**Appendix**

**Table S1. Detailed description of LGE patterns.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Patient** |  |  | **Location** | **Segment** |
| 1 | Non ischemic | Junctional | Mid inferior | 10 |
| 2 | Non ischemic | Intramyocardial | Basal inferolateral  | 5 |
| 3 | Non ischemic | Intramyocardial | Basal inferolateral | 5 |
| 4 | Non ischemic | Subepicardial | Basal inferolateral  | 5 |
| 5 | Non ischemic | Junctional | Mid | 7,8,9,10,11,12 |
| 6 | Non-ischemic | Subepicardial | Basal inferolateral  | 5 |
| 7 | Non ischemic | Subepicardial | Basal inferior and inferolateral  | 4,5 |
| 8 | Non ischemic | Patchy | Basal inferolateral, mid inferolateral  | 5,11 |
| 9 | Non-ischemic | Intramyocardial | Mid anteroseptal and inferoseptal, apical septal | 8,9,14 |
| 10 | Non ischemic | Junctional | Basal inferoseptal, mid inferoseptal  | 3,9 |
| 11 | Non ischemic | Subendocardial | Septal inferior |  |
| 12 | Non ischemic |  | Basal inferior | 4 |
| 13 | Non ischemic | Intramyocardial | Basal inferior | 4 |

**Table S2. Combination of MVP and MAD and arrhythmogenicity.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **No inferolateral MAD** | **Inferolateral MAD only** | **Inferolateral MAD and MVP** | **Two sites**  | **Three sites** | **All sites** |
| High PVC burden, n(%) | 36/158 (23%) | 7/14 (50%) | 9/10 (90%) | 7/34 (21%) | 5/11 (46%) | 8/8 (100%) |
| Non-sustained VT, n(%) | 62/152 (41%) | 7/14 (50%) | 8/10 (80%) | 12/33 (36%) | 6/11 (55%) | 7/8 (88%) |
| Appropriate ICD therapy, n(%) | 29/158 (19%) | 2/14 (14%) | 1/10 (10%) | 4/34 (12%) | 0/11 (0%) | 2/8 (25%) |

Abbreviations: MAD; mitral annular disjunction, MVP; mitral valve prolapse, PVC; premature ventricular complex, VT; ventricular tachycardia, ICD; implantable cardioverter defibrillator.

**Table S3. Proarrhythmic characteristics stratified by the presence of MVP.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **MVP**  | **No MVP**  | **P-value** |
| **High PVC burden, n(%)** | 10/13 (77%) | 41/167 (25%) | <0.001 |
| **Non-sustained VT, n(%)** | 9/13 (69%) | 66/161 (41%) | 0.048 |
| **Appropriate ICD therapy, n(%)** | 2/13 (15%) | 28/166 (17%) | 1.000 |

Abbreviations: MVP; mitral valve prolapse, PVC; premature ventricular complex, ICD; implantable cardioverter defibrillator, VT; ventricular tachycardia.

**Table S4. Proarrhythmic characteristics stratified by total MAD sum.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | High PVC Burden | Non-sustained VT | ICD-therapy |
| **≥4mm (mean)** | Yes | 31/78 (40%) | 0.004 | 37/77 (48%) | 0.310 | 11/76 (15%) | 0.351 |
|  | No | 21/104 (20%) |  | 40/99 (40%) |  | 21/106 (20%) |  |
| **≥3mm (median)** | Yes | 32/97 (33%) | 0.159 | 44/95 (46%) | 0.457 | 14/94(15%) | 0.325 |
|  | No | 20/85 (24%) |  | 33/81 (41%) |  | 18/88 (21%) |  |
| **≥6mm (75th)** | Yes | 22/49 (45%) | 0.003 | 24/48 (50%) | 0.306 | 7/49 (14%) | 0.478 |
|  | No | 30/133 (23%) |  | 53/128 (41%) |  | 25/133 (19%) |  |
| **≥10mm (90th)** | Yes | 11/20 (55%) | 0.006 | 11/19 (58%) | 0.188 | 2/20 (10%) | 0.535 |
|  | No | 41/162 (25%) |  | 76/157 (42%) |  | 30/162 (19%) |  |
| **≥12mm (95th)** | Yes | 7/10 (70%) | 0.009 | 7/10 (70%) | 0.107 | 2/10 (20%) | 0.689 |
|  | No | 45/172 (28%) |  | 70/166 (42%) |  | 30/172 (17%) |  |

Abbreviations: MAD; mitral annular disjunction, ICD; implantable cardioverter defibrillator, PVC; premature ventricular complex.

