**Table 1**

Baseline Characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristics | All patients  (n=1023) | Paroxysmal AF  (n = 641) | Persistent AF  (n = 382) | P-value |
| **Radiomics features** | | | | |
| Laa, cm2 | 25.5 ± 6.28 | 23.82 ± 5.54 | 28.32 ± 6.46 | < 0.001 |
| Ap, cm | 4.1 ± 0.88 | 3.92 ± 0.83 | 4.4 ± 0.87 | < 0.001 |
| Trans, cm | 7.31 ± 1.01 | 7.09 ± 0.91 | 7.68 ± 1.06 | < 0.001 |
| LSPV, cm | 10.2 (8.5, 11.9) | 10.3 (8.6, 12) | 10 (8.43, 11.6) | 0.263 |
| RSPV, cm | 10.8 (9.2, 12.7) | 11 (9.3, 12.8) | 10.6 (9.1, 12.55) | 0.135 |
| **Clinical features** | | | | |
| Age, y | 61.33 ± 10.03 | 62.04 ± 9.78 | 60.13 ± 10.34 | 0.004 |
| Gender, n (%) |  |  |  | 0.003 |
| Male | 674 (66) | 400 (62) | 274 (72) |  |
| Female | 349 (34) | 241 (38) | 108 (28) |  |
| AF History, m | 2 (0.5, 5) | 2 (0.58, 5) | 2 (0.5, 5) | 0.483 |
| LA, cm | 3.92 ± 0.64 | 3.71 ± 0.57 | 4.26 ± 0.6 | < 0.001 |
| LV, cm | 4.63 ± 0.51 | 4.61 ± 0.51 | 4.67 ± 0.5 | 0.062 |
| EF, % | 60.04 ± 5.39 | 60.55 ± 5.25 | 59.18 ± 5.53 | < 0.001 |
| BMI, kg/m2 | 24.3 ± 3.16 | 23.99 ± 3.14 | 24.82 ± 3.12 | < 0.001 |
| NT-ProBNP, pg/ml | 320.4 (128.39, 686.83) | 211.3 (90.98, 423.87) | 606.3 (326.15, 899.75) | < 0.001 |
| Ccr, % | 90.46 (74.06, 108.53) | 89.47 (72.73, 108.53) | 92.01 (77.05, 108.53) | 0.143 |
| UA, Mmol/L | 364.35 ± 93.95 | 353.01 ± 93.89 | 383.38 ± 91.05 | < 0.001 |
| PAI, n (%) |  |  |  | < 0.001 |
| No | 341 (33) | 242 (38) | 99 (26) |  |
| Yes | 682 (67) | 399 (62) | 283 (74) |  |
| NYHA, n (%) |  |  |  | < 0.001 |
| No | 875 (86) | 568 (89) | 307 (80) |  |
| Yes | 148 (14) | 73 (11) | 75 (20) |  |
| PreAAD, n (%) |  |  |  | 0.004 |
| No | 502 (49) | 340 (53) | 162 (42) |  |
| Class I | 268 (26) | 155 (24) | 113 (30) |  |
| Class II | 154 (15) | 83 (13) | 71 (19) |  |
| Class III | 99 (10) | 63 (10) | 36 (9) |  |
| Ablationtype, n (%) |  |  |  | < 0.001 |
| PVI | 851 (83) | 641 (100) | 210 (55) |  |
| +PV antrum | 85 (8) | 0 (0) | 85 (22) |  |
| +Roof linear | 87 (9) | 0 (0) | 87 (23) |  |
| AAD.Discharged, n (%) |  |  |  | < 0.001 |
| No | 173 (17) | 139 (22) | 34 (9) |  |
| Class I | 330 (32) | 114 (18) | 216 (57) |  |
| Class II | 332 (32) | 286 (45) | 46 (12) |  |
| Class III | 62 (6) | 47 (7) | 15 (4) |  |
| Class Ⅳ | 126 (12) | 55 (9) | 71 (19) |  |
| Pre.Amiodarone, n (%) |  |  |  | < 0.001 |
| No | 834 (82) | 569 (89) | 265 (69) |  |
| Yes | 189 (18) | 72 (11) | 117 (31) |  |
| Data are presented as mean±SD or median (quartile). AF atrial fibrillation; LA, left atrium diameter; LV, left ventricle diameter;EF, ejection fraction; BMI, body mass index; Ccr, creatinine clearance; UA, Uric acid; NYHA, New York Heart Association Class IV; Variables associated with antiarrhythmic drug status: PreAAD, AAD.Discharged. | | | | |

