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Is atrial fibrillation a marker of poor prognosis in patients with hypertrophic cardiomyopathy?

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Atrial fibrillation (AF) in HCM patients

- Common arrhythmia in HCM patients
- Higher prevalence than in common population (20 %)[1]
- Mechanism – hemodynamic changes[2]
  - Diastolic dysfuntion
  - Left ventricular outflow tract obstruction (LVOTO)
  - Mitral regurgitation

1) ROWIN, Ethan J., et al. Clinical profile and consequences of atrial fibrillation in hypertrophic cardiomyopathy. *Circulation*, 2017, 136.25: 2420-2436.
2) FALASCONI, Giulio, et al. Atrial fibrillation in hypertrophic cardiomyopathy: pathophysiology, diagnosis and management. *American journal of cardiovascular disease*, 2020, 10.4: 409.

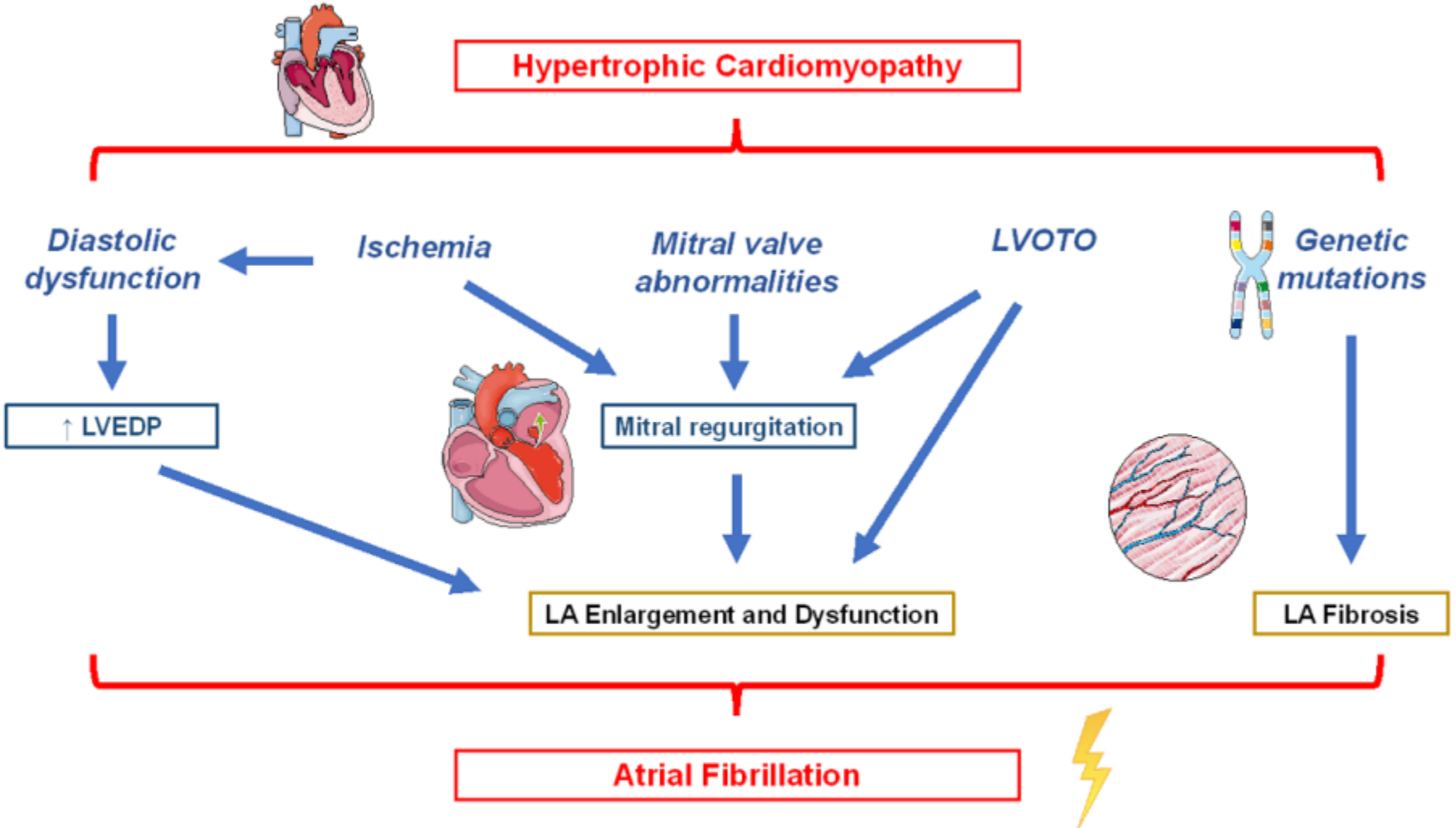
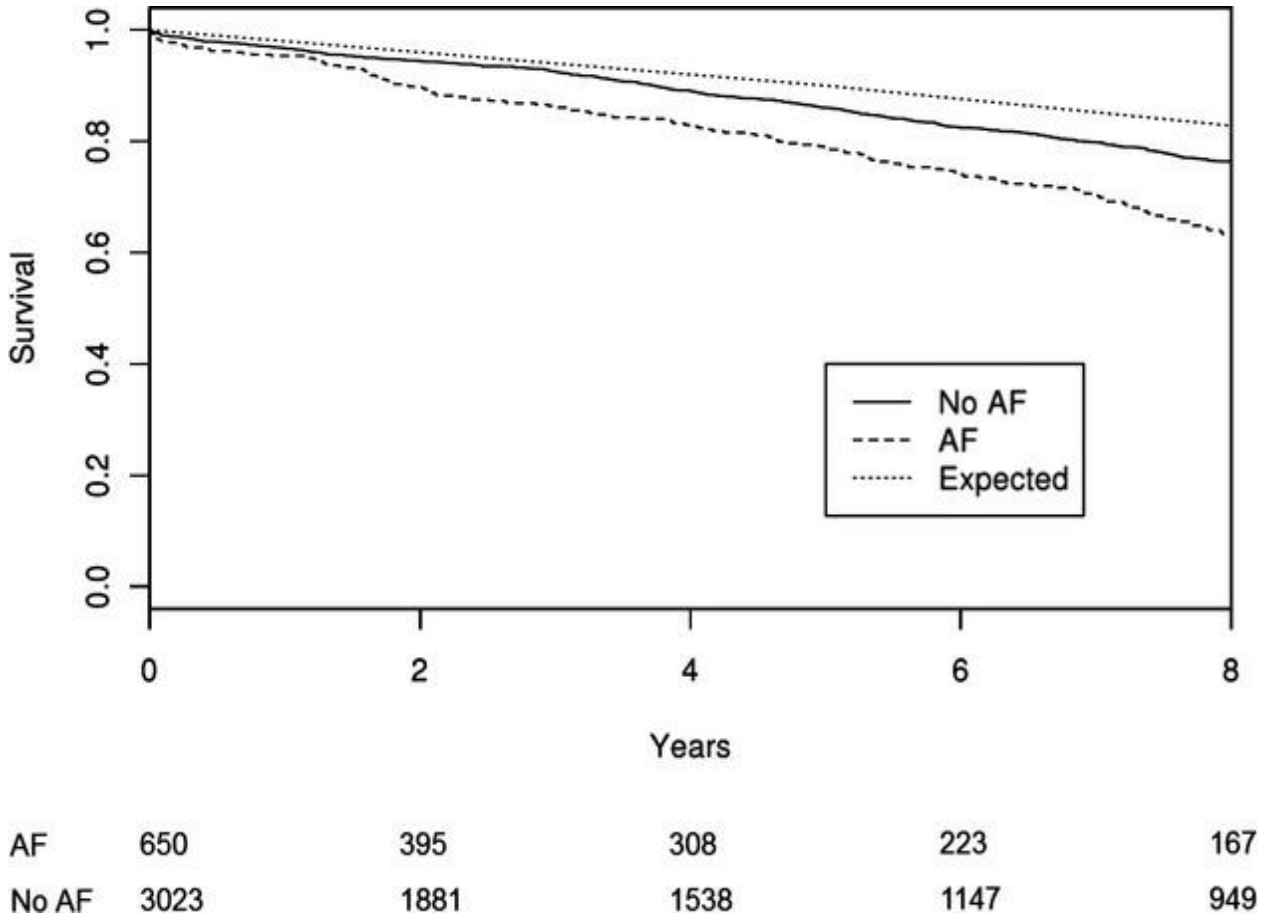


