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FigureS3 Forest plot and summary statistics of the surgery influence on intrahepatic
cholangiocarcinoma incidence for CSS in ICC.

TableS1 The proportion of TNM stages for TNM I-IV, unmatched TNM I-III B and matched TNM I-III B for ICC patients.

| TNM Distribution | Non-Surgery | Surgery | P-value | |
|-----------------------|-------------|------------|---------|-------|
| TNM I-IV | | | <0.001 | 1.026 |
| IA | 54 (5.6) | 79 (21.1) | | |
| IB | 85 (8.8) | 48 (12.8) | | |
| II | 212 (21.9) | 107 (28.5) | | |
| IIIA | 8 (0.8) | 6 (1.6) | | |
| IIIB | 173 (17.8) | 109 (29.1) | | |
| IV | | | | |
| Unmatched TNM I-III B | | | <0.001 | 0.357 |
| IA | 54 (10.2) | 79 (22.6) | | |
| IB | 85 (16.0) | 48 (13.8) | | |
| II | 212 (39.8) | 107 (30.7) | | |
| IIIA | 8 (1.5) | 6 (1.7) | | |
| IIIB | 173 (32.5) | 109 (31.2) | | |
| Matched TNM I-III B | | | 0.398 | 0.181 |
| IA | 31 (12.4) | 46 (18.5) | | |
| IB | 37 (14.9) | 33 (13.3) | | |
| II | 97 (39.0) | 85 (34.1) | | |
| IIIA | 6 (2.4) | 5 (2.0) | | |
| IIIB | 78 (31.3) | 80 (32.1) | | |

Abbreviations: ICC, intrahepatic cholangiocarcinoma; TNM, tumor node metastasis.

TableS2 Characteristics of ICC patients above 65 years old before and after propensity score matching (continued)

| Characteristic | Unmatched | | | | Matched | | | |
|-------------------------|------------|-------------|------------|---------|------------|-------------|------------|---------|
| | ALL | Non-surgery | Surgery | P-value | ALL | Non-surgery | Surgery | P-value |
| | (n=619) | (n=416) | (n=253) | | (n=388) | (n=194) | (n=194) | |
| Age, years | 73.7±6.44 | 74.5±6.84 | 72.3±5.49 | <0.001 | 72.5±5.46 | 72.5±5.61 | 72.6±5.31 | 0.809 |
| Gender | | | | 0.202 | | | | 1.000 |
| Female | 353(52.8%) | 228(54.8%) | 125(49.4%) | | 198(51.0%) | 99(51.0%) | 99(51.0%) | |
| Male | 316(47.2%) | 188(45.2%) | 128(50.6%) | | 190(49.0%) | 95(49.0%) | 95(49.0%) | |
| Ethnicity | | | | 0.912 | | | | 1.000 |
| White | 534(79.8%) | 331(79.6%) | 203(80.2%) | | 313(80.7%) | 156(80.4%) | 157(80.9%) | |
| Non-white | 135(20.2%) | 85(20.4%) | 50(19.8%) | | 75(19.3%) | 38(19.6%) | 37(19.1%) | |
| Grade | | | | 0.014 | | | | 0.751 |
| Well-moderately | 392(58.6%) | 228(54.8%) | 164(64.8%) | | 248(63.9%) | 122(62.9%) | 126(64.9%) | |
| Poorly-undifferentially | 277(41.4%) | 188(45.2%) | 89(35.2%) | | 140(36.1%) | 72(37.1%) | 68(35.1%) | |
| TNM stage | | | | 0.001 | | | | 0.059 |
| IA | 97(14.5%) | 42(10.1%) | 55(21.7%) | | 59(15.2%) | 21(10.8%) | 38(19.6%) | |
| IB | 109(16.3%) | 76(18.3%) | 33(13.0%) | | 62(16.0%) | 35(18.0%) | 27(13.9%) | |
| II | 240(35.9%) | 161(38.7%) | 79(31.2%) | | 136(35.1%) | 77(39.7%) | 59(30.4%) | |
| IIIA | 11(1.64%) | 6(1.44%) | 5(1.98%) | | 9(2.32%) | 4(2.06%) | 5(2.58%) | |
| IIIB | 212(31.7%) | 131(31.5%) | 81(32.0%) | | 122(31.4%) | 57(29.4%) | 65(33.5%) | |
| Chemotherapy | | | | 0.019 | | | | 0.835 |
| No | 386(57.7%) | 225(54.1%) | 161(63.6%) | | 239(61.6%) | 121(62.4%) | 118(60.8%) | |
| Yes | 283(42.3%) | 191(45.9%) | 92(36.4%) | | 149(38.4%) | 73(37.6%) | 76(39.2%) | |
| Radiotherapy | | | | 0.009 | | | | 1.000 |
| No | 550(82.2%) | 329(79.1%) | 221(87.4%) | | 331(85.3%) | 165(85.1%) | 166(85.6%) | |
| Yes | 119(17.8%) | 87(20.9%) | 32(12.6%) | | 57(14.7%) | 29(14.9%) | 28(14.4%) | |

Abbreviations: ICC, intrahepatic cholangiocarcinoma; TNM, tumor node metastasis.

