**Supplementary materials**

**Supplementary Table 1.** Combined contingency table for early-stage HCC cases comparing GAAD with PIVKA-II, AFP, AFP-L3, GALAD, and ultrasound

|  |  |  |  |
| --- | --- | --- | --- |
|  | **GAAD+** | **GAAD-** | **Total** |
| PIVKA-II+PIVKA-II -**Total** | 15419 | 21214 | 171633 |
| AFP-L3+AFP-L3-**Total** | 81119 | 11314 | 92433 |
| AFP+AFP-**Total** | 91019 | 11314 | 102333 |
| GALAD+GALAD-**Total** | 19019 | 01414 | 191433 |
| Ultrasound+Ultrasound-**Total** | 10919 | 41014 | 141933 |

AFP, α-fetoprotein; AFP-L3, *Lens culinaris* agglutinin-reactive fraction of α-fetoprotein; GAAD, gender (biological sex), age, AFP, PIVKA-II; GALAD, gender (biological sex), age, AFP-L3, AFP, PIVKA-II; HCC, hepatocellular carcinoma; PIVKA-II, protein induced by vitamin K absence or antagonist II.