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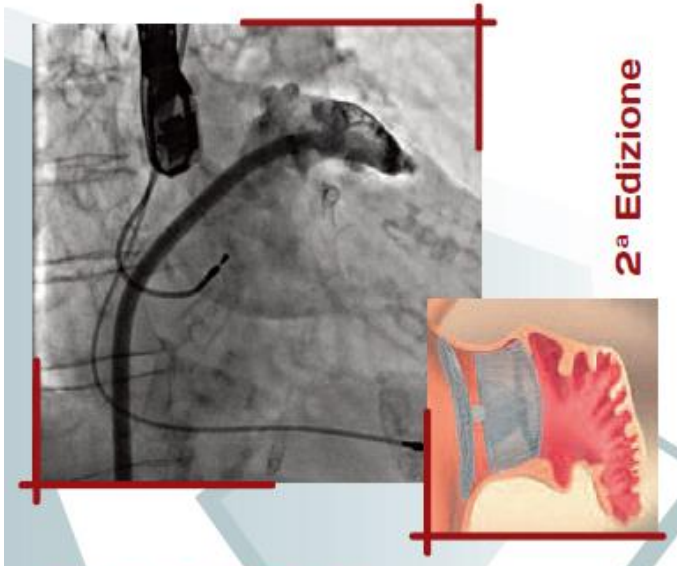

2ª Edizione

CHIUSURA PERCUTANEA DELL' AURICOLA SINISTRA: dalle linee guida alla pratica clinica

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Ospedale San Giovanni Bosco
Torino

Terapia antiaggregante/anticoagulante dopo la chiusura dell'auricola sinistra.

Quale e per quanto tempo?

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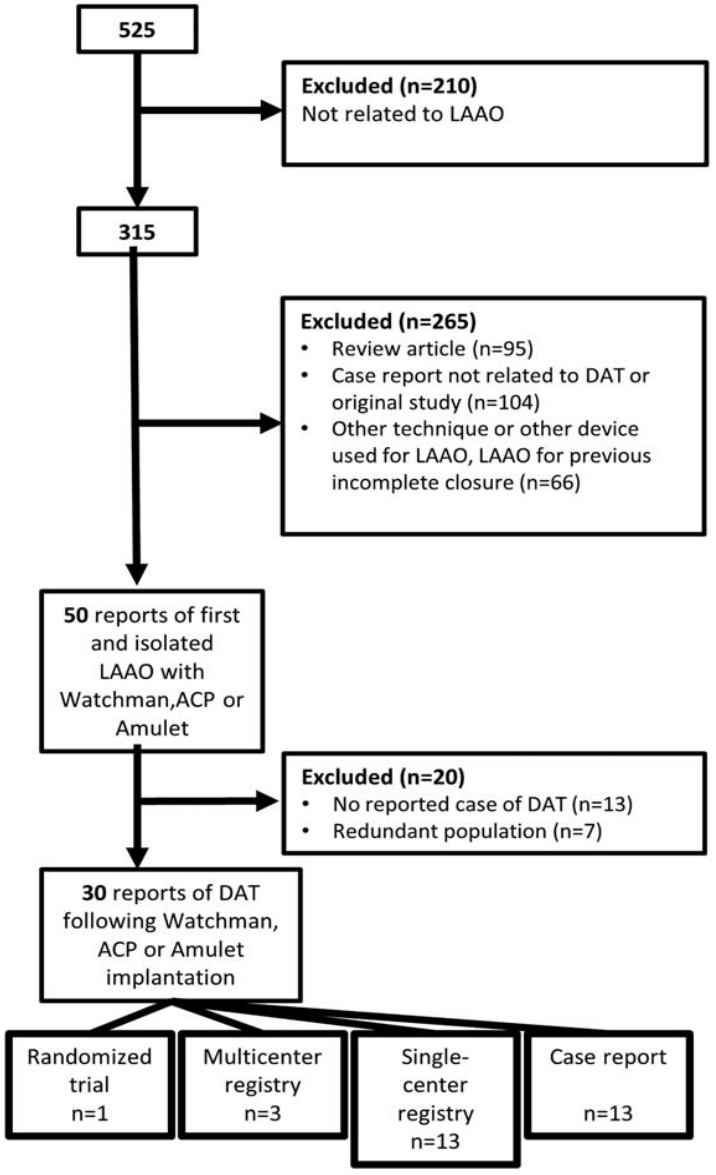
Background

- The development of thrombus on the surface of the LAA occluder is of significant clinical concern.
- Device thrombus might place patients at very high risk of thromboembolic events and require treatment with oral anticoagulation, both sequelae that the LAA closure procedure was designed to avoid in the first place.

