**Table 1.** Clinical characteristics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Totaln = 69 | Moderate MR n = 53 (76.8%) | Severe MR n = 16 (23.2%) | *p* | No MR reductionn = 44 (63.8%) | MR reductionn = 25 (36.2%) | *p* |
| Age, median (IQR), years | 82 (80–85) | 82 (80–85) | 82 (79.75–84.25) | 0.743 | 82 (79.5–84.5) | 83.5 (80.25–85) | 0.188 |
| Female, n (%) | 45 (65.2) | 33 (62.3) | 12 (75) | 0.389 | 27 (61.4) | 18 (72) | 0.437 |
| BMI, mean (SD), kg/m2 | 27.5 (47) |  27.7 (4.9) | 27 (4.6) | 0.648 | 28.2 (5.2) | 26.2 (3.6) | 0.141 |
| NYHA class III–IV, n (%) | 53 (76.8) | 40 (75.5) | 13 (81.3) | 0.598 | 36 (81.8) | 17 (68) | 0.456 |
| Diabetes, n (%) | 21 (30.4) | 17 (32.1) | 4 (25) | 0.444 | 12 (27.3) | 9 (36) | 0.972 |
| Hypertension, n (%) | 60 (87) | 45 (84.9) | 15 (93.8) | 0.107 | 38 (86.4) | 22 (88) | 0.096 |
| Nicotynism, n (%) | 8 (11.6) | 8 (15.1) | 0 | 0.695 | 7 (15.9) | 1 (4) | 0.73 |
| Prior PCI, n (%) | 23 (33.3) | 17 (32.1) | 6 (37.5) | 0.607 | 14 (31.8) | 9 (36) | 0.038 |
| Priormyocardialinfarction, n (%) | 19 (27.5) | 14 (26.4) | 5 (31.3) | 0.081 | 16 (36.4) | 3 (12) | 0.357 |
| Prior CABG, n (%) | 9 (13) | 9 (17) | 0 | 0.717 | 7 (15.9) | 2 (8) | 0.312 |
| Atrialfibrilation, n (%) | 36 (52.2) | 27 (50.9) | 9 (56.3) | 0.640 | 25 (56.8) | 11 (44) | 0.197 |
| COPD, n (%) | 7 (10.1) | 6 (11.3) | 1 (6.3) | 0.613 | 7 (15.9) | 0 | 0.035 |
| Hemoglobin, mean (SD), g/dl | 11.7 (1.8) |  11.8 (1.9) | 11.2 (1.2) | 0.262 | 11.7 (1.6) | 10.3 (1.5) | 0.856 |
| Chronic kidney disease (eGFR<60ml/min/m2), n (%) | 47 (68.1) | 36 (67.9) | 11 (68.8) | 0.957 | 35 (79.5) | 12 (48) | 0.007 |
| eGFR, median (IQR), ml/min/m2 | 51 (40–64) | 53 (42–64) | 49.50 (40–60.75) | 0.664 | 50.5 (40–58) | 60 (42–67) | 0.25 |
| Creatinine, median (IQR), umol/l | 96 (84–113) | 97 (84–113) | 93 (87–112) | 0.971 | 98.5 (85–118.25) | 93 (81–108) | 0.274 |
| NT–proBNP, median (IQR), pg/ml | 3740 (1985–10403) | 3583 (2069–10279) | 4127 (1404–11114) | 0.973 | 3467 (1976–10155) | 4766 (2028–10155) | 0.512 |
| NT–proBNP> 3000 pg/ml, n (%) | 35 (50.7) | 26 (49.1) | 9 (56.3) | 0.759 | 22 (50) | 13 (52) | 0.764 |
| Pacemaker, n (%) | 19 (27.5) | 13 (24.5) | 6 (37.5) | 0.316 | 12 (27.3) | 7 (28) | 0.954 |
| Bundle branchblock, n (%) | 13 (18.8) | 11 (20.8) | 2 (12.5) | 0.468 | 9 (20.5) | 4 (16) | 0.658 |
| STS–PROM, median (IQR), % | 4.77 (3.4–6.1) | 4.43 (3.2–4.95) | 4.57 (3.5–5.9) | 0.738 | 4.99 (3.92–5.7) | 4.23 (3.54–4.95) | 0.774 |
| EuroScore II, median (IQR), % | 5.32 (4.29–7.9) | 4.94 (4.03–7.5) | 5.51 (4.39–7.9) | 0.569 | 4.9 (3.65–7.6) | 5.46 (4.17–7.61) | 0.644 |

