## Supplementary Table S1

The clinicopathological features of patients with or without splenomegaly after PSM

| Clinical variables                      | Splenomegaly (n=140) | Non-Splenomegaly (n=140) | P   |
|-----------------------------------------|-----------------------|--------------------------|-----|
| Age, year                               | 48.0 (32.0–75.0)      | 49.0 (15.0–75.0)         | 0.791|
| Sex                                     |                       |                          | 1.000|
| Male                                    | 126 (90.0%)           | 125 (89.3%)              |     |
| Female                                  | 14 (10.0%)            | 15 (10.7%)               |     |
| Hepatitis B virus infection             |                       |                          | 1.000|
| No                                      | 33 (23.6%)            | 33 (23.6%)               |     |
| Yes                                     | 107 (76.4%)           | 107 (76.4%)              |     |
| HBsAg                                   |                       |                          | 0.675|
| No                                      | 14 (10%)              | 11 (7.9%)                |     |
| Yes                                     | 126 (90%)             | 129 (92.1%)              |     |
| Tumor diameter                          | 8.0 (0.0–18.0)        | 8.0 (1.2–20.0)           | 0.440|
| No of tumor                             |                       |                          | 1.000|
| Single                                  | 122 (87.1%)           | 121 (86.4%)              |     |
| Multiple                                | 18 (12.9%)            | 19 (13.6%)               |     |
| PVTT I                                  | 46 (32.9%)            | 51 (36.4%)               |     |
| II                                      | 94 (67.1%)            | 89 (63.6%)               |     |
| Encapsulation                           |                       |                          | 0.057|
| No                                      | 87 (62.1%)            | 87 (62.1%)               |     |
| Incomplete                              | 9 (6.4%)              | 20 (14.3%)               |     |
| Complete                                | 44 (31.5%)            | 33 (23.6%)               |     |
| Liver Cirrhosis                         |                       |                          | 0.870|
| No                                      | 21 (15.0%)            | 23 (16.4%)               |     |
| Yes                                     | 119 (85.0%)           | 117 (83.6%)              |     |
| Ascites                                 |                       |                          | 1.000|
| No                                      | 120 (85.7%)           | 119 (85.0%)              |     |
| Yes                                     | 20 (14.3%)            | 21 (15.0%)               |     |
| Esophageal and gastric varices          |                       |                          | 0.770|
| No                                      | 109 (77.9%)           | 112 (80.0%)              |     |
| Yes                                     | 31 (22.1%)            | 28 (20.0%)               |     |
| Child-Pugh                              |                       |                          | 0.684|
| A                                       | 138 (98.6%)           | 136 (97.1%)              |     |
| B                                       | 2 (1.4%)              | 4 (2.9%)                 |     |
| Satellite lesions                       |                       |                          | 0.951|
| None                                    | 11 (7.9%)             | 12 (8.6%)                |     |
| Same lobe                               | 117 (83.6%)           | 115 (82.1%)              |     |
| Different lobe                          | 12 (8.6%)             | 13 (9.4%)                |     |
| Thickness of splenic hilum              | 5.0 (4.1–15.0)        | 4.0 (4.0–4.0)            | <0.001|
| TBIL                                    | 15.0 (5.3–32.0)       | 13.0 (4.0–34.0)          | 0.054|
| DBIL                                    | 6.0 (2.1–16.0)        | 5.0 (1.0–13.0)           | 0.139|
| ALB                                     | 41.50 (30.0–52.0)     | 42.2 (33.0–50.1)         | 0.170|
| ALT                                     | 47.0 (11.0–262.0)     | 39.0 (14.0–303.0)        | 0.291|
| PT                                      | 12.5 (0.0–112.0)      | 11.9 (0.0–15.5)          | 0.179|
| GGT                                     | 119.0 (0.0–1052.0)    | 121.5 (23.0–810.0)       | 0.324|
| ALP                                     | 107.5 (46.0–372.0)    | 107.5 (0.0–595.0)        | 0.274|
| AFP                                     | 1210.0 (0.0–1210.0)   | 940.1 (0.0–1210.0)       | 0.053|
| CA199                                   | 17.2 (0.0–235.6)      | 21.0 (0.0–114.0)         | 0.287|
| CEA                                     | 2.0 (0.0–12.0)        | 2.3 (0.0–14.9)           | 0.594|
| AST                                     | 47.0 (14.9–390.0)     | 51.0 (15.7–309.0)        | 0.602|
| PLT                                     | 141.0 (40.0–400.0)    | 139.0 (0.0–495.0)        | 0.460|

