Supplemental Material

Data S1.

Intradevice Leak (IDL) and Peridevice Leak (PDL) assessment on CT scan

LAA Patency was adjudicated by measuring the linear attenuation coefficient (Hounsfield unit, HU) in the LAA distal to the device and comparing contrast density to left atrium (LA). The measurement of HU was performed by positioning the region of interest at the center of LA and in the highest visually estimated contrast density point within the LAA. LAA was considered patent if LAA density ≥ 100 and/or ≥ 25% of that of the left atrium (LA). In the event of LAA patency, at least one of three subtypes (IDL, PDL, patent LAA with no visible leak) was assigned based on the distribution pattern of contrast medium between LAA and LA.

IDL was defined as visible continuity of contrast through the entire length of the device. It was looked for by using reconstructed plane parallel to device long axis (sagittal and coronal views). PDL was assigned when a continuity of contrast between LA and LAA was visible along the side of the device. It was searched for on the lobe margins by using reconstructed plane parallel to device short axis (axial view). In the event of LAA patency without any continuity of contrast between LA and LAA (neither at the sides nor through the lobe), the LAA was defined as patent LAA with no visible leak).

Table S1. Impact of LAA morphology on post implantation landing zone eccentricity and remodeling.

	Chicken wing morphology (n=25)	**Non-chicken wing morphology (n=79)**	**p**
S1 eccentricity	1.07 (1.04-1.09)	1.06 (1.04-1.09)	0.23
S1/ LZ area increase (%)	143 (124-161)	135 (106-161)	0.58
S2 eccentricity	1.06 (1.05-1.12)	1.09 (1.05-1.17)	0.54
	Windsock morphology (n=58)	**Non-windsock morphology (n=46)**	
S1 eccentricity	1.06 (1.04-1.10)	1.06 (1/04-1.08)	0.61
S1/ LZ area increase (%)	133 (104-161)	142 (118-160)	0.15
S2 eccentricity	1.09 (1.05-1.18)	1.08 (1.05-1.12)	0.35
	Cauliflower morphology (n=11)	**Non-cauliflower morphology (n=93)**	
S1 eccentricity	1.05 (1.04-1.07)	1.05 (1.04-1.1)	0.10
S1/ LZ area increase (%)	145 (111-156)	135 (106-161)	0.79
S2 eccentricity	1.09 (1.05-1.14)	1.09 (1.05-1.17)	0.48
	Cactus morphology (n=11)	**Non-cactus morphology (n=93)**	
S1 eccentricity	1.07 (1.05-1.08)	1.06 (1.04-1.10)	0.68
S1/ LZ area increase (%)	130 (114-208)	137 (107-159)	0.43
S2 eccentricity	1.09 (1.05-1.13)	1.08 (1.05-1.17)	0.98

Table S2.LAA characteristics and dimensions in patients with permanent/persistent vs. paroxysmal AF.