Continuous variables are represented as mean (SD) and median (IQR); categorical variables are presented as numbers (%). BMI — body mass index; CABG — coronary artery bypass grafting; COPD — chronic obstructive pulmonary disease; eGFR — estimated glomerular filtration rate; MR — mitral regurgitation; NT–proBNP — N–terminal pro B–type natriuretic peptide; NYHA — New York Heart Association; PCI — percutaneous coronary intervention; STS–PROM — Society of Thoracic Surgery – predicted risk of mortality

**Table 2.** Baseline echocardiographic variables

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Totaln = 69 | Moderate MR n = 53 (76.8%) | Severe MR n = 16 (23.2%) | *p* | No MR reduction n = 44 (63.8%) | MR reduction n = 25 (36.2%) | *p* |
| Chambers |
| LVEDD, median (IQR), mm | 50 (45–55) | 50 (45–54) | 48 (39.25–57.75) | 0.507 | 49 (45–53) | 51.5 (41–55.5) | 0.637 |
| LVEF, median (IQR), % | 55 (40–60) | 52.5 (40–60) | 59 (44.7–65) | 0.210 | 53 (39–65) | 55 (40–60) | 0.537 |
| Left atrium area, mean (SD), cm2 | 30.4 (6.4) | 27.3 (6.2) |  31.2 (6.32) | 0.044 | 30.5 (6.7) | 30.1 (5.9) | 0.789 |
| Aortic valve |
| Peak aortic gradient, mean (SD), mmHg | 71.2 (29.2) | 71.4 (30.8) | 72 (28.9) | 0.878 | 75.6 (32.1) | 64.6 (25.5) | 0.274 |
| Mean aortic gradient, mean (SD), mmHg | 43.7 (17.3) | 43.9 (17.2) | 43.2 (18.3) | 0.906 | 45.2 (19) | 41.0 (13.8) | 0.363 |
| Aortic valve area, median (IQR), cm2 | 0.64 (0.5–0.9) |  0.7 (0.5–0.9) | 0.57 (0.5–0.77) | 0.443 | 0.67 (0.5–0.8) | 0.6 (0.6–0.9) | 0.329 |
| Aortic valve area index, median (IQR), cm2/m2 | 0.42 (0.32–0.49) | 0.43 (0.36–0.53) | 0.37 (0.29–0.45) | 0.143 | 0.39 (0.35–0.48) | 0.45 (0.32–0.54) | 0.488 |
| Moderate to severe AR, n (%) | 38 (55.1) | 28 (52.8) | 10 (62.5) | 0.117 | 25 (56.8) | 13 (52) | 0.938 |
| Mitral valve |
| Mitral annulus, mean (SD), mm | 34.8 (6.3) | 31.4 (8.4) |  35.6 (5.4) | 0.024 | 35.6 (5.6) | 33.3 (7.39) | 0.170 |
| Mean mitral gradient, median (IQR), mmHg | 2 (1.5–3) | 2 (1.5–3) | 3 (2.15–4.25) | 0.529 | 2 (1.45–3) | 2 (1.55–4) | 0.643 |
| MR etiologyPrimary, n (%)Secondary, n (%) | 39 (56.5)30 (43.5) | 30 (56.6)23 (43.4) | 9 (56.3)7 (43.8) |  1 | 25 (56.8)19 (43.2) | 14 (56)11 (44) |  1 |
| MR vena contracta, median (IQR), cm | 0.53 (0.32–0.79) | 0.4 (0.25–0.54) | 1.03(0.85–1.08) | <0.001 | 0.53 (0.31–0.73) | 0.53 (0.33–0.92) | 0.727 |
| MR EROA, median (IQR), cm2 | 0.3(0.15–0.57) | 0.2(0.1–0.31) | 0.71 (0.57–0.82) | <0.001 | 0.28 (0.1–0.46) | 0.33 (0.17–0.57) | 0.267 |
| MR regurgitant volume, median (IQR), ml | 49 (40–66) | 43.5 (36–51) | 78 (69–84) | <0.001 | 48 (41–64) | 51 (40–66) | 0.617 |
| Tricuspid valve |
| Moderate to severe TR, n (%) | 33 (47.8) | 25 (47.2) | 8 (50) | 0.609 | 24 (54) | 9 (36) | 0.172 |
| Pulmonary systolic artery pressure, mean (SD), mmHg  | 45.7 (17.9) |  45.5 (29.8) | 46.5 (20.9) | 0.898 | 47 (27.7)  | 41.0 (13.8) | 0.350 |

