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Temporal Trends and Predictors of Surgical Ablation for Atrial Fibrillation across a Multistate Healthcare System

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Background

- Multiple class I and class IIa recommendations exist related to surgical ablation (SA) for atrial fibrillation (AF) in patients undergoing cardiac surgery^{1,2}
- While the number of patients undergoing SA for AF has increased over time, little data is available about its use since 2014³

Objective

- Examine temporal trends and predictors of SA for AF in a large US healthcare system

Methods

- We retrospectively analyzed data from the Society for Thoracic Surgery Adult Cardiac Surgery Database for 21 hospitals in the Providence Health system
- All patients with preoperative AF who underwent isolated coronary artery bypass graft (CABG) surgery, isolated aortic valve replacement (AVR), AVR with CABG (AVR+CABG), isolated mitral valve repair or replacement (MVRr), and MVRr with CABG (MVRr+CABG) from 7/1/2014 to 3/31/2020 were included
- Temporal trends in SA were evaluated using the Cochran-Armitage trends test
- A multi-level logistic regression model was used to examine specific predictors of SA at the patient-, hospital- (annual surgical and AF catheter ablation volumes), and surgeon- (annual surgical volume and years since training) level

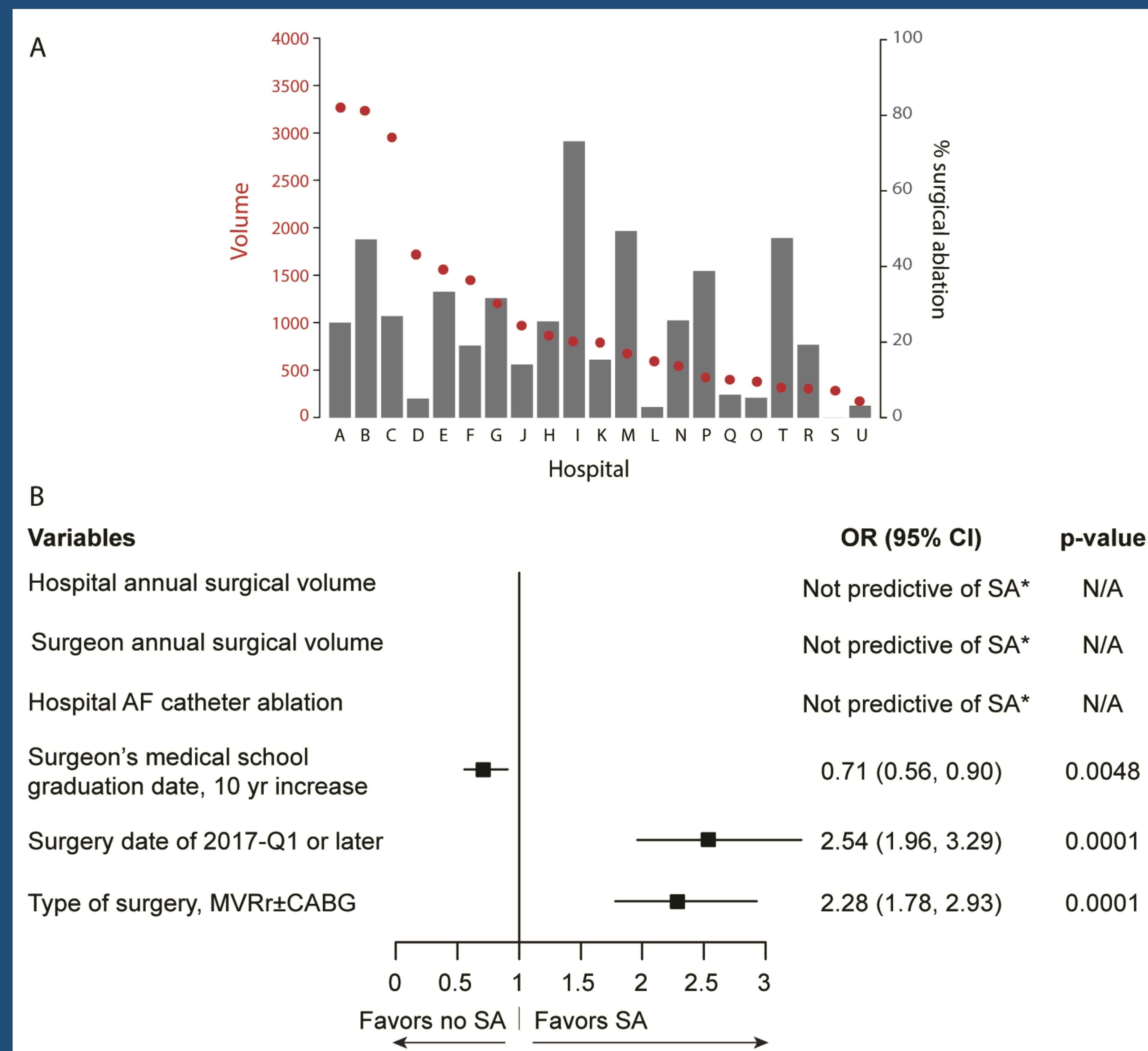
Results