Figure 1. Pathophysiology of atrial fibrillation in hypertrophic cardiomyopathy. LA = Left Atrium; LVEDP = Left Ventricular End-Diastolic Pressure; LVOTO = Left Ventricular Outflow Tract Obstruction.

Falasconi G et al., American Journal of Cardiovascular Disease, 2020

Background

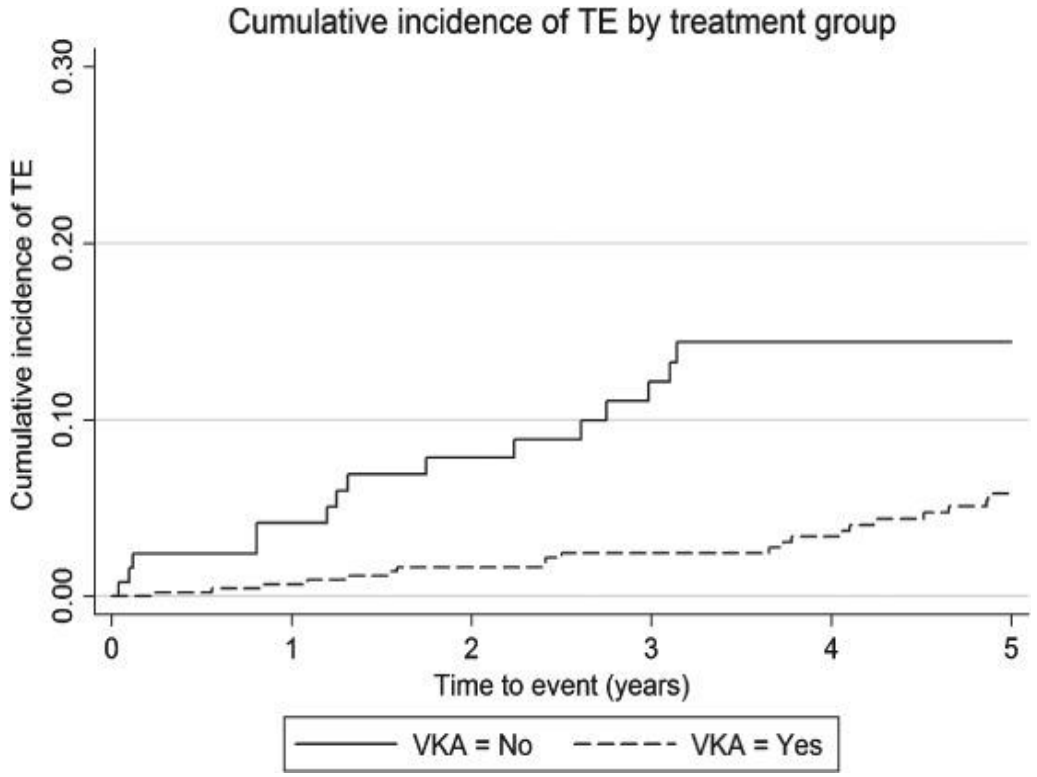
- AF and mortality in HCM pts
  - 3673 patients
  - Median follow-up 4,1 years
  - 1069 patients died
- HR 1,45 (95% CI 1,24-1,69)



SIONTIS, Konstantinos C., et al. Atrial fibrillation in hypertrophic cardiomyopathy: prevalence, clinical correlations, and mortality in a large high-risk population. *Journal of the American Heart Association*, 2014, 3.3: e001002.

Background

- Risk of thromboembolic events (TE)
  - CHA2DS2-VASc score does not correlate with risk of TE