Continuous variables are represented as mean (SD) and median (IQR); categorical variables are presented as numbers (%). AR — aortic regurgitation; EROA — effective regurgitant orifice area; LVEDD — left ventricular end–diastolic dimension; LVEF — left ventricular ejection fraction; MR — mitral regurgitation

**Table 3.** Procedure, complications and outcomes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Totaln = 69 | Moderate MR n = 53 (76.8%) | Severe MR n = 16 (23.2%) | *p* | No MR reduction n = 44 (63.8%) | MR reduction n = 25 (36.2%) | *p* |
| Procedure |
| Self–expandablevalves, n (%) | 54 (78.3) | 39 (73.6) | 15 (93.8) | 0.094 | 34 (77.3) | 18 (72) | 0.772 |
| Transfemoralaccess, n (%) | 66 (95.7) | 50 (94.3) | 16 (100) | 1 | 43 (97.7) | 23 (92) | 0.288 |
| Complications |
| Highest creatinine, median (IQR), umol/l | 109 (92–131) | 109 (92–131) | 107 (90.8–130.8) | 0.915 | 113.5 (94.5–137.3) | 104 (90–124) | 0.127 |
| Acute kidney injury, n (%) | 12 (17.4) | 10 (18.9) | 2 (12.5) | 0.566 | 9 (20.5) | 3 (12) | 0.381 |
| Lowest hemoglobin, mean (SD), g/dl | 10 (14.5) | 10.1 (1.8) | 11.2 (1.2) | 0.479 | 9.9 (1.7) | 10.3 (1.56) | 0.329 |
| Blood transfusion, n (%) | 13 (18.8) | 12 (22.6) | 1 (6.3) | 0.147 | 9 (20.5) | 4 (16) | 0.658 |
| Pacemaker, n (%)  | 6 (8.7) | 3 (5.7) | 3 (18.8) | 0.109 | 4 (9.1) | 2 (8) | 0.888 |
| Stroke, n (%) | 2 (2.9) | 2 (3.8) | 0 | ─ | 2 (4.5) | 0 | ─ |
| Tamponade, n (%) | 1 (1.5) | 1 (1.9) | 0 | ─ | 1 (6.25) | 0 | ─ |
| Death, n (%) | 0 | 0 | 0 | N/A | 0 | 0 | N/A |
| Myocardial infarction, n (%) | 0 | 0 | 0 | N/A | 0 | 0 | N/A |
| Outcomes |
| All–causemortality, n (%) | 15 (21.7) | 11 (20.8) | 4 (25) | 0.732 | 13 (29.5) | 2 (8) | 0.047 |
| Heart failure hospitalization, global, n (%) | 25 (36.2) | 18 (34) | 7 (43.8) | 0.478 | 20 (45.5) | 5 (20) | 0.03 |
| All–cause mortality or heart failure hospitalization, n (%) | 29 (42.1) | 21 (39.6) | 8 (50) | 0.778 | 22 (50) | 7 (28) | 0.078 |

Continuous variables are represented as mean (SD) and median (IQR); categorical variables are presented as numbers (%). MR — mitral regurgitation

