Editorial

How to identify better candidate to radioembolization in case of hepatocellular carcinoma and portal vein tumoral thrombosis

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Hepatocellular carcinoma (HCC) is the most common primary liver cancer and the fifth most common malignant tumor worldwide. Liver resection is a curative treatment for HCC and can be safety performed by a minimally invasive procedure in all liver segments without size limitations (1,2).

Nevertheless, some patients are diagnosed with HCC and portal vein tumor thrombosis (PVTT). According to the staging system of the Barcelona Clinic Liver Cancer (BCLC), patients with macrovascular invasion are staged as BCLC-C. For those patients, the prognosis is generally poor. However, the management of HCC with macrovascular invasion is still controversial. Indeed, recent studies proposed different surgical procedure such as one-stage resection or associating liver partition and portal vein ligation, with promising results (3-5).

Trans-arterial radioembolization (TARE) is a type of brachytherapy performed by selective intraarterial injection of yttrium-90 microspheres. This innovative technique has been described as a potential curative or downstaging therapy in the setting of liver transplantation even in patients with PVTT (6,7).

We read with great interest the manuscript entitled "*Development of a prognostic score to predict response to yttrium-90 radioembolization for hepatocellular carcinoma with portal vein invasion*" written by Dr. Spreafico *et al.* (8).

Authors present a retrospective single center study on 120 patients with HCC and PVTT, receiving TARE as elective treatment. Median age at TARE treatment was 64 years with a MELD score of 8. All patients were classified as BCLC-C, and the PVTT was graded as segmentary (PV1), secondary order branch (PV2) and first-order branch (PV3) in 53 (44.2%), 37 (30.8%) and 30 (25%) patients respectively. The median tumor diameter was 7.3 cm.

The authors reported a median overall survival of 14.1 months, without any death at 30 days after first dose treatment. The 1- and 3-year survival rates were 53.2% and 18.5% respectively. Only one patient was treated with a curative intent after TARE undergoing liver transplant. The majority of progression were observed into the liver (76.6%).

The authors developed a prognostic classification allowing to identify which patients would benefit from TARE. Bilirubin (cutoff 1.2 mg/dL =0 or 2 points), PVTT grade (PV1-2-3=0, 2 or 3 points) and tumor burden (cutoff 50% liver volume =0 or 3 points) at the time of TARE were the three variables independently correlated with survival. Thus, 3 prognostic categories were proposed: favorable prognosis (0 points), intermediate prognosis (2–3 points) and dismal prognosis (>3 points). The three categories had a median overall survival of 32.2, 14.9 and 7.8 months respectively.

According to the presented prognostic classification physicians may propose TARE in those patients with low bilirubin, PVTT grade PV1 and tumor burden inferior of 50% of liver volume. Those patients may be in a second-period candidate for liver resection or liver transplantation. In this way TARE would become an alternative bridge or downstaging therapy to transplantation (9,10). Furthermore, other studies have shown that TARE has a better response rate compared to TACE in patients with an advanced BCLC stage (11,12).

Nonetheless, no prospective comparison of liver resection versus systemic treatments or TARE has ever been

reported (13).

Authors describe for patients with 0 points (absence of adverse prognostic factors) a median overall survival of 32.2 months and a median progression-free survival of 14.1 months. As suggested by authors and previously described in others series, the downstaging observed after TARE, could lead to a curative treatment in a patient with PVTT with subsequent liver transplant (6,10-14).

Radioembolization is playing a role in the therapeutic algorithm of HCC for BCLC class A, B, and C. If we consider the possibility of downstaging HCC patient with PVTT, many patients could have a chance to be cured. Indeed, in front of these promising results, prospective comparative studies are needed to reinforce and confirm these preliminary results. In an alternative to accepted palliative treatment, the score from Spreafico *et al*. suggest in which patient to date a TARE treatment will be useful. For patients with a score over 3 points, authors suggest performing conventional palliative therapy. Multiple cases series have been reported worldwide even in patients with PVVT in a first-order branch (7). Maybe for those patients personalized dosimetry or sequential multiple TARE procedure will be helpful.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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