TableS3 Characteristics of ICC patients above 70 years old before and after propensity score matching (continued)

| Characteristic | Unmatched | | | | Matched | | | |
|-------------------------|----------------|------------------------|--------------------|---------|----------------|------------------------|--------------------|---------|
| | ALL (n=454) | Non-surgery (n=296) | Surgery (n=158) | P-value | ALL (n=284) | Non-surgery (n=142) | Surgery (n=142) | P-value |
| Age, years | 76.8±5.45 | 77.5±5.80 | 75.5±4.46 | <0.001 | 75.9±4.75 | 75.8±5.04 | 76.0±4.46 | 0.813 |
| Gender | | | | 0.077 | | | | 1.000 |
| Female | 237(52.2%) | 164(55.4%) | 73(46.2%) | | 137(48.2%) | 68(47.9%) | 69(48.6%) | |
| Male | 217(47.8%) | 132(44.6%) | 85(53.8%) | | 147(51.8%) | 74(52.1%) | 73(51.4%) | |
| Ethnicity | | | | 0.693 | | | | 1.000 |
| White | 368(81.1%) | 242(81.8%) | 126(79.7%) | | 230(81.0%) | 115(81.0%) | 115(81.0%) | |
| Non-white | 86(18.9%) | 54(18.2%) | 32(20.3%) | | 54(19.0%) | 27(19.0%) | 27(19.0%) | |
| Grade | | | | 0.02 | | | | 0.713 |
| Well-moderately | 261(57.5%) | 158(53.4%) | 103(65.2%) | | 178(62.7%) | 91(64.1%) | 87(61.3%) | |
| Poorly-undifferentially | 193(42.5%) | 138(46.6%) | 55(34.8%) | | 106(37.3%) | 51(35.9%) | 55(38.7%) | |
| TNM stage | | | | 0.015 | | | | 0.088 |
| IA | 68(15.0%) | 32(10.8%) | 36(22.8%) | | 43(15.1%) | 15(10.6%) | 28(19.7%) | |
| IB | 82(18.1%) | 58(19.6%) | 24(15.2%) | | 50(17.6%) | 29(20.4%) | 21(14.8%) | |
| II | 162(35.7%) | 111(37.5%) | 51(32.3%) | | 108(38.0%) | 60(42.3%) | 48(33.8%) | |
| IIIA | 6(1.32%) | 5(1.69%) | 1(0.63%) | | 3(1.06%) | 2(1.41%) | 1(0.70%) | |
| IIIB | 136(30.0%) | 90(30.4%) | 46(29.1%) | | 80(28.2%) | 36(25.4%) | 44(31.0%) | |
| Chemotherapy | | | | 0.004 | | | | 0.613 |
| No | 285(62.8%) | 171(57.8%) | 114(72.2%) | | 191(67.3%) | 93(65.5%) | 98(69.0%) | |
| Yes | 169(37.2%) | 125(42.2%) | 44(27.8%) | | 93(32.7%) | 49(34.5%) | 44(31.0%) | |
| Radiotherapy | | | | <0.001 | | | | 1.000 |
| No | 373(82.2%) | 229(77.4%) | 144(91.1%) | | 255(89.8%) | 127(89.4%) | 128(90.1%) | |
| Yes | 81(17.8%) | 67(22.6%) | 14(8.86%) | | 29(10.2%) | 15(10.6%) | 14(9.86%) | |

Abbreviations: ICC, intrahepatic cholangiocarcinoma; TNM, tumor node metastasis.

TableS4 Characteristics of ICC patients above 75 years old before and after propensity score matching (continued)

| Characteristic | Unmatched | | | <i>P</i> -value | Matched | | | <i>P</i> -value |
|-------------------------|-------------------------|---------------------------------|----------------------------|-----------------|-------------------------|--------------------------------|----------------------------|-----------------|
| | ALL (<i>n</i> =272) | Non-surgery (<i>n</i> =189) | Surgery (<i>n</i> =83) | | ALL (<i>n</i> =152) | Non-surgery (<i>n</i> =76) | Surgery (<i>n</i> =76) | |
| Age, years | 80.1±4.52 | 80.6±4.85 | 78.9±3.40 | 0.001 | 79.4±4.07 | 79.8±4.58 | 79.1±3.48 | 0.311 |
| Gender | | | | 0.353 | | | | 0.871 |
| Female | 154(56.6%) | 111(58.7%) | 43(51.8%) | | 82(53.9%) | 40(52.6%) | 42(55.3%) | |
| Male | 118(43.4%) | 78(41.3%) | 40(48.2%) | | 70(46.1%) | 36(47.4%) | 34(44.7%) | |
| Ethnicity | | | | 0.432 | | | | 0.364 |
| White | 216(79.4%) | 153(81.0%) | 63(75.9%) | | 110(72.4%) | 52(68.4%) | 58(76.3%) | |
| Non-white | 56(20.6%) | 36(19.0%) | 20(24.1%) | | 42(27.6%) | 24(31.6%) | 18(23.7%) | |
| Grade | | | | 0.015 | | | | 0.86 |
| Well-moderately | 169(62.1%) | 108(57.1%) | 61(73.5%) | | 106(69.7%) | 52(68.4%) | 54(71.1%) | |
| Poorly-undifferentially | 103(37.9%) | 81(42.9%) | 22(26.5%) | | 46(30.3%) | 24(31.6%) | 22(28.9%) | |
| TNM stage | | | | 0.28 | | | | 0.381 |
| IA | 43(15.8%) | 24(12.7%) | 19(22.9%) | | 22(14.5%) | 7(9.21%) | 15(19.7%) | |
| IB | 56(20.6%) | 42(22.2%) | 14(16.9%) | | 30(19.7%) | 17(22.4%) | 13(17.1%) | |
| II | 89(32.7%) | 63(33.3%) | 26(31.3%) | | 55(36.2%) | 30(39.5%) | 25(32.9%) | |
| IIIA | 3(1.10%) | 2(1.06%) | 1(1.20%) | | 2(1.32%) | 1(1.32%) | 1(1.32%) | |
| IIIB | 81(29.8%) | 58(30.7%) | 23(27.7%) | | 43(28.3%) | 21(27.6%) | 22(28.9%) | |
| Chemotherapy | | | | 0.001 | | | | 1 |
| No | 193(71.0%) | 122(64.6%) | 71(85.5%) | | 128(84.2%) | 64(84.2%) | 64(84.2%) | |
| Yes | 79(29.0%) | 67(35.4%) | 12(14.5%) | | 24(15.8%) | 12(15.8%) | 12(15.8%) | |
| Radiotherapy | | | | 0.001 | | | | 0.442 |
| No | 222(81.6%) | 144(76.2%) | 78(94.0%) | | 145(95.4%) | 74(97.4%) | 71(93.4%) | |
| Yes | 50(18.4%) | 45(23.8%) | 5(6.02%) | | 7(4.61%) | 2(2.63%) | 5(6.58%) | |

Abbreviations: ICC, intrahepatic cholangiocarcinoma; TNM, tumor node metastasis.