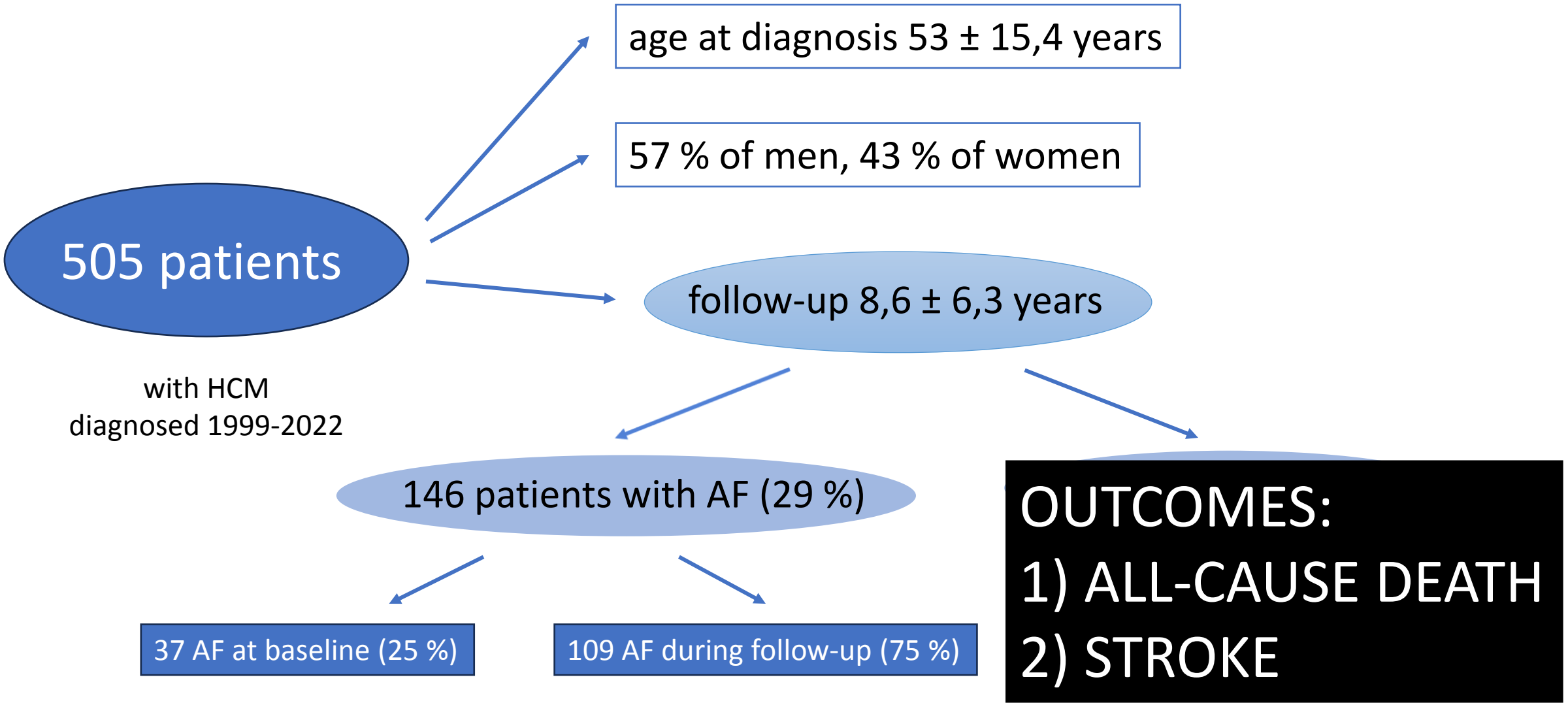
HR 0.41; 95% CI 0.22–0.76

GUTTMANN, Oliver P., et al. Prediction of thrombo-embolic risk in patients with hypertrophic cardiomyopathy (HCM Risk-CVA). *European journal of heart failure*, 2015, 17.8: 837-845.

Objective

- IS AF A MARKER OF POOR PROGNOSIS IN HCM PATIENTS?

