

**Supplementary Table 1. Locations of extra-PV triggers during de novo AFCA**

	Overall (n=1864)	Female (n=528)	Male (n=1336)	P value
Extra-PV trigger	217 (11.6)	86 (16.3)	131 (9.8)	<0.001
Unmappable	16 (7.4)	7 (8.1)	9 (6.9)	
SVC	41 (18.9)	21 (24.4)	20 (15.3)	
RA	29 (13.4)	11 (12.8)	18 (13.7)	
Interatrial septum	59 (27.2)	23 (26.7)	36 (27.5)	
Coronary sinus	36 (16.6)	12 (14.0)	24 (18.3)	
LA	25 (11.5)	7 (8.1)	18 (13.7)	
LOM	11 (5.1)	5 (5.8)	6 (4.6)	

AFCA, atrial fibrillation catheter ablation; LA, left atrium; LOM, ligament of Marshall; PV, pulmonary vein;

RA, right atrium; SVC, superior vena cava.

**Supplementary Table 2. Clinical rhythm outcomes after de novo AFCA**

	Overall (n=2999)	Female (n=794)	Male (n=2205)	P value
Follow-up months	48.2 ± 34.9	50.1 ± 34.2	47.6 ± 35.1	0.081
Post-ABL medication				
ACEi, or ARB, n (%)	1024 (34.2)	267 (33.7)	757 (34.4)	0.745
Beta blocker, n (%)	1122 (37.5)	281 (35.4)	841 (38.2)	0.180
Statin, n (%)	936 (31.3)	272 (34.3)	664 (30.2)	0.035
AAD Use				
AADs at discharge, n (%)	853 (28.5)	240 (30.3)	613 (27.8)	0.203
AADs after 3 months, n (%)	1144 (38.2)	338 (42.6)	806 (36.6)	0.003
AADs at final follow-up, n (%)	981 (32.7)	313 (39.4)	668 (30.3)	<0.001
Early recurrence, n (%)				
Recurrence type AF, n (% in early recur)	665 (68.6)	176 (65.7)	489 (69.8)	0.251
Recurrence type AT, n (% in early recur)	304 (31.4)	92 (34.3)	212 (30.2)	0.251
Clinical recurrence, n (%)				
AF recurrence, n (% in recur/% in overall)	790 (72.2/26.3)	233 (71.5/29.3)	557 (72.5/25.3)	0.778
AT recurrence, n (% in recur/% in overall)	304 (27.8/10.1)	93 (28.5/11.7)	211 (27.5/9.6)	0.778
Cardioversion, n (% in recur/% in overall)	310 (28.3/10.3)	77 (23.6/9.7)	233 (30.3/10.6)	0.029

AAD antiarrhythmic drug; ACEi, angiotensin-converting enzyme inhibitor; AF, atrial fibrillation; AFCA, atrial fibrillation catheter ablation; ARB, angiotensin receptor blocker; AT, atrial tachycardia.

**Supplementary Table 3. Baseline characteristics of patients with a de novo ablation before and after propensity score matching**

