ASK THE EXPERTS

TARE in Advanced HCC: When Is It Optimal and Why?

International perspectives on when to utilize transarterial radioembolization to increase the likelihood of curative outcomes in patients with advanced-stage hepatocellular carcinoma.

With Jin Woo Choi, MD, PhD, and Riad Salem, MD, MBA

Jin Woo Choi, MD, PhD
Seoul National University Hospital
Seoul National University
Seoul, Republic of Korea
jwchoi.med@snu.ac.kr
Disclosures: None.

Transarterial radioembolization (TARE) can be considered for patients with unilobar hepatocellular carcinoma (HCC) and ipsilateral portal vein tumor thrombosis (Vp1-3), provided there is no hepatic vein invasion, no extrahepatic spread, Child-Pugh A status, and an ECOG (Eastern Cooperative Oncology Group) performance status of 0 to 1. Although this represents an advanced stage of HCC, locoregional treatments may still be viable, and an effective locoregional treatment can potentially increase the likelihood of curative outcomes.

Despite the rapid development of immune checkpoint inhibitors, which are now the frontline treatment for advanced HCC, there is a significant lack of detailed data for this specific patient population posttreatment with immune checkpoint inhibitors. Historically, Asian countries have considered lobectomy as a viable option for these patients, particularly in cases of Vp1 and Vp2. This aggressive approach can result in a cancer-free status if there are no occult tumors in the remaining liver; however, it can be catastrophic if any small tumor seeds are present. Indeed, overall survival (OS) and recurrence-free survival rates substantially decrease during the first 18 months, stabilizing in the following years.[1,2] Nevertheless, this approach could be justified in the past, even in the era of tyrosine kinase inhibitors, due to the limited survival outcomes after systemic treatments. However, with immune checkpoint inhibitor–based systemic treatments now offering longer OS, the opportunity cost of this risky approach increases.

In this context, TARE can be an ideal frontline treatment for this specific patient population. For Vp1 and Vp2, ablative TARE can effectively downstage the tumor, providing a test of time and inducing hypertrophy of the future liver remnant, or it can serve as a definitive treatment. For Vp3, TARE may lead to curative conversion, although the chances are lower than in Vp1 and Vp2 cases, or it can assist subsequent systemic treatments by safely reducing tumor burden. However, high-level evidence for TARE in locally advanced HCC is lacking, and ongoing trials, including the RESOLVE trial (NCT06166576), will help establish the role of TARE in this potentially curative yet advanced HCC population.

1. Vitale A, Burra P, Frigo AC, et al. Survival benefit of liver resection for patients with hepatocellular carcinoma across different Barcelona Clinic Liver Cancer stages: a multicentre study. J Hepatol. 2015; 62:617-624. doi: 10.1016/j.jhep.2014.10.037
2. Kim KS, Choi GS, Rhu J, Kim J. Comparison between laparoscopic liver resection and open liver resection in patients with hepatocellular carcinoma with portal vein tumor thrombosis. Surg Endosc. 2024;38:2116-2123. doi: 10.1007/s00464-024-10732-y

Riad Salem, MD, MBA
Vice Chair, Image-Guided Therapy
Chief, Vascular and Interventional Radiology
Department of Radiology
Professor of Radiology, Medicine, and Transplantation
Northwestern Medicine
Feinberg School of Medicine
Chicago, Illinois
rsalem1@nm.org
Disclosures: Consultant to Boston Scientific Corporation, Cook, Siemens, Sirtex, Terumo, AstraZeneca, Genentech, Eisai, Autem, Roche, and TriSalus.

Currently, treatment for HCC is guided by the BCLC (Barcelona Clinic Liver Cancer) algorithm, and patients with vascular invasion fit into the category of advanced HCC and can be effectively treated with systemic therapy. However, many physicians believe that patients with liver-only disease and vascular invasion (so-called locally advanced HCC) should be treated with TARE. Why is that? First, TARE is an arterial therapy that allows you to give high-dose radiotherapy in vascular tumors such as HCC with vascular invasion and portal vein thrombosis. Second, there is evidence of a strong antitumoral effect on the portal vein thrombus with TARE in that we have treated patients where the thrombus has retracted or completely dissolved, and patients have subsequently undergone resection and even transplant. This is an area where we can potentially find a patient population where we can break the guideline rules and individualize treatment.

In my opinion, patients with locally advanced HCC should be treated with TARE first, and most should be treated relatively quickly (within a few weeks) and augmented with systemic therapy (ie, 4-6 weeks); we are noticing that patients respond very well to TARE and do not have additional side effects when you add systemic therapy.

We also now have very strong data from the DOSISPHERE-01 study, which randomized patients with large tumors and vascular invasion to normal-dose or high-dose TARE. With use of high-dose TARE in portal vein thrombosis, survival increased by > 150%, and patients were 10-fold more likely to receive curative resection in large tumors.[1] With this, we now have randomized data showing the role of TARE in patients with portal vein thrombosis, who we are now resecting and transplanting, as well as data showing the safety of standard-of-care systemic therapies following TARE. For me, there still is a role of TARE in that locally advanced patient population.

Conversely, scenarios where radioembolization might not be beneficial include patients with vascular invasion but extrahepatic disease or if the vascular invasion is associated with significant lung shunting where you cannot administer a good dose. In addition, if the Tc-99m MAA (macroaggregated albumin) scan shows that the spheres will not accumulate in the portal vein thrombus or if the thrombus is bilobar, I think that's too much thrombus to really be beneficial. One other scenario where TARE would not be considered is in the presence of liver dysfunction (ie, poor liver function tests, very low albumin, elevated bilirubin) or liver failure.

An area of disagreement for use of TARE is in patients with main portal vein thrombosis. My contention is the data are just as good with radioembolization in main portal vein thrombosis as they are with systemic therapy, so I would still try TARE and then augment with systemic therapy. ■

1. Garin E, Tselikas L, Guiu B, et al. Long-term overall survival after selective internal radiation therapy for locally advanced hepatocellular carcinomas: updated analysis of DOSISPHERE-01 trial. J Nucl Med. 2024;65:264-269. doi: 10.2967/jnumed.123.266211