TableS5 Estimated 3-month and 6-month survival rates of surgery and non-surgery groups for M0 stage ICC patients in different age stratification

| | | Above 60 years old | | | | Above 65 years old | | | | Above 70 years old | | | | Above 75 years old | | | |
|---------------------|--|---------------------------|-----------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|
| | | 3-Month | | 6-Month | | 3-Month | | 6-Month | | 3-Month | | 6-Month | | 3-Month | | 6-Month | |
| | | Estimat ed rate (%) | P- valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e |
| OS | | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 |
| Non- surge ry | | 67.7(62. 2-73.8) | | 53.8(48. 0-60.5) | | 62.1(55. 7-69.4) | | 48.4(41. 8-56.1) | | 59.5(51. 9-68.2) | | 45.2(37. 6-54.2) | | 47.8(37. 7-60.7) | | 35.5(26. 1-48.3) | |
| Surge ry | | 95.2(0.9 26- 0.979) | | 86.7(82. 6-91.0) | | 93.3(89. 8-96.9) | | 84.5(79. 6-89.8) | | 92.3(88. 0-96.8) | | 82.4(76. 4-88.9) | | 92.1(86. 2-98.4) | | 80.3(71. 8-89.7) | |
| CSS | | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 |
| Non- surge ry | | 68.1(62. 5-74.1) | | 54.9(49. 0-61.5) | | 62.6(56. 1-69.8) | | 50.3(43. 7-57.9) | | 61.3(53. 8-70.0) | | 47.3(39. 7-56.5) | | 51.3(41. 0-64.1) | | 43.7(33. 5-56.9) | |
| Surge ry | | 95.6(93. 0-98.2) | | 87.9(83. 9-92.0) | | 93.8(90. 4-97.3) | | 85.5(80. 7-90.6) | | 92.9(88. 8-97.2) | | 84.4(78. 6-90.1) | | 92.1(86. 2-98.4) | | 80.3(71. 8-89.7) | |

TableS6 Estimated 3-month and 6-month survival rates of surgery and non-surgery groups for N0 stage ICC patients in different age stratification

| | | Above 60 years old | | | | Above 65 years old | | | | Above 70 years old | | | | Above 75 years old | | | |
|---------------------|--|---------------------------|-----------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|
| | | 3-Month | | 6-Month | | 3-Month | | 6-Month | | 3-Month | | 6-Month | | 3-Month | | 6-Month | |
| | | Estimat ed rate (%) | P- valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e | Estimat ed rate (%) | P - valu e |
| OS | | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 |
| Non- surge ry | | 64.6(59. 0-70.9) | | 54.1(48. 3-60.7) | | 61.3(54. 8-68.7) | | 47.5(40. 8-55.2) | | 62.6(54. 2-72.4) | | 50.6(42. 0-60.9) | | 50.4(39. 3-64.8) | | 38.7(28. 1-53.2) | |
| Surge ry | | 96.4(94. 1-98.7) | | 90.0(86. 3-93.8) | | 95.8(93. 0-98.7) | | 87.9(83. 3-92.6) | | 94.5(90. 4-98.9) | | 86.4(80. 2-93.0) | | 93.4(87. 4-99.9) | | 85.2(76. 8-94.6) | |
| CSS | | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 | | <0.0 01 |
| Non- surge ry | | 65.0(59. 4-71.2) | | 56.0(50. 2-62.6) | | 61.3(54. 8-68.7) | | 49.5(42. 8-57.2) | | 62.6(54. 2-72.4) | | 53.2(44. 6-63.5) | | 50.4(39. 3-64.8) | | 40.1(29. 4-54.7) | |
| Surge ry | | 96.8(94. 6-99.0) | | 91.1(87. 7-94.7) | | 96.3(93. 6-99.0) | | 89.4(85. 1-93.9) | | 94.5(90. 4-98.9) | | 87.3(81. 3-93.7) | | 93.4(87. 4-99.9) | | 85.2(76. 8-94.6) | |

TableS7 Estimated 3-month and 6-month survival rates of surgery and non-surgery groups for N1 stage ICC patients in different age stratification

| | | Above 60 years old | | | | Above 65 years old | | | | Above 70 years old | | | | Above 75 years old | | | |
|-------------|--|--------------------|--------|-----------------|--------|--------------------|--------|-----------------|--------|--------------------|--------|-----------------|--------|--------------------|--------|-----------------|--------|
| | | 3-Month | | 6-Month | | 3-Month | | 6-Month | | 3-Month | | 6-Month | | 3-Month | | 6-Month | |
| | | Estimat | P- | Estimat | P - | Estimat | P - | Estimat | P - | Estimat | P - | Estimat | P - | Estimat | P - | Estimat | P - |
| | | ed rate | valu | ed rate | valu | ed rate | valu | ed rate | valu | ed rate | valu | ed rate | valu | ed rate | valu | ed rate | valu |
| | | (%) | e | (%) | e | (%) | e | (%) | e | (%) | e | (%) | e | (%) | e | (%) | e |
| OS | | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 |
| Non-surgery | | 63.4(53.0-76.0) | | 57.5(46.8-70.5) | | 57.6(45.1-73.6) | | 51.0(38.5-67.6) | | 59.7(48.8-73.0) | | 47.1(36.3-61.1) | | 55.2(41.7-72.9) | | 42.6(29.7-61.1) | |
| Surge ry | | 88.4(81.2-96.3) | | 73.7(64.0-84.9) | | 85.4(76.0-96.0) | | 75.0(63.7-88.3) | | 86.2(74.5-99.7) | | 72.4(57.8-90.7) | | 78.6(59.8-100.0) | | 64.3(43.5-95.0) | |
| CSS | | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 |
| Non-surgery | | 67.2(56.8-79.5) | | 60.9(50.1-73.9) | | 63.0(50.5-78.7) | | 58.3(45.5-74.6) | | 64.7(53.8-77.8) | | 52.8(41.6-67.0) | | 63.2(49.5-80.7) | | 51.7(37.8-70.8) | |
| Surge ry | | 88.4(81.2-96.3) | | 75.1(65.5-86.1) | | 85.4(76.0-96.0) | | 77.0(65.9-89.9) | | 86.2(74.5-99.7) | | 75.6(61.3-93.1) | | 78.6(59.8-100.0) | | 64.3(43.5-95.0) | |

