

## Appendix 1

### Nomogram performance in individual patients

The intrahepatic lesions of them had been detected through enhanced CT, however, which was not confirmed. The first patient was 58 years old (13 points) with abdominal pain (0 points) and vomiting (3 points); his ALK value was 297 U/L (32 points), CA 19-9 value was 188 U/mL (42 points), and CEA value was 1 µg/L (13 points); his comprehensive radiological diagnosis was inflammation of bile duct (35 points). According to the nomogram, his probability of IHL-ICC was approximately 0.100 (total points: 138), which was less than the cut-off value of 0.107 for the nomogram corresponding to total points of 140.

The second patient was 75 years old (28 points) with abdominal pain (0 points) and vomiting (3 points); his ALK value was 122 U/L (32 points), CA 19-9 value was 3.6 U/mL (13 points), and CEA value was 6 µg/L (41 points); his comprehensive radiological diagnosis was suspicious lesion (57 points). According to the nomogram, his probability of IHL-ICC was approximately 0.378 (total points: 174), which was obviously more than the cut-off value of 0.107 for the nomogram corresponding to total points of 140. Finally, by postoperative pathology, the former patient was diagnosed as IHL-IBL, and the latter patient was diagnosed as IHL-ICC.

Features <i>Figure 9</i>	Age	Abdominal pain	Vomiting	ALK (U/L)	CA 19-9 (U/mL)	CEA (µg/L)	Radiological diagnosis	Total points based on the nomogram	Probability of IHL-ICC
Patient A	58	+	+	297	188	1	IBI	138	0.100
Patient B	75	+	+	122	3.6	6	suspicious lesion	174	0.378

## Appendix 2

### The score corresponding to each risk factor and total score corresponding to probability, sensitivity and specificity of ICC in detail

