

Anticoagulation, recanalization, and complication rates after venous ablation – An analysis of the Vascular Quality Initiative registry

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INTRODUCTION

● Background

- The impact of anticoagulation on outcomes after superficial venous ablation procedures is unclear.
- Single-center studies with small cohorts have suggested post-intervention complication rates after saphenous ablation are unaffected by anticoagulation, with conflicting results on rates of post-intervention recanalization.

● Aims

- In this study, we assess the relationship between anticoagulation and complications, clinical improvement, and recanalization rates.

METHODOLOGY

● Data

- **Data source:** Vascular Quality Initiative registry
- **Cohort:** Patients undergoing thermal or non-thermal venous ablation procedures between January 2015 and December 2018
- **Exposure variable:** Anticoagulation status at time of procedure
- **Primary outcome:** Days of recanalization-free survival
- **Secondary outcomes:**

- Rates of post-operative complications,
- Clinical improvement on the revised Venous Clinical Severity Scale (VCSS)
- Patient-reported symptom improvement on Heaviness-Achiness-Swelling-Throbbing-Itching (HASTI) scale

● Statistical Analysis

- Multivariate logistic regression and Cox proportional hazards models were used to compare outcomes between anticoagulated and non-anticoagulated patients
- Subgroup analysis was performed comparing thermal and non-thermal ablation methods