TableS8 Univariate and multivariate cox results table for above 60 years old patients of ICC for overall survival

| | No event | Event | Univariable | | Multivariable | |
|-----------------|---------------|---------------|----------------------------|----------------|----------------------------|----------------|
| | <i>N</i> =152 | <i>N</i> =346 | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> |
| TNM: | | | | | | |
| IA | 41 (27.0%) | 36 (10.4%) | Ref. | Ref. | Ref. | Ref. |
| IB | 24 (15.8%) | 46 (13.3%) | 1.76 [1.14;2.73] | 0.011 | 1.40[0.90;2.17] | 0.136 |
| II | 48 (31.6%) | 134 (38.7%) | 2.29 [1.58;3.32] | <0.001 | 2.24[1.55;3.25] | <0.001 |
| IIIA | 3 (1.97%) | 8 (2.31%) | 2.22 [1.03;4.79] | 0.041 | 1.68[0.78;3.64] | 0.186 |
| IIIB | 36 (23.7%) | 122 (35.3%) | 2.58 [1.78;3.75] | <0.001 | 2.68[1.83;3.91] | <0.001 |
| Radiotherapy: | | | | | | |
| No | 125 (82.2%) | 305 (88.2%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 27 (17.8%) | 41 (11.8%) | 0.68 [0.49;0.94] | 0.02 | 0.71[0.51;0.99] | 0.043 |
| Chemotherapy: | | | | | | |
| No | 77 (50.7%) | 196 (56.6%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 75 (49.3%) | 150 (43.4%) | 0.70 [0.56;0.87] | 0.001 | 0.51[0.40;0.64] | <0.001 |
| Grade: | | | | | | |
| Well-Moderately | 103 (67.8%) | 203 (58.7%) | Ref. | Ref. | Ref. | Ref. |

| | | | | | | |
|-------------------------|-------------|-------------|------------------|--------|------------------|--------|
| Poorly-Undifferentially | 49 (32.2%) | 143 (41.3%) | 1.26 [1.02;1.56] | 0.034 | 1.28[1.03;1.59] | 0.024 |
| Gender: | | | | | | |
| Female | 73 (48.0%) | 185 (53.5%) | Ref. | Ref. | | |
| Male | 79 (52.0%) | 161 (46.5%) | 0.95 [0.77;1.18] | 0.661 | | |
| Surgery: | | | | | | |
| No | 32 (21.1%) | 217 (62.7%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 120 (78.9%) | 129 (37.3%) | 0.28 [0.22;0.35] | <0.001 | 0.258[0.21;0.32] | <0.001 |
| Race: | | | | | | |
| White | 127 (83.6%) | 269 (77.7%) | Ref. | Ref. | | |
| Non-White | 25 (16.4%) | 77 (22.3%) | 1.24 [0.96;1.60] | 0.094 | | |

TableS9 Univariate and multivariate cox results table for above 65 years old patients of ICC for overall survival

| | No event | Event | Univariable | | Multivariable | |
|-------------------------|---------------|---------------|----------------------------|----------------|----------------------------|----------------|
| | <i>N</i> =115 | <i>N</i> =273 | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> |
| TNM: | | | | | | |
| IA | 30 (26.1%) | 29 (10.6%) | Ref. | Ref. | Ref. | Ref. |
| IB | 19 (16.5%) | 43 (15.8%) | 1.69 [1.06;2.71] | 0.011 | 1.40[0.87;2.26] | 0.163 |
| II | 35 (30.4%) | 101 (37.0%) | 2.18 [1.44;3.30] | <0.001 | 1.99[1.31;3.04] | 0.001 |
| IIIA | 2 (1.74%) | 7 (2.56%) | 2.13 [0.93;4.87] | 0.041 | 1.30[0.56;3.02] | 0.537 |
| IIIB | 29 (25.2%) | 93 (34.1%) | 2.31 [1.52;3.52] | <0.001 | 2.52[1.64;3.88] | <0.001 |
| Radiotherapy: | | | | | | |
| No | 89 (77.4%) | 242 (88.6%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 26 (22.6%) | 31 (11.4%) | 0.53 [0.36;0.77] | 0.001 | 0.51[0.35;0.75] | <0.001 |
| Chemotherapy: | | | | | | |
| No | 62 (53.9%) | 177 (64.8%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 53 (46.1%) | 96 (35.2%) | 0.60 [0.47;0.77] | <0.001 | 0.40[0.31;0.53] | <0.001 |
| Grade: | | | | | | |
| Well-Moderately | 81 (70.4%) | 167 (61.2%) | Ref. | Ref. | Ref. | Ref. |
| Poorly-Undifferentially | 34 (29.6%) | 106 (38.8%) | 1.42 [1.11;1.81] | 0.005 | 1.54[1.20;1.98] | <0.001 |
| Gender: | | | | | | |

| | | | | | | |
|-----------|------------|-------------|------------------|--------|------------------|--------|
| Female | 58 (50.4%) | 140 (51.3%) | Ref. | Ref. | | |
| Male | 57 (49.6%) | 133 (48.7%) | 1.08 [0.85;1.38] | 0.506 | | |
| Surgery: | | | | | | |
| No | 27 (23.5%) | 167 (61.2%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 88 (76.5%) | 106 (38.8%) | 0.29 [0.23;0.38] | <0.001 | 0.227[0.17;0.30] | <0.001 |
| Race: | | | | | | |
| White | 94 (81.7%) | 219 (80.2%) | Ref. | Ref. | | |
| Non-White | 21 (18.3%) | 54 (19.8%) | 1.11 [0.82;1.50] | 0.49 | | |