**Table S5. Mitral regurgitation in 13 IVF patients with MVP.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Mitral regurgitation on echocardiogram or CMR** | **Bileaflet prolapse** | **Flail** |
| **MVP patient 1** | Mild MR | Yes | No |
| **MVP patient 2** | Mild MR | No | No |
| **MVP patient 3** | No | No | No |
| **MVP patient 4** | No | Yes | No |
| **MVP patient 5** | Mild MR | No | No |
| **MVP patient 6** | Mild MR | Yes | No |
| **MVP patient 7** | Mild MR | Yes | No |
| **MVP patient 8** | No | No | No |
| **MVP patient 9** | No | No | No |
| **MVP patient 10** | Mild MR | Yes | No |
| **MVP patient 11** | Mild MR | Yes | No |
| **MVP patient 12** | No | No | No |
| **MVP patient 13** | No | No | No |

Abbreviations: MR; mitral regurgitation, MVP; mitral valve prolapse

**Table S6. Anti-arrhythmic medication use of IVF patients with and without inferolateral MAD.** Patients using anti-arrhythmic medication for supraventricular tachycardia, hypertension, or non-cardiac causes are not listed as IVF patients using anti-arrhythmic medication.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Inferolateral MAD****N = 22** | **No inferolateral MAD****N = 144** | **P** |
| **Anti-arrhythmic medication use at last follow-up**  | 16 (73%) | 76 (53%) | 0.080 |
| **Anti-arrhythmic medication use during follow-up** | 18 (82%) | 82 (57%) | 0.026 |

Abbreviations: MAD; mitral annular disjunction, IVF; idiopathic ventricular fibrillation.

**Table S7. Genetic tests results of patients with inferolateral MAD.**

|  |  |
| --- | --- |
| **ID** | **Genetic test results** |
| **1** | Likely Pathogenic TRDN and PPA2, VUS ANK2 and TTN |
| **2** | Normal (only arrhythmia panel tested) |
| **3** | Normal (only arrhythmia panel tested) |
| **4** | Normal (only arrhythmia panel tested) |
| **5** | Normal (only arrhythmia panel tested) |
| **6** | Normal (only arrhythmia panel tested) |
| **7** | Normal (only arrhythmia panel tested) |
| **8** | Normal (only arrhythmia panel tested) |
| **9** | VUS KCNE1 |
| **10** | Normal |
| **11** | Missing |
| **12** | Missing |
| **13** | Normal (only arrhythmia panel tested) |
| **14** | Normal (only arrhythmia panel tested) |
| **15** | VUS CACNB2 and RMB20 |
| **16** | Normal |
| **17** | Normal |
| **18** | Pathogenic TTN |
| **19** | VUS DSP and TMEM43 |
| **20** | Normal |
| **21** | Missing |
| **22** | Missing |
| **23** | Missing |
| **24** | Missing |

**Figure S1. Inclusion flow-chart.** IVF patients from 9 collaborating centres (n = 252) were evaluated for inclusion. In total, 51 patients were included from our previous report.

**Figure S2. Influence of the length of MAD on PVC burden, non-sustained VT, appropriate ICD therapy or MVP.** Green boxes indicate ‘Yes’, grey boxes indicate ‘No’. Abbreviations: PVC; premature ventricular complex, VT; ventricular tachycardia, ICD; implantable cardioverter defibrillator, MAD; mitral annular disjunction, MVP: mitral valve prolapse.