Figure S1 Calibration Curve by bootstrap method of the model. The apparent and the bias-corrected curves showed good agreement with the ideal curve in both (A) training cohort, and (B) validation cohort.

Figure S2 The predictive performance of the APP score for the postoperative 90-day mortality for huge HCC in the entire retrospective cohort. In the entire cohort, the higher incidence of 90-day mortality after hepatectomy was observed in the high-risk group (APP score $>-1.96$) compared with that of the low-risk group (APP score $\leq -1.96$), (31.3% vs. 2.5%, ***$P<0.001$).
### Table S1 Detailed clinicopathologic characteristics of the training, validation, and prospective cohorts

| Characteristics                  | Training cohort (n=798) | Validation cohort (n=329) | P value | Prospective cohort (n=93) |
|----------------------------------|------------------------|----------------------------|---------|--------------------------|
| **Diabetes mellitus**            |                        |                            |         |                          |
| No                               | 719                    | 294                        | 0.709   | 82                       |
| Yes                              | 79                     | 35                         |         | 11                       |
| **Hypertension**                 |                        |                            |         |                          |
| No                               | 744                    | 306                        | 0.892   | 85                       |
| Yes                              | 54                     | 23                         |         | 8                        |
| **CNLC staging**                 |                        |                            |         |                          |
| I–II                             | 596                    | 258                        | 0.184   | 71                       |
| III                              | 202                    | 71                         |         | 22                       |
| **BCLC staging**                 |                        |                            |         |                          |
| A                                | 494                    | 189                        | 0.164   | 59                       |
| B-C                              | 304                    | 140                        |         | 34                       |
| **ALT (U/L)**                    | 80.9±228.3             | 71.0±167.2                 | 0.473   | 40.7±39.8                |
| **Platelet counts (10^9/L)**     | 193.6±77.1             | 202.1±74.0                 | 0.090   | 207.9±66.8               |
| **TB (μmol/L)**                  | 14.0±13.0              | 13.5±17.4                  | 0.642   | 13.7±4.9                 |
| **Albumin (g/L)**                | 39.6±4.2               | 39.2±3.8                   | 0.096   | 42.0±4.4                 |
| **Prothrombin time (s)**         | 12.3±1.2               | 12.2±1.0                   | 0.093   | 12.1±0.9                 |
| **Creatine (μmol/L)**            | 71.6±17.5              | 71.9±15.8                  | 0.799   | 73.8±13.7                |
| **Blood loss (mL)**              | 473.1±525.0            | 536.1±597.7                | 0.059   | 480.1±621.0              |
| **intraoperative transfusion**   |                        |                            |         |                          |
| No                               | 444                    | 258                        | 0.637   | 76                       |
| Yes                              | 134                    | 71                         |         | 17                       |
| **Tumor differentiation**        |                        |                            |         |                          |
| I–II                             | 563                    | 265                        | 0.001*  | 67                       |
| III–IV                           | 235                    | 64                         |         | 26                       |
| **Microvascular Invasion**       |                        |                            |         |                          |
| No                               | 318                    | 110                        | 0.051   | 26                       |
| Yes                              | 480                    | 219                        |         | 67                       |

CNLC staging, China liver cancer staging; BCLC staging, Barcelona clinic liver cancer staging; GGT, γ-glutamyl transpeptidase; ALT, alanine aminotransferase; TB, total bilirubin.
Table S2 The subgroup analysis of APP score in the 90-day mortality in training and validation cohort

| Cohort              | AUC | 95% CI       | 90-day mortality, n (%) |        |        |
|---------------------|-----|--------------|-------------------------|--------|--------|
|                     |     |              | High risk group | Low risk group |
| Training cohort     |     |              |                     |        |        |
| Cirrhosis           |     |              |                     |        |        |
| Yes                 | 0.800 | 0.737–0.863 | 42 (32.8)         | 0 (0.0) |        |
| No                  | 0.860 | 0.804–0.917  | 20 (28.8)         | 15 (2.9) |        |
| Preoperative TACE   |     |              |                     |        |        |
| Yes                 | 0.965 | 0.927–1.00   | 5 (25.0)          | 0 (0.0) |        |
| No                  | 0.863 | 0.824–0.902  | 57 (31.7)        | 15 (2.9) |        |
| Anatomical liver resection | | | | | |
| Yes                 | 0.880 | 0.836–0.925  | 37 (35.9)       | 6 (2.3) |        |
| No                  | 0.861 | 0.803–0.918  | 25 (25.7)        | 9 (2.7) |        |
| Validation cohort   |     |              |                     |        |        |
| Cirrhosis           |     |              |                     |        |        |
| Yes                 | 0.885 | 0.797–0.973  | 8 (25.8)          | 1 (1.6) |        |
| No                  | 0.918 | 0.863–0.973  | 16 (36.4)        | 5 (2.6) |        |
| Preoperative TACE   |     |              |                     |        |        |
| Yes                 | 0.906 | 0.805–1.00   | 1 (16.7)         | 0 (0.0) |        |
| No                  | 0.905 | 0.857–0.954  | 23 (33.3)        | 6 (2.6) |        |
| Anatomical liver resection | | | | | |
| Yes                 | 0.894 | 0.826–0.962  | 12 (27.3)       | 2 (1.9) |        |
| No                  | 0.915 | 0.845–0.984  | 12 (38.7)        | 4 (2.7) |        |

AUC, area under curve; 95% CI, 95% confidential interval; TACE, transcatheter arterial chemoemobolization.