| | | | | | | |
|-----------|------------|-------------|------------------|--------|-----------------|--------|
| Female | 38 (48.1%) | 99 (48.3%) | Ref. | Ref. | | |
| Male | 41 (51.9%) | 106 (51.7%) | 1.06 [0.81;1.40] | 0.655 | | |
| Surgery: | | | | | | |
| No | 17 (21.5%) | 125 (61.0%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 62 (78.5%) | 80 (39.0%) | 0.27 [0.20;0.36] | <0.001 | 0.23[0.17;0.32] | <0.001 |
| Race: | | | | | | |
| White | 67 (84.8%) | 163 (79.5%) | Ref. | Ref. | | |
| Non-White | 12 (15.2%) | 42 (20.5%) | 1.23 [0.87;1.72] | 0.24 | | |

TableS11 Univariate and multivariate cox results table for above 75 years old patients of ICC for overall survival

| | No event | Event | Univariable | | Multivariable | |
|-------------------------|--------------|---------------|----------------------------|----------------|----------------------------|----------------|
| | <i>N</i> =37 | <i>N</i> =115 | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> |
| TNM: | | | | | | |
| IA | 11 (29.7%) | 11 (9.57%) | Ref. | Ref. | Ref. | Ref. |
| IB | 8 (21.6%) | 22 (19.1%) | 1.78 [0.86;3.68] | 0.118 | 1.32[0.64;2.74] | 0.452 |
| II | 10 (27.0%) | 45 (39.1%) | 2.50 [1.29;4.85] | 0.007 | 1.81[0.93;3.54] | 0.081 |
| IIIA | 0 (0.00%) | 2 (1.74%) | 2.35 [0.52;10.6] | 0.268 | 0.77[0.17;3.56] | 0.737 |
| IIIB | 8 (21.6%) | 35 (30.4%) | 2.83 [1.42;5.62] | 0.003 | 2.49[1.24;4.98] | 0.01 |
| Radiotherapy: | | | | | | |
| No | 34 (91.9%) | 111 (96.5%) | Ref. | Ref. | | |
| Yes | 3 (8.11%) | 4 (3.48%) | 0.54 [0.20;1.48] | 0.232 | | |
| Chemotherapy: | | | | | | |
| No | 28 (75.7%) | 100 (87.0%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 9 (24.3%) | 15 (13.0%) | 0.57 [0.33;0.98] | 0.044 | 0.47[0.27;0.82] | 0.008 |
| Grade: | | | | | | |
| Well-Moderately | 29 (78.4%) | 77 (67.0%) | Ref. | Ref. | | |
| Poorly-Undifferentially | 8 (21.6%) | 38 (33.0%) | 1.37 [0.93;2.02] | 0.116 | | |
| Gender: | | | | | | |

| | | | | | | |
|-----------|------------|------------|------------------|--------|-----------------|--------|
| Female | 21 (56.8%) | 61 (53.0%) | Ref. | Ref. | | |
| Male | 16 (43.2%) | 54 (47.0%) | 1.11 [0.77;1.60] | 0.579 | | |
| Surgery: | | | | | | |
| No | 6 (16.2%) | 70 (60.9%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 31 (83.8%) | 45 (39.1%) | 0.24 [0.16;0.36] | <0.001 | 0.22[0.15;0.33] | <0.001 |
| Race: | | | | | | |
| White | 29 (78.4%) | 81 (70.4%) | Ref. | Ref. | | |
| Non-White | 8 (21.6%) | 34 (29.6%) | 1.42 [0.95;2.13] | 0.085 | | |

TableS12 Univariate and multivariate cox results table for above 60 years old patients of ICC for cancer-specific survival

| | No event | Event | Univariable | | Multivariable | |
|-------------------------|---------------|---------------|----------------------------|----------------|----------------------------|----------------|
| | <i>N</i> =169 | <i>N</i> =329 | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> |
| TNM: | | | | | | |
| IA | 44 (26.0%) | 33 (10.0%) | Ref. | Ref. | Ref. | Ref. |
| IB | 26 (15.4%) | 44 (13.4%) | 1.84 [1.17;2.88] | 0.008 | 1.46[0.93;2.30] | 0.102 |
| II | 54 (32.0%) | 128 (38.9%) | 2.37 [1.62;3.48] | <0.001 | 2.31[1.57;3.39] | <0.001 |
| IIIA | 3 (1.78%) | 8 (2.43%) | 2.40 [1.11;5.21] | 0.027 | 1.80[0.83;3.93] | 0.138 |
| IIIB | 42 (24.9%) | 116 (35.3%) | 2.65 [1.80;3.92] | <0.001 | 2.69[1.81;3.99] | <0.001 |
| Radiotherapy: | | | | | | |
| No | 141 (83.4%) | 289 (87.8%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 28 (16.6%) | 40 (12.2%) | 0.70 [0.50;0.98] | 0.035 | 0.73[0.52;1.02] | 0.065 |
| Chemotherapy: | | | | | | |
| No | 91 (53.8%) | 182 (55.3%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 78 (46.2%) | 147 (44.7%) | 0.74 [0.59;0.92] | 0.006 | 0.53[0.42;0.68] | <0.001 |
| Grade: | | | | | | |
| Well-Moderately | 116 (68.6%) | 190 (57.8%) | Ref. | Ref. | Ref. | Ref. |
| Poorly-Undifferentially | 53 (31.4%) | 139 (42.2%) | 1.31 [1.05;1.63] | 0.017 | 1.33[1.07;1.66] | 0.011 |
| Gender: | | | | | | |

| | | | | | | |
|-----------|-------------|-------------|------------------|--------|-----------------|--------|
| Female | 82 (48.5%) | 176 (53.5%) | Ref. | Ref. | | |
| Male | 87 (51.5%) | 153 (46.5%) | 0.95 [0.77;1.18] | 0.663 | | |
| Surgery: | | | | | | |
| No | 36 (21.3%) | 213 (64.7%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 133 (78.7%) | 116 (35.3%) | 0.26 [0.20;0.32] | <0.001 | 0.24[0.19;0.30] | <0.001 |
| Race: | | | | | | |
| White | 141 (83.4%) | 255 (77.5%) | Ref. | Ref. | | |
| Non-White | 28 (16.6%) | 74 (22.5%) | 1.26 [0.97;1.63] | 0.085 | | |

