Editorial

Living donor liver transplantation can be a rescue treatment for hepatocellular carcinoma

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For intermediate-stage hepatocellular carcinoma (HCC) in the Barcelona Clinic Liver Cancer (BCLC), transarterial chemoembolization (TACE) is advised as the initial treatment. The term "BCLC intermediate-stage HCC" (BCLC stage B) refers to a group of patients with varying liver functions and single big nodules or many nodules that do not have distant metastases or vascular invasion (1). In general, tumors beyond the Milan criteria (single tumor >5 cm or ≥4 nodules) are classified as BCLC intermediate-stage HCC. Consequently, not every patient with intermediate-stage HCC in BCLC is a good candidate for TACE alone; this is especially true for patients who have a substantial tumor bulk, multinodular dissemination, or decreased liver function. TACE refractory cases cannot get full TACE treatment.

There is growing evidence that more aggressive radical treatments such as surgical liver resection (LR) and liver transplantation (LT) are feasible for select HCC patients with BCLC stage B (2). According to Tsai *et al.*, patients with BCLC intermediate-stage HCC who underwent living donor lung transplantation (LDLT) had 1-, 3-, and 5-year OS rates of 92.3%, 89.2%, and 84.1%, respectively. These rates are significantly superior to the comparable rates of 84.1%, 57.7%, and 43.3% in the non-LDLT group (3). They proposed that advanced age, a high neutrophil-lymphocyte ratio, and a frequency of locoregional therapies (LRTs) greater than three were predisposing risk factors for mortality following LDLT in BCLC stage B patients. The present study's highly positive conclusion is that patients with BCLC stage B patients who receive LDLT have a better prognosis than those who do not, and this finding is supported by other research on expanded indications. Although risk factor analysis is important, rejecting LDLT when these risk factors are present is not always simple.

There are still doubts about LDLT as an initial treatment for BCLC intermediate-stage HCC. Tsai *et al.* showed that 94 patients (90.4%) had received LRTs before LDLT; 18 cases had undergone surgical LR, 84 cases had received TACE, and 35 cases received radiofrequency ablation. For individuals with intermediate-stage HCC in BCLC, LDLT is not the first line of treatment (3). Just 10% of patients received LDLT as their first course of therapy (3). A previous review paper reported that LT is a treatment option for selected patients with BCLC stage B HCC (4).

Korean and Chinese guidelines recommended that LRTs as downstaging therapy to reduce tumor burden be within the LT criteria for patients who are initially beyond the criteria (5,6). Kaplan-Meier analysis showed that a higher frequency of LRTs before LDLT (>3) were significantly associated with higher HCC recurrence and poor OS (3).

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It is crucial to keep the intermediate-stage HCC in BCLC stable or to downstage it without allowing the malignancy to spread. A tumor burden that is aggressive, characterized by its size, quantity, and fast recurrence, may make downstaging more challenging. To keep possible LT recipients within the parameters, more LRTs might be needed. On the other hand, if patients underwent more LRT sessions, it was anticipated that their cancer would advance or reach a level higher than BCLC stage B.

The eligibility requirements for BCLC intermediate-stage HCC selection vary per institution, and LDLT is an extremely complicated technical process. The BCLC has the idea of treatment stage migration, which permits more flexibility in treatment allocation even though it is considered a strict algorithm. Additionally, the recent subclassification of BCLC stage B, which is based on cancer stage-oriented algorithms, shows some similarities and impacts from the therapeutic hierarchy idea, primarily on the patient's readiness for LDLT. When hepatectomy patients have liver failure or HCC recurrence, salvage LDLT does not lead to worse short- and long-term outcomes than primary LDLT (7). The overall transplantable pool of patients after LR has not decreased (8). To prevent waitlist dropout, all patients should be offered bridging and downstaging treatment. Nonetheless, a major issue facing the world is the lack of suitable living liver donors.

To successfully manage HCC, multidisciplinary treatment, is crucial since it enables the integration of many medical specializations to offer patients comprehensive care (9). When it comes to the diagnosis and treatment of HCC, multidisciplinary team helps offer a comprehensive approach. It also plays a significant role in assisting in the determination of the best course of action for each patient (10). When determining LDLT for HCC patients, multidisciplinary treatment is also crucial.

In conclusion, patients with BCLC intermediate-stage HCC represent a diverse population, and while determining LDLT for a given patient, multidisciplinary team should take into account the patient's performance status as well as the aggressiveness and characteristics of the tumor.

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