Data were presented as n (%) or medians with interquartile range (IQR). PSM, propensity score matching; HBsAg, Hepatitis B surface antigen; PVTT, portal vein tumor thrombus; TBIL, Total Bilirubin; DBIL, Direct Bilirubin; ALB, Albumin; ALT, Alanine Aminotransferase; PT, Prothrombin time; GGT, γ-Glutamyltransferase; ALP, Alkaline phosphatase; AFP, α-fetoprotein; CA199, Carbohydrate Antigen 19-9; CEA, Carcinoembryonic antigen; AST, Aspartate Aminotransferase; PLT, Platelet.
## Table S2: The clinicopathological features of patients with or without splenectomy after PSM

| Clinical variables                  | Splenectomy (n=49)          | Non-splenectomy (n=49)         | P      |
|------------------------------------|----------------------------|--------------------------------|--------|
| Age, year                          | 48.0 (33.0–69.0)            | 47.0 (32.0–75.0)               | 0.667  |
| Sex                                |                            |                                | 1.000  |
| Male                               | 46 (93.9%)                 | 47 (95.9%)                     |        |
| Female                             | 3 (6.1%)                   | 2 (4.1%)                       |        |
| Hepatitis B virus infection        |                            |                                | 0.814  |
| No                                 | 11 (22.4%)                 | 13 (26.5%)                     |        |
| Yes                                | 38 (77.6%)                 | 36 (73.5%)                     |        |
| HBsAg                              |                            |                                | 0.912  |
| No                                 | 3 (6.1%)                   | 3 (6.1%)                       | 1.000  |
| Yes                                | 46 (93.9%)                 | 46 (93.9%)                     |        |
| Tumor diameter                     | 8.0 (1.2–15.0)             | 7.3 (0.0–14.4)                 | 0.855  |
| No of tumor                        |                            |                                | 1.000  |
| Single                             | 42 (85.7%)                 | 42 (86.5%)                     |        |
| Multiple                           | 7 (14.3%)                  | 7 (13.5%)                      |        |
| PVTT                               |                            |                                | 0.827  |
| I                                  | 16 (32.7%)                 | 14 (28.6%)                     |        |
| II                                 | 33 (67.3%)                 | 35 (71.4%)                     |        |
| Encapsulation                      |                            |                                | 1.000  |
| No                                 | 31 (63.3%)                 | 30 (61.2%)                     |        |
| Incomplete                         | 3 (6.1%)                   | 3 (6.1%)                       |        |
| Complete                           | 15 (30.6%)                 | 16 (32.7%)                     |        |
| Liver Cirrhosis                    |                            |                                | 1.000  |
| No                                 | 7 (14.3%)                  | 8 (16.3%)                      |        |
| Yes                                | 42 (85.7%)                 | 41 (83.7%)                     |        |
| Ascites                            |                            |                                | 0.715  |
| No                                 | 44 (89.8%)                 | 46 (93.9%)                     |        |
| Yes                                | 5 (10.2%)                  | 3 (6.1%)                       |        |
| Esophageal and gastric varices     |                            |                                | 1.000  |
| No                                 | 40 (81.6%)                 | 40 (81.6%)                     |        |
| Yes                                | 9 (18.4%)                  | 9 (18.4%)                      |        |
| Child-Pugh                         |                            |                                | 0.495  |
| A                                  | 47 (95.9%)                 | 49 (100.0%)                    |        |
| B                                  | 2 (4.1%)                   | 0 (0.0%)                       |        |
| Satellite lesions                  |                            |                                | 1.000  |
| None                               | 4 (8.2%)                   | 4 (8.2%)                       |        |
| Same lobe                          | 42 (85.7%)                 | 41 (83.6%)                     |        |
| Different lobe                     | 3 (6.1%)                   | 4 (8.2%)                       |        |
| Thickness of splenic hilum         | 5.0 (4.1–10.0)             | 5 (4.1–15.0)                   | 0.842  |
| TBIL                               | 15.6 (6.0–29.0)            | 15.0 (5.3–32.0)                | 0.458  |
| DBIL                               | 6.0 (3.0–16.0)             | 5.9 (2.1–14.0)                 | 0.545  |
| ALB                                | 41.0 (30.0–52.0)           | 30.0 (30.0–49.0)               | 0.858  |
| ALT                                | 47.0 (18.0–262.0)          | 52.0 (13.3–138.0)              | 0.880  |
| PT                                 | 12.5 (0.0–112.0)           | 12.4 (0.0–14.4)                | 0.316  |
| GGT                                | 122.0 (36.0–1052.0)        | 133.0 (43.0–584.0)             | 0.445  |
| ALP                                | 107.0 (60.0–372.0)         | 112.0 (82.0–255.0)             | 0.418  |
| AFP                                | 1000.0 (1.0–1210.0)        | 1210.0 (0.0–1210.0)            | 0.906  |
| CA199                               | 15.6 (0.0–91.6)            | 19.8 (0.0–193.3)               | 0.185  |
| CEA                                | 2.0 (0.0–7.2)              | 2.0 (0.0–6.0)                  | 0.700  |
| AST                                | 41.0 (17.1–263.0)          | 42.0 (17.1–184.0)              | 0.740  |
| PLT                                | 141.0 (42.0–384.0)         | 149.0 (40.0–400.0)             | 0.336  |

