Prediction of Sinus Rhythm Maintenance Using Clinical Parameters Following Atrial Fibrillation Ablation With Pulsed-Field and Radiofrequency Energy

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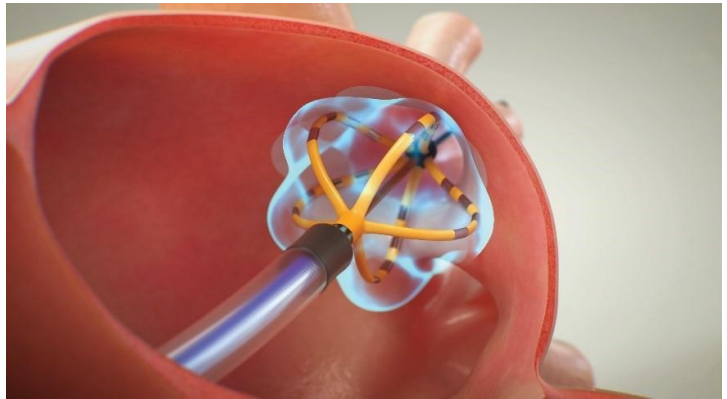
Background & Aim

- PFA and RFA are both effective for AF ablation
- Predictors of sinus rhythm (SR) maintenance remain unclear.
- **Aim:** Identify baseline clinical predictors of 12-month SR maintenance after AF ablation using PFA and RFA

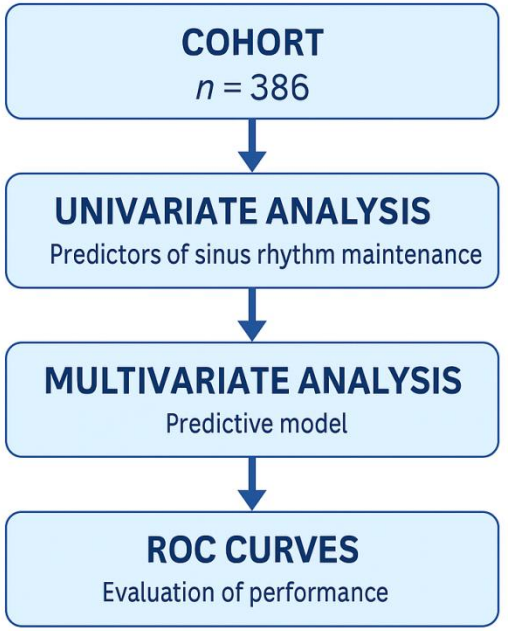
Methods I

- Single center, non-randomized, cohort study.
- All consecutive patients were enrolled
- 386 patients: 260 PFA, 126 RFA.
- Paroxysmal AF: Only PVI.
- Non-paroxysmal AF: Posterior wall and MI isthmus in PFA group. In the RF group, additional ablations beyond PVI on the operator‘s discretion.
- 24-hour Holter monitoring and clinical check-up
  3, 6-9 and 12 months after AF ablation
  to assess SR maintenance.



Methods II

- Prospective cohort (n = 386 ; 260 PFA 126 RFA)
- Logistic regression for predictors: age, sex, weight, BMI, IHD, HTN, EF , LA size, AF type, diabetes, ablation type
- Separate models for whole cohort + PFA + RFA

