LETTERS TO THE EDITORS

Primary role of radioembolization as a downstaging strategy in patients with macrovascular invasion prior to liver transplantation

Giovanni Battista Levi Sandri[1], Giammauro Berardi[1,2], Valerio Giannelli[2] & Giuseppe Maria Ettorre[1]

1 Division of General Surgery and Liver Transplantation, S. Camillo Hospital, Rome, Italy
2 Liver and Transplant Unit, San Camillo Forlanini Hospital, Rome, Italy
E-mail: gblevisandri@gmail.com

Liver transplantation (LT) is a life-saving treatment for chronic liver disease with or without hepatocellular carcinoma (HCC). As widely reported in the last 20 years, LT for HCC achieves excellent results when Milan criteria are fulfilled [1]. However, around 35% of HCC patients are diagnosed with portal or hepatic vein tumour thrombosis (PVTT/HVTT); these patients are classified as T3b or BCLC-C according to the current classifications and are therefore generally excluded from LT.

Nowadays, modern locoregional treatments (LRTs) allow to successfully downstage and downgrade different HCC presentations, including those with vascular invasion. Surgical resection or radioembolization with yttrium-90 (Y90) is safe and effective strategies to potentially transplanting patients who were initially outside Milan criteria. The recent multicentric study by Assalino et al. delivers a very interesting message for LT surgeons [2]. We warmly congratulate the authors for their research and the results presented, and we totally agree with the conclusions. The authors made a huge effort to centralize images and standardize radiological evaluation in order to reduce potential bias: as a result, of the 36 reviewed radiological images only 29 (80.5%) confirmed the diagnosis of PVTT or HVTT. Standardization of radiological evaluation and strategies to decrease potential over- or underestimation of tumour thrombosis should be encouraged in order to properly refer patients to the most appropriate treatment.

Downstaging treatment was TACE in 15 cases, Y90 in nine cases and liver resection in five cases. During pathological examination, no viable residual tumour was observed in 11 patients. Five of nine patients initially treated with Y90, five of 15 patients treated with TACE, and one of five patients resected. After a median follow-up of 44 months following LT, the authors reported no disease recurrence in 9 out of 15 (60%) TACE patients, 8 out of 9 (88.9%) Y90 patients and 4 out of 5 (80%) resected patients. Eventually, patients treated with Y90 had higher complete response and less frequently developed recurrence. Although differences are not statistically significant because of the small cohort and number of events, a trend favouring Y90 could be speculated. These results support and enhance the data around the downstaging properties of Y90 that have been well described in the literature [3]. Another issue that we would like to raise is the lack of information around surgical procedures, especially regarding type of approach (open or minimally invasive) and type of resection (minor or major). This information is essential for the outcome of salvage transplantation as minimally invasive approach has been shown to improve the outcome, while a major liver resection could significantly worsen prognosis [4]. Furthermore, currently surgical resection could be performed successfully after Y90 even by laparoscopy [5].

Finally, alpha-fetoprotein (AFP) level has been associated with disease presentation, evolution and recurrence, as well as with decreasing trends following LRT [6]. We have previously observed a significant decrease in AFP after Y90 [7]; furthermore, when AFP reached normal levels, the risk of recurrence was comparable to patients with initial low AFP levels. The study reported by Assalino et al. lacks the analysis of AFP levels and its evolution with time during the waiting list period. More recently, using the dual positron emission tomography with ^{18}F-fluorodeoxyglucose and ^{11}C-choline we can exclude extra-hepatic disease before LT [8].

We congratulate again with the authors for the publication and for the efforts gathering this multicentric data, and we therefore encourage future multicentric studies comparing different LRT in patients undergoing LT with tumoral thrombosis.

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