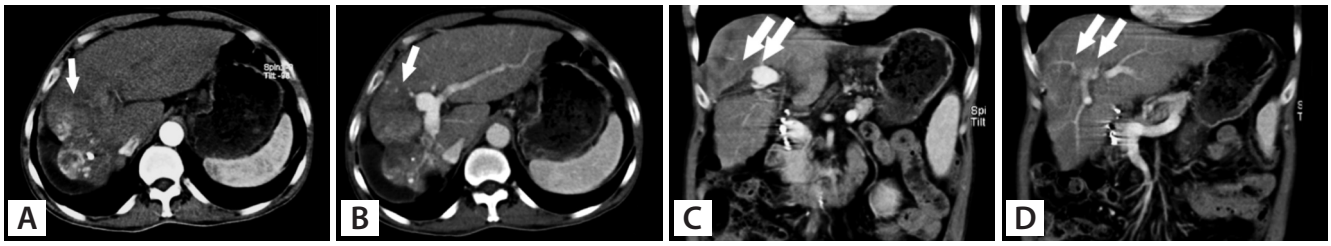

Figure 6.
Follow up CT scan after 3-month from the second SIRT in axial (A,B) and coronal reconstruction (C,D) views showed apparent complete necrosis of the tumours within the liver and left portal vein (white arrows).
Note hyperdense lipiodol deposition from previous chemoembolisation treatments (white arrowheads).

Sirtex Medical United Kingdom Ltd
Building 3, Chiswick Park, 566 Chiswick High Road, London W4 5YA, United Kingdom

667-E-0517