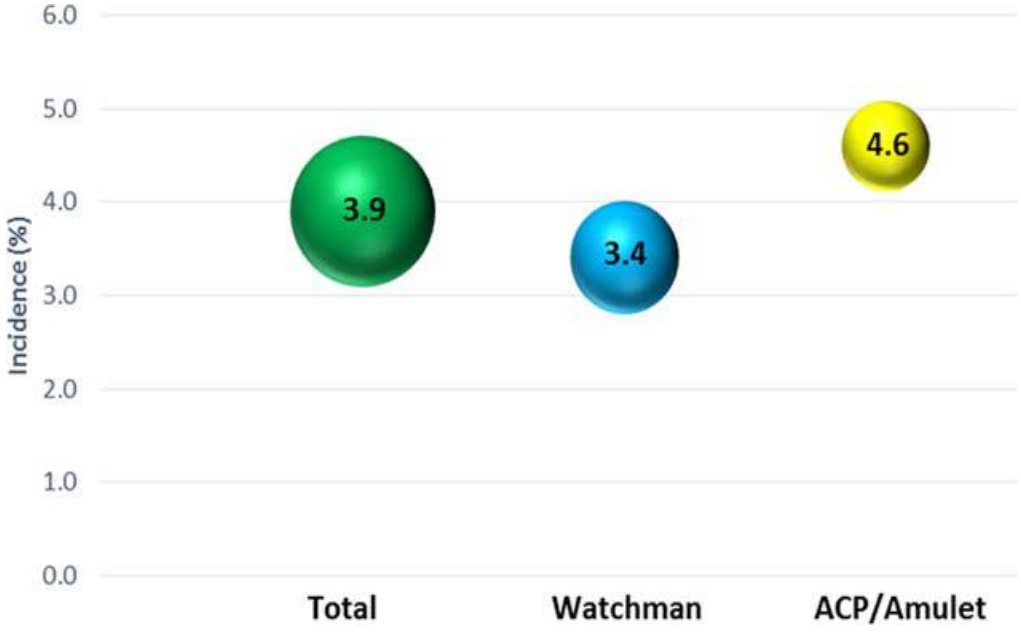
Device Relate Thrombosis after LAAC



30 studies describing DAT were included.

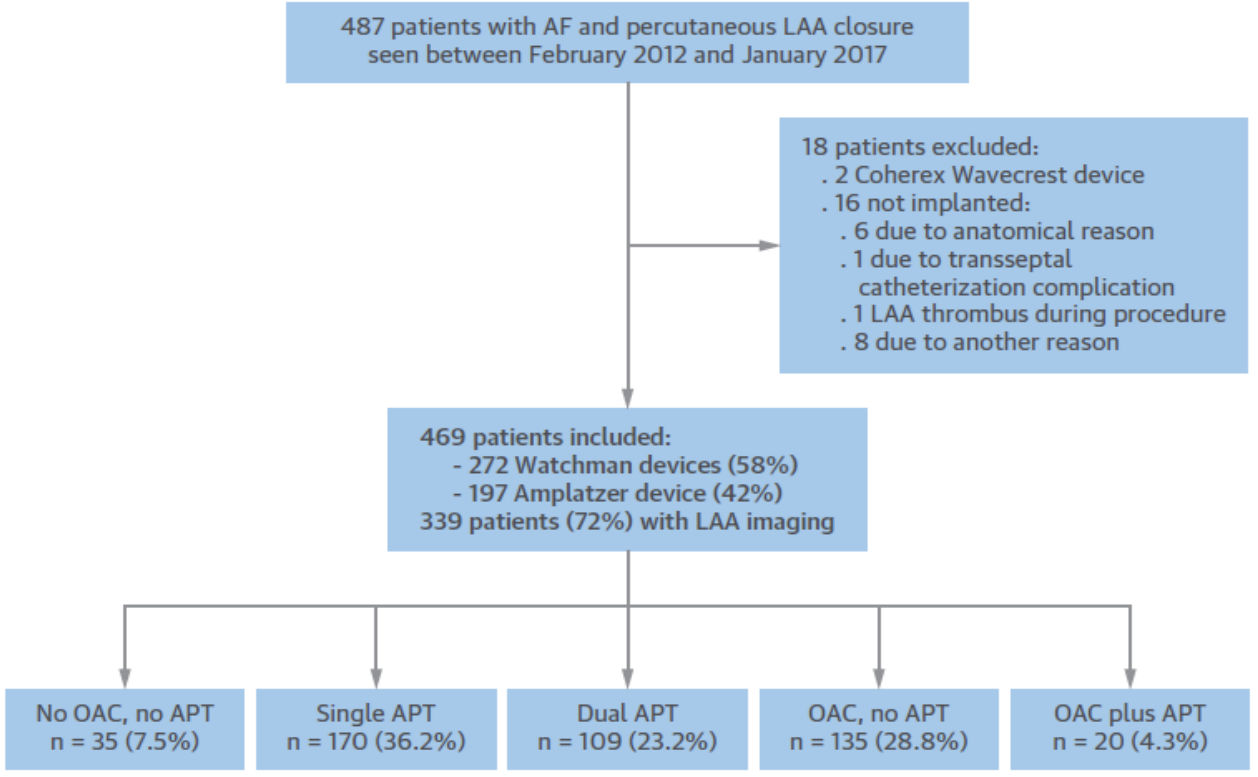
Overall incidence of DAT was 3.9%
(82 DAT for 2118 implanted devices).

