**Table S1. Inflammatory markers of interest**

|  |  |  |
| --- | --- | --- |
| **Inflammatory marker** | **Laboratory parameters** | **Formula** |
| Platelet-to-lymphocyte ratio (PLR) | Platelets;  Lymphocytes | Platelets/Lymphocytes |
| Neutrophil-to-lymphocyte ratio (NLR) | Neutrophils;  Lymphocytes | Neutrophils/Lymphocytes |
| Monocyte-to-lymphocyte ratio (MLR) | Monocytes;  Lymphocytes | Monocytes/Lymphocytes |
| Systemic index of inflammation (SII) | Platelets;  Neutrophils;  Lymphocytes | Platelets × (Neutrophils/ Lymphocytes) |

**Table S2. Characteristics of locally advanced rectal cancer patients grouped by PIV after propensity score matching**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristics | Total  (n = 104) | Low-PIV  (n = 52) | High-PIV  (n = 52) | P-value |
| Age (Years) |  |  |  | 0.556 |
| < 60 | 55 (52.8%) | 29 (55.8%) | 26 (50.0%) |  |
| ≥ 60 | 49 (47.2%) | 23 (44.2%) | 26 (50.0%) |  |
| Gender |  |  |  | 0.547 |
| Male | 63 (60.6%) | 33 (63.5%) | 30 (57.7%) |  |
| Female | 41 (39.4%) | 19 (36.5%) | 22 (42.3%) |  |
| Differentiation |  |  |  | 0.888 |
| Well | 13 (12.5%) | 6 (11.5%) | 7 (13.5%) |  |
| Moderate | 82 (78.8%) | 42 (80.8%) | 40 (76.9%) |  |
| Poor | 9 (8.7%) | 4 (7.7%) | 5 (9.6%) |  |
| CEA Pretreatment |  |  |  | 0.684 |
| Normal | 66 (63.5%) | 32 (61.5%) | 34 (65.4%) |  |
| Elevated | 38 (36.5%) | 20 (38.5%) | 18 (34.6%) |  |
| cT |  |  |  | 0.512 |
| cT3 | 75 (72.1%) | 39 (76.5%) | 36 (74.2%) |  |
| cT4 | 29 (27.9%) | 13 (23.5%) | 16 (25.8%) |  |
| cN |  |  |  | 0.676 |
| Negative | 34 (32.7%) | 16 (30.8%) | 18 (34.6%) |  |
| Positive | 70 (67.3%) | 36 (69.2%) | 34 (65.4%) |  |
| ypT |  |  |  | 0.098 |
| ypT0 | 16 (15.4%) | 11 (21.2%) | 5 (9.6%) |  |
| ypT1-2 | 16 (15.4%) | 10 (19.2%) | 6 (11.5%) |  |
| ypT3-4 | 72 (69.2%) | 31 (59.6%) | 41 (78.8%) |  |
| ypN |  |  |  | 0.012 |
| Negative | 73 (70.2%) | 42 (80.7%) | 31 (59.6%) |  |
| Positive | 31 (29.8%) | 10 (19.2%) | 21 (40.4%) |  |
|  |  |  |  |  |

CEA: carcinoembryonic antigen; PIV: pan-immune-inflammation value

**Table S3. Univariate and multivariate logistic analysis for pCR in LARC after propensity score matching**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristic | Univariable (pCR) | | Multivariable (pCR) | |
| HR (95% CI) | *P* | HR (95% CI) | *P* |
| Age |  |  |  |  |
| < 60 | ref |  |  |  |
| ≥ 60 | 1.12 (0.36-1.42) | 0.547 |  |  |
| Gender |  |  |  |  |
| Male | ref |  |  |  |
| Female | 1.15 (0.81-2.73) | 0.219 |  |  |
| Differentiation |  |  |  |  |
| Well | ref |  |  |  |
| Moderate | 1.13 (0.61-2.54) | 0.434 |  |  |
| Poor | 0.55 (0.15-1.27) | 0.226 |  |  |
| CEA Pretreatment |  |  |  |  |
| Normal | ref |  |  |  |
| Elevated | 0.88 (0.43-1.78) | 0.634 |  |  |
| cT |  |  |  |  |
| cT3 | ref |  | ref |  |
| cT4 | 1.24 (1.02-3.23) | 0.044 | 1.18 (0.96-4.74) | 0.081 |
| cN |  |  |  |  |
| Negative | ref |  |  |  |
| Positive | 1.51 (0.69-2.88) | 0.118 |  |  |
| PIV |  |  |  |  |
| ≤ 454.7 | ref |  | ref |  |
| > 454.7 | 0.48 (0.19-0.88) | 0.031 | 0.42 (0.21-0.92) | 0.041 |

CEA: Carcinoembryonic Antigen; LARC: locally advanced rectal cancer; pCR: pathologic complete response; PIV: pan-immune-inflammation value; ref: reference.

