

## Sniper® Balloon Microcatheter Balloon-TACE, an Emerging Technique that Improves Efficacy

**Sniper is commonly used in TACE to increase Lipiodol and microparticle distribution across the tumor, thereby improving tumor response.**

The mechanism of Balloon-TACE (B-TACE) was unknown just 5 years ago, even though B-TACE studies were beginning to emerge showing a 2-7 fold increase in Lipiodol staining of HCC nodules as compared to standard microcatheters (S-TACE) (1,2).

### Two-Arm Studies

To date, there are six two-arm studies describing the superior efficacy of B-TACE as compared to S-TACE (TABLES 1 & 2, FIGURES 1 & 2). Between 2014 and 2016, Ogawa, Arai, and Irie published studies demonstrating, for the first time, that pressure injection using B-TACE improves CR by 1.8X, 1.4X, and 1.4X respectively, and improves 1, 3 & 5-year survival by 82.1%, 62.7% and 65.3% (TABLE 1) (3,4,5). In 2021, Golfieri, in a 530-patient study, showed a 1.4X improvement in CR, and in the same year, Lucatelli demonstrated an improvement in CR by 1.4X, TABLE 2 (6,7). Golfieri also noted that the number of patients that required retreatment at 6 months was reduced by 2.4X when balloon occlusion was used and Lucatelli found that time to recurrence was extended by 1.3X with a balloon microcatheter.

### Single Arm Studies

In 2018, Goldman showed a CR of 60%, an OR of 93%, and disease control of 100% when balloon occlusion was used (8). In 2019, Lucatelli demonstrated a CR of 44.8%, a PR of 55%, and an OR of 100% (9). In 2021, Lee demonstrated a complete response of 74% and 100% disease control with B-TACE (10).

### Discussion

Six two-arm studies, including 914 patients, show a comparison of B-TACE and S-TACE. B-TACE resulted in an average improvement in CR of 1.5X. In a 530-patient study, retreatment at 6 months was reduced by 2.4X and in a 149-patient study, time to recurrence was increased by 1.3X when a balloon microcatheter was used (6,7). Murakami demonstrated that incomplete Lipiodol distribution resulted in 100% recurrence while complete Lipiodol distribution resulted in only 13% recurrence at 12 months (11). This makes an obvious point that the amount and distribution of embolic in the tumor is key to the best response. The data herein provides evidence that B-TACE, using pressure or flow redistribution, improves the delivery of embolic and thereby efficacy. More studies need to be done to better understand this promising technique.

### Clinical Data

**Table 1: Two-Arm Studies, 5 Year Survival**

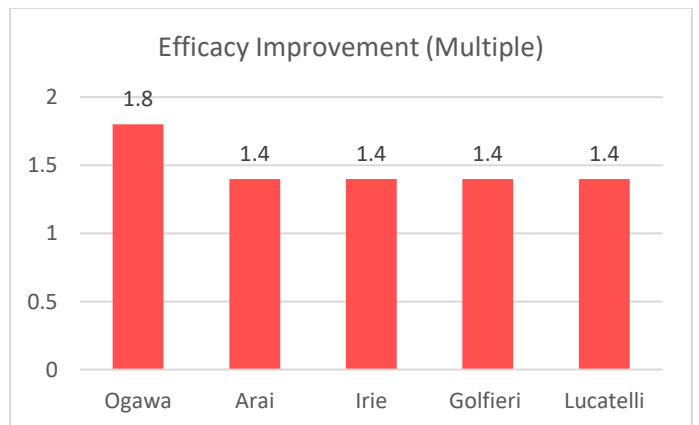
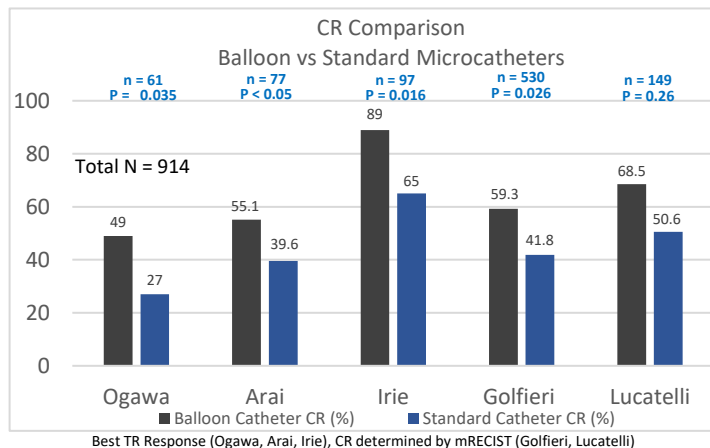
Author	Microcatheter	n	TE 4 (%)	TE 3 (%)	TE 2 (%)	TE 4 Improvement Multiple	Survival Improvement (%)		
							1 year	2 year	5 year
Ogawa (cTACE) 2015	Standard	61	27	-	-	1.8X	-	-	-
	Balloon		49	-	-		-	-	-
Arai (cTACE) 2015	Standard	97	39.6	33.3	25	1.4X	-	-	-
	Balloon		55.1	38.8	4.1		-	-	-
Irie (cTACE) 2016	Standard	77	65	20	6	1.4X	82.6%	63.0%	53.0%
	Balloon		89	11	0		-	-	-

TE 4: Disappearance or 100% necrosis, TE 3: >50% reduction in tumor size or >50% necrosis, TE 2: A response other than that of TE1, TE 2 or TE 4, TE 1: More than 25% increase in tumor size

**Table 2: Two-Arm Studies, Retreatments & Time to Recurrence**

Author	Microcatheter	n	CR (%)	PR (%)	SD (%)	CR Improvement Multiple	% Retreatment (6 month)	TTR (days)
Balloon	59.3	30.8	5.5	9	-			
Lucatelli (DEB-TACE) 2021	Standard	149	50.6	3.4	30.3	1.4X	-	219
	Balloon		68.4	10.5	0.0		-	278

\*1-6 month follow up, Tumor response using mRECIST criteria



## References

Available upon request or can be found at <https://embolx.com/publications/>

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