**Supplementary Table 1.** Baseline characteristics of all patients

| Characteristic                      | Without thrombi (n = 34) | With thrombi (n = 34) | p  |
|-------------------------------------|--------------------------|-----------------------|----|
| **Sex, n (%)**                      |                          |                       |    |
| Female                              | 7 (20.6)                 | 6 (17.7)              | 1.000 |
| Male                                | 27 (79.4)                | 28 (82.4)             |    |
| **Median age (IQR), years**        | 61.0 (52.0, 70.0)        | 60.5 (52.8, 65.3)     | 0.868 |
| < 55                                | 9 (26.5)                 | 9 (26.5)              |    |
| ≥ 55                                | 25 (73.5)                | 25 (73.5)             |    |
| **ECOG, n (%)**                     |                          |                       |    |
| 0                                   | 26 (76.5)                | 20 (58.8)             | 0.136 |
| 1                                   | 8 (23.5)                 | 10 (29.4)             |    |
| 2                                   | 0 (0.0)                  | 3 (8.8)               |    |
| 3                                   | 0 (0.0)                  | 1 (2.9)               |    |
| **Alpha-fetoprotein, ng/mL**        |                          |                       |    |
| < 400                               | 20 (60.6)                | 19 (61.3)             | 1.000 |
| ≥ 400                               | 13 (39.4)                | 12 (38.7)             |    |
| **Etiology of liver disease, n (%)**|                          |                       |    |
| No liver disease                    | 5 (14.7)                 | 4 (11.8)              | 1.000 |
| Condition                        | Group 1 | Group 2 | p-value |
|---------------------------------|---------|---------|---------|
| Liver disease present           | 29 (85.3) | 30 (88.2) | 1.000   |
| Chronic hepatitis B             | 28 (96.6) | 23 (76.7) |         |
| Chronic hepatitis C             | 0 (0.0)  | 6 (20.0)  |         |
| Alcoholic hepatitis             | 1 (3.4)  | 1 (3.3)   |         |
| **Child–Pugh stage, n (%)**     |         |         |         |
| A                               | 29 (85.3) | 22 (64.7) | 0.091   |
| B                               | 5 (14.7)  | 12 (35.3) |         |
| **CLIP, n (%)**                 |         |         |         |
| 0-1                             | 23 (67.6) | 8 (23.5)  | 0.001   |
| 2-5                             | 11 (32.4) | 26 (76.5) |         |
| **Distant metastases, n (%)**   |         |         |         |
| No                              | 3 (8.8)   | 16 (47.1) | 0.001   |
| Yes                             | 30 (88.2) | 18 (52.9) |         |
| Lung                            | 20 (66.7) | 11 (61.1) | 0.938   |
| Bone                            | 8 (26.7)  | 3 (16.7)  | 0.499   |
| Lymph node                      | 14 (46.7) | 10 (55.6) | 0.766   |
| Other†                          | 10 (33.3) | 7 (38.9)  | 0.938   |
| **Thrombus location, n (%)**    |         |         |         |
| IVC                             |          | 6 (17.6) |         |
| Vascular Invasion, n (%) |       |       |       |
|-------------------------|-------|-------|-------|
| IVC + 1st branch PV     | 4 (11.8) |       |       |
| Main PV + bilateral 1st branch PV | 14 (41.2) |       |       |
| Main PV + 1st branch PV | 1 (2.9) |       |       |
| Main PV                 | 1 (2.9) |       |       |
| Bilateral 1st branch PV | 1 (2.9) |       |       |
| 1st branch PV           | 7 (20.6) |       |       |

**Previous treatment, n (%)**

| Treatment                      | No   | Yes  | P-value |
|--------------------------------|------|------|---------|
| No                             | 2 (5.9) | 7 (20.6) | 0.150   |
| Yes                            | 32 (94.1) | 27 (79.4) |       |
| Surgical resection             | 17 (53.1) | 12 (44.4) | 0.687   |
| TACE                           | 22 (68.8) | 13 (48.2) | 0.181   |
| RFA/PEI                        | 11 (34.4) | 8 (29.6) | 0.913   |
| HAIC                           | 8 (25.0) | 12 (44.4) | 0.195   |
| Previous sorafenib             | 27 (84.4) | 21 (77.8) | 0.755   |
| Previous lenvatinib            | 1 (3.1) | 1 (3.7) | 1.000   |

**PD-1 inhibitors as systemic therapy, n (%)**

| Line   | No   | Yes  | P-value |
|--------|------|------|---------|
| First-line | 5 (14.7) | 11 (32.4) | 0.249   |
| Second-line | 27 (79.4) | 22 (64.7) |       |
| Third-line | 2 (5.9) | 1 (2.9) |       |
### PD-1 inhibitors combined with TKIs, n (%)

|                | No   | Yes  | p-value |
|----------------|------|------|---------|
|                | 13 (38.2) | 13 (38.2) | 1.000 |
| Sorafenib      | 11 (52.4) | 16 (76.2) | 0.198 |
| Regorafenib    | 2 (9.5) | 1 (4.8) | 1.000 |
| Lenvatinib     | 8 (38.1) | 4 (19.0) | 0.306 |

†With tumor thrombi: three missing values; without tumor thrombi: one missing value
‡With tumor thrombi: 3, 3, and 1 patient with peritoneal metastases, adrenal involvement, and diaphragm invasion, respectively; without tumor thrombi: 6, 3, and 1 patient with peritoneal metastases, adrenal involvement, and diaphragm invasion, respectively

ECOG, Eastern Cooperative Oncology Group performance status; CLIP, Cancer of the Liver Italian Program Scoring System; BCLC, Barcelona Clinic Liver Cancer; IVC, inferior vena cava; PV, portal vein; TACE, transcatheter arterial chemoembolization; RFA, radiofrequency ablation; PEI, percutaneous ethanol injection; HAIC, hepatic arterial infusion chemotherapy; PD-1, programmed cell death protein-1; TKI, tyrosine kinase inhibitor