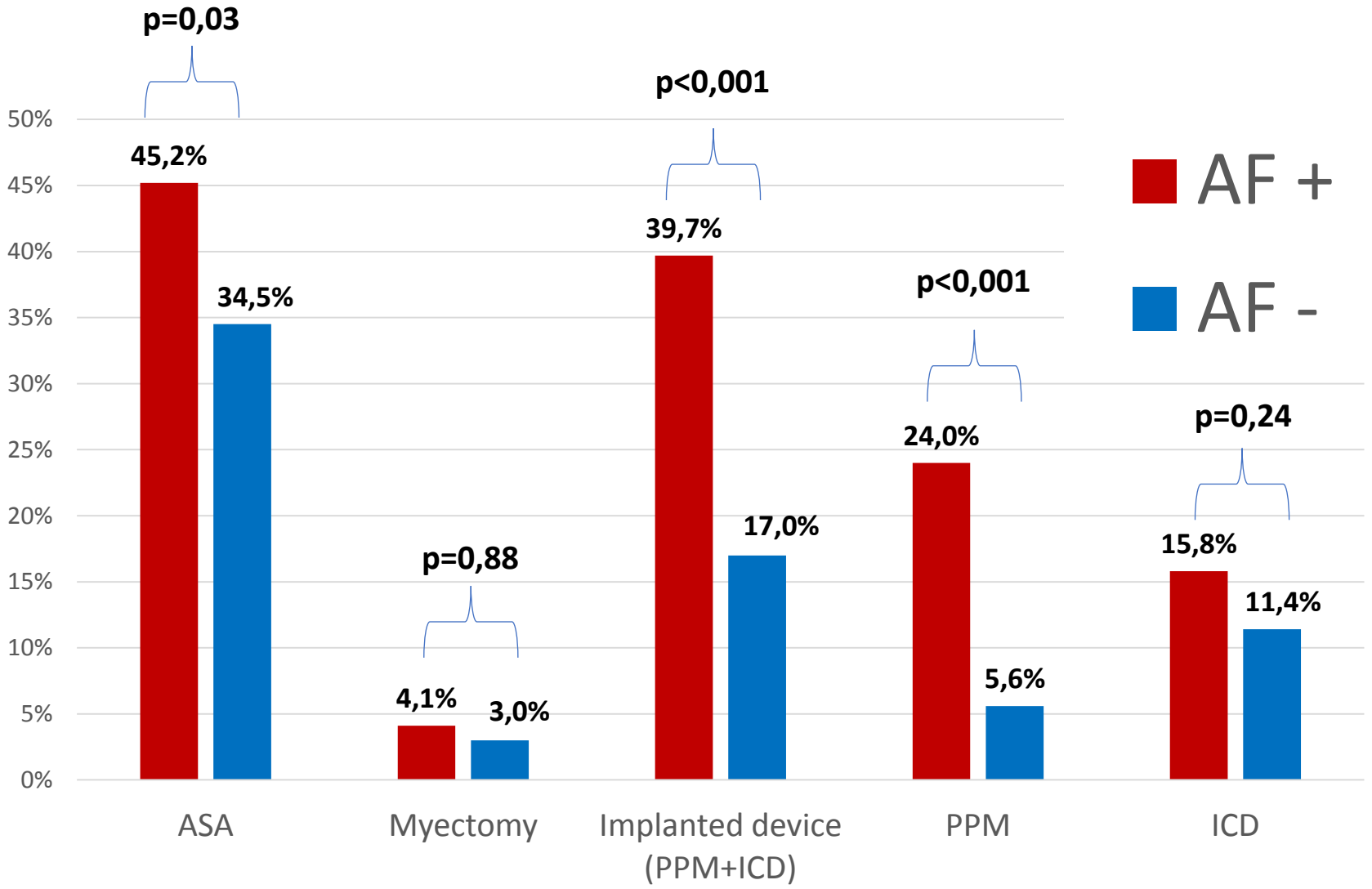
Methods

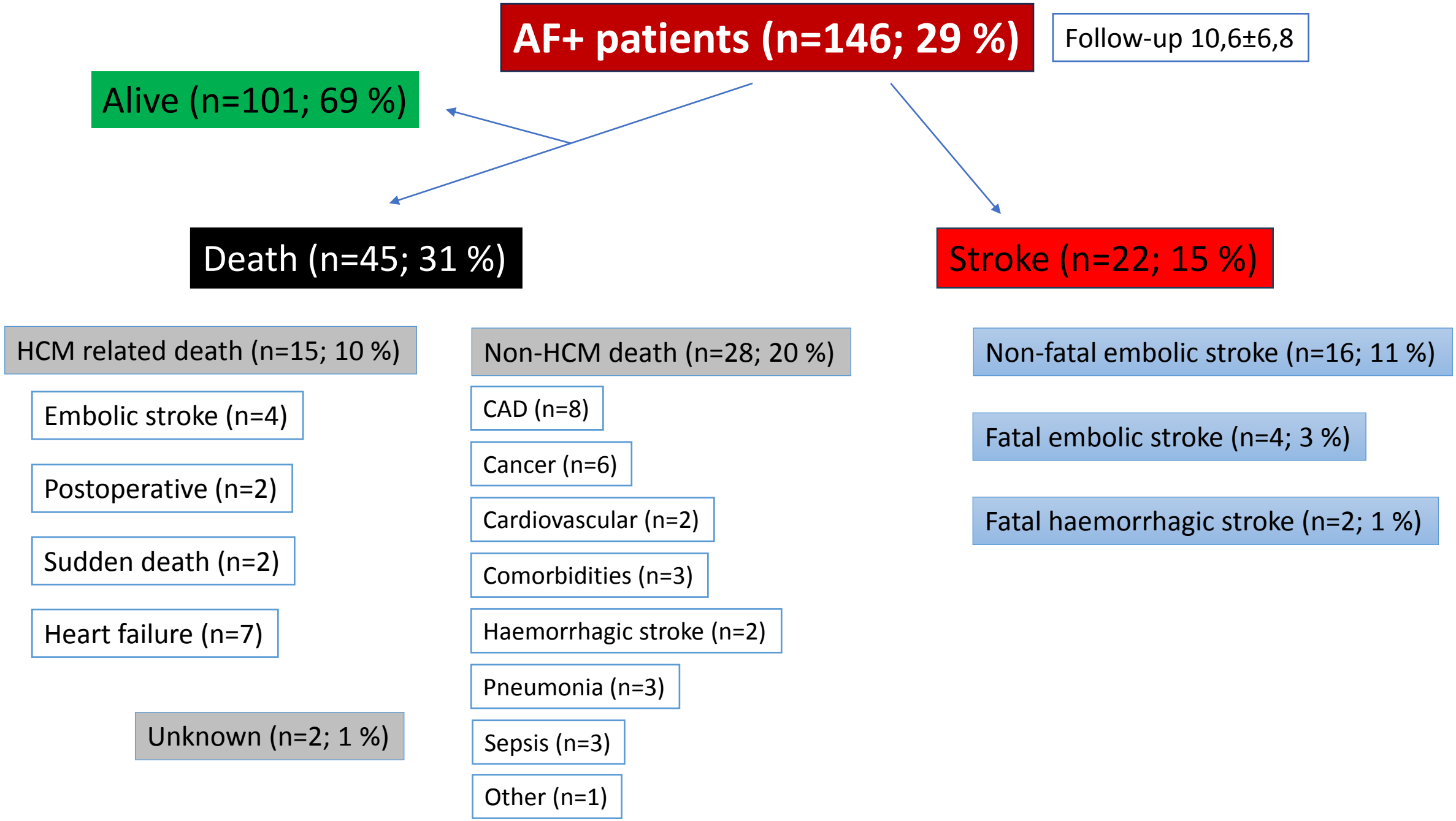

age at diagnosis 53 ± 15,4 years
57 % of men, 43 % of women
505 patients
with HCM
diagnosed 1999-2022
follow-up 8,6 ± 6,3 years
146 patients with AF (29 %)
37 AF at baseline (25 %)
109 AF during follow-up (75 %)
OUTCOMES:
1) ALL-CAUSE DEATH
2) STROKE

