Comparison of Transarterial Chemoembolization vs Radioembolization for Large Unresectable Hepatocellular Carcinoma (> 8 cm): A Propensity Score Matching Analysis

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Introduction & Purpose

Transarterial radioembolization (TARE) is currently employed across various HCC stages. In a study targeting HCC patients, in which 70.2% of 40 patients had tumors larger than 8 cm, Kim et al. reported that the therapeutic effect of TARE was similar to that of liver resection. Nevertheless, large HCC may have high lung shunt fraction and many extrahepatic branches, which increases the risk of radiation pneumonitis or adjacent organ radiation damage after TARE. Therefore, Barcelona Clinic Liver Cancer (BCLC) staging system specifically recommended TARE for HCC patients with single lesions under 8 cm. The challenge of selecting an initial treatment for HCC large than 8 cm revolved around juxtaposing tumor responses against potential adverse effects. This study was undertaken to compare the safety and efficacy of transarterial chemoembolization (TACE) and TARE in patients diagnosed with large HCC over 8 cm.
This study aimed to compare TACE and TARE as first-line treatments for HCC > 8 cm.

Materials & Methods

This retrospective study analyzed 129 HCC patients from January 2010 to December 2021, including 40 patients who received TARE and 89 treated with TACE as primary therapies. Following Propensity Score Matching (PSM), 40 patients from each group were harmonized for baseline characteristics. Tumor responses were assessed based on mRECIST criteria, and survival outcomes between the two treatment groups were illustrated using Kaplan-Meier curves and further contrasted with the Log-rank test.

Results

There was no significant difference in the objective response rate (ORR) and disease control rate (DCR) at 3, 6, and 12 months between two treatment groups; **ORR and DCR** were 72.6%, 83.1% in TACE group vs 72.5%. 87.5% in TARE group, for best tumor response (p value?). **Overall survival (OS) and progression-free survival (PFS)** between the two groups were comparable pre- and post-PSM. After PSM, the OS was 33.2 months (20.0-58.6) in TACE group and 38.1 months (13.8-98.1) in TARE group (p=0.53), while PFS was 11.5 months (7.7-18.4) and 9.1 months (5.2-23.8) respectively. **Post-PSM hospital stay** was longer for the TACE group; 5.5 days (IQR 4.8-7 days) in TACE group vs 2 days (IQR 2-3 days) in TARE group (p<0.001). **Post-embolization syndrome** developed more in TACE group (100% vs. 75%). **Significant adverse events** were 72% in TACE group vs. 5% in TARE group (p<0.001).

Table 1. Comparison of post-PSM tumor response between groups treated with TACE and TARE

Tumor response (Post-PSM) N (%)	3 months (N=78)			6 months (N=68)			12 months (N=54)			Best tumor response (N=78)		
	TACE *(n=38)*	TARE *(n=40)*	p	TACE *(n=31)*	TARE *(n=37)*	p	TACE *(n=26)*	TARE *(n=28)*	p	TACE *(n=38)*	TARE *(n=40)*	p
CR	8 (21.1)	2 (5)	-	13 (41.9)	10 (27)	0.626	12 (46.2)	9 (32.1)	0.438	14 (36.8)	12 (30)	0.506
PR	17 (44.7)	23 (57.5)	0.368	9 (29)	14 (40.5)	0.006	7 (28.9)	8 (28.6)	1	14 (36.8)	17 (42)	0.999
SD	7 (18.4)	10 (25)	0.668	5 (16.1)	3 (8.1)	-	0	1 (3.6)	-	4 (10)	6 (15)	-
PD	6 (15.8)	5 (12.5)	0.927	4 (12.9)	9 (24.3)	-	7 (26.9)	10 (35.7)	0.688	6 (15.8)	5 (12.5)	0.810
ORR	65.8%	62.5%	0.947	70.9%	67.5%	0.003	73.1%	60.7%	0.5	72.6%	72.5%	0.625
DCR	84.2%	87.5%	0.927	87%	75.6%	0.003	73.1%	64.3%	0.688	83.1%	87.5%	0.981

Table 2. Comparison of post-PSM adverse events in TACE and TARE treatment groups

	Adverse event	TACE (n=40)		TARE (n=40)		p	
		Any grade	3 or 4	Any grade	3 or 4	Any grade	3 or 4
Overall incidence	No. of events	171	53	72	2	-	-
	No. of patients	40	29	30	2	0.002	<0.001
Specific adverse event (No. of patients)	Abdominal pain	25	2	8	1	<0.001	-
	Vomiting	9	0	5	0	0.377	-
	GI ulceration	4	1	0	0	-	-
	Cholecystitis	1	1	0	0	1	-
	Fever	7	0	3	0	0.31	-
	Radiation	0	0	2	0	-	-
	AST	36	26	12	1	<0.001	<0.001
	ALT	38	19	12	0	<0.001	<0.001
	Bilirubin	22	2	7	0	0.001	-
	Albumin	17	0	16	0	1	-

