

IMPACT OF CATHETER ABLATION ON VALVULAR REMODELING IN PATIENTS WITH AF WITH LEFT VENTRICULAR SYSTOLIC DYSFUNCTION

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Background

Patients with AF and left ventricular systolic dysfunction (LVSD) have varying degrees of mitral regurgitation. AF catheter ablation (CA) is associated with significant recovery of LV systolic function however little is known if mitral regurgitation (MR) also improves.

Aim

To determine the outcome of MR in patients with AF and LVSD undergoing index AF ablation.

Method

We examined clinical characteristics, cardiac remodeling and ablation outcomes at 12 months among 275 patients with AF and LVSD between November 2015 and March 2024 according to baseline MR severity.

Results

275 consecutive patients (mean age 60.6±10.2 years, 17% female, median NYHA class 3 (IQR 2-3)) underwent CA and were classified according to baseline MR severity (trivial n=45, mild n=120, moderate or greater severity n=110).

Baseline characteristics were comparable, however, those moderate or greater MR had lower LVEF (21.2±12.1% vs 26.8±10.0% in mild and 37.6±8.9% in trivial MR, p<0.001) and more significant TR (R=0.488, p<0.001). LA dimensions did not significantly differ across MR groups (LAA X² p=0.545, LAVI X² p=0.574).

Arrhythmia recurrence occurred in 45.8% overall and recurrence (X² p=0.093) and AF burden was comparable across subgroups (p=0.184, figure 1).

Baseline MR severity did not influence arrhythmia recurrence (OR 1.31, 95% CI 0.31-5.43, p=0.713) nor LV recovery (OR 1.23, 95% CI 0.83-1.81, p=0.305).

At 12 months, 79.6% exhibited at least 1 grade of improvement in the degree of MR ("MR responders"), with only 5.5% exhibiting moderate or greater MR at 12 months vs 40.0% at baseline (X² p<0.001, figure 2a) accompanied by significant LA and LV reverse remodeling.

Change in LV dimensions predicted MR "responders" (individuals who experienced an improvement in MR severity; OR 0.89 95% CI 0.82-0.96, p=0.003) with a greater reduction in LV size from baseline to 12 months in MR responders (-5.9±5.7 vs non-responders -2.0±5.0, p<0.001, figure 2b).

Change in LA size did not influence MR improvement (OR 0.99, 95% CI 0.97-1.03, p=0.742).

Change in MR severity was inversely associated with 12-month AF burden (R² = -0.275, p=0.004).