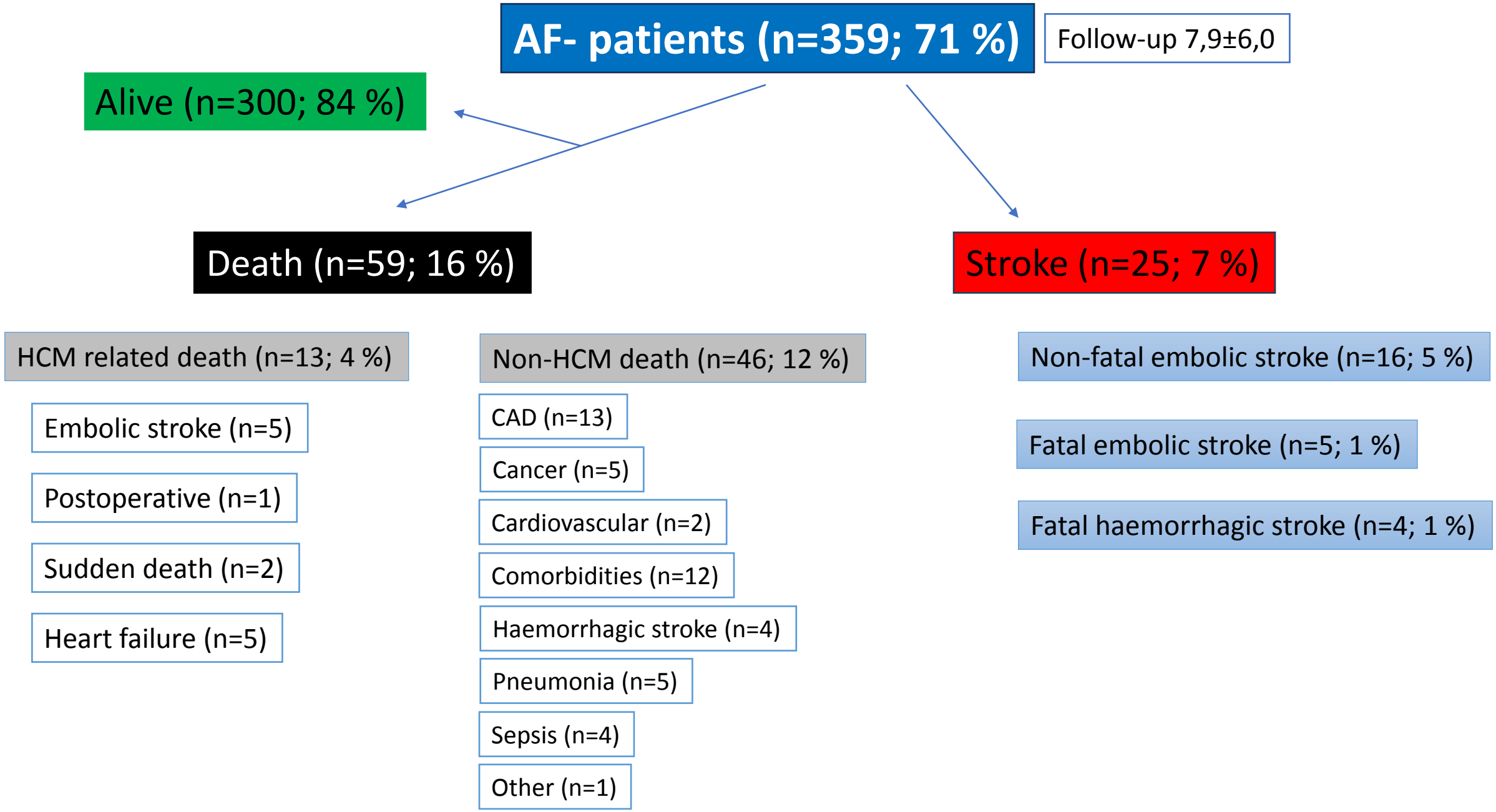
Baseline characteristics

	All (n=505)	AF + (n=146)	AF- (n=359)	p-value
Male sex	**288 (57 %)**	**73 (50 %)**	**215 (60 %)**	**p=0,053**
Age at diagnosis	**53±16**	**57±14**	**52±16**	**p<0,001**
Follow-up	**8,7±6,3**	**10,6±6,8**	**7,9±6,0**	**p<0,001**
ESC score at baseline	2,3±1,8 %	2,4±2,3 %	2,2±1,5 %	p=0,42
NYHA baseline	**2,2±0,7**	**2,4±0,8**	**2,1±0,7**	**p<0,001**
Arterial hypertension	174 (35 %)	58 (40 %)	116 (32 %)	p=0,14
Diabetes	37 (7 %)	11 (8 %)	26 (7 %)	p=0,94
CAD	30 (6 %)	11 (8 %)	19 (5 %)	p=0,45
MLVWT	19±5	19±5	19±5	p=0,5
LVEF	72±10	72±10	72±10	p=0,79
LVOTO (>30 mmHg)	**240 (48 %)**	**81 (56 %)**	**159 (44 %)**	**p=0,03**
LA diameter	**46±6**	**48±5**	**46±6**	**p<0,001**

