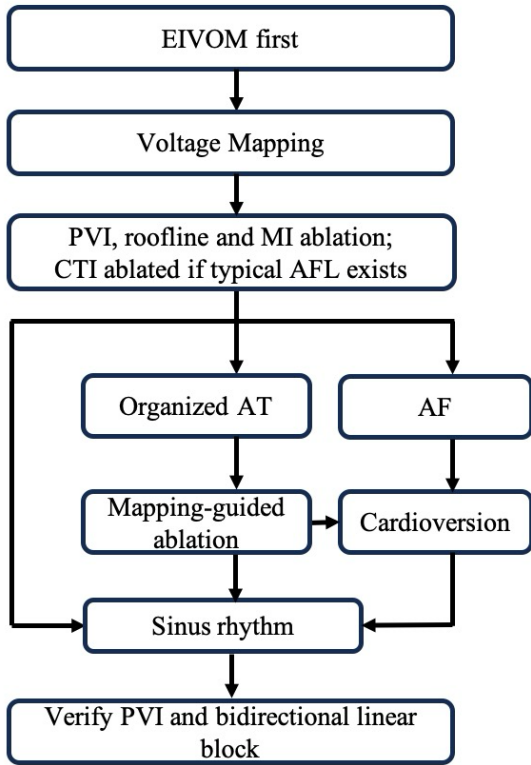


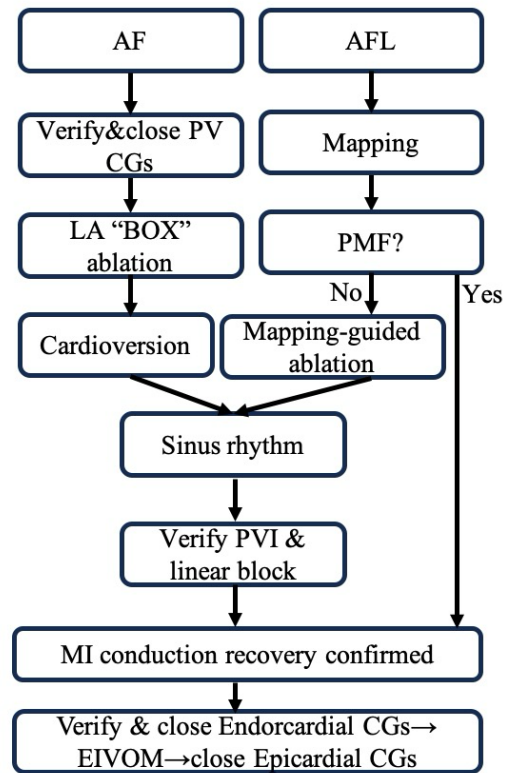
Supplemental Figure 1. The flow chart of the index (A) and re-ablation (B) procedure.

EIVOM, Vein of Marshall ethanol infusion; PVI, pulmonary vein isolation; MI, mitral isthmus; CTI, cavo-tricuspid isthmus; AFL, atrial flutter; AT, atrial tachycardia; AF, atrial fibrillation; CGs, conduction gaps; LA, left atrium; PMF, peri-mitral flutter.