	Before PS matching			P value	After PS matching			P value
	Overall (n=2999)	Female (n=794)	Male (n=2205)		Overall (n=938)	Female (n=469)	Male (n=469)	
Age, years	58.3 ± 10.9	61.1 ± 10.7	57.2 ± 10.8	<0.001	61.7 ± 10.0	61.7 ± 9.9	61.8 ± 10.2	0.930
Persistent AF (%)	956 (31.9)	218 (27.5)	738 (33.5)	0.002	251 (26.8)	122 (26.0)	129 (27.5)	0.658
BSA	1.8 ± 0.2	1.6 ± 0.1	1.9 ± 0.2	<0.001	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	0.065
Comorbidities (%)								
Heart failure	352 (11.7)	122 (15.4)	230 (10.4)	<0.001	93 (9.9)	52 (11.1)	41 (8.7)	0.275
Hypertension	1381 (46.0)	378 (47.6)	1003 (45.5)	0.324	453 (48.3)	242 (51.6)	211 (45.0)	0.050
Diabetes	453 (15.1)	109 (13.7)	344 (15.6)	0.228	149 (15.9)	72 (15.4)	77 (16.4)	0.721
Stroke or TIA	337 (11.2)	104 (13.1)	233 (10.6)	0.061	113 (12.0)	54 (11.5)	59 (12.6)	0.688
Vascular disease	316 (10.5)	61 (7.7)	255 (11.6)	0.003	101 (10.8)	36 (7.7)	65 (13.9)	0.003
CHA <sub>2</sub> DS <sub>2</sub> VASc score	1.7 ± 1.5	2.6 ± 1.5	1.4 ± 1.4	<0.001	2.1 ± 1.5	2.6 ± 1.5	1.6 ± 1.5	<0.001
Non-Gender	1.4 ± 1.4	1.6 ± 1.5	1.4 ± 1.4	<0.001	1.6 ± 1.5	1.6 ± 1.5	1.6 ± 1.5	0.755
CHA <sub>2</sub> DS <sub>2</sub> VA score								
Echocardiographic parameters								
LA dimension, mm	41.4 ± 6.2	40.6 ± 6.3	41.6 ± 6.2	<0.001	40.4 ± 6.0	40.4 ± 5.7	40.5 ± 6.3	0.911
LV ejection fraction, %	63.1 ± 8.4	64.8 ± 8.0	62.5 ± 8.4	<0.001	64.5 ± 7.6	64.4 ± 7.3	64.7 ± 7.9	0.460
E/Em	10.2 ± 4.4	12.2 ± 5.4	9.5 ± 3.8	<0.001	11.1 ± 4.7	11.2 ± 4.0	11.1 ± 5.3	0.855
LAA flow velocity, cm/s (n=1421)	48.2 ± 22.1	45.0 ± 22.0	49.5 ± 22.1	0.001	47.5 ± 21.4	46.7 ± 20.8	48.1 ± 22.0	0.492
LA voltage (n=2119)	1.3 ± 0.7	1.1 ± 0.6	1.4 ± 1.4	<0.001	1.3 ± 0.6	1.2 ± 0.6	1.4 ± 0.6	0.005
Procedure time, min	171.5 ± 55.9	170.5 ± 52.8	171.8 ± 56.9	0.553	171.0 ± 53.5	168.6 ± 51.5	173.3 ± 55.3	0.175
Ablation time, s	4429.5 ± 1702.9	4235.4 ± 1594.9	4499.4 ± 1735.2	<0.001	4348.0 ± 1602.6	4212.0 ± 1547.2	4484.0 ± 1646.5	0.009
Ablation lesions (%)								
CPVI	2999 (100)	794 (100)	2201 (100)		938 (100.0)	469 (100.0)	469 (100.0)	
CTI	2651 (88.5)	704 (88.9)	1947 (88.4)	0.771	839 (89.6)	414 (88.7)	425 (90.6)	0.379
Empirical extra-PV LA ablation*	932 (31.1)	230 (29.0)	702 (31.8)	0.146	259 (27.6)	119 (25.4)	140 (29.9)	0.144
Posterior box	873 (29.1)	217 (27.3)	656 (29.8)	0.214	239 (25.5)	111 (23.7)	128 (27.3)	0.231

Anterior line	633 (21.1)	157 (19.8)	476 (21.6)	0.310	166 (17.7)	75 (16.1)	91 (19.4)	0.210
Mitral isthmus line	141 (4.7)	38 (4.8)	103 (4.7)	0.982	38 (4.1)	17 (3.6)	21 (4.5)	0.615
CFAE ablation	140 (4.7)	23 (2.9)	117 (5.3)	0.008	41 (4.4)	16 (3.4)	25 (5.3)	0.204
Extra-PV trigger (n=1864)	217 (11.6)	86 (16.3)	131 (9.8)	<0.001	80 (12.5)	46 (14.5)	34 (10.5)	0.160

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AF, atrial fibrillation; BSA, body surface area; CFAE, complex fractionated atrial electrograms; CPVI, circumferential pulmonary vein isolation; CTI, carvotricuspid isthmus; E/Em, the ratio of the early diastolic mitral inflow velocity (E) to the early mitral annular velocity (Em); LA, left atrium; LAA, left atrium appendage; LV, left ventricle; PV, pulmonary vein; TIA, transient ischemic attack.

\* Additional ablation lesions other than the pulmonary veins in the LA.