	Permanent/ Persistent AF (n=45)	Paroxysmal AF (n=59)	p
Pre implantation CT scan			
LAA length, mm	38.8 (34 -43.3)	39.0 (33.8-41.9)	0.58
Landing zone max diameter, mm	23 (20.5-27.3)	21.1 (18.0-24.3)	0.03
Landing zone min diameter, mm	17.4 (15.4-22.8)	16.5 (14.1-17.7)	0.02
Landing zone eccentricity	1.23 (1.17-1.37)	1.29 (1.18-1.45)	0.14
Landing zone area, mm2	326 (247-490)	287 (193-343)	0.003
Chicken Wing morphology, n(%)	10 (22)	15 (25)	0.71
Windsock morphology, n(%)	29 (65)	29 (49)	0.12
Cauliflower morphology, n(%)	6 (13)	5 (9)	0.53
Cactus morphology, n(%)	0	19 (17)	0.005
WM FLX device, n(%)	25 (56)	31 (53)	0.76
Device diameter, mm	27 (25-31)	27 (24-27)	0.03
Oversized prosthesis, n(%)	12 (27)	25 (42)	0.1
Post implantation CT scan			
Device Section 1 / Landing zone			
Landing zone max diameter, mm	26.2 (23.1-28.5)	24.3 (21.4-26.1)	0.02
Landing zone min diameter, mm	23.7 (21.4-26.9)	22.6 (19.5-24.5)	0.06
S1 plane eccentricity	1.06 (1.04-1.10)	1.06 (1.04-1.08)	0.24
S1/ Landing zone area, mm2	475 (396-608)	429 (314-498)	0.04
Device Section 2			
Max diameter, mm	21.9 (18.9-25.6)	19.6 (16.8-22.0)	0.002
Min diameter, mm	19.3 (16.9-23.2)	17.8 (14.8-21.2)	0.02
S2 plane eccentricity	1.1 (1.05-1.20)	1.08 (1.05-1.13)	0.12
S2 area, mm2	346 (250-451)	275 (201-367)	0.007
LAA patency, n(%)	29 (64)	29 (49)	0.12
Intradevice leak, n(%)	16 (36)	13 (22)	0.13
Peridevice leak, n(%)	18 (40)	21 (36)	0.65
LZ area increase (%)	33.7 (8.3-51.6)	40.5 (5.9-74.6)	0.06
Device maximal compression	28.9 (21.6-39.0)	33.3 (21.7-44.1)	0.24
Device minimal compression	7.8 (1.1-15.9)	8.8 (2.2-18.8)	0.63

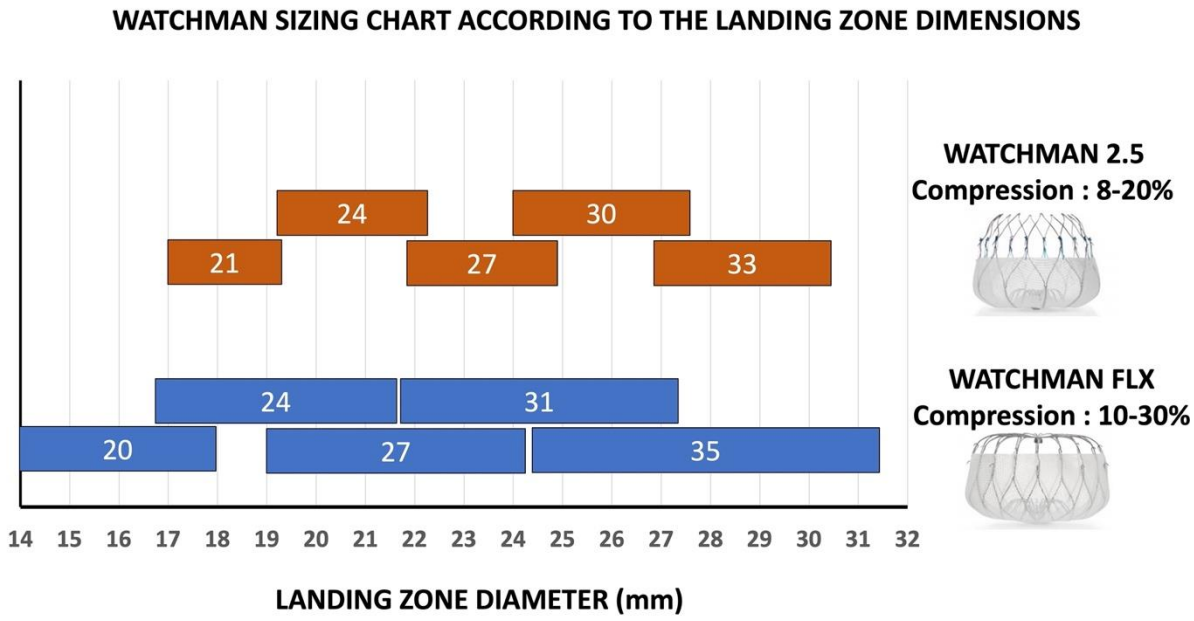
Table S3. Impact of peridevice leaks and residual LAA patency (assessed by CT scan) on post implantation landing zone eccentricity, remodeling and device compression.

