

## Comparison of Survival Between Resection and Radiofrequency Ablation for Hepatocellular Carcinoma

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**Background/Aims:** It remains controversial whether surgical resection provides superior overall survival (OS) for early hepatocellular carcinoma (HCC) compared to radiofrequency ablation (RFA). In this study, we aimed to compare OS after RFA with that after resection for chronic hepatitis B (CHB)-related early HCC after adjusting for antiviral treatment.

**Methods:** This retrospective study included 761 patients who underwent surgical resection (n=567) or RFA (n=194) as an initial treatment for hepatitis B virus-related HCC patients at very early or early stage between 2006 and 2016 at a single referral center. Primary and secondary endpoints were OS and recurrence-free survival (RFS), respectively. Baseline characteristics were balanced using inverse probability of treatment weighting (IPTW).

**Results:** The RFA group had a smaller mean tumor size (1.7 vs. 3.9 cm), but a higher proportion of cirrhotic patients (85.6% vs. 63.1%) than the resection group (both  $P < 0.01$ ). During 81.0 (interquartile range, 62.3–107.1) months of follow-up, RFA was not independently associated with either OS (adjusted hazard ratio [aHR]=0.814, 95% confidence interval [CI]=0.394–1.683,  $P=0.58$ ) or RFS (aHR=1.324, 95% CI=0.976–1.797,  $P=0.07$ ) after employing IPTW. Antiviral treatment including tenofovir or entecavir was independently associated with longer OS (aHR=0.488, 95% CI=0.290–0.823,  $P=0.01$ ) and RFS (aHR=0.548, 95% CI=0.398–0.755,  $P < 0.01$ ). There was no difference in both OS (aHR=0.522, 95% CI=0.058–4.724,  $P=0.56$ ) and RFS (aHR=1.116, 95% CI=0.738–1.688,  $P=0.60$ ) between patients treated with tenofovir vs. entecavir.

**Conclusions:** RFA may provide comparable OS to resection in the treatment of very early or early HCC, although RFS is marginally shorter than in the resection group after adjusting for antiviral treatment.

Figure 1. Kaplan-Meier estimates of (A) OS and (B) RFS in the hospital cohort after IPTW.

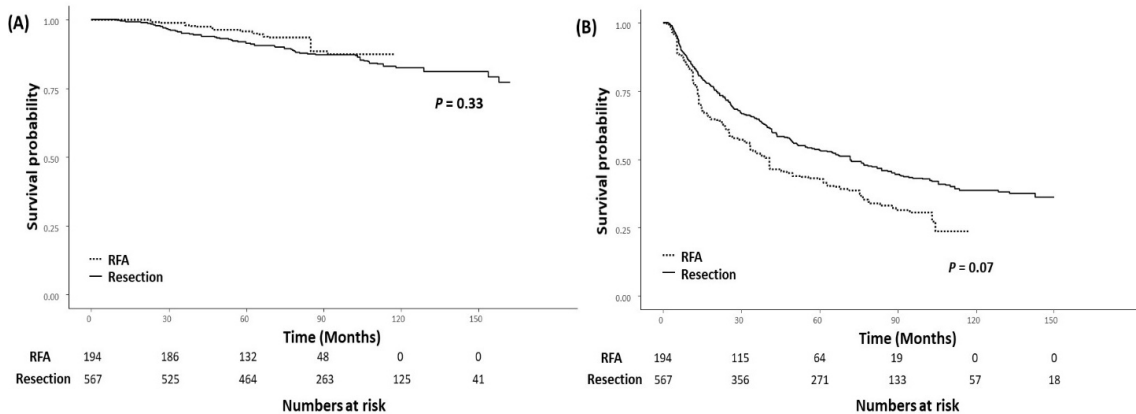


Table 1. Univariable and multivariable analyses for (A) overall survival and (B) recurrence-free survival after IPTW.

(A)				
Variables	Univariable analysis		Multivariable analysis	
	HR	P	AHR	P
Total bilirubin	1.772 (0.996–3.151)	0.052		
Albumin	0.340 (0.161–0.720)	<0.01	0.338 (0.150–0.761)	0.01
Serum creatinine	1.653 (1.502–1.819)	<0.01	1.446 (1.228–1.701)	<0.01
Tumor size	1.163 (1.088–1.243)	<0.01	1.102 (1.021–1.188)	0.01
Antiviral treatment <sup>†</sup>	0.531 (0.294–0.959)	0.04	0.488 (0.290–0.823)	0.01
RFA compared to resection	0.717 (0.342–1.503)	0.38	0.814 (0.394–1.683)	0.58
(B)				
Variables	Univariable analysis		Multivariable analysis	
	HR	P	AHR	P
Platelets	0.995 (0.992–0.998)	<0.01	0.996 (0.994–0.999)	0.01
Albumin	0.631 (0.424–0.937)	0.02		
Serum creatinine	1.238 (1.053–1.456)	0.01		
log <sub>10</sub> (HBV DNA)	1.074 (1.006–1.146)	0.03		
HBsAg-positive	1.642 (1.036–2.604)	0.03		
Cirrhosis	1.717 (1.139–2.588)	0.01	1.506 (1.002–2.265)	0.049
Antiviral treatment <sup>†</sup>	0.589 (0.416–0.833)	<0.01	0.548 (0.398–0.755)	<0.01
RFA compared to resection	1.430 (0.997–2.050)	0.052	1.324 (0.976–1.797)	0.07