The median time from procedure to diagnosis of DAT was 1.5 months (IQR: 0–2.9).



Lampereur et All., CCI 2017

Device-Related Thrombosis After LAAC: RELEXAO Registry

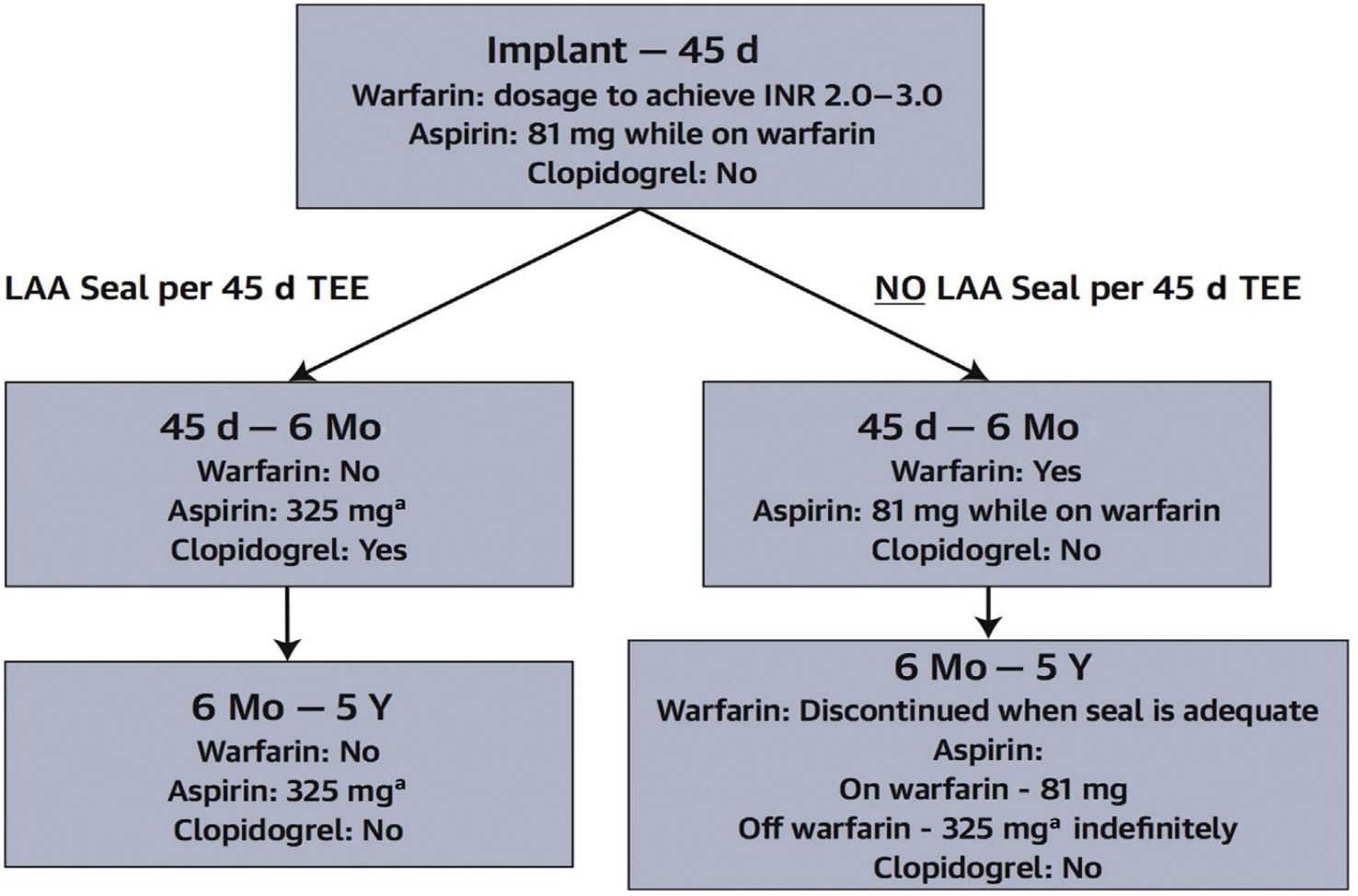


	HR (95% CI)	p Value
Thrombus formation on the device		
Age (per 1-yr increase)	1.07 (1.01–1.14)	0.02
Previous ischemic stroke	3.68 (1.17–11.62)	0.03
CHA_2DS_2-VASc score	0.69 (0.44–1.06)	0.09
APT at discharge	0.35 (0.12–1.04)	0.06
Dual APT at discharge	0.10 (0.01–0.76)	0.03
OAC at discharge	0.26 (0.09–0.77)	0.02
Strokes or TIAs		
Vascular disease	5.03 (1.39–18.23)	0.01
Thrombus on the device	4.39 (1.05–18.43)	0.04