TableS13 Univariate and multivariate cox results table for above 65 years old patients of ICC for cancer-specific survival

| | No event | Event | Univariable | | Multivariable | |
|-------------------------|---------------|---------------|----------------------------|----------------|----------------------------|----------------|
| | <i>N</i> =130 | <i>N</i> =258 | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> |
| TNM: | | | | | | |
| IA | 33 (25.4%) | 26 (10.1%) | Ref. | Ref. | Ref. | Ref. |
| IB | 22 (16.9%) | 40 (15.5%) | 1.75 [1.07;2.87] | 0.026 | 1.46[0.89;2.41] | 0.138 |
| II | 41 (31.5%) | 95 (36.8%) | 2.28 [1.48;3.52] | <0.001 | 2.08[1.34;3.24] | 0.001 |
| IIIA | 2 (1.54%) | 7 (2.71%) | 2.36 [1.02;5.44] | 0.044 | 1.44[0.61;3.36] | 0.404 |
| IIIB | 32 (24.6%) | 90 (34.9%) | 2.48 [1.60;3.85] | <0.001 | 2.67[1.70;4.19] | <0.001 |
| Radiotherapy: | | | | | | |
| No | 104 (80.0%) | 227 (88.0%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 26 (20.0%) | 31 (12.0%) | 0.57 [0.39;0.82] | 0.003 | 0.55[0.37;0.80] | 0.002 |
| Chemotherapy: | | | | | | |
| No | 73 (56.2%) | 166 (64.3%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 57 (43.8%) | 92 (35.7%) | 0.61 [0.48;0.79] | <0.001 | 0.41[0.31;0.54] | <0.001 |
| Grade: | | | | | | |
| Well-Moderately | 93 (71.5%) | 155 (60.1%) | Ref. | Ref. | Ref. | Ref. |
| Poorly-Undifferentially | 37 (28.5%) | 103 (39.9%) | 1.48 [1.15;1.90] | 0.002 | 1.61[1.25;2.08] | <0.001 |
| Gender: | | | | | | |

| | | | | | | |
|-----------|-------------|-------------|------------------|--------|-----------------|--------|
| Female | 69 (53.1%) | 129 (50.0%) | Ref. | Ref. | | |
| Male | 61 (46.9%) | 129 (50.0%) | 1.14 [0.89;1.45] | 0.309 | | |
| Surgery: | | | | | | |
| No | 32 (24.6%) | 162 (62.8%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 98 (75.4%) | 96 (37.2%) | 0.28 [0.21;0.36] | <0.001 | 0.22[0.16;0.29] | <0.001 |
| Race: | | | | | | |
| White | 107 (82.3%) | 206 (79.8%) | Ref. | Ref. | | |
| Non-White | 23 (17.7%) | 52 (20.2%) | 1.13 [0.83;1.53] | 0.43 | | |

TableS14 Univariate and multivariate cox results table for above 70 years old patients of ICC for cancer-specific survival

| | No event | Event | Univariable | | Multivariable | |
|-------------------------|--------------|---------------|----------------------------|-----------------|----------------------------|-----------------|
| | <i>N</i> =97 | <i>N</i> =187 | <i>HR</i> (95% <i>CI</i>) | <i>p</i> -value | <i>HR</i> (95% <i>CI</i>) | <i>p</i> -value |
| TNM: | | | | | | |
| IA | 26 (26.8%) | 17 (9.09%) | Ref. | Ref. | Ref. | Ref. |
| IB | 14 (14.4%) | 36 (19.3%) | 2.18 [1.22;3.88] | 0.008 | 1.69[0.95;3.03] | 0.075 |
| II | 32 (33.0%) | 76 (40.6%) | 2.66 [1.57;4.51] | <0.001 | 2.08[1.22;3.54] | 0.007 |
| IIIA | 0 (0.00%) | 3 (1.60%) | 4.77 [1.39;16.4] | 0.013 | 1.86[0.54;6.46] | 0.327 |
| IIIB | 25 (25.8%) | 55 (29.4%) | 2.69 [1.56;4.65] | <0.001 | 3.01[1.73;5.24] | <0.001 |
| Radiotherapy: | | | | | | |
| No | 86 (88.7%) | 169 (90.4%) | Ref. | Ref. | | |
| Yes | 11 (11.3%) | 18 (9.63%) | 0.74 [0.45;1.20] | 0.216 | | |
| Chemotherapy: | | | | | | |
| No | 62 (63.9%) | 129 (69.0%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 35 (36.1%) | 58 (31.0%) | 0.69 [0.51;0.94] | 0.019 | 0.47[0.34;0.65] | <0.001 |
| Grade: | | | | | | |
| Well-Moderately | 65 (67.0%) | 113 (60.4%) | Ref. | Ref. | | |
| Poorly-Undifferentially | 32 (33.0%) | 74 (39.6%) | 1.16 [0.86;1.55] | 0.327 | | |
| Gender: | | | | | | |

| | | | | | | |
|-----------|------------|-------------|------------------|--------|-----------------|--------|
| Female | 50 (51.5%) | 87 (46.5%) | Ref. | Ref. | | |
| Male | 47 (48.5%) | 100 (53.5%) | 1.13 [0.85;1.51] | 0.396 | | |
| Surgery: | | | | | | |
| No | 22 (22.7%) | 120 (64.2%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 75 (77.3%) | 67 (35.8%) | 0.24 [0.17;0.33] | <0.001 | 0.21[0.34;0.65] | <0.001 |
| Race: | | | | | | |
| White | 82 (84.5%) | 148 (79.1%) | Ref. | Ref. | | |
| Non-White | 15 (15.5%) | 39 (20.9%) | 1.25 [0.88;1.78] | 0.22 | | |