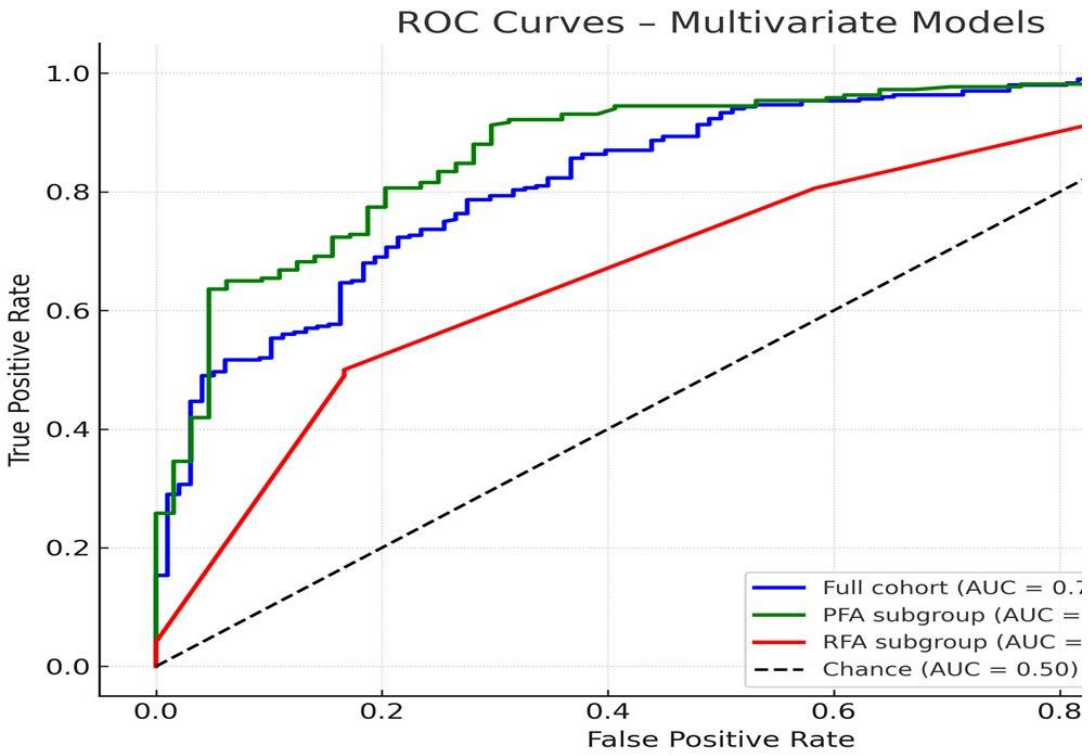


Patient Characteristics

	PFA group 260	RFA group 126	p
Age	63.1± 12.7	65.4 ± 10.7	0.05
Male sex (%)	207 (65.3)	84(72.1)	0.27
Hypertension (%)	212 (66.7)	81 (68.8)	0.99
Diabetes mellitus (%)	57 (18.2)	37 (31.3)	0.26
Body mass index	29.9 ± 4.9	30.3 ± 5.2	0.20
CHA_2DS_2VASc score	2.39 ± 1.68	2.28 ± 1.69	0.79
Paroxysmal AF (%)	159(49.8)	73 (62)	0.03
ECHOcardiography			
LV EF (%)	42.6 ± 4.8	41.2 ± 4.9	0.75
LA size (mm)	41.7 ± 5.8	43.3 ± 5.1	0.25
Medication			
Current AAD use (%)	145 (45.5)	63 (53.1)	0.62

Results

- Whole Cohort (n = 386)
  - ↑ Age → lower SR (OR 0.96; p = 0.007)
  - ↑ Weight → lower SR (OR 0.97; p = 0.003)
  - Persistent AF → lower SR (OR 0.50; p = 0.03)
    Model AUC = 0.73
- PFA Subgroup (n = 260)
  - ↑ Age (OR 0.92; p < 0.001)
  - ↑ Weight (OR 0.96; p < 0.001)
    Model AUC = 0.79 (best performance)
- RFA Subgroup (n = 126)
  - Persistent AF → lower SR (OR 0.41; p = 0.04)
  - Baseline β-blocker use → higher SR (OR 2.98; p = 0.02)
    Model AUC = 0.69



Conclusion and Clinical implementation

- Our analysis confirms that:
  - Sinus rhythm maintenance after ablation is strongly influenced by **age**, **body weight**, and **type of atrial fibrillation**.
  - The **predictive model showed the highest accuracy in the PFA subgroup (AUC = 0.79)**
  - Implementing a **simple clinical scoring system** could improve patient selection and enhance long-term treatment success.


THANK
YOU!