CHA_2DS_2-VASc score	0.71 (0.47–1.06)	0.09
APT at discharge	1.35 (0.20–9.06)	0.75
Dual APT at discharge	0.64 (0.15–2.69)	0.54
OAC at discharge	0.39 (0.06–2.61)	0.33

Thrombus on the device (HR: 4.39; 95% CI: 1.05 to 18.43) was an independent predictor of ischemic strokes and transient ischemic attacks during follow-up.

Fauchier et All., JACC 2018

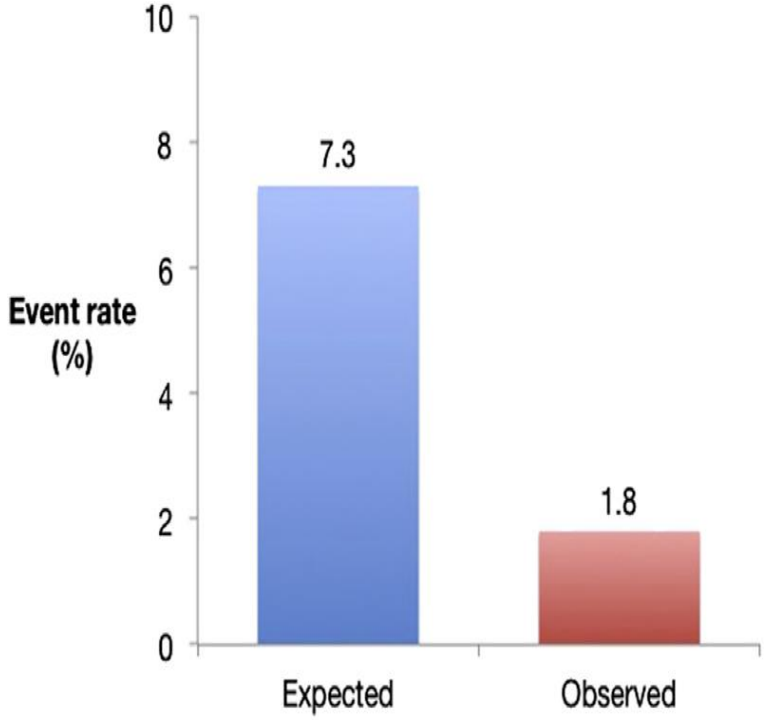
PROTECT-AF and PREVAIL trials



ASAP
(ASA Plavix Feasibility Study with WATCHMAN Left Atrial Appendage Closure Technology)

In ASAP, patients received dual antiplatelet therapy after implant with aspirin and clopidogrel for 6 months, then aspirin monotherapy thereafter.