	PDL (n=39)	No PDL (n=65)	p
Maximal device compression (%)	30.4 (20.6-43.3)	29.6 (21.9-41.0)	0.62
Minimal device compression (%)	7.0 (0-16.3)	9.1 (2.0-17.3)	0.23
S1 eccentricity	1.07 (1.04-1.11)	1.06 (1.04-1.08)	0.22
S1/ LZ area increase (%)	133 (106-163)	140 (109-157)	0.82
S2 eccentricity	1.10 (1.07-1.20)	1.07 (1.05-1.13)	0.04
	LAA patency on CT scan (n=58)	**No LAA patency on CT scan (n=46)**	**p**
Maximal device compression (%)	29.4 (19.3-41.7)	33.5 (22.5-43.2)	0.33
Minimal device compression (%)	6.5 (0-14.2)	12.6 (3-19)	0.005
S1 eccentricity	1.06 (1.04-1.11)	1.06 (1.04-1.08)	0.24
S1/ LZ area increase (%)	136 (110-171)	142 (105-155)	0.66
S2 eccentricity	1.09 (1.06-1.19)	1.06 (1.04-1.12)	0.02

Table S4. Incidence of peridevice leaks (assessed by CT scan) among the different LAA morphologies.

	PDL (n=39)	No PDL (n=65)	p
Chicken wing morphology, n (%)	8 (20)	17 (26)	0.52
Windsock morphology, n (%)	23 (59)	35 (54)	0.61
Cauliflower morphology, n (%)	4 (11)	7 (11)	**p>0.99**
Cactus morphology, n (%)	4 (10)	6 (9)	**p>0.99**

Figure S1. WATCHMAN sizing charts based on the manufacturer abacus.



This figure illustrates the sizing options for WMFLX or WM2.5 according to the landing zone dimensions and the expected target compression rate (which is higher with WMFLX compared to WM2.5).

In case the LZ maximal diameter ranges from 17 to 27 mm, two potential WMFLW devices can be implanted, as illustrated by the overlaps in the chart: normal or oversized. Hence, a LAA with a landing zone maximal diameter equal to 23 mm could be occluded with a 27 mm (normal size) or 31 mm (oversized) WM FLX.

On the contrary, these overlaps are less frequent in the WM 2.5 chart and the same 23 mm LAA could only be occluded by a 27 mm prosthesis. Thus, most of the anatomy are only accessible to one device type and the options for oversizing are limited.

Figure S2. Flow chart of the study.