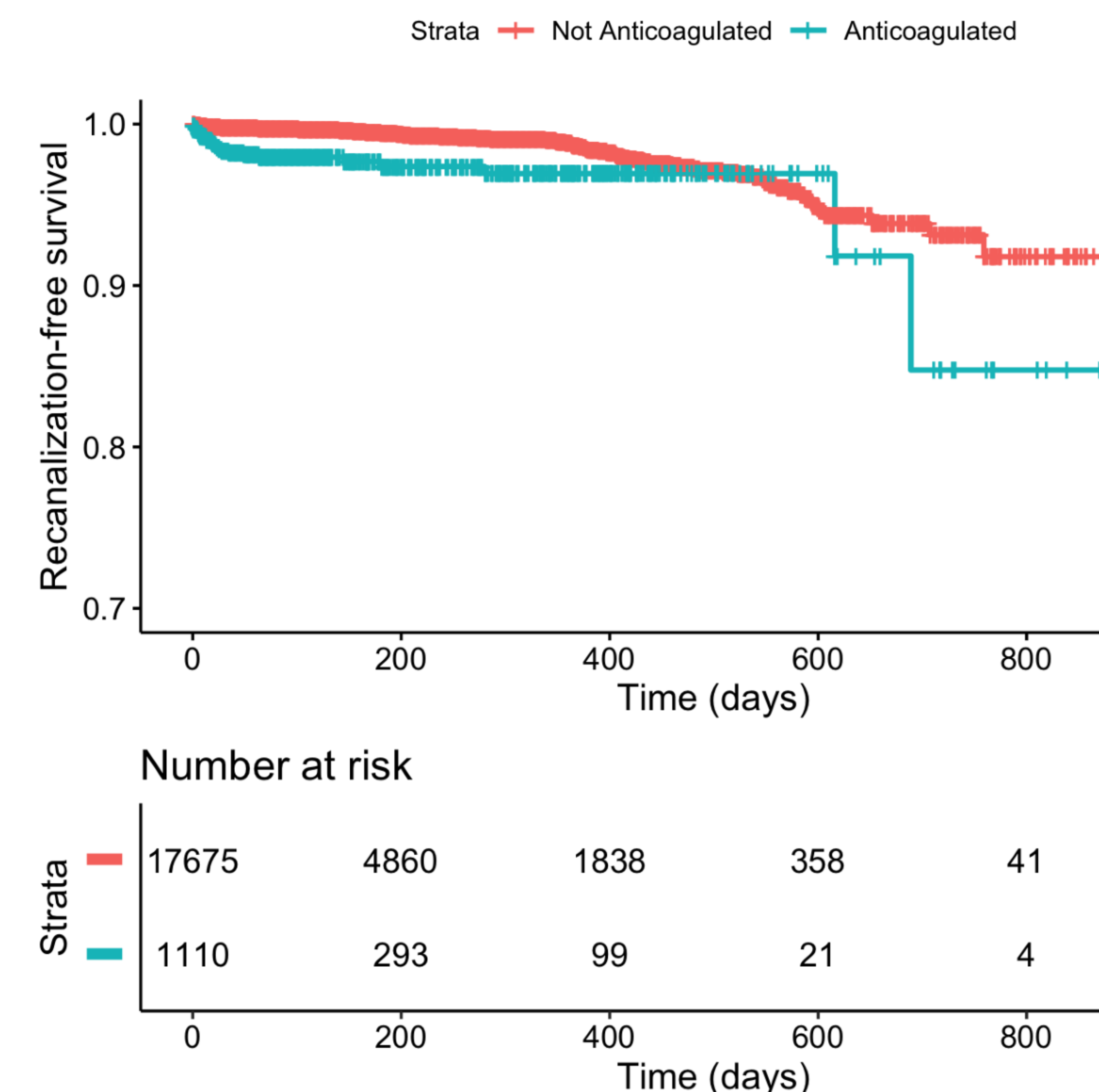


Figure 1. Recanalization-free survival by anticoagulation status.

Table 1. Outcomes by anticoagulation status

	Not Anticoagulated (N=25202)	Anticoagulated (N=1659)	P-value
Immediate post-procedure complication			
Unplanned hospitalization	65 (0.3%)	3 (0.2%)	0.799
90-day Complications			
Hematoma	136 (0.5%)	11 (0.7%)	0.48
Bleeding requiring intervention	11 (0.0%)	2 (0.1%)	0.177
Superficial phlebitis	224 (0.9%)	13 (0.8%)	0.792
Proximal thrombus extension	262 (1.0%)	12 (0.7%)	0.307
DVT in treated leg	133 (0.5%)	11 (0.7%)	0.462
Paresthesias in treated leg	256 (1.0%)	16 (1.0%)	1
Recanalization	126 (0.5%)	24 (1.4%)	<0.001
Clinical Improvement			
VCSS Improved	10101 (40.1%)	688 (41.5%)	0.0175
Mean change in VCSS Score	-3.60 (3.43)	-3.52 (3.90)	0.343
HASTI Score Improved	13276 (52.7%)	790 (47.6%)	<0.001
Mean change in HASTI score	-6.63 (5.78)	-6.26 (6.06)	0.0683

RESULTS

● Cohort

- 17,585 patients were identified, including 999 patients who underwent venous ablation while anticoagulated.
- A total of 26,861 procedures were performed, of which 16,501 (61.4%) treated the great saphenous vein. In 19,510 (72.6%) of the procedures a thermal technique was used.

● Primary outcome (Figure 1)

- On multivariate regression, anticoagulation was associated with significantly higher rates of recanalization (OR 2.67, 95% CI 1.642-4.176, $p < 0.001$), when adjusted for age, sex, pre-intervention CEAP class, and ablation type. On time-to-event analysis with Cox proportional hazards modeling (Figure 1), anticoagulation was also associated with significantly worse recanalization-free survival (OR 2.77, 95% CI 1.76-4.39, $p < 0.001$).

● Secondary outcomes (Table 1)

- **Complications:** There were no differences in rates of post-operative complications between anticoagulated and non-anticoagulated groups.
- **Clinical improvement:** Anticoagulated patients were slightly more likely to have improvement in VCSS score (41.5% vs 40.1%, $p < 0.0175$), but the extent of change in VCSS score did not differ significantly (-3.60 vs -3.52, $p = 0.343$).
- **Patient-reported symptom improvement:** Anticoagulated patients were slightly less likely to self-report symptom improvement on the HASTI scale (52.7% vs 47.6%, $p < 0.001$), but the difference in extent of HASTI improvement did not differ significantly (-6.63 points vs -6.26 points, $p = 0.0683$).
- On subgroup analysis, anticoagulated patients had worse recanalization-free survival regardless of whether thermal (OR 2.56, $p < 0.001$) or non-thermal (OR 5.89, $p < 0.001$) techniques were used.

CONCLUSION

- **Rates of recanalization and recanalization-free survival time were significantly worse in anticoagulated patients**, though complication rates did not differ significantly.
- In patients whose thrombotic risk prevents temporary discontinuation of anticoagulation, venous ablation procedures can be safely performed, but higher rates of post-intervention surveillance should be considered.
- This study is limited by retrospective design, data limitations, and potential confounding variables.