Variables are presented as the mean  $\pm$  standard deviation or count (percentage)

**Supplementary Table 4. Baseline characteristics of patients with AAD use after AF recurrence before and after propensity score matching**

	Before PS matching				After PS matching			
	AAD user after recurrence (n=788)	Female (n=228)	Male (n=560)	P value	AAD user after recurrence (n=280)	Female (n=140)	Male (n=140)	P value
Age, years	59.1 ± 10.5	61.2 ± 10.5	58.3 ± 10.3	<0.001	62.2 ± 9.6	62.1 ± 9.1	62.3 ± 10.2	0.892
Persistent AF (%)	317 (40.2)	68 (29.8)	249 (44.5)	<0.001	89 (31.8)	46 (32.9)	43 (30.7)	0.797
BSA	1.8 ± 0.2	1.7 ± 0.1	1.9 ± 0.2	<0.001	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	0.519
Total follow up, mo	45.6 ± 30.5	42.6 ± 27.2	46.8 ± 31.7	0.063	45.8 ± 28.5	44.1 ± 27.0	47.5 ± 30.0	0.320
Time (recurrence ~ <i>de novo</i> AFCA), mo	21.9 ± 22.3	25.3 ± 22.4	20.5 ± 22.1	0.007	23.8 ± 23.6	25.5 ± 23.7	22.0 ± 23.4	0.222
Comorbidities (%)								
Heart failure	94 (11.9)	39 (17.1)	55 (9.8)	0.006	32 (11.4)	17 (12.1)	15 (10.7)	0.851
Hypertension	387 (49.1)	120 (52.6)	267 (47.7)	0.237	140 (50.0)	80 (57.1)	60 (42.9)	0.023
Diabetes	134 (17.0)	35 (15.4)	99 (17.7)	0.494	52 (18.6)	24 (17.1)	28 (20.0)	0.645
Stroke or TIA	101 (12.8)	32 (14.0)	69 (12.3)	0.593	37 (13.2)	19 (13.6)	18 (12.9)	1.000
Vascular disease	99 (12.6)	24 (10.5)	75 (13.4)	0.326	41 (14.6)	17 (12.1)	24 (17.1)	0.310
Non-gender CHA <sub>2</sub> DS <sub>2</sub> VASc score	1.5 ± 1.4	1.7 ± 1.5	1.5 ± 1.4	0.029	1.8 ± 1.5	1.8 ± 1.5	1.7 ± 1.5	0.872
Echocardiographic parameters								
LA dimension, mm	42.5 ± 6.3	40.9 ± 6.0	43.2 ± 6.3	<0.001	41.3 ± 5.8	41.3 ± 5.4	41.2 ± 6.1	0.925
LV ejection fraction, %	62.6 ± 8.3	63.7 ± 8.1	62.2 ± 8.3	0.015	63.9 ± 7.7	64.1 ± 7.8	63.6 ± 7.7	0.564
E/Em	10.4 ± 4.3	12.2 ± 5.2	9.7 ± 3.6	<0.001	11.1 ± 4.1	10.9 ± 3.3	11.3 ± 4.7	0.364
Procedure time, min	186.4 ± 59.3	178.8 ± 51.9	189.5 ± 61.8	0.014	181.0 ± 50.3	181.4 ± 46.0	180.6 ± 54.4	0.898
Ablation time, s	4925.8 ± 1806.0	4580.1 ± 1561.8	5065.7 ± 1879.2	<0.001	4745.1 ± 1541.0	4786.2 ± 1415.1	4704.6 ± 1659.8	0.660
Ablation lesions (%)								
CPVI	788 (100.0)	228 (100.0)	560 (100.0)		280 (100.0)	140 (100.0)	140 (100.0)	
CTI	716 (91.1)	204 (89.9)	512 (91.6)	0.528	258 (92.5)	128 (92.1)	130 (92.9)	0.986
Empirical extra-PV LA ablation*	329 (41.8)	71 (31.1)	258 (46.1)	<0.001	95 (33.9)	46 (32.9)	49 (35.0)	0.801