Procedure and Device-Related Serious Adverse Events (N = 150)	
Device embolization	2 (1.3%)
Pericardial effusion with tamponade (percutaneous drainage)	2 (1.3%)
Pericardial effusion, no tamponade (no intervention required)	3 (2.0%)
Device thrombus with ischemic stroke*	1 (0.7%)
Femoral pseudoaneurysm (surgically repaired)	1 (0.7%)
Femoral hematoma/bleeding	2 (1.3%)
Other†	3 (2.0%)
Total patients with procedure- and device-related SAEs	13 (8.7%)



Safety and efficacy of early anticoagulation drug regimens after WATCHMAN left atrial appendage closure: three-month data from the EWOLUTION prospective, multicentre, monitored international WATCHMAN LAA closure registry

Post-procedural medication regimen.

Anticoagulation status post implant		%
Nothing (N=65)		6.4
Single APT (N=69)		6.9
Dual APT (N=605)		60.2
NOAC (total N=109, full dose N=64)	Dabigatran (N=47, full dose N=32)	10.8
	Rivaroxaban (N=39, full dose N=24)	
	Apixaban (N=23, full dose N=8)	
VKA (N=156)		15.5

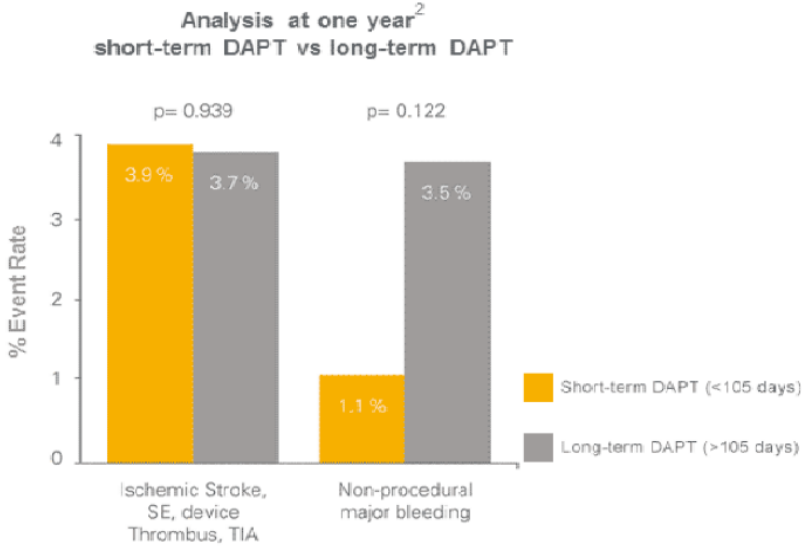
APT: antiplatelet therapy; NOAC: non-vitamin K oral anticoagulants; VKA: vitamin K antagonists

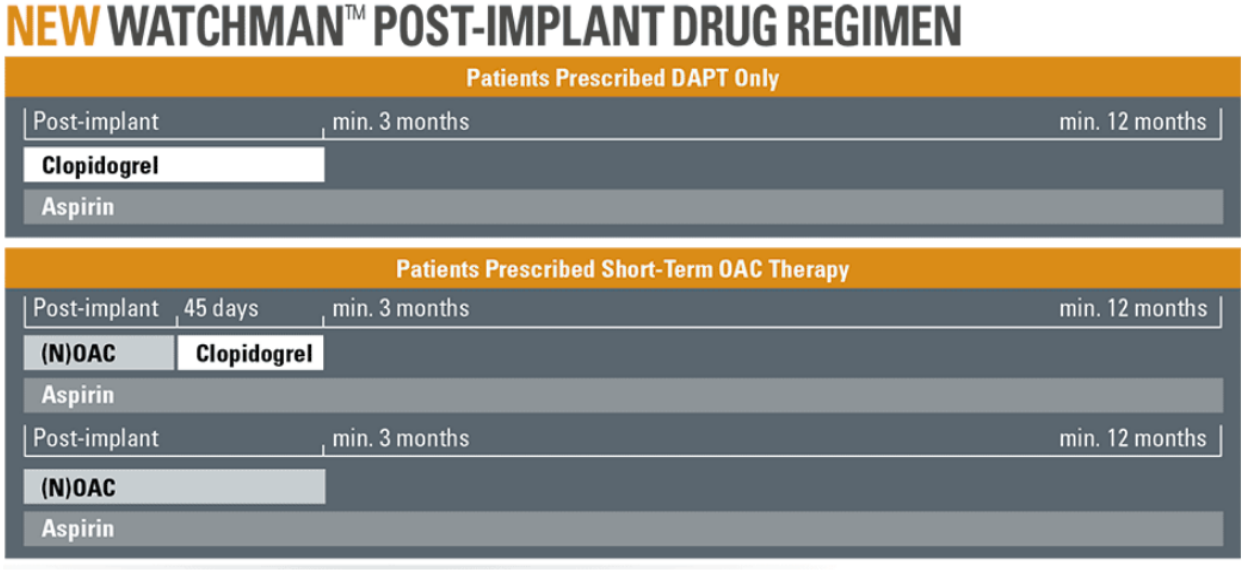
Multivariate Cox proportional hazards model regarding thrombus on the device within 92 days of implant.