TableS15 Univariate and multivariate cox results table for above 75 years old patients of ICC for cancer-specific survival

| | No event | Event | Univariable | | Multivariable | |
|-------------------------|--------------|---------------|----------------------------|----------------|----------------------------|----------------|
| | <i>N</i> =49 | <i>N</i> =103 | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> | <i>HR</i> (95% <i>CI</i>) | <i>p-value</i> |
| TNM: | | | | | | |
| IA | 12 (24.5%) | 10 (9.71%) | Ref. | Ref. | Ref. | Ref. |
| IB | 8 (16.3%) | 22 (21.4%) | 1.96 [0.93;4.15] | 0.077 | 1.48[0.70;3.14] | 0.31 |
| II | 15 (30.6%) | 40 (38.8%) | 2.41 [1.20;4.84] | 0.013 | 1.76[0.87;3.55] | 0.115 |
| IIIA | 0 (0.00%) | 2 (1.94%) | 2.58 [0.56;11.8] | 0.223 | 0.88[0.19;4.11] | 0.868 |
| IIIB | 14 (28.6%) | 29 (28.2%) | 2.52 [1.22;5.21] | 0.013 | 2.20[1.05;4.58] | 0.036 |
| Radiotherapy: | | | | | | |
| No | 46 (93.9%) | 99 (96.1%) | Ref. | Ref. | | |
| Yes | 3 (6.12%) | 4 (3.88%) | 0.62 [0.23;1.69] | 0.351 | | |
| Chemotherapy: | | | | | | |
| No | 38 (77.6%) | 90 (87.4%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 11 (22.4%) | 13 (12.6%) | 0.55 [0.31;0.99] | 0.047 | 0.46[0.25;0.83] | 0.01 |
| Grade: | | | | | | |
| Well-Moderately | 37 (75.5%) | 69 (67.0%) | Ref. | Ref. | | |
| Poorly-Undifferentially | 12 (24.5%) | 34 (33.0%) | 1.35 [0.89;2.04] | 0.155 | | |
| Gender: | | | | | | |

| | | | | | | |
|-----------|------------|------------|------------------|--------|-----------------|--------|
| Female | 28 (57.1%) | 54 (52.4%) | Ref. | Ref. | | |
| Male | 21 (42.9%) | 49 (47.6%) | 1.13 [0.77;1.66] | 0.542 | | |
| Surgery: | | | | | | |
| No | 13 (26.5%) | 63 (61.2%) | Ref. | Ref. | Ref. | Ref. |
| Yes | 36 (73.5%) | 40 (38.8%) | 0.24 [0.16;0.37] | <0.001 | 0.23[0.25;0.83] | <0.001 |
| Race: | | | | | | |
| White | 37 (75.5%) | 73 (70.9%) | Ref. | Ref. | | |
| Non-White | 12 (24.5%) | 30 (29.1%) | 1.38 [0.90;2.12] | 0.139 | | |

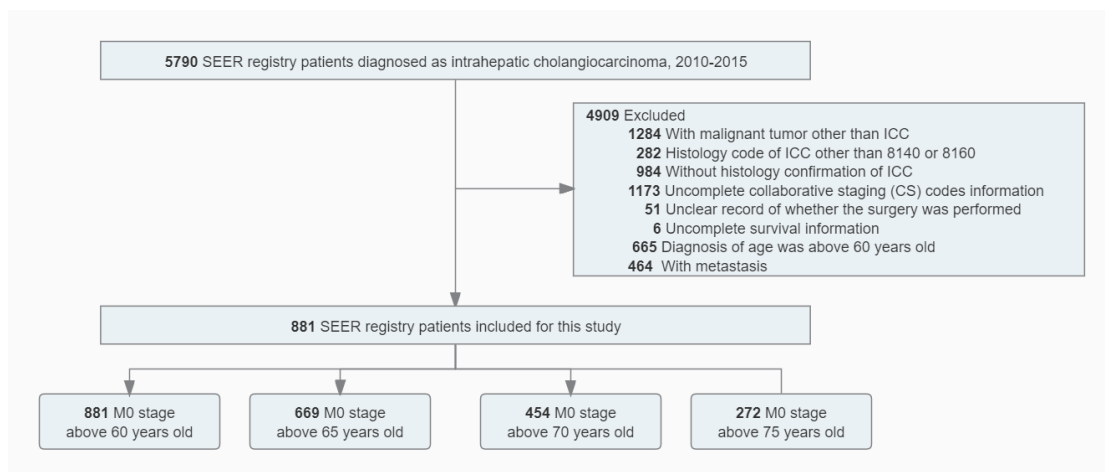
TableS16 Estimated 2-year survival rates of surgery and non-surgery groups for ICC patients above 80 years old

| | | Above 80 years old | |
|-----|-------------|--------------------|-----------------|
| | | 2-Year | |
| | | Estimated rate (%) | <i>P</i> -value |
| OS | Non-surgery | 5.8(0.6-10.9) | <0.01 |
| | Surgery | 50.4(61.0-39.8) | |
| CSS | Non-surgery | 8.3(1.1-15.5) | <0.01 |
| | Surgery | 50.4(61.0-39.8) | |

TableS17 Estimated 3-month and 6-month survival rates of surgery and non-surgery groups for ICC patients above 80 years old