Table 3. Comparison of hospitalization duration between TACE and TARE treatment groups before and after PSM

		TACE	TARE	p
Before PSM	N	89	40	
	Median (days)	5 (4-7)	2 (2-3)	<0.001
After PSM	N	40	40	
	Median (days)	5.5 (4.8-7)	2 (2-3)	<0.001

Figure 1. The Kaplan-Meier survival analysis of HCC patients' overall survival (OS) and progression free survival (PFS) before PSM between TARE and TACE group. **(A)** The median OS time was 30.1 months (18.9-40.4) in the TACE group and 38.1 months (13.8-98.1) in the TARE group with p=0.11. **(B)** The median PFS time was 7.7 months (5.4-12.5) in the TACE group and 9.1 months (5.2-23.8) in the TARE group with p=0.1.

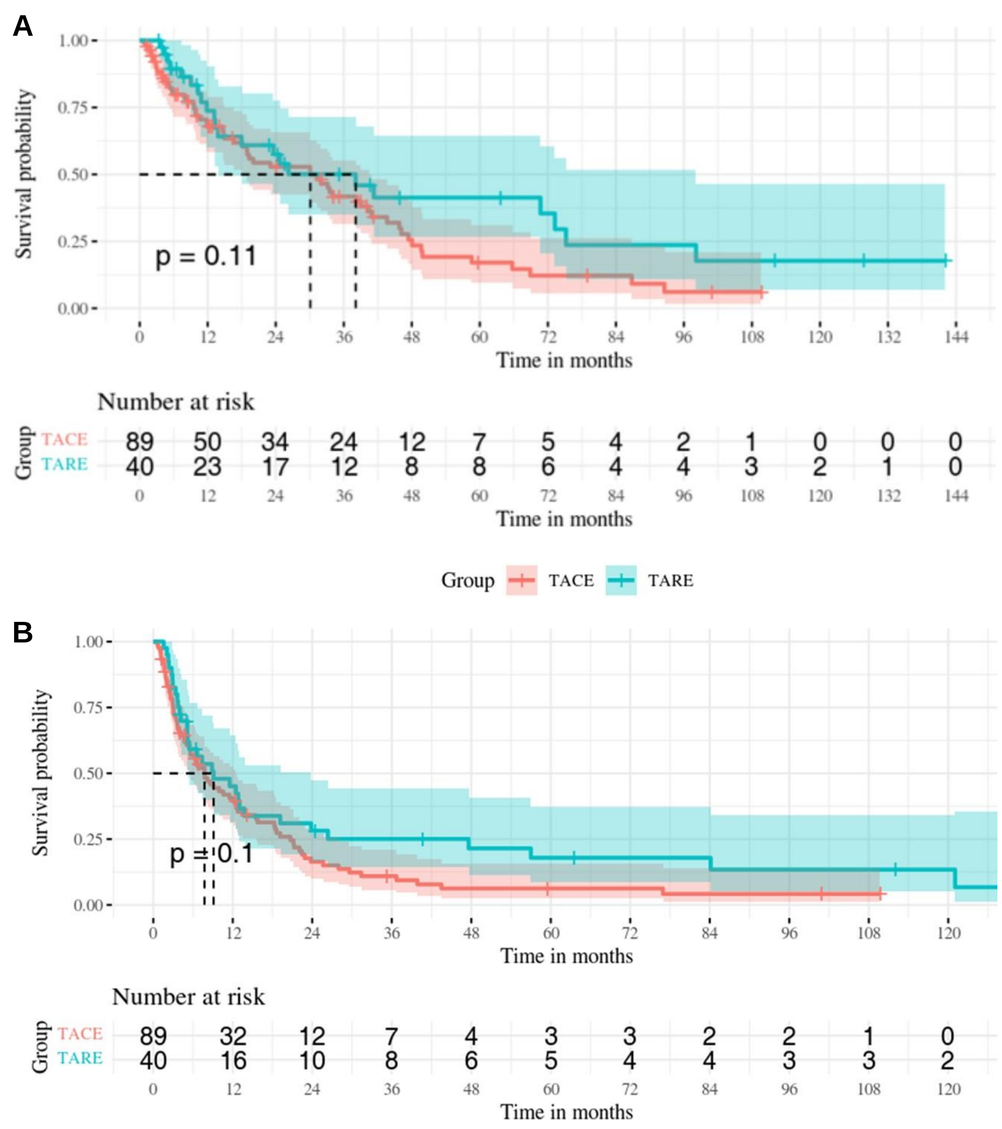
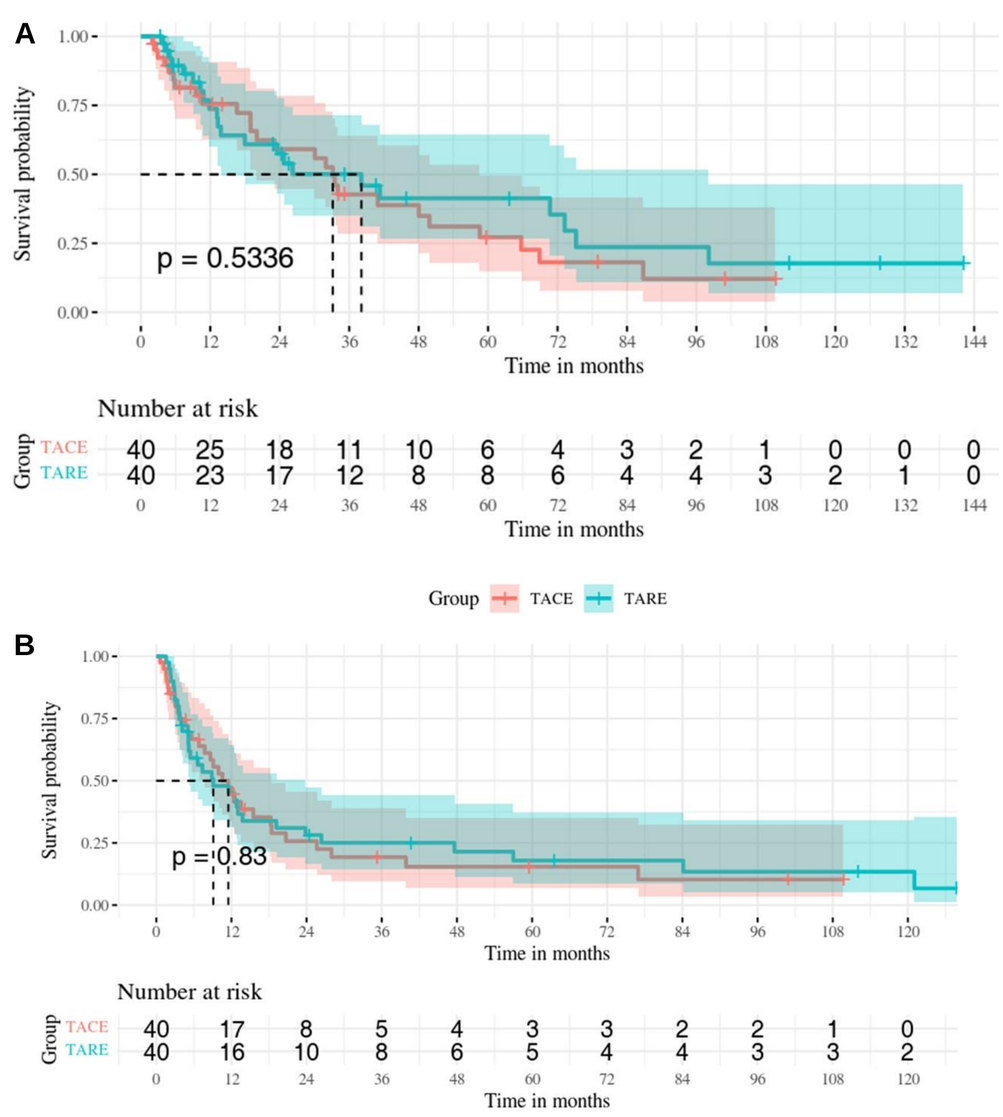


Figure 2 The Kaplan-Meier survival analysis of HCC patients' overall survival (OS) and progression free survival (PFS) after PSM between TARE and TACE group. **(A)** The median OS time was 33.2 months (20.0-58.6) in the TACE group and 38.1 months (13.8-98.1) in the TARE group with p=0.534. **(B)** The median PFS time was 11.5 months (7.7-18.4) in the TACE group and 9.1 months (5.2-23.8) in the TARE group with p=0.83.



Conclusion

Both TARE and TACE demonstrate comparable efficacy in tumor response and survival for HCC patients with diameters exceeding 8 cm. However, TARE emerges as a safer therapeutic modality.