	Thrombus on the device within 92 days of implant procedure		Univariate Cox proportional hazards results[1]			Multivariate Cox proportional hazards results[2]		
Characteristic	No	Yes	Hazard ratio	95% CI	*p*-value	Hazard ratio	95% CI	*p*-value*
Post-implant medication status								
NOAC	16.1% (123/765)	5.0% (1/20)	2.053	(0.2748, 15.331)	0.4834	1.0		
None	6.7% (51/765)	5.0% (1/20)	1.256	(0.1682, 9.3838)	0.8240	1.795	(0.1102, 29.263)	0.6811
Single APT	6.7% (51/765)	10.0% (2/20)	0.646	(0.1499, 2.7850)	0.5580	3.265	(0.2913, 36.594)	0.3373
Warfarin	9.8% (75/765)	5.0% (1/20)	3.607	(0.4828, 26.940)	0.2112	0.617	(0.0386, 9.8577)	0.7324
DAPT	60.8% (465/765)	75.0% (15/20)	0.530	(0.1927, 1.4585)	0.2190	2.795	(0.3556, 21.976)	0.3285
Eligible for OAT	27.6% (211/765)	30.0% (6/20)	0.902	(0.3466, 2.3473)	0.8327	0.663	(0.2466, 1.7826)	0.4154

Bergmann et All., EuroIntervention 2017

Safety and efficacy of early anticoagulation drug regimens after WATCHMAN left atrial appendage closure: three-month data from the EWOLUTION prospective, multicentre, monitored international WATCHMAN LAA closure registry





Bergmann et All., EuroIntervention 2017

Left atrial appendage occlusion for stroke prevention in atrial fibrillation: multicentre experience with the AMPLATZER Cardiac Plug

1,053 consecutive patients from 22 centres

Antithrombotic medication	Baseline N=1,047	Last FU N=1,001
ASA	641 (61.2)	845 (84.4)
Clopidogrel	232 (22.2)	242 (24.2)
Warfarin	255 (24.3)	30 (3.0)
Direct OAC	30 (2.9)	14 (1.4)
LMWH	168 (16.0)	2 (0.2)
No treatment	87 (8.3)	60 (6.0)
Unknown	15 (1.4)	19 (1.9)
Therapy details		
ASA	324 (31.0)	638 (63.7)
ASA+clopidogrel	164 (15.7)	189 (18.9)
ASA+warfarin	65 (6.2)	10 (1.0)
ASA+direct OAC	12 (1.1)	6 (0.6)
ASA+LMWH	57 (5.4)	0 (0.0)
Clopidogrel	39 (3.7)	52 (5.2)
Clopidogrel+warfarin	5 (0.5)	0 (0.0)
Clopidogrel+direct OAC	1 (0.1)	0 (0.0)
Warfarin	167 (16.0)	16 (1.6)
Direct OAC	14 (1.3)	10 (1.0)
LMWH	76 (7.3)	2 (0.2)
Triple therapy	20 (1.9)	2 (0.2)
Unknown	15 (1.4)	19 (1.9)

- A total of 632/1,001 of successfully implanted patients with complete clinical follow-up (63%) had a TEE at seven (IQR 3-11) months after the index procedure.
- A thrombus related to the device was observed in 28/632 patients (4.4%)
- No strokes or TIAs occurred in patients with thrombus or incomplete closure at follow-up.

Tsikas et All., EuroIntervention 2015

Incidence and Clinical Impact of Device-Associated Thrombus and Peri-Device Leak Following Left Atrial Appendage Closure With the Amplatzer Cardiac Plug

Baseline antithrombotic	
None	19 (5.6%)
Aspirin	217 (64.0%)
Clopidogrel/prasugrel/ticagrelor	59 (17.4%)
Warfarin	87 (25.7%)
Direct OAC	9 (2.7%)
Heparin	62 (18.3%)

Values are n (%).