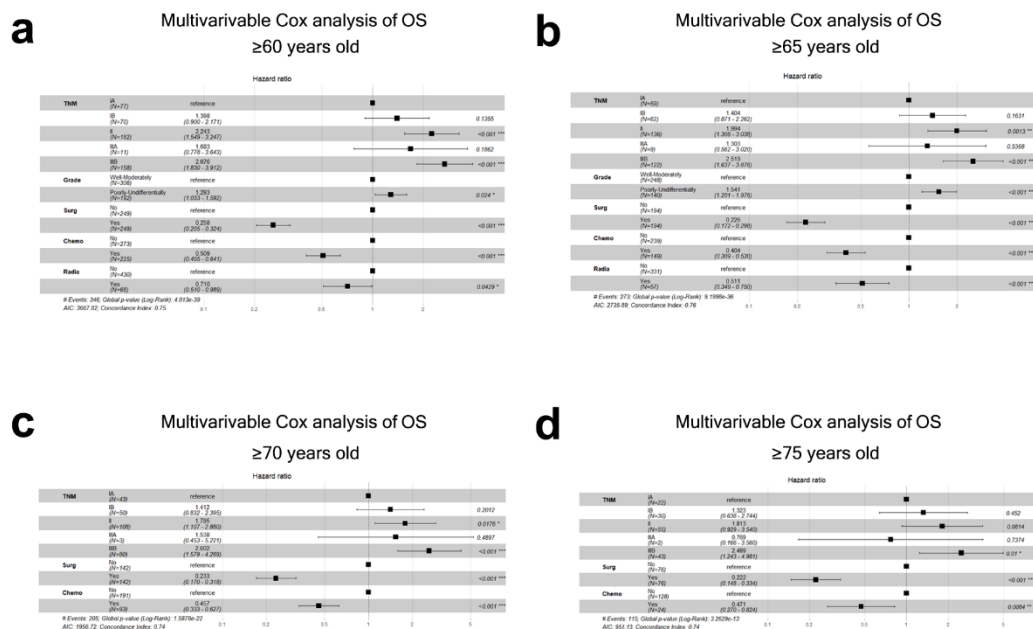
| | | M0 | | | | N0 | | | |
|-------------|--|--------------------|-----------------|--------------------|-----------------|--------------------|-----------------|--------------------|-----------------|
| | | 3-Month | | 6-Month | | 3-Month | | 6-Month | |
| | | Estimated rate (%) | <i>P</i> -value | Estimated rate (%) | <i>P</i> -value | Estimated rate (%) | <i>P</i> -value | Estimated rate (%) | <i>P</i> -value |
| OS | | | <0.001 | | <0.001 | | <0.001 | | <0.001 |
| Non-surgery | | 53.9(44.1-63.63) | | 26.9(18.2-35.6) | | 58.0(47.3-68.7) | | 24.1(14.7-33.48) | |
| Surgery | | 92.3(87.1-97.5) | | 84.6(76.8-91.7) | | 95.5(91.1-99.9) | | 86.4(79.1-93.7) | |
| CSS | | | <0.001 | | <0.001 | | <0.001 | | <0.001 |
| Non-surgery | | 56.4(46.5-66.3) | | 38.7(28.7-48.7) | | 58.0(47.3-68.7) | | 29.0(19.1-38.9) | |
| Surgery | | 92.3(87.1-97.5) | | 84.6(77.5-91.7) | | 95.5(91.1-99.9) | | 86.4(79.1-93.7) | |

Figure S1 Flowchart of Patient Selection.



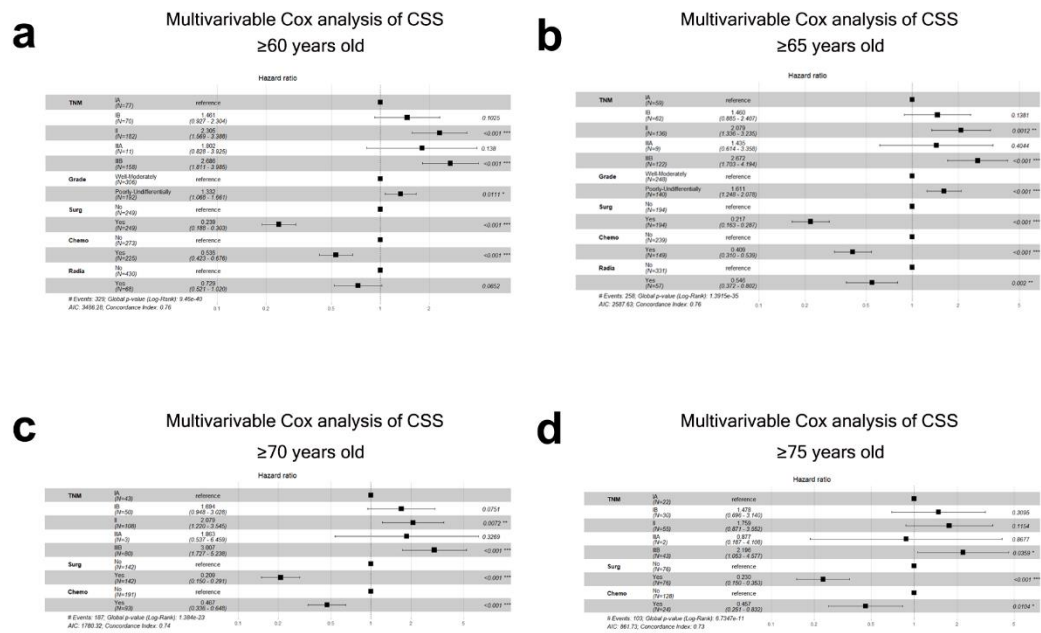
SEER, Surveillance, Epidemiology, and End Results; ICC, intrahepatic cholangiocarcinoma; M0, non-distant metastasis; N0, lymph node-negative; N1, lymph node-positive.

FigureS2 Forest plot and summary statistics of the surgery influence on intrahepatic cholangiocarcinoma incidence for OS in ICC.



Multivariable Cox regression analysis for OS above 60 years old (a), above 65 years old (b), above 70 years old (c) and above 75 years old (d). Abbreviations: ICC, intrahepatic cholangiocarcinoma; OS, overall survival.

FigureS3 Forest plot and summary statistics of the surgery influence on intrahepatic cholangiocarcinoma incidence for CSS in ICC.



Multivariable Cox regression analysis for OS above 60 years old (a), above 65 years old (b), above 70 years old (c) and above 75 years old (d). Abbreviations: ICC, intrahepatic cholangiocarcinoma; CSS cancer-specific survival.