**Table S4. Univariate and multivariate Cox analysis for OS in LARC after propensity score matching**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristic | Univariable (OS) | | Multivariable (OS) | |
| HR (95% CI) | *P* | HR (95% CI) | *P* |
| Age |  |  |  |  |
| < 60 | ref |  |  |  |
| ≥ 60 | 1.32 (0.69-2.21) | 0.412 |  |  |
| Gender |  |  |  |  |
| Male | ref |  |  |  |
| Female | 1.11 (0.61-2.47) | 0.739 |  |  |
| Differentiation |  |  |  |  |
| Well | ref |  |  |  |
| Moderate | 1.32(0.64-2.43) | 0.351 |  |  |
| Poor | 2.21 (0.78-5.32) | 0.198 |  |  |
| CEA Pretreatment |  |  |  |  |
| Normal | ref |  |  |  |
| Elevated | 1.32 (0.85-2.21) | 0.437 |  |  |
| cT |  |  |  |  |
| cT1-2 | ref |  | ref |  |
| cT3-4 | 1.67 (1.34-3.56) | 0.021 | 2.51 (1.81-4.02) | 0.009 |
| cN |  |  |  |  |
| Negative | ref |  |  |  |
| Positive | 1.23 (0.83-2.88) | 0.289 |  |  |
| ypT |  |  |  |  |
| ypT0 | ref |  |  |  |
| ypT1-2 | 2.12 (0.89-7.63) | 0.158 |  |  |
| ypT3-4 | 1.96 (0.74-4.58) | 0.206 |  |  |
| ypN |  |  |  |  |
| ypN0 | ref |  |  |  |
| ypN1-2 | 1.85 (0.81-4.09) | 0.113 |  |  |
| PIV |  |  |  |  |
| ≤ 454.7 | ref |  | ref |  |
| > 454.7 | 2.96 (1.85-6.01) | 0.002 | 3.11 (1.85-6.33) | 0.001 |

CEA: carcinoembryonic antigen; LARC: locally advanced rectal cancer; OS: overall survival; PIV: pan-immune-inflammation value; ref: reference.

**Table S5. Univariate and multivariate Cox analysis for DFS in LARC after propensity score matching**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristic | Univariable (DFS) | | Multivariable (DFS) | |
| HR (95% CI) | *P* | HR (95% CI) | *P* |
| Age |  |  |  |  |
| < 60 | ref |  |  |  |
| ≥ 60 | 1.25 (0.68-2.53) | 0.502 |  |  |
| Gender |  |  |  |  |
| Male | ref |  |  |  |
| Female | 0.81 (0.69-1.85) | 0.623 |  |  |
| Differentiation |  |  |  |  |
| Well | ref |  |  |  |
| Moderate | 1.02 (0.62-2.85) | 0.436 |  |  |
| Poor | 1.65 (0.59-4.31) | 0.247 |  |  |
| CEA Pretreatment |  |  |  |  |
| Normal | ref |  |  |  |
| Elevated | 1.45 (0.88-3.06) | 0.332 |  |  |
| cT |  |  |  |  |
| cT1-2 | ref |  | ref |  |
| cT3-4 | 2.11 (1.26-3.54) | 0.012 | 2.26 (1.32-4.02) | 0.008 |
| cN |  |  |  |  |
| Negative | ref |  | ref |  |
| Positive | 1.93 (0.98-3.59) | 0.063 | 2.03 (0.88-4.02) | 0.098 |
| ypT |  |  |  |  |
| ypT0 | ref |  |  |  |
| ypT1-2 | 1.91 (0.87-3.96) | 0.118 |  |  |
| ypT3-4 | 2.35 (0.58-6.33) | 0.384 |  |  |
| ypN |  |  |  |  |
| ypN0 | ref |  | ref |  |
| ypN1-2 | 1.85 (1.01-3.86) | 0.046 | 1.05 (0.83-2.95) | 0.158 |
| PIV |  |  |  |  |
| ≤ 454.7 | ref |  | ref |  |
| > 454.7 | 2.58 (1.49-4.06) | 0.003 | 2.89 (1.66-5.32) | 0.001 |

CEA: carcinoembryonic Antigen; DFS: disease free survival; LARC: locally advanced rectal cancer; PIV: pan-immune-inflammation value; Ref: reference.