- Among 3,124 patients with preoperative AF, 910 (29%) underwent SA (Table 1)
- The highest rates of SA occurred in patients undergoing isolated MVRr (n=324, 44.8%) and MVRr+CABG (n=75, 35.2%)
- 92% of patients undergoing SA had pulmonary vein isolation, but significant variability was noted in the total number of ablation lesions performed
- Rates of SA for AF increased over time (p<0.0001) (Figure 1), but varied greatly across facilities (Central Figure); in addition, there was no correlation with surgical volume

Wide variability in rates of surgical ablation for atrial fibrillation exist,

highlighting the need for increased collaboration

between cardiologists, electrophysiologists, and cardiac surgeons



(A) Total surgery volume (red markers) and % SA (bars) at individual facilities

(B) Forest plot showing potential predictors of SA tested in the study

*These variables did not reach the significance threshold for inclusion in the final multivariable model

AF = atrial fibrillation, CABG = coronary artery bypass graft, MVRr = mitral valve repair or replacement, Q = quarter, SA = surgical ablation

Results (Continued)

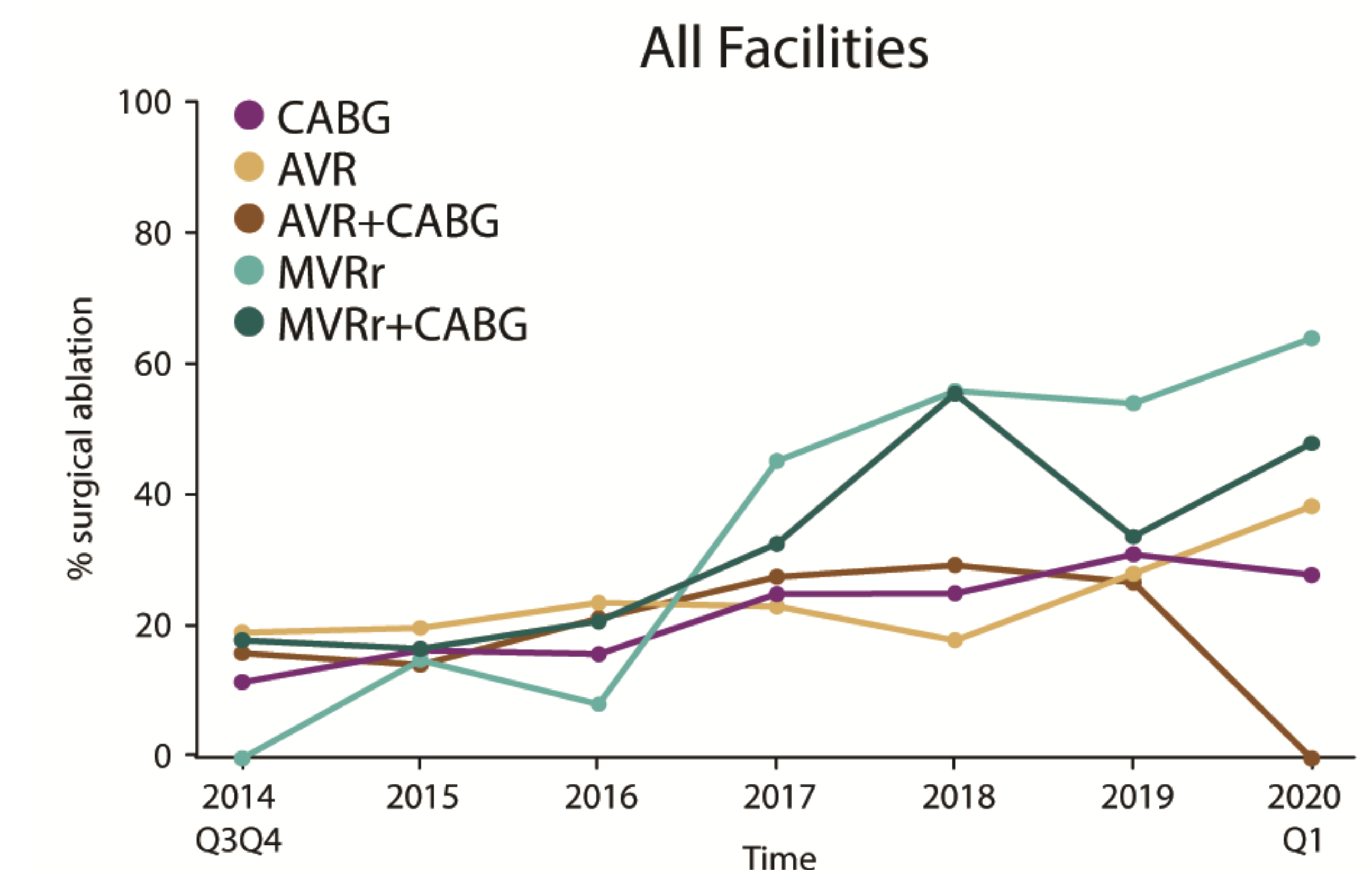
- Predictors of SA include surgeries occurring in 2017-Q1 or later, MVRr±CABG, and fewer years since graduation from medical school for the primary operator (Central Figure)
- Hospital annual surgical volume, AF catheter ablation volume, and operator annual surgical volume were not predictive of SA