Figure 1: AF burden at 12 months according to baseline MR severity

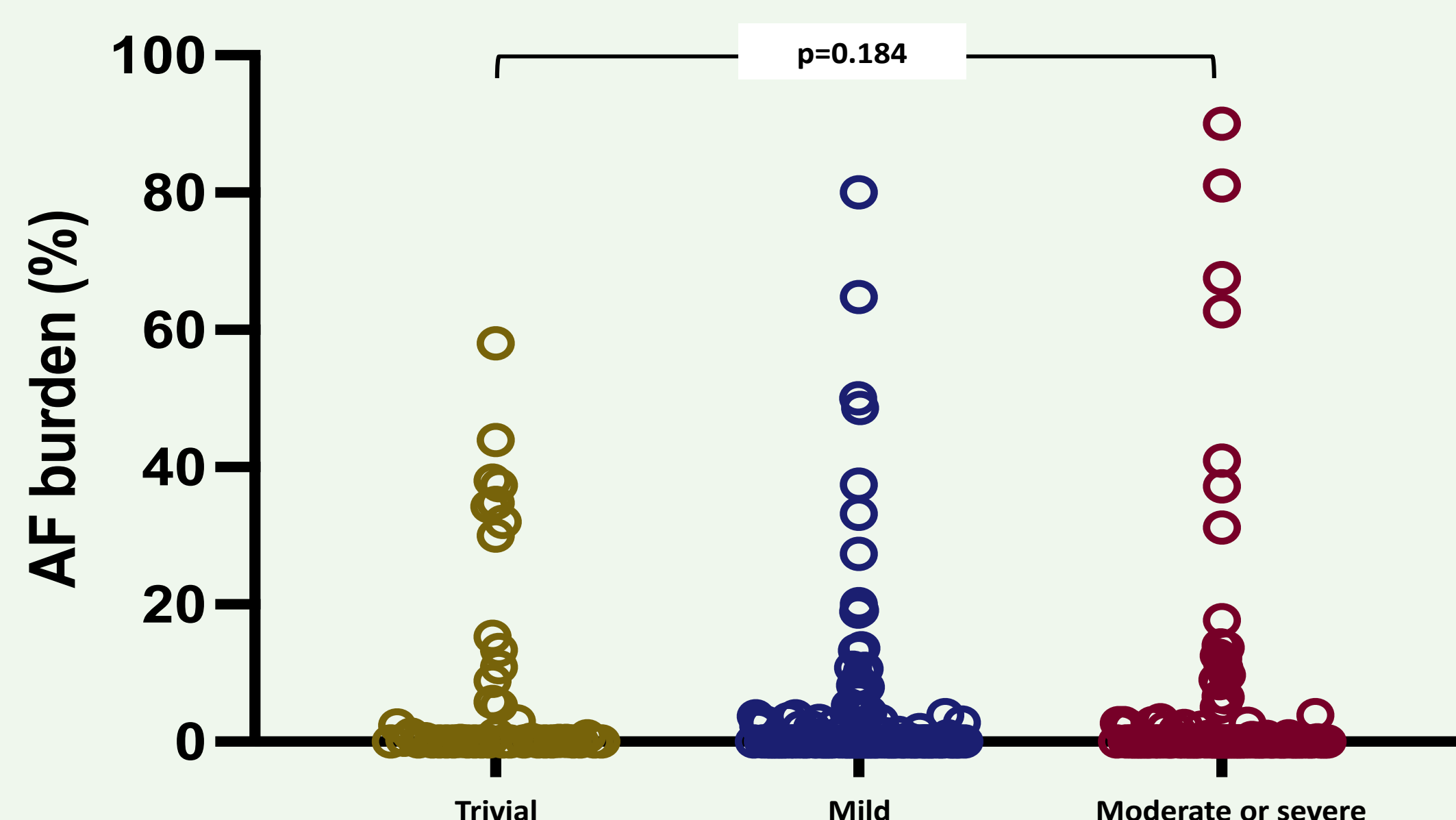


Figure 2a: AF burden at 12 months according to baseline MR severity

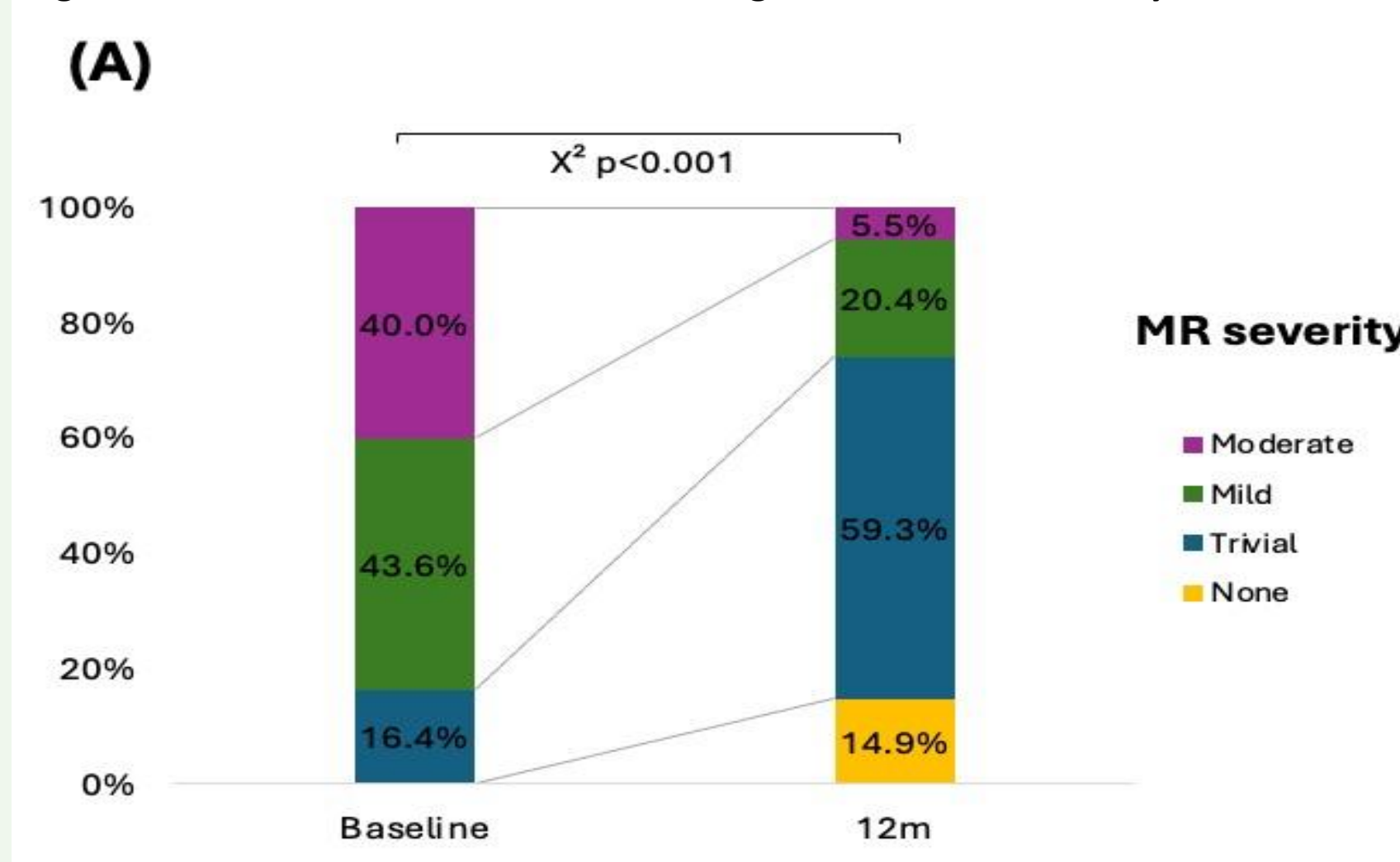


Figure 2b: Change in LV dimensions according to MR severity

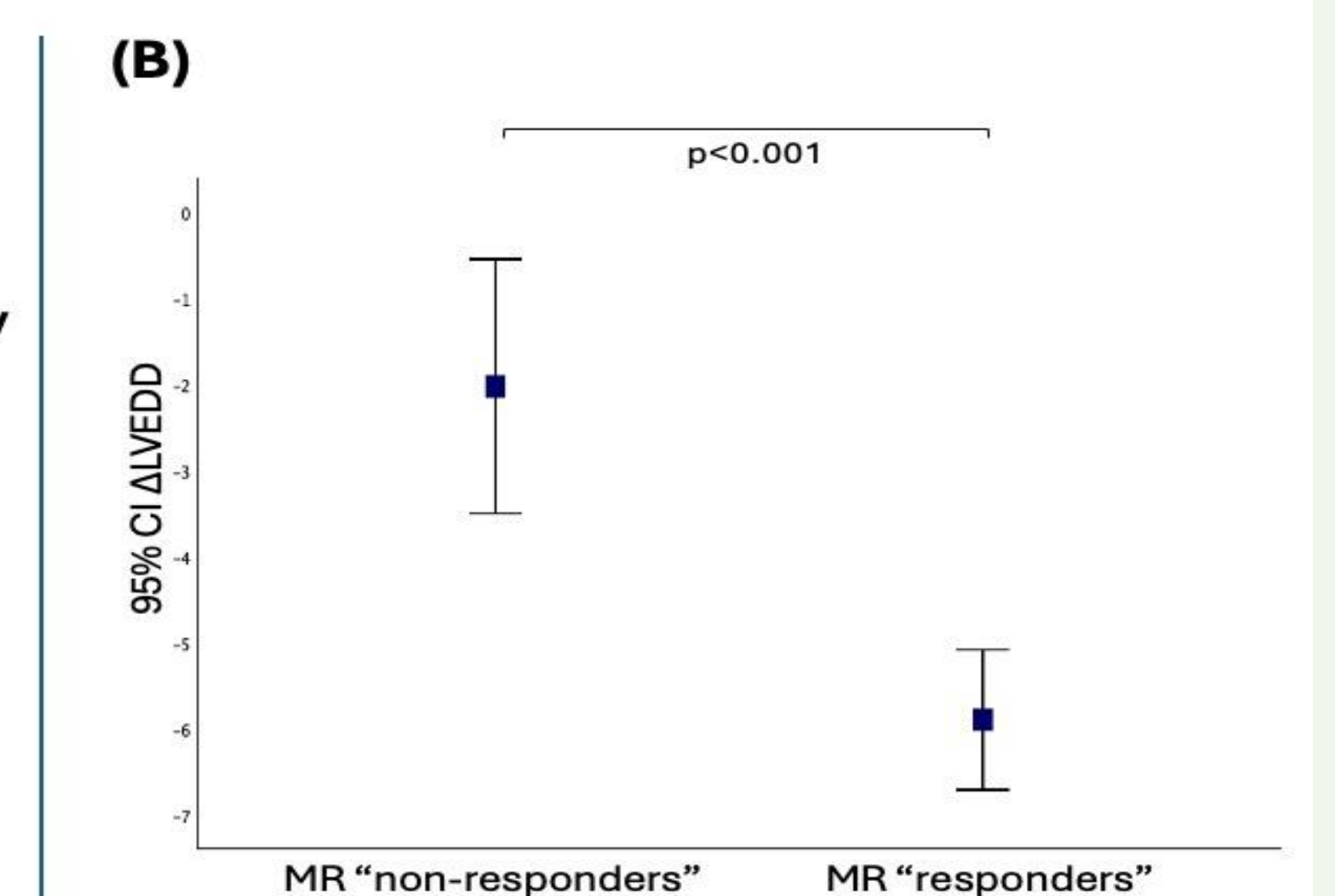


Figure 2: The majority experienced a significant improvement in MR severity from baseline to 12m (figure 2a, left), which was largely driven by LV reverse remodeling (figure 2b, right).

Conclusion

In patients with AF and LVSD undergoing CA, there was a reduction in MR at 12 months corresponding with LV reverse remodeling, suggesting that MR in this setting is largely driven by ventricular rather than atrial remodeling and reversibility is predicated on LV improvement.