Data were presented as n (%) or medians with interquartile range [IQR]. PSM, propensity score matching; HBsAg, Hepatitis B surface antigen; PVTT, portal vein tumor thrombus; TBIL, Total Bilirubin; DBIL, Direct Bilirubin; ALB, Albumin; ALT, Alamine Aminotransferase; PT, Prothrombin time; GGT, γ-Glutamyltransferase; ALP, Alkaline phosphatase; AFP, α-fetoprotein; CA199, Carbohydrate Atigen 19-9; CEA, Carcinoembryonic antigen; AST, Aspartate Aminotransferase; PLT, Platelet.
### Table S6
Comparison of RFS and OS rate among HCC patients with PVTT with or without splenectomy after PSM

| Indexes | n   | 1-year | 2-year | 3-year | Median survival time (95% CI) | Log-rank | P value |
|---------|-----|--------|--------|--------|-------------------------------|----------|---------|
| OS      |     |        |        |        |                               |          |         |
| Non-splenectomy | 576 | 51.7 (47.8–56.0) | 28.0 (24.5–31.9) | 18.6 (15.5–22.4) | 12.4 (11.7–13.5) | 40.0  | <0.001  |
| Splenectomy     | 140 | 25.7 (19.4–34.1)  | 10.2 (6.1–17.2)   | 7.2 (3.7–13.9)    | 7.4 (6.7–9.6)    |        |         |
| RFS     |     |        |        |        |                               |          |         |
| Non-splenectomy | 576 | 32.3 (28.6–36.4)  | 21.1 (17.9–24.8)  | 16.1 (13.1–19.7)  | 6.5 (6.3–7.8)   | 35.1  | <0.001  |
| Splenectomy     | 140 | 17.6 (12.2–25.2)  | 6.8 (3.4–13.6)    | 5.4 (2.4–12.3)    | 4.3 (3.8–5.3)   |        |         |

RFS, recurrence-free survival; OS, overall survival; HCC, hepatocellular carcinoma; PVTT, portal vein tumor thrombus; PSM, propensity score matching.

### Table S3
Comparison of RFS and OS rate among HCC patients with PVTT with or without splenomegaly before PSM

| Indexes | n   | 1-year | 2-year | 3-year | Median survival time (95% CI) | Log-rank | P value |
|---------|-----|--------|--------|--------|-------------------------------|----------|---------|
| OS      |     |        |        |        |                               |          |         |
| Non-splenomegaly | 576 | 61.7 (57.8–65.6) | 38.9 (35.8–42.1) | 18.6 (15.5–22.4) | 12.4 (11.7–13.5) | 40.0  | <0.001  |
| Splenomegaly     | 140 | 25.7 (19.4–34.1)  | 10.2 (6.1–17.2)   | 7.2 (3.7–13.9)    | 7.4 (6.7–9.6)    |        |         |
| RFS     |     |        |        |        |                               |          |         |
| Non-splenomegaly | 576 | 32.3 (28.6–36.4)  | 21.1 (17.9–24.8)  | 16.1 (13.1–19.7)  | 6.5 (6.3–7.8)   | 35.1  | <0.001  |
| Splenomegaly     | 140 | 17.6 (12.2–25.2)  | 6.8 (3.4–13.6)    | 5.4 (2.4–12.3)    | 4.3 (3.8–5.3)   |        |         |

RFS, recurrence-free survival; OS, overall survival; HCC, hepatocellular carcinoma; PVTT, portal vein tumor thrombus; PSM, propensity score matching.

