|                               | training | validation | test   | P value |
|-------------------------------|----------|------------|--------|---------|
| No. of Patient                | 156      | 53         | 50     | -       |
| No. of cases                  | 156      | 53         | 50     | -       |
| Male                          | 74.5%    | 67.9%      | 64%    | 0.30    |
| Age (years)                   | 57.9±14.4| 61.5±11.9  | 57.8±11.8 | 0.22 |
| BSA\(^a\) (m\(^2\))          | 1.69±0.16| 1.66±0.12  | 1.66±0.12 | 0.28 |
| IVSd\(^b\) (cm)               | 0.95±0.11| 0.96±0.11  | 0.97±0.12 | 0.49 |
| LVPWd\(^c\) (cm)              | 0.92±0.12| 0.94±0.11  | 0.93±0.12 | 0.58 |
| IVSd/LVPWd                    | 1.05±0.12| 1.03±0.11  | 1.04±0.11 | 0.13 |
| LVM\(^d\) (g)                 | 147.6±32.3| 148.7±29.5| 146.4±31.6 | 0.94 |
| LVMI\(^e\)                    | 87.1±14.8| 89.4±14.4  | 88.0±15.3 | 0.63 |
| EF\(^f\) (%)                  | 65.8±6.6 | 64.1±7.9   | 63.8±6.7 | 0.13 |
| LVDd\(^g\) (cm)               | 4.60±0.39| 4.64±0.39  | 4.57±0.43 | 0.63 |

\(^a\)BSA: Body surface area; \(^b\)IVSd: Diastolic interventricular septum; \(^c\)LVPWd: Diastolic left ventricular post wall; \(^d\)LVM: Left ventricular mass; \(^e\)LVMI: Left ventricular mass index; \(^f\)EF: Ejection fraction; \(^g\)LVDd: Diastolic left ventricular diameter;
| Table. S2 Baseline characteristics of patients between training, validation and test datasets of hypertrophic cardiomyopathy group |
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Table S3 Baseline characteristics of patients between training, validation and test datasets of HHD group

|                        | training | validation | test | P value |
|------------------------|----------|------------|------|---------|
| No. of Patient         | 114      | 38         | 37   | -       |
| No. of cases           | 114      | 38         | 37   | -       |
| Male                   | 86.8%    | 71.1%      | 78.4%| 0.16    |
| Age (years)            | 63.8±11.3| 55.6±14.3  | 55.8±13.3| <0.05  |
| BSA\(^a\)(m\(^2\))    | 1.70±0.16| 1.71±0.15  | 1.67±0.12| 0.38    |
| IVSd\(^b\) (cm)        | 1.30±0.13| 1.37±0.17  | 1.34±0.14| 0.01    |
| LVPWd\(^c\) (cm)       | 1.13±0.14| 1.20±0.17  | 1.19±0.19| 0.02    |
| IVSd/LVPWd             | 1.16±0.10| 1.15±0.10  | 1.14±0.10| 0.69    |
| LVM\(^d\)(g)           | 219.6±86.9| 239.0±91.6| 221.1±75.6| 0.47    |
| LVMI\(^e\)             | 132.8±42.8| 143.2±50.3| 136.8±43.8| 0.46    |
| EF\(^f\) (%)           | 67.2±8.7 | 63.5±9.7  | 66.5±7.2| 0.083   |
| LVDd\(^g\) (cm)        | 4.77±0.61| 4.77±0.64  | 4.61±0.45| 0.35    |

\(^a\)BSA: Body surface area; \(^b\)IVSd: Diastolic interventricular septum; \(^c\)LVPWd: Diastolic left ventricular post wall; \(^d\)LVM: Left ventricular mass; \(^e\)LVMI: Left ventricular mass index; \(^f\)EF: Ejection fraction; \(^g\)LVDd: Diastolic left ventricular diameter;
|                              | training | validation | test | P value |
|------------------------------|----------|------------|------|---------|
| No. of Patient              | 34       | 13         | 11   | -       |
| No. of cases                | 83       | 28         | 26   | -       |
| Male                        | 70.5%    | 92.3%      | 81.8%| 0.28    |
| Age (years)                 | 62.0±8.0 | 61.5±10.1  | 62.6±8.0| 0.94  |
| BSA*(m²)                    | 1.64±0.14| 1.78±0.14  | 1.68±0.14 | <0.05 |
| IVSd* (cm)                  | 1.49±0.21| 1.65±0.24  | 1.5±0.18 | 0.02   |
| LVPWd* (cm)                 | 1.35±0.25| 1.50±0.32  | 1.37±0.27| 0.04   |
| IVSd/LVPWd                  | 1.11±0.12| 1.12±0.11  | 1.12±0.17| 0.98   |
| LVM*(g)                     | 227.6±52.9| 276.1±82.6| 231.3±47.0| <0.05 |
| LVMI*                       | 139.3±32.2| 153.8±40.1| 138.7±32.7| 0.13 |
| EF* (%)                     | 61.2±7.1 | 48.8±12.3  | 57.3±12.6| <0.05 |
| LVDd* (cm)                  | 4.15±0.42| 4.22±0.43  | 4.16±0.48| 0.76   |
| GLS-Avg* (%)                | 14.0±3.9 | 10.7±3.6  | 11.4±4.2 | <0.05 |

*BSA: Body surface area; ^IVSd: Diastolic interventricular septum; LVWPd: Diastolic left ventricular post wall; ^LVM: Left ventricular mass; ^LVMI: Left ventricular mass index; ^EF: Ejection fraction; ^LVDd: Diastolic left ventricular diameter; ^GLS-Avg: Average global longitudinal strain;
Etiology classification model

LVH detection model
Etiology identification model

LVH detection model
Etiology classification model

LVH detection model