**Supplementary Table 1. The clinical characteristics of 12 HCC patients.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HCC ID | NAT ID | Gender | Age | Etiology | BCLC | CNLC | Tumor size(cm) | MVI | AFP (μg/L） |
| 5A | 1A | male | 76 | HBV | A | Ia | 4.2\*4.1 | M0 | 2.4 |
| 6A | 2A | male | 70 | HBV | B | Ib | 5.4\*4.4 | M0 | 8.98 |
| 7A | 3A | male | 75 | HBV | A | Ia | 3.9\*3.7 | M0 | 10.5 |
| 8A | 4A | male | 68 | non-HBV | B | Ib | 6.2\*6.1 | M0 | 1.9 |
| 11A | 15A | male | 74 | HBV | A | Ib | 1.5\*2.3 | M1 | 69.1 |
| 9A | 13A | male | 55 | HBV | B | Ib | 9.0\*5.3 | M0 | 13394.7 |
| 10A | 14A | male | 68 | non-HBV | B | Ib | 5.7\*5.6 | M1 | 3.42 |
| 12A | 16A | male | 66 | non-HBV | B | Ib | 6.1\*6.2 | M0 | 7.17 |
| 17A | 19A | male | 68 | HBV | A | Ib | 3.6\*3.2 | M0 | 2 |
| 18A | 20A | male | 58 | HBV | C | IIIb | 9.2\*8.9 | M1 | 5.02 |
| 21A | 22A | male | 72 | HBV | B | Ib | 5.4\*4.2 | M0 | 3.81 |
| 25A | 26A | male | 52 | HBV | B | IIa | 12.3\*8.1 | M1 | 100000 |