A The Index Procedure

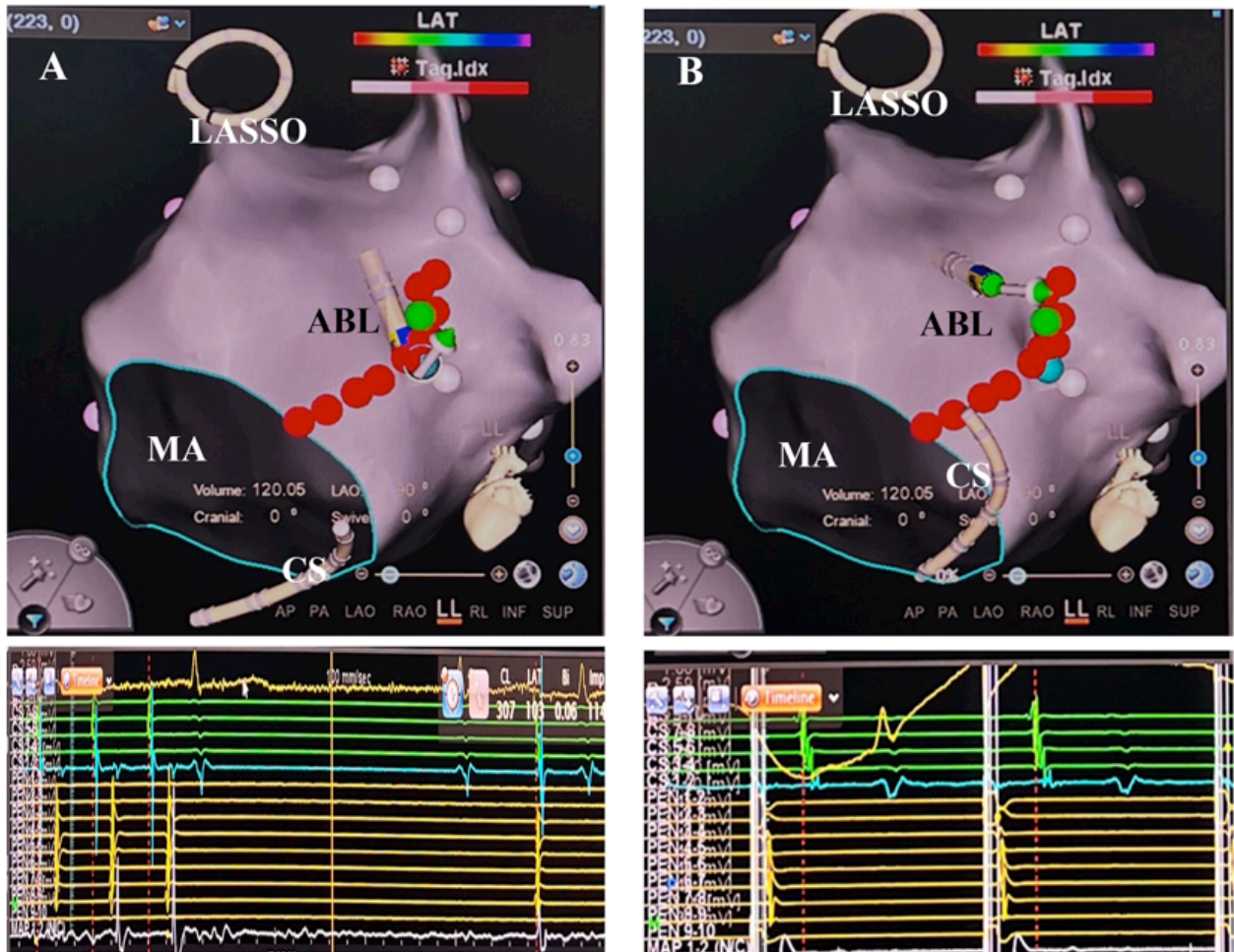


B The Re-ablation Procedure



Supplementary Figure 2. RF ablation of counterclockwise PMF.

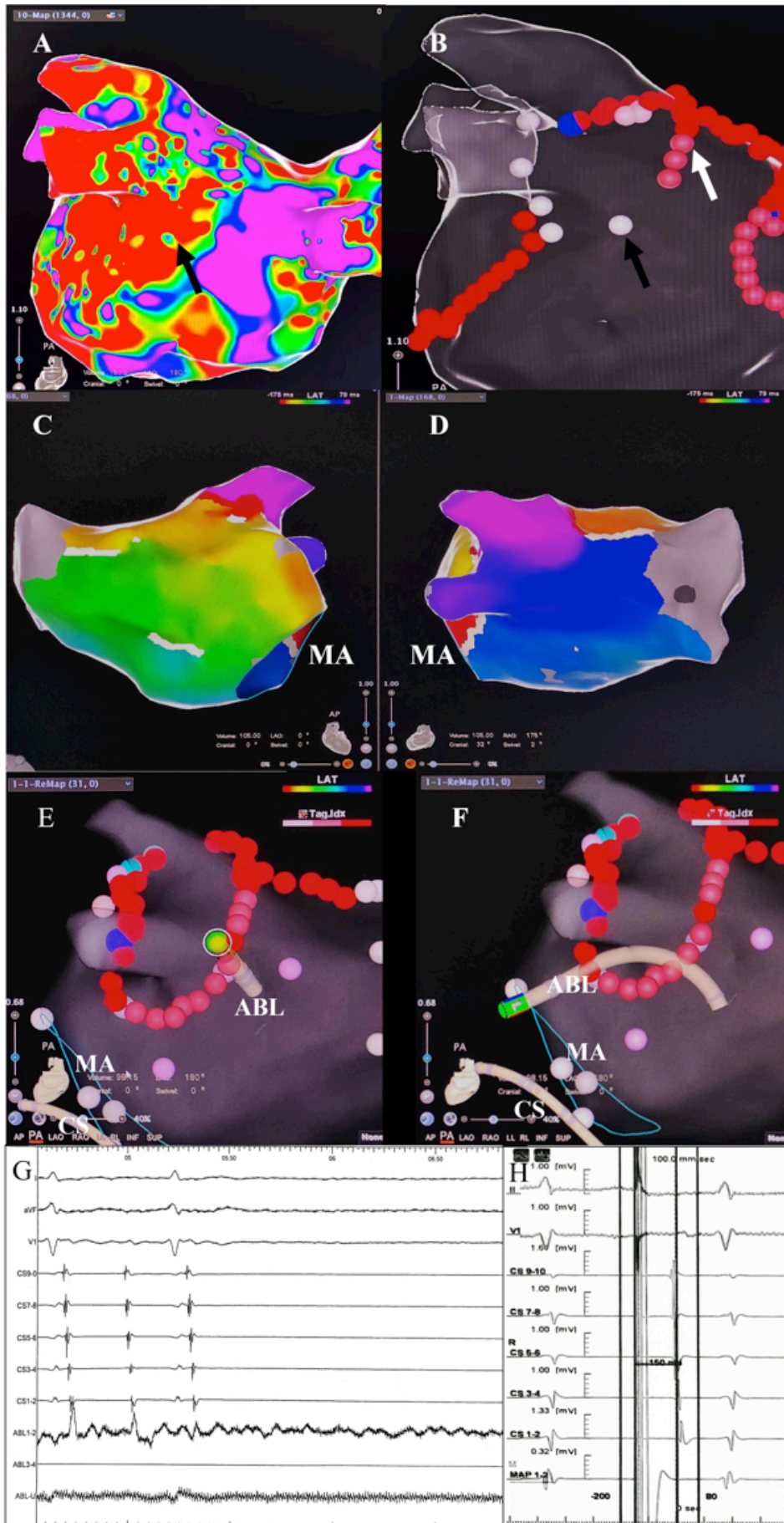
(A) Contiguous lesions (red dots) from mitral annulus to the lateral ridge. Flutter terminated with ridge ablation (blue dot), confirming a MI-CG. (B) Post-conversion pacing revealed slow MI conduction; touch-up ridge ablation (green dot) achieved MI block (confirmed by ABL pacing). *RF, radiofrequency; MI, mitral isthmus*