**Table 2**

Machine learning outcomes of RSI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | AUC(95%CI) | Precision | Recall | F |
| Gradient Boosting | 0.8478[0.8291,0.8666] | 0.8269 | 0.9738 | 0.8943 |
| Support Vector Machine | 0.8182[0.7996,0.8368] | 0.8255 | 1.0000 | 0.9044 |
| AdaBoost | 0.8551[0.8387,0.8716] | 0.8290 | 0.9924 | 0.9033 |
| Random Forest | **0.8587[****0.8421,0.8753]** | 0.8337 | 0.9746 | 0.8986 |
| K-Nearest Neighbor | 0.7963[0.7766,0.816] | 0.8259 | 0.9992 | 0.9043 |
| Neural Network | 0.8545[0.8388,0.8703] | 0.8278 | 0.9873 | 0.9003 |

**Table 3**

Machine learning outcomes of CLI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | AUC(95%CI) | Precision | Recall | F |
| Gradient Boosting | 0.852[0.8161,0.8879] | 0.8253 | 0.8253 | 0.9039 |
| Support Vector Machine | **0.8526[0.8185,0.8866]** | 0.8253 | 0.8253 | 0.9040 |
| AdaBoost | 0.8522[0.8212,0.8832] | 0.8271 | 0.8271 | 0.9050 |
| Random Forest | 0.8522[0.8114,0.893] | 0.8253 | 0.8253 | 0.9039 |
| K-Nearest Neighbor | 0.8126[0.7634,0.8619] | 0.8254 | 0.8254 | 0.9044 |
| Neural Network | 0.8472[0.7954,0.8989] | 0.8383 | 0.8383 | 0.8447 |

**Table 4**

The multivariate Cox analysis of RiskScore by Lasso model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristics | Coef | Hazard Ratio (HR) | 95%CI | P-value |
| Laa | 0.03308 | 1.03363 | [1.004,1.064] | 0.0261\* |
| IAB | 0.23914 | 1.27015 | [1.014,1.591] | 0.0372\* |
| AF | 0.58349 | 1.79229 | [1.204,2.669] | 0.0041\* |
| Pre.Amiodarone | 0.51319 | 1.67061 | [1.104,2.528] | 0.0151\* |
| \*Statistically significant. | | | | |

**Table 5**

The multivariate Cox analysis of the composite risk score (TCRS)

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristics | Hazard Ratio (HR) | 95%CI | P-value |
| RSI | 570.0065 | [266.155, 1220.7] | < 0.001 |
| CLI | 56.2765 | [9.783, 323.7] | < 0.001 |

**Table 6**

The C-index of the risk models

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Index | C-index | SE | 95%CI | P-value |
| Whole cohort | RSI | 0.9203 | 0.0099 | [0.9008,0.9397] | < 0.001 |
| CLI | 0.8377 | 0.0191 | [0.8002,0.8752] | < 0.001 |
| TCRS | 0.9334 | 0.0080 | [0.9176,0.9491] | < 0.001 |
| Training cohort | RSI | 0.9291 | 0.0098 | [0.9098,0.9483] | < 0.001 |
| CLI | 0.8377 | 0.0236 | [0.7914,0.8839] | < 0.001 |
| TCRS | 0.9371 | 0.0077 | [0.9221,0.9521] | < 0.001 |
| Validation cohort 1 | RSI | 0.9125 | 0.0270 | [0.8596,0.9653] | < 0.001 |
| CLI | 0.8479 | 0.0420 | [0.7656,0.9303] | < 0.001 |
| TCRS | 0.9454 | 0.0120 | [0.9219,0.9689] | < 0.001 |
| Validation cohort 2 | RSI | 0.8894 | 0.0371 | [0.8166,0.9621] | < 0.001 |
| CLI | 0.8431 | 0.0492 | [0.7466,0.9395] | < 0.001 |
| TCRS | 0.9072 | 0.0404 | [0.8281,0.9864] | < 0.001 |