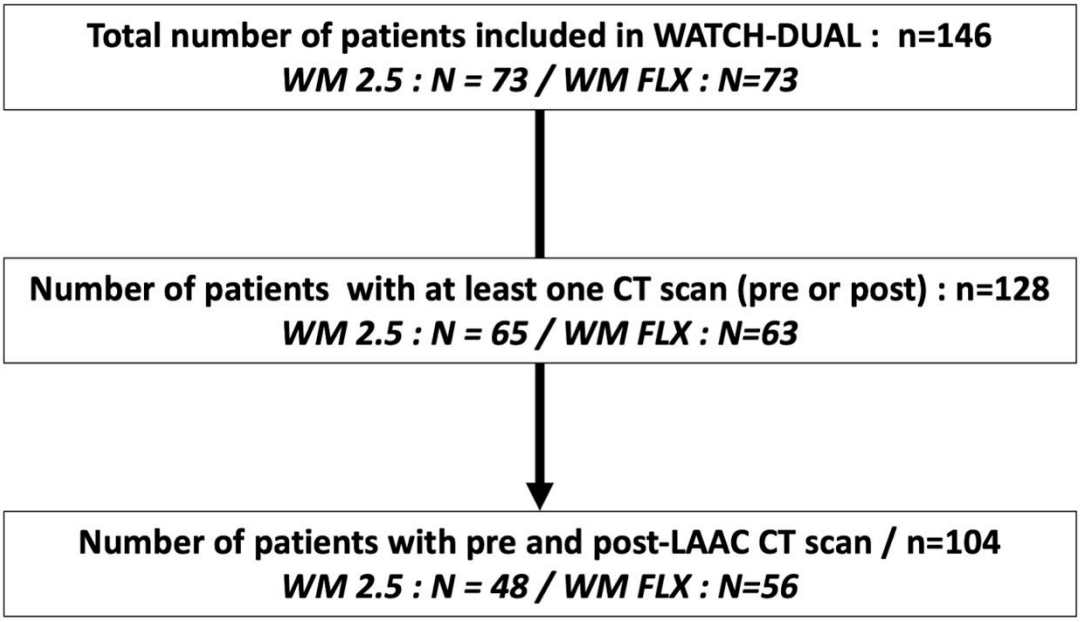
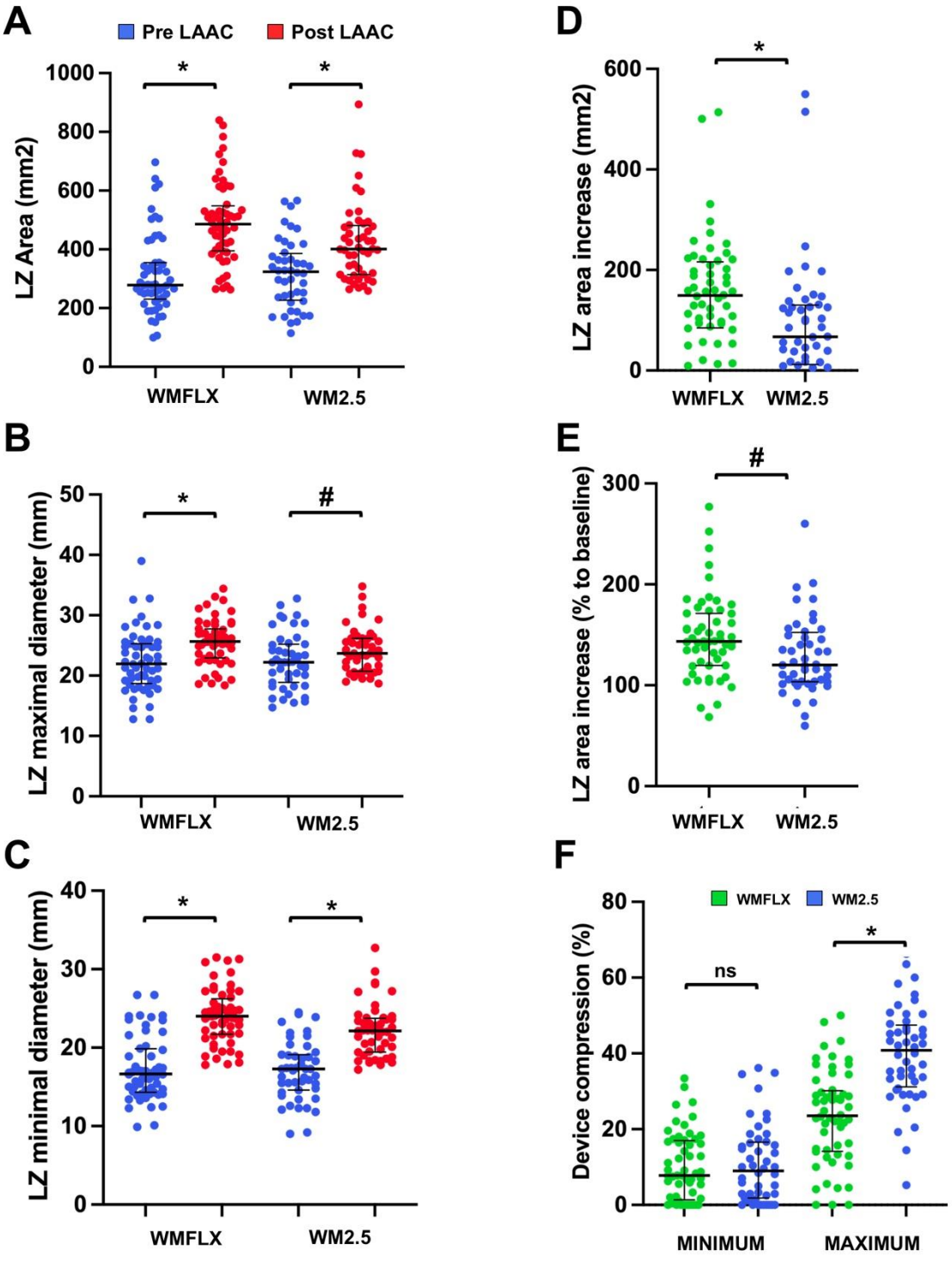
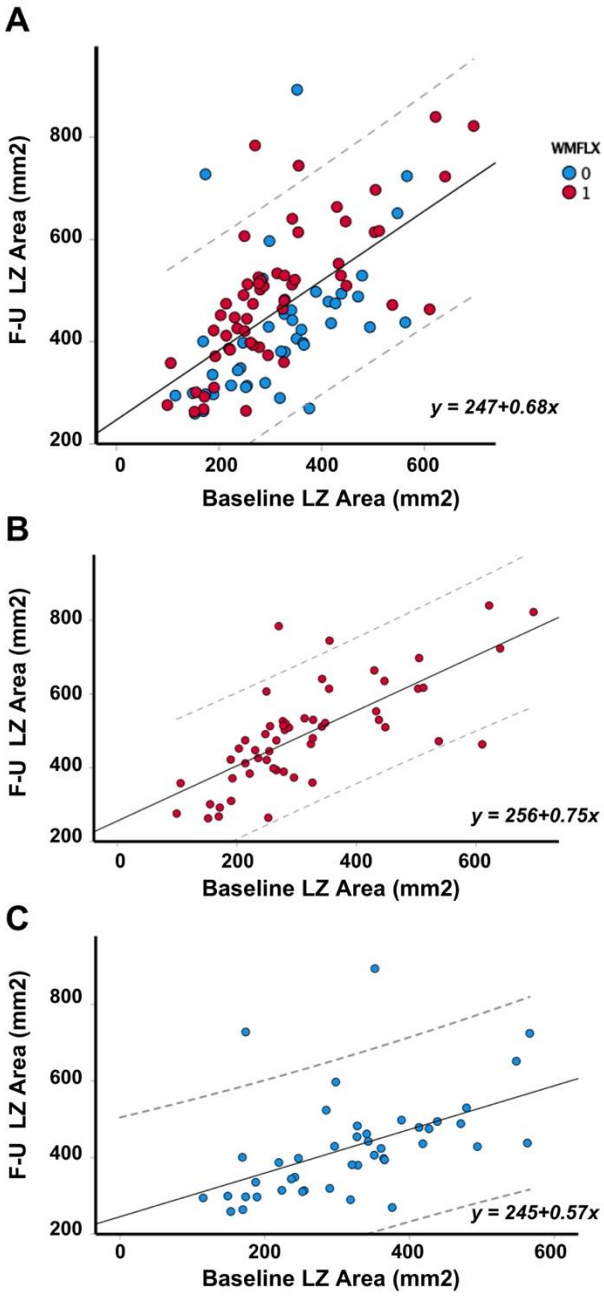


Figure S3. LAA dimensions and device compression rate measured by CT scan before and after LAAC procedure in patients with WMFLX and WM2.5 implantation.



The figure provides the variations of landing zone dimensions (A-E) in the WM2.5 and in WMFLX patients. The minimal and maximal device compression in LAA are provided in panel F. (*: p <0.001; # : p<0.05). Data are expressed as Median (Interquartile Range).

Figure S4. Relationship between LZ area at baseline and at follow-up in patients with WMFLX (panel A) and WM2.5 (panel B).



The linear regression analysis identified that the LZ area enhancement was significantly more pronounced in the WMFLX group compared to the other as the regression coefficient was significantly larger in this group compared to the WM2.5 group (p=0.03 with on way ANCOVA analysis).