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# Impact of Tumour Biology on Outcomes of Radical Therapy for Hepatocellular Carcinoma Oligo-Recurrence after Liver Transplantation

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**Introduction:** It is uncertain whether tumour biology affects radical treatment for post-transplant hepatocellular carcinoma (HCC) oligo-recurrence, i.e. recurrence limited in numbers and locations amendable to radical therapy.

**Methods:** We conducted a retrospective study on 144 patients with post-transplant HCC recurrence.

**Results:** Early recurrence within one year after transplant (HR 2.53, 95% CI 1.653.88, $p < 0.001$), liver recurrence (HR 1.74, 95% CI 1.122.68, $p = 0.01$) and AFP >200 ng/mL upon recurrence (HR 1.62, 95% CI 1.042.52, $p = 0.03$) predicted mortality following recurrence. In patients with early recurrence and liver recurrence, radical treatment was associated with improved post-recurrence survival (early recurrence: median 18.2+/-1.5 vs. 9.2+/-1.5 months, $p < 0.001$; liver recurrence: median 28.0+/-4.5 vs. 11.6+/-2.0, $p < 0.001$). In patients with AFP >200 ng/mL, improvement in survival did not reach statistical significance (median 18.2+/-6.5 vs. 8.8+/-2.2 months, $p = 0.13$). Survival benefits associated with radical therapy were reduced in early recurrence (13.6 vs. 9.0 months) and recurrence with high AFP (15.4 vs. 9.3 months) but were similar among patients with and without liver recurrence (16.9 vs. 16.4 months). They were also diminished in patients with multiple biological risk factors (0 risk factor: 29.0 months; 1 risk factor: 19.7 months; 23 risk factors: 3.4 months).

**Conclusion:** The survival benefit following radical therapy was superior in patients with favourable biological recurrence but was also observed in patients with poor tumour biology. Treatment decisions should be individualized considering the oncological benefits, quality of life gain and procedural morbidity.