Radioembolization for hepatocellular carcinoma (our experience)

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BACKGROUND

Hepatocellular carcinoma (HCC) is the fifth most common cancer worldwide and the third leading cause of cancer-related mortality. Selective internal radiation therapy (SIRT) with Yttrium-90 (90Y) microspheres, also known as transarterial radioembolization (TARE) is a minimally invasive, image-guided treatment that delivers intra-arterial brachytherapy directly to hepatic tumors. Multiple studies have demonstrated the potential efficacy of TARE in patients with unresectable HCC. While current BCLC guidelines do not establish TARE as a standard of care in any disease stage, they acknowledge its utility in select patient populations. The LEGACY study supports TARE as a potentially curative option in early-stage HCC patients with tumors not amenable to ablation or surgery, or as a bridging strategy to transplantation. In BCLC stage B, TARE serves as an alternative to TACE, particularly in patients with large, multiple or bilobar tumors. In advanced-stage (BCLC C), TARE may be considered in carefully selected patients with preserved liver function, limited macrovascular invasion, or contraindications to systemic therapy.

AIM

This study aimed to retrospectively evaluate the safety and treatment response of HCC patients treated at our institution with TARE, either as monotherapy or in combination with systemic therapy.

METHODS

Between June 2012 and March 2025, a total of 28 patients with HCC (18 males, 10 females; mean age: 63 years, range: 45–85) were treated with 90Y microspheres. Liver function status included 21 patients with Child-Pugh class A cirrhosis, 4 with class B, and 3 without underlying cirrhosis. Based on BCLC classification, 3 patients were classified as stage A, 20 as stage B (not candidates for TACE), and 5 as stage C. One patient with BCLC A underwent radioembolization as a bridging therapy to downsize the tumor prior to surgery. In three BCLC C patients, TARE was followed by systemic therapy with atezolizumab and bevacizumab. Tumor response was evaluated using both mRECIST and RECIST criteria.

RESULTS

A total of 35 TARE procedures were performed across 28 patients (range: 1–3 procedures per patient). Additional 7 procedures were conducted in 5 patients due to disease progression TARE was performed as a single-lobar session or segmental treatment in 25 procedures; in 10 procedures we performed bilobar treatment. The median value of

the implanted Y-90 activity was 1.4 GBq (range: 0.42-3.57). At 6-month follow-up, the disease control rate, defined as complete response, partial response, or stable disease was 83.3%.. All three BCLC C patients treated with TARE in combination with atezolizumab/bevacizumab achieved complete responses per mRECIST and became eligible for surgical resection. Pathological evaluation post-resection showed no residual viable tumor tissue. Three patients developed mild post-radioembolization syndrome, presenting as localized pain, which was successfully managed with nonsteroidal anti-inflammatory drugs (NSAIDs). No cases of liver function deterioration or radioembolization-induced liver disease (REILD) were reported.

CONCLUSION

TARE, either as a stand-alone therapy or in combination with systemic treatment, appears to be a safe and effective therapeutic option for patients across early (BCLC A), intermediate (BCLC B), and selected advanced (BCLC C) stages of HCC. It also demonstrates value as a downsizing strategy in patients not suitable for surgical intervention due to tumor size or anatomical location.

References

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