Supplementary Figure 3. An unusual case of atypical PMF with LPV-CG-dependent isthmus.

(A-B) Initial ablation showed EIVOM-induced LVAs (red) extending from the lateral ridge to the posteroinferior LPV antrum (black arrow). RFA lesions (red dots) on the upper LPV antrum achieved isolation (blue dot). (C-D) Redo mapping revealed PMF despite MI block (white line). (E-H) PMF terminated after LPV-CG ablation (green dot), with LPV re-isolation via lateral ridge ablation (blue dot). Pacing confirmed persistent MI block without touch-up ablation.

PMF, peri-mitral flutter; RFA, radiofrequency ablation; MI, mitral isthmus; LPV, left pulmonary vein; CG, conduction gap



Supplementary Table 1. Logistic regression analysis for MI conduction recovery prediction

	Univariate analysis		Multivariate analysis	
	OR (95%CI)	P-value	OR(95% CI)	P-value
Age	0.995 (0.940, 1.052)	0.852		
Gender	5.515 (1.717, 17.715)	0.004		
BMI index	0.895 (0.746, 1.073)	0.231		
AF duration	1.015 (1.005, 1.025)	0.004	1.012 (1.002, 1.023)	0.021
CHA ₂ DS ₂ -VASc score	0.849 (0.619, 1.163)	0.307		
LAD at the index ablation	0.828 (0.745, 0.920)	<0.001		
LVEDD at the index ablation	1.002 (0.928, 1.081)	0.966		
LVEF at the index ablation	0.979 (0.926, 1.034)	0.442		
EIVOM use	4.632 (1.835, 11.689)	0.001	3.611 (1.377, 9.465)	0.009
LA volume at the index ablation	0.981 (0.967, 0.995)	0.006		

BMI=body mass index; LAD=left atrial diameter; LVEDD=left ventricular end diastolic diameter; LVEF=left ventricular ejection fraction; LA=left atrium

Supplementary Table 2. Effectiveness of EIVOM on MI block in re-ablation procedure

	EIVOM cohort (n=41)	Non-EIVOM cohort (n=50)	P value
EIVOM for PML ablation			
Amount of PMF	19	30	
Clockwise/counterclockwise reentry	11/8	21/9	
CL of PML (ms)	269±11	240±34	0.02
EIVOM use in PMF ablation	0	15	
EIVOM terminated PMF	0	12	
EIVOM for MI ablation in AF recurrence			
Number of cases with AF recurrence	16	15	
MI blocked by EIVOM after RFA failure	0	6	
MI blocked by RFA	16	8	

PMF=Peri-mitral flutter; CL=cycle length; MI=mitral isthmus; RFA=radiofrequency ablation