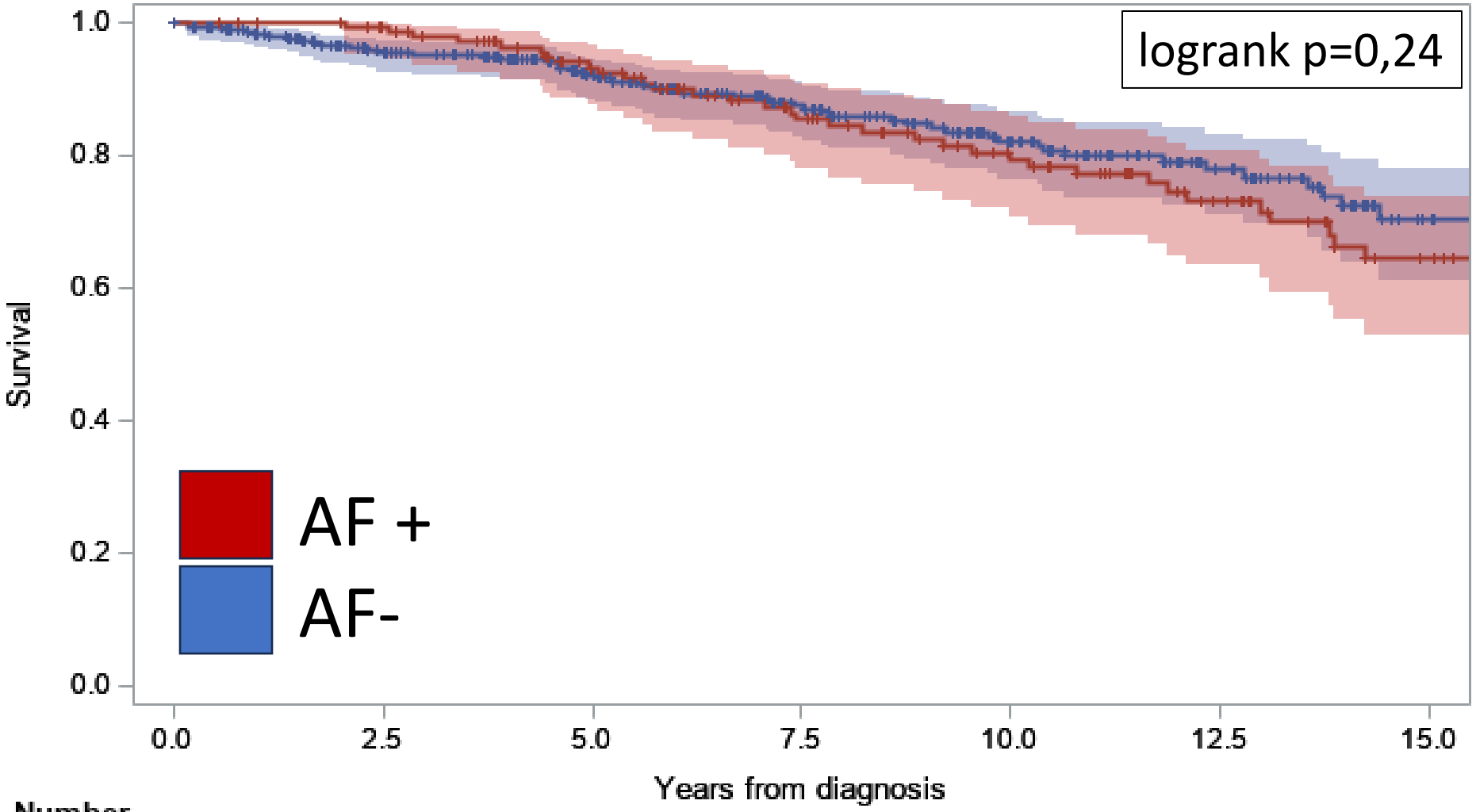
Interventions during follow-up




AF+ patients (n=146; 29 %)
Follow-up 10,6±6,8
Alive (n=101; 69 %)
Death (n=45; 31 %)
Stroke (n=22; 15 %)
HCM related death (n=15; 10 %)
Embolic stroke (n=4)
Postoperative (n=2)
Sudden death (n=2)
Heart failure (n=7)
Unknown (n=2; 1 %)
Non-HCM death (n=28; 20 %)
CAD (n=8)
Cancer (n=6)
Cardiovascular (n=2)
Comorbidities (n=3)
Haemorrhagic stroke (n=2)
Pneumonia (n=3)
Sepsis (n=3)
Other (n=1)
Non-fatal embolic stroke (n=16; 11 %)
Fatal embolic stroke (n=4; 3 %)
Fatal haemorrhagic stroke (n=2; 1 %)


AF- patients (n=359; 71 %)
Follow-up 7,9±6,0
Alive (n=300; 84 %)
Death (n=59; 16 %)
Stroke (n=25; 7 %)
HCM related death (n=13; 4 %)
Embolic stroke (n=5)
Postoperative (n=1)
Sudden death (n=2)
Heart failure (n=5)
Non-HCM death (n=46; 12 %)
CAD (n=13)
Cancer (n=5)
Cardiovascular (n=2)
Comorbidities (n=12)
Haemorrhagic stroke (n=4)
Pneumonia (n=5)
Sepsis (n=4)
Other (n=1)
Non-fatal embolic stroke (n=16; 5 %)
Fatal embolic stroke (n=5; 1 %)
Fatal haemorrhagic stroke (n=4; 1 %)