Device-associated thrombus was observed in 3.2% of patients; TEE imaging was performed at a mean duration of 165 ± 135 days after LAAC

Predictors of Device-Associated Thrombus

	Univariate Model		Multivariate Model	
	Hazard Ratio (95% CI)	p Value	Hazard Ratio (95% CI)	p Value
Age (yrs)	0.98 (0.91–1.06)	0.592		
Female	3.82 (1.10–13.35)	0.036	4.22 (1.18–15.10)	0.027
BMI (kg/m^2)	0.97 (0.84–1.12)	0.686		
Smoking	4.97 (1.24–20.02)	0.024	5.79 (1.37–24.38)	0.017
Hypertension	2.23 (0.59–8.98)	0.231		
Dyslipidemia	0.54 (0.16–1.82)	0.320		
Diabetes	0.48 (0.14–1.59)	0.228		
CHA_2DS_2-VASc score	1.12 (0.76–1.65)	0.573		
$CHADS_2$ score	0.89 (0.55–1.45)	0.644		
HAS-BLED score	0.96 (0.59–1.58)	0.884		
ACP size	0.96 (0.82–1.13)	0.631		

Of the 11 observed DAT:
7 were treated with dual-antiplatelet therapy, 3 with clopidogrel alone, and 1 with OAC post–LAA closure.

None of these 11 cases resulted in stroke or TIA over a mean follow-up period of 322 ± 141 days.

Saw et All., JACC 2017

Amulet Global Observational Registry

In this prospective registry, 1088 patients were enrolled at 61 sites in Europe, Australia, Israel, Chile, and Hong Kong.

Unlike the patients evaluated in the WATCHMAN research experience, who were eligible for long-term oral anticoagulation, 83% of the patients enrolled in this global registry had contraindications to oral anticoagulation.

Antithrombotic therapy at discharge.

Medication type		
No antithrombotic therapy		2.0%
Single APT	Aspirin	16.0%
	Clopidogrel or another antiplatelet	7.0%
DAPT		54.3%
OAC (alone or combined with APT)		18.9%

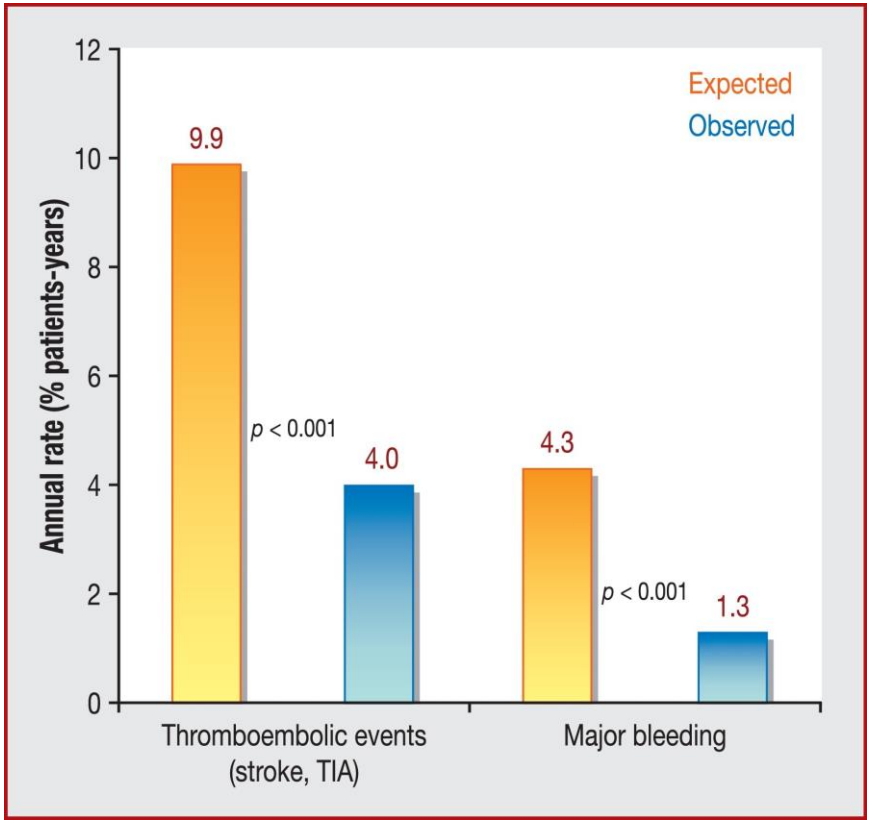
Data are percentages of all patients. APT: antiplatelet therapy; DAPT: dual antiplatelet therapy; OAC: oral anticoagulation

Follow-up TEE imaging was available in 673 patients (62%) at a mean of 2.4 months after implant. Device associated thrombus was identified in 1.5% (10).