Extra-PV trigger	72 (14.9)	29 (18.0)	43 (13.3)	0.217	30 (15.2)	16 (14.8)	14 (15.7)	1.000
AAD use after recurrence (%)				0.944				1.000
Class IC	294 (37.3)	86 (37.7)	208 (37.1)		98 (35.0)	49 (35.0)	49 (35.0)	
Class III	494 (62.7)	142 (62.3)	352 (62.9)		182 (65.0)	91 (65.0)	91 (65.0)	
Amiodarone	269 (34.1)	63 (27.6)	206 (36.8)	0.018	88 (31.4)	39 (27.9)	49 (35.0)	0.247

AAD, antiarrhythmic drug; AF, atrial fibrillation; AFCA, atrial fibrillation catheter ablation; BSA, body surface area; CPVI, circumferential pulmonary vein isolation; CTI, carvotricuspid isthmus; E/Em, the ratio of the early diastolic mitral inflow velocity (E) to the early mitral annular velocity (Em); LA, left atrium; LV, left ventricle; PV, pulmonary vein; TIA, transient ischemic attack.

\* Additional ablation lesions other than the pulmonary veins in the LA.

Variables are presented as the mean  $\pm$  standard deviation or count (percentage)

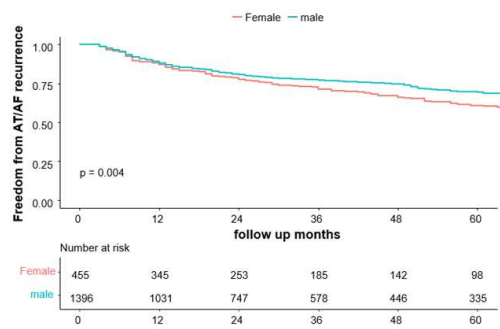
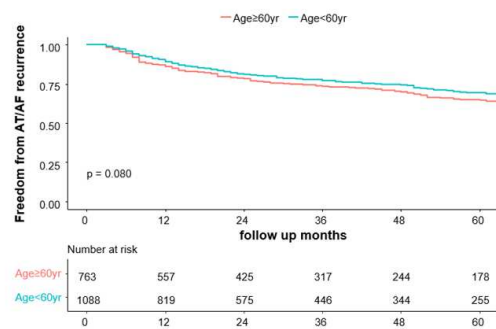
**Supplementary Table 5. Adverse effects and types of AADs**

	Overall (n=788)	Female (n=228)	Male (n=560)	P value
Side effects of AADs	107 (13.6)	33 (14.5)	74 (13.2)	0.724
Thyroid dysfunction	44 (5.6)	11 (4.8)	33 (5.9)	
Liver function test abnormality	14 (1.8)	3 (1.3)	11 (2.0)	
QT prolongation	1 (0.1)	0 (0)	1 (0.2)	
Sinus node dysfunction	35 (4.4)	13 (5.7)	22 (3.9)	
Interstitial pulmonary fibrosis	2 (0.3)	1 (0.4)	1 (0.2)	
Others*	11 (1.4)	5 (2.2)	6 (1.1)	
Duration of AAD use, mo	23.6 ± 23.7	24.1 ± 20.8	23.4 ± 24.8	0.702
Flecainide (%)	256 (31.6)	75 (32.9)	181 (32.3)	0.943
Propafenone (%)	31 (3.8)	10 (4.4)	21 (3.8)	0.830
Pilsicainide (%)	5 (0.6)	1 (0.4)	4 (0.7)	1.000
Amiodarone (%)	269 (34.1)	63 (27.6)	206 (36.8)	0.018
Dronedarone (%)	157 (19.4)	56 (24.6)	101 (18.0)	0.048
Sotalolol (%)	70 (8.7)	24 (10.5)	46 (8.2)	0.370

AAD, antiarrhythmic drug.

\* Dyspnea, bradycardia, urticarial, edema.

