**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** | 15  4  19 | 2  12  14 | 17  16  33 |
| AFP-L3+  AFP-L3-  **Total** | 8  11  19 | 1  13  14 | 9  24  33 |
| AFP+  AFP-  **Total** | 9  10  19 | 1  13  14 | 10  23  33 |
| GALAD+  GALAD-  **Total** | 19  0  19 | 0  14  14 | 19  14  33 |
| Ultrasound+  Ultrasound-  **Total** | 10  9  19 | 4  10  14 | 14  19  33 |

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.