Of these 10 patients with device thrombus, three (30%) were on single and three (30%) on dual APT, and four (40%) were on OAC.

Landmesser et All., EuroIntervention 2017

LAAC followed by single antiplatelet therapy: Short- and mid-term outcomes.



76 patients underwent successful LAAC

After a mean follow-up of 13 months, the rates of death, stroke and major bleeding were 2.6%, 4.0% and 1.3%, respectively.

Device thrombosis was observed at 3 months in five (6.8%) patients who remained asymptomatic.

Jalal et All., Archive Cardiovascular Disease 2017

Early antithrombotic therapy discontinuation: our experience

Patients underwent LAAC recruited from 4 different centers in Italy and Switzerland

21 patients (11,9%) discontinued antithrombotic therapy in the first six months after LAAC, or were discharged without any therapy due to their clinical conditions.

Early antithrombotic therapy discontinuation: our experience

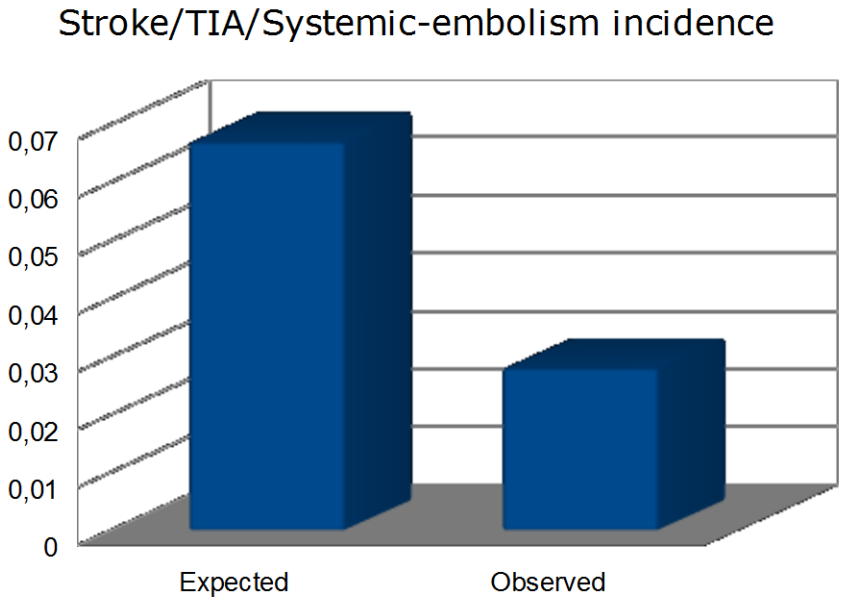
Clinical Featues		
Male Sex		14 (58%)
Age		79,1 ± 8,2
CAD		8 (38%)
CHF		4 (19%)
CKD		1 (4,8%)
Previous Stroke/TIA		4 (19%)
CHADS-VaSC		4,1 ± 0,9
HAS-BLEED		3,3 ± 1
LAAC Indication	ICH	2 (9,6%)
	Gastrointestinal Bleeding	7 (33,3%)
	Other bleeding	3 (14,3)
	Other	9 (42,8)
Antithrombotic therapy at discharge		
DAPT		5 (23,8)
ASA		1 (4,8%)
LMWH		3 (14,3)
No therapy		12 (57,1)

12 patients were discharged after LAAC without any antithrombotic therapy due to their clinical condition and bleeding risk stratification

9 patients discontinued antithrombotic therapy in the first six months of follow-up due to severe bleeding episodes

Early antithrombotic therapy discontinuation: our experience

After a mean follow-up of 20,4 ± 13,3 months



6 patients died:
2 to non-cardiovascular causes;
4 to cardiovascular or unknown-causes.
All this patients were discharged without any therapy.

No deviced associated thrombosis were identified at the TEE follow-up

A 58% reduction of stroke/TIA/systemic-embolism patient-year rate expected by the CHADS-VaSC score was observed

Take home messages

Device associated thrombosis in many study does not strictly correlate with clinical events

Best antithrombotic therapy after LAAC is still debated, and literature evidences are limited

Shortened antithombotic regimens could be a safe option in frail patients with very-high bleeding risk


Grazie