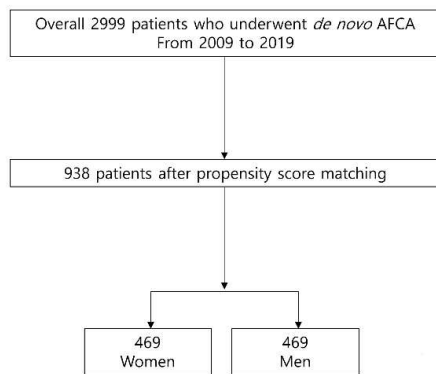
**Supplementary Figure 1. Risk of AF recurrence without AAD according to the sex after the *de novo* AFCA (A) and according to age after *de novo* AFCA (B). AAD, antiarrhythmic drug; AT, atrial tachycardia; AF, atrial fibrillation; AFCA, atrial fibrillation catheter ablation.**

A. Sex-dependent Rhythm outcome off-AAD after *de novo* AFCAB. Age-dependent Rhythm outcome off-AAD after *de novo* AFCA

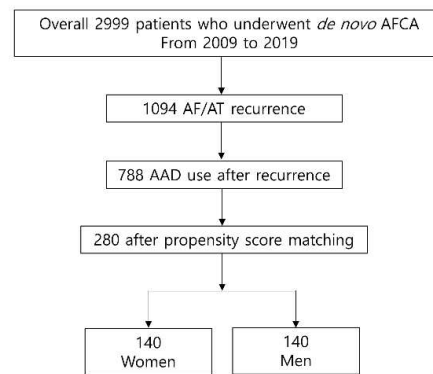


**Supplementary Figure 2. Propensity score matching in each group.** AF, atrial fibrillation; AFCA, atrial fibrillation catheter ablation; AAD, antiarrhythmic drug.

A. *De novo* AFCA

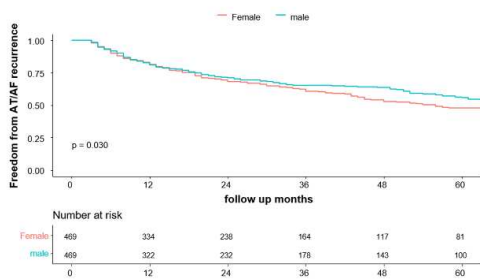


B. AAD use (post-AFCA recurrence)

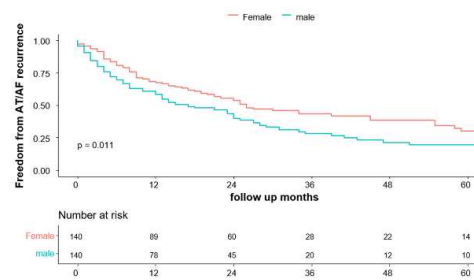


**Supplementary Figure 3. AF recurrence according to the sex after the de novo AFCA (A) and AAD use in patients with AF recurrence after AFCA (B) and according to the age after de novo AFCA. AF, atrial fibrillation; AFCA, atrial fibrillation catheter ablation; AAD, antiarrhythmic drug.**

A. Sex-dependent Rhythm outcome after *de novo* AFCA

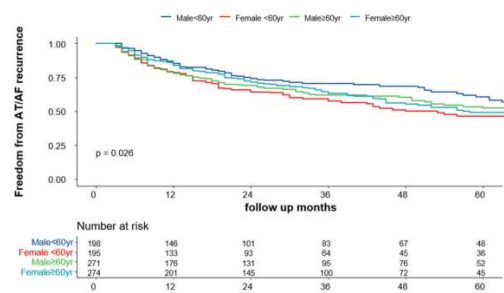


B. Sex-dependent Rhythm outcome after AAD use (post-AFCA recurrence)

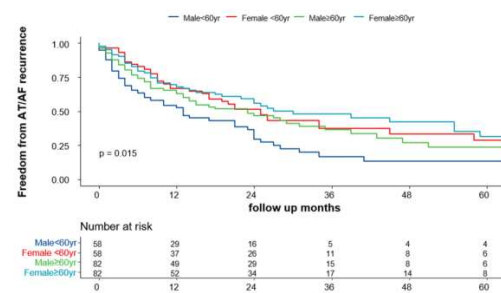


**Supplementary Figure 4. AF recurrence after De novo AFCA (A) and AAD use (B) according to the age and sex.** AF, atrial fibrillation; AFCA, atrial fibrillation catheter ablation; AAD, antiarrhythmic drug.

A. Rhythm outcome after *de novo* AFCA



B. Rhythm outcome after AAD use (post-AFCA recurrence)



**Supplementary Figure 5. Risk of AF recurrence after AAD use according to the sex in the group with Class IC AADs (A) and Class III AADs (B) and the age in the group with Class I AADs (C) and Class III AADs (D). AAD, antiarrhythmic drug; AF, atrial fibrillation.**