### Table S4
Comparison of RFS and OS rate among HCC patients with PVTT with or without splenectomy before PSM

| Indexes | n   | 1-year | 2-year | 3-year | Median survival time (95% CI) | Log-rank | P value |
|---------|-----|--------|--------|--------|-------------------------------|----------|---------|
| OS      |     |        |        |        |                               |          |         |
| Non-splenomegaly | 576 | 51.4 (43.8–60.4) | 21.4 (15.6–29.4) | 10.1 (6.9–17.1) | 12.4 (10.3–13.8) | 12.1  | <0.001  |
| Splenomegaly     | 140 | 25.7 (19.4–34.1)  | 10.2 (6.1–17.2)   | 7.2 (3.7–13.9)    | 7.4 (6.7–9.6)    |        |         |
| RFS     |     |        |        |        |                               |          |         |
| Non-splenomegaly | 576 | 22.8 (16.7–31.0)  | 18.3 (8.6–20.6)   | 7.2 (3.6–14.2)    | 6.3 (5.4–7.3)   | 7.6   | <0.001  |
| Splenomegaly     | 140 | 17.6 (12.2–25.2)  | 8.8 (3.4–13.6)    | 5.4 (2.4–12.3)    | 4.3 (3.8–5.3)   |        |         |

RFS, recurrence-free survival; OS, overall survival; HCC, hepatocellular carcinoma; PVTT, portal vein tumor thrombus; PSM, propensity score matching.

### Table S5
Comparison of RFS and OS rate among HCC patients with PVTT with or without splenomegaly after PSM

| Indexes | n   | 1-year | 2-year | 3-year | Median survival time (95% CI) | Log-rank | P value |
|---------|-----|--------|--------|--------|-------------------------------|----------|---------|
| OS      |     |        |        |        |                               |          |         |
| Non-splenomegaly | 140 | 51.4 (43.8–60.4) | 21.4 (15.6–29.4) | 10.1 (6.9–17.1) | 12.4 (10.3–13.8) | 12.1  | <0.001  |
| Splenomegaly     | 140 | 25.7 (19.4–34.1)  | 10.2 (6.1–17.2)   | 7.2 (3.7–13.9)    | 7.4 (6.7–9.6)    |        |         |
| RFS     |     |        |        |        |                               |          |         |
| Non-splenomegaly | 140 | 22.8 (16.7–31.0)  | 18.3 (8.6–20.6)   | 7.2 (3.6–14.2)    | 6.3 (5.4–7.3)   | 7.6   | <0.001  |
| Splenomegaly     | 140 | 17.6 (12.2–25.2)  | 8.8 (3.4–13.6)    | 5.4 (2.4–12.3)    | 4.3 (3.8–5.3)   |        |         |

RFS, recurrence-free survival; OS, overall survival; HCC, hepatocellular carcinoma; PVTT, portal vein tumor thrombus; PSM, propensity score matching.

### Table S6
Comparison of RFS and OS rate among HCC patients with PVTT with or without splenectomy after PSM

| Indexes | n   | 1-year | 2-year | 3-year | Median survival time (95% CI) | Log-rank | P value |
|---------|-----|--------|--------|--------|-------------------------------|----------|---------|
| OS      |     |        |        |        |                               |          |         |
| Non-splenectomy | 49  | 4.1 (1.1–15.9) | 0.0 (0.0–0.0) | 0.0 (0.0–0.0) | 6.3 (5.6–7.2) | 58.5  | <0.001  |
| Splenectomy     | 49  | 59.2 (46.9–74.7) | 38.9 (35.8–42.1) | 13.2 (9.8–16.6) | 14.0 (12.1–23.7) |        |         |
| RFS     |     |        |        |        |                               |          |         |
| Non-splenectomy | 49  | 2.0 (0.3–14.2) | 0.0 (0.0–0.0) | 0.0 (0.0–0.0) | 3.6 (2.7–4.6) | 36.6  | <0.001  |
| Splenectomy     | 49  | 42.9 (30.8–59.7) | 18.3 (9.3–36.0) | 14.6 (6.5–32.8) | 11.1 (9.0–15.3) |        |         |

RFS, recurrence-free survival; OS, overall survival; HCC, hepatocellular carcinoma; PVTT, portal vein tumor thrombus; PSM, propensity score matching.