All-cause mortality

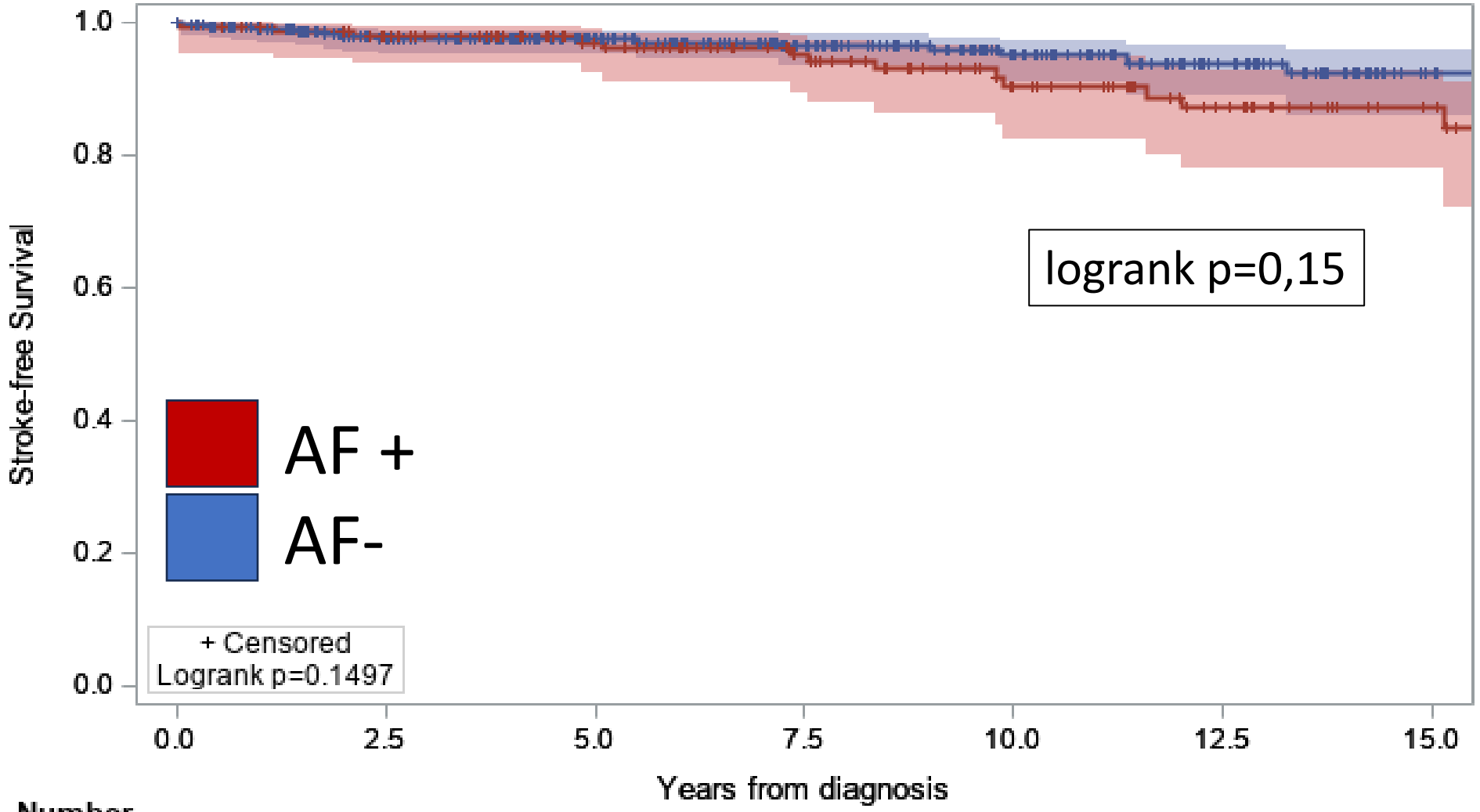


All-cause mortality

MV analysis

Risk factor	Hazard ratio	95% confidence interval		P-value
Atrial fibrillation	1,372	0,904	2,081	0,13
Age at diagnosis	**1,103**	**1,080**	**1,126**	**<0,001**
Max. LV thickness	**1,081**	**1,041**	**1,122**	**<0,001**
Female sex	1,275	0,835	1,948	0,26
Arterial hypertension	0,770	0,500	1,187	0,24
Diabetes	1,622	0,790	3,330	0,19
CAD	0,667	0,351	1,269	0,22

Stroke


1.0
0.8
0.6
0.4
0.2
0.0
Stroke-free Survival
logrank p=0,15
AF +
AF-
+ Censored
Logrank p=0.1497
0.0
2.5
5.0
7.5
10.0
12.5
15.0
Years from diagnosis
Number at Risk
Presence of Fibrilation
0
1
0 355 220 117 28
1 147 111 68 30

Stroke

MV analysis

Risk factor	Hazard ratio	95% confidence interval		P-value
Age at diagnosis	**1,045**	**1,007**	**1,084**	**0,02**
Atrial fibrillation	0,695	0,317	1,524	0,36
LA diameter	0,951	0,883	1,023	0,18
CHA2DS2-VASc score (low vs. high risk)	0,290	0,034	2,451	0,26

Conclusion

- Contemporary treated **HCM patients with AF have similar all-cause mortality and incidence of stroke like patients without AF**.
- Age at diagnosis and MLVWT are independent risk factors for all-cause mortality.
- Age at diagnosis is the only independent predictor of stroke.

Thank you for your attention

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