

Supplementary Table 1. Baseline characteristics in both cohorts

Variable	Training cohort,n(%)	Validation cohort,n(%)	P-value
	n=126	n=89	
Follow time, median, month	29	79	0.207
Age , mean(sd), y	50.40 (10.24)	53.79 ( 10.03)	0.017
Tumor diameter, mean(SD), cm	8.78 (3.90)	7.64 (5.46)	0.077
Status			0.893
Alive	47 (37.30%)	34 (38.20%)	
Dead	79 (62.70%)	55 (61.80%)	
Gender			0.454
Male	109 (86.51%)	80 (89.89%)	
Female	17 (13.49%)	9 (10.11%)	
Anatomic Location			<0.001
Left or other	58 (46.03%)	14 (15.73%)	
Right	68 (53.97%)	75 (84.27%)	
Number of tumors			0.002
Solitary	91 (72.22%)	80 (89.89%)	
Multiple	35 (27.78%)	9 (10.11%)	
Tumor type			0.057
Nodular	57 (45.24%)	52 (58.43%)	
Mass or diffuse	69 (54.76%)	37 (41.57%)	
Cirrhosis			0.081
No	57 (45.24%)	51 (57.30%)	
Yes	69 (54.76%)	38 (42.70%)	
PVTT <sup>a</sup>			0.003
No	89 (70.63%)	78 (87.64%)	
Yes	37 (29.37%)	11 (12.36%)	
Histological grade			0.277
1	19 (15.08%)	7 ( 7.87%)	
2	92 (73.02%)	70 (78.65%)	
3	15 (11.90%)	12 (13.48%)	
T Stage			0.564
1	42 (33.33%)	35 (39.33%)	
2	30 (23.81%)	15 (16.85%)	
3	49 (38.89%)	34 (38.20%)	
4	5 ( 3.97%)	5 ( 5.62%)	
GRK4 peritumor			0.087

---

	negative	3 ( 2.38%)	9 (10.71%)	
	1+	6 ( 4.76%)	4 ( 4.76%)	
	2+	43 (34.13%)	25 (29.76%)	
	3+	74 (58.73%)	46 (54.76%)	
GRK4 tumor				0.402
	negative	53 (42.06%)	40 (44.94%)	
	1+	25 (19.84%)	20 (22.47%)	
	2+	30 (23.81%)	13 (14.61%)	
	3+	18 (14.29%)	16 (17.98%)	

---

a: PVTT, portal vein tumor thrombus