Table 1: Patient Demographics

| Variable | All | No SA | SA | p-value |
|--------------------------|-------------|--------------|------------|---------|
| Patients | 3,124 | 2,214 (70.9) | 910 (29.1) | N/A |
| Age, years | 72 [65-78] | 72 [65-78] | 71 [64-76] | 0.0001 |
| Female | 843 (27.0) | 564 (25.5) | 279 (30.7) | 0.003 |
| Race | | | | 0.3275 |
| White | 2743 (90.1) | 1958 (90.8) | 785 (88.3) | |
| Black | 31 (1.0) | 21 (1.0) | 10 (1.1) | |
| Native American | 45 (1.5) | 34 (1.6) | 11 (1.2) | |
| Native Pacific | 23 (0.8) | 14 (0.7) | 9 (1.0) | |
| Asian | 114 (3.7) | 78 (3.6) | 36 (4.1) | |
| Other | 104 (3.4) | 67 (3.1) | 37 (4.2) | |
| CHF | 999 (32.0) | 757 (34.2) | 242 (26.6) | 0.0001 |
| Hypertension | 2637 (84.4) | 1890 (85.4) | 747 (82.1) | 0.0218 |
| Diabetes | 1111 (35.6) | 849 (38.4) | 262 (28.8) | 0.0001 |
| Previous cardiac surgery | 1401 (44.9) | 1048 (47.4) | 353 (38.8) | 0.0001 |
| Previous CABG surgery | 103 (3.3) | 97 (4.4) | 6 (0.7) | 0.0001 |
| Previous valve surgery | 207 (6.6) | 186 (8.4) | 2 (2.3) | 0.0001 |
| Previous PCI | 659 (21.1) | 517 (23.4) | 142 (15.6) | 0.0001 |
| Previous MI | 1112 (35.7) | 866 (39.3) | 246 (27.1) | 0.0001 |

CABG = coronary artery bypass graft, CHF = congestive heart failure, PCI = percutaneous coronary intervention, SA = surgical ablation

Figure 1 – Surgical ablation trends over time



Percent surgical ablation over time for each surgery type for all facilities.

AVR = aortic valve replacement, CABG = coronary artery bypass graft, MVRr = mitral valve repair or replacement

Conclusions

- Rates of SA for AF at the time of cardiac surgery was noted to be highly variable in a large multistate healthcare system
- Clinicians should be encouraged to leverage a multidisciplinary approach to more consistently evaluate which AF patients undergoing cardiac surgery could benefit from SA

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References: 1. January CT, Wann LS, Alpert JS, et al. 2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation. J Am Coll Cardiol. 2014;64:e1-e76. 2. Badhwar V, Rankin JS, Damiano RJ, et al. The Society of Thoracic Surgeons 2017 Clinical Practice Guidelines for the Surgical Treatment of Atrial Fibrillation. Ann Thorac Surg. 2017;103:329-341. 3. Badhwar V, Rankin JS, Ad N, et al. Surgical Ablation of Atrial Fibrillation in the United States: Trends and Propensity Matched Outcomes. Ann Thorac Surg. 2017;104:493-500.

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