**Table 4.** Follow–up echocardiographic variables

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Totaln = 69 | Moderate MR n = 53 (76.8%) | Severe MR n = 16 (23.2%) | *p* | No MR reduction n = 44 (63.8%) | MR reduction n = 25 (36.2%) | *p* |
| Chambers |
| LVEDD, median (IQR), mm | 47.5. (44–52.8) | 48 (44.5–53) | 45 (42–48) | 0.193 | 47.5 (44.75–52) | 47.5 (43–53.8) | 0.79 |
| Postprocedural LVEDD reduction, mean (SD), mm | 2.2 (3.92) | 1.6 (4.4) | 2.7 (7.5) | 0.516 | 0.7 (3.9) | 3.8 (6.2) | 0.032 |
| LVEF, median (IQR), % | 55 (45–60) | 55 (45–60) | 60 (48.3–62) | 0.48 | 55 (45–60) | 60 (50–65) | 0.102 |
| Postprocedural LVEF improvement, mean (SD), % | 2.1 (9.1) | 3.3 (13.1) | 0.1 (10.2) | 0.075 | 1.1 (9) | 3.9 (17.1) | 0.086 |
| Aortic valve |
| Peak aortic gradient, median (IQR), mmHg  | 11.6 (9–14.7) | 11.6 (9–5.8) | 10.2 (9–13) | 0.164 | 11.6 (9–16) | 11.6 (8.4–14.4) | 0.62 |
| Mean aortic gradient, mean (SD), mmHg | 7.2 (2.8) | 6.2 (2.1) | 7.4 (2.9) | 0.143 | 7.5 (2.7) | 6.6 (2.9) | 0.18 |
| Effective orifice area, median (IQR), cm2 | 1.9 (1.7–2.2) | 2 (1.7–2.1) | 1.9 (1.7–2.2) | 0.481 | 2 (1.6–2.2) | 1.9 (1.8–2.2) | 0.66 |
| Effective orifice area index, median (IQR), cm2/m2 | 1.1 (0.9–1.4) | 1.2 (0.9–1.5) | 1.1 (0.8–1.4) | 0.652 | 1.2 (0.9–1.3) | 1.1 (1–1.4) | 0.895 |
| Moderate to severe PVL, n (%) | 8 (11.6) | 5 (9.4) | 3 (18.8) | 0.143 | 5 (11.4) | 3 (12) | 0.834 |
| Mitral valve |
| Mitral annulus, mean (SD), mm | 34 (5.9) | 33.4 (7.4) |  36.1 (5.4) | 0.12 | 35.1 (5.5) | 32.6 (6.9) | 0.21 |
| Peak mitral gradient, median (IQR), mmHg | 5.8. (4.8–7.8) | 5.8 (4.8–7.5) | 9 (6.3–14.4) | 0.075 | 5.8 (4.8–7) | 5.8 (4–7.8) | 0.99 |
| Mean mitral gradient, median (IQR), mmHg | 2 (1.12–3) | 2 (1.1–3) | 3 (2.2–4.75) | 0.138 | 2 (1.15–3.25) | 1.5 (1.15–3) | 0.561 |
| MR vena contracta, median (IQR), cm | 0.35 (0.22–0.55) | 0.29 (0.19–0.43) | 0.61 (0.35–0.94) | <0.001 | 0.52 (0.41–0.71) | 0.22 (0.17–0.28) | <0.001 |
| MR EROA, median (IQR), cm2 | 0.22 (0.15–0.34) | 0.19 (0.15–0.28) | 0.36 (0.26–0.51) | 0.001 | 0.33 (0.25–0.44) | 0.16 (0.13–0.19) | <0.001 |
| MR regurgitant volume, median (IQR), ml | 33 (19–46) | 28.5 (18–44) | 44 (33–66) | 0.006 | 47 (38–63) | 20 (15–28) | <0.001 |
| Tricuspid valve |
| Moderate to severe TR, n (%) | 19 (27.5) | 13 (24.5) | 6 (37.5) | 0.16 | 16 (36.4) | 3 (12) | 0.01 |
| Pulmonary systolic artery pressure, mean (SD), mmHg  | 30.2 (25.2) | 29.3 (24.1) | 33 (29.3) | 0.468 | 36.2 (24.8) | 19.6 (22.8) | 0.015 |

Continuous variables are represented as mean (SD) and median (IQR); categorical variables are presented as numbers (%). AR — aortic regurgitation; EROA, effective regurgitant orifice area; LVEDD — left ventricular end–diastolic dimension; LVEF — left ventricular ejection fraction; MR — mitral regurgitation; PVL — perivalvular leak