Risk factor	Points				
Age>60					
≤60	13				
>60	28				
Abdominal pain					
No	13				
Yes	0				
Vomiting					
No	13				
Yes	3				
ALK (U/L)					
≤100	13				
>100	32				
CEA (μg/L)					
≤5	13				
5-10	41				
>10	100				
CA 19-9 (U/mL)					
≤145	13				
>145	42				
Imagological diagnosis					
No mass-related lesion found	13				
Inflammatory mass	35				
Suspicious of cancer	57				
Cancer	75				
Total points	Probability of ICC	Sensitivity	95% CI	Specificity	95% CI
≥68	≥0.004810077	100	96.3–100.0	0	0.0–0.4
>68	>0.004810077	100	96.3–100.0	3.86	2.7–5.3
>78	>0.007463398	100	96.3–100.0	11.05	9.1–13.2
>83	>0.009347652	100	96.3–100.0	14.06	11.9–16.5
>87	>0.011118308	98.98	94.4–100.0	17.81	15.4–20.4
>90	>0.0128891	98.98	94.4–100.0	18.67	16.2–21.3
>91	>0.012911568	98.98	94.4–100.0	20.71	18.1–23.5
>93	>0.014467588	97.96	92.8–99.8	27.9	25.0–30.9
>96	>0.01614892	97.96	92.8–99.8	28	25.1–31.0
	>0.017191246				
>97	>0.017452754	96.94	91.3–99.4	34.66	31.6–37.8
>100	>0.019182943	96.94	91.3–99.4	36.37	33.3–39.6
	>0.019909789				
>102	>0.021478305	95.92	89.9–98.9	43.24	40.0–46.5
>105	>0.024857636	95.92	89.9–98.9	43.99	40.8–47.2
>106	>0.024900441	95.92	89.9–98.9	45.6	42.4–48.9
>107	>0.025620138	95.92	89.9–98.9	46.03	42.8–49.3
>109	>0.026891544	95.92	89.9–98.9	47.21	44.0–50.5
>110	>0.029478809	95.92	89.9–98.9	48.18	44.9–51.4
	>0.029529332				
	>0.032394418				
>112	>0.033021025	92.86	85.8–97.1	57.73	54.5–60.9
>113	>0.033515118	92.86	85.8–97.1	58.48	55.2–61.7
>115	>0.034131204	92.86	85.8–97.1	59.87	56.6–63.0
	>0.036778055				
	>0.037827732				
	>0.038145656				
>116	>0.039680273	90.82	83.3–95.7	61.91	58.7–65.0
>119	>0.045122837	89.8	82.0–95.0	63.73	60.6–66.8
	>0.045789435				
>120	>0.04586659	88.78	80.8–94.3	63.73	60.6–66.8
	>0.049506795				
>122	>0.051188186	87.76	79.6–93.5	66.09	63.0–69.1
	>0.054279993				
>124	>0.055978587	84.69	76.0–91.2	67.81	64.7–70.8
>125	>0.056071901	82.65	73.7–89.6	69.85	66.8–72.8
	>0.057639288				
>126	>0.060401155	80.61	71.4–87.9	71.89	68.9–74.8
>127	>0.061349484	80.61	71.4–87.9	72.42	69.4–75.3
>128	>0.06453512	79.59	70.3–87.1	73.07	70.1–75.9
>129	>0.06946972	79.59	70.3–87.1	73.28	70.3–76.1
>130	>0.071223065	79.59	70.3–87.1	73.82	70.9–76.6
	>0.071281484				
	>0.07225204				
>131	>0.074645257	75.51	65.8–83.6	78	75.2–80.6
>132	>0.07595799	75.51	65.8–83.6	78.43	75.7–81.0
	>0.083077125				
>134	>0.084461835	73.47	63.6–81.9	79.94	77.2–82.5
>135		73.47	63.6–81.9	80.36	77.7–82.9
>137	>0.092298379	72.45	62.5–81.0	81.76	79.1–84.2
>138	>0.096166283	72.45	62.5–81.0	82.19	79.6–84.6
>140	>0.100417695	72.45	62.5–81.0	82.62	80.0–85.0
	>0.106587272				
	>0.106671366				
	>0.108067714				
	>0.109557503				
>141	>0.111504677	66.33	56.1–75.6	86.27	83.9–88.4
>143	>0.117787377	66.33	56.1–75.6	86.37	84.0–88.5
>144	>0.126244333	66.33	56.1–75.6	86.7	84.3–88.8
>145	>0.127207114	66.33	56.1–75.6	86.8	84.5–88.9
>146	>0.130213774	66.33	56.1–75.6	87.88	85.6–89.9
>147	>0.1319739	66.33	56.1–75.6	88.09	85.8–90.1
>148	>0.138286507	66.33	56.1–75.6	88.73	86.5–90.7
	>0.147968412				
>150	>0.150297193	63.27	52.9–72.8	89.16	87.0–91.1
>151	>0.160663223	62.24	51.9–71.8	89.38	87.2–91.3
	>0.162604581				
>152	>0.171739477	61.22	50.8–70.9	89.38	87.2–91.3
>153		61.22	50.8–70.9	89.91	87.8–91.8
>154	>0.174075378	60.2	49.8–70.0	90.45	88.4–92.3
>155	>0.178930518	60.2	49.8–70.0	90.67	88.6–92.5
	>0.179189885				
	>0.183529665				
	>0.186028428				
	>0.188910873				
>156	>0.191289925	54.08	43.7–64.2	93.13	91.3–94.7
	>0.193677867				
	>0.209159283				
>159	>0.220011449	52.04	41.7–62.2	93.67	91.9–95.1
>160	>0.222521873	50	39.7–60.3	94.1	92.4–95.5
	>0.24059441				
	>0.249799009				
>163	>0.25319525	46.94	36.8–57.3	95.6	94.1–96.8
>164	>0.25829848	46.94	36.8–57.3	95.92	94.4–97.1
>165	>0.262298016	45.92	35.8–56.3	96.03	94.6–97.2
>166	>0.272035503	44.9	34.8–55.3	96.46	95.1–97.6
	>0.29151588				
>169	>0.304993164	43.88	33.9–54.3	97.1	95.8–98.1
>170	>0.308090249	42.86	32.9–53.3	97.85	96.7–98.7
>172	>0.337590309	41.84	31.9–52.2	97.85	96.7–98.7
	>0.347105434				
>174	>0.351406215	40.82	31.0–51.2	98.18	97.1–98.9
>175	>0.358461447	39.8	30.0–50.2	98.39	97.4–99.1
>176	>0.370977472	38.78	29.1–49.2	98.61	97.6–99.3
>177	>0.377255422	38.78	29.1–49.2	98.71	97.8–99.3
	>0.377824066				
>183	>0.436483592	37.76	28.2–48.1	98.82	97.9–99.4
>184	>0.456496155	36.73	27.2–47.1	98.82	97.9–99.4
>185	>0.465036946	32.65	23.5–42.9	99.14	98.3–99.6
>188	>0.504930778	32.65	23.5–42.9	99.25	98.5–99.7
>192	>0.5490912	31.63	22.6–41.8	99.25	98.5–99.7
>194	>0.566481716	30.61	21.7–40.7	99.25	98.5–99.7
>198	>0.601935507	29.59	20.8–39.7	99.46	98.8–99.8
>203	>0.665678939	26.53	18.1–36.4	99.57	98.9–99.9
>204	>0.673444307	25.51	17.2–35.3	99.57	98.9–99.9
>209	>0.71000862	24.49	16.4–34.2	99.57	98.9–99.9
>212	>0.736310922	24.49	16.4–34.2	99.68	99.1–99.9
>213	>0.751355024	23.47	15.5–33.1	99.89	99.4–100.0
	>0.752455165				
	>0.775968072				
>216	>0.781008698	19.39	12.1–28.6	99.89	99.4–100.0
>218	>0.791314442	19.39	12.1–28.6	100	99.6–100.0
>219	>0.794410664	18.37	11.3–27.5	100	99.6–100.0
>228	>0.855057814	17.35	10.4–26.3	100	99.6–100.0
>231	>0.874411041	16.33	9.6–25.2	100	99.6–100.0
>235	>0.890871315	15.31	8.8–24.0	100	99.6–100.0
>240	>0.911063244	14.29	8.0–22.8	100	99.6–100.0
>243	>0.917484287	13.27	7.3–21.6	100	99.6–100.0
>247	>0.930814382	11.22	5.7–19.2	100	99.6–100.0
>261	>0.962218909	10.2	5.0–18.0	100	99.6–100.0
>262	>0.96332335	9.18	4.3–16.7	100	99.6–100.0
>265	>0.968569863	8.16	3.6–15.5	100	99.6–100.0
>272	>0.976112351	7.14	2.9–14.2	100	99.6–100.0
>274	>0.977926362	6.12	2.3–12.9	100	99.6–100.0
>275	>0.979568228	5.1	1.7–11.5	100	99.6–100.0
>285	>0.986126899	4.08	1.1–10.1	100	99.6–100.0
>290	>0.989428886	2.04	0.2–7.2	100	99.6–100.0
>303	>0.993895584	0	0.0–3.7	100	99.6–100.0