

The Abandoned Inferior Vena Cava Filter: Is it a Big Deal? Inferior Vena Cava Filter Retrieval Rates and Clinical Outcomes of Non-Retrieval

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Background

Many patients with inferior vena cava filters (IVCF) never have them retrieved and there are no adequately sized studies examining IVCF retrieval rates and clinical events in patients with abandoned IVCFs. In this retrospective cohort study, we evaluated the differences in rates of venous thromboembolism, mortality and retrieval success as a function of time in patients who underwent IVCF retrieval within 12 months vs. patients in whom the filter was never retrieved.

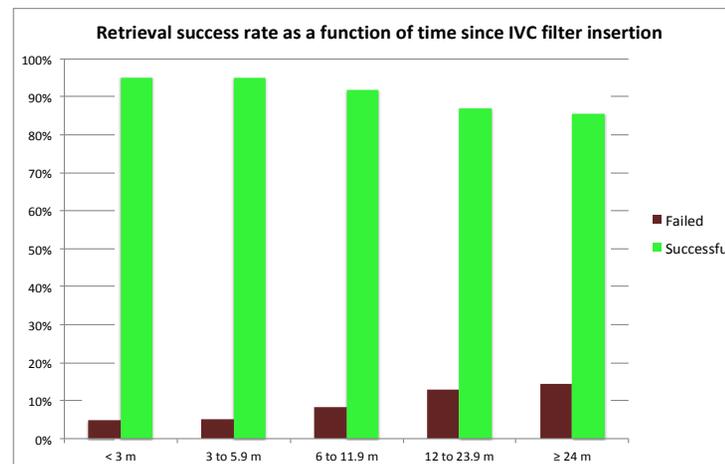
Methods

Enrollment included 1,709 patients who underwent IVCF placement between 1/2011 - 12/2017 within the Aurora Metro Health System. Procedure dates, recurrent deep vein thrombosis (DVT), pulmonary embolism (PE) and mortality dates were collected. Endpoints between patients who underwent successful filter retrieval within 12 months and those with abandoned IVCF (never retrieved after 12 months of follow-up) were compared via multivariate regression analyses.

Results

Successful IVCF retrieval was achieved in 770 of 1,709 patients who underwent placement. The success rate was 98.2% in the first retrieval attempt. There was a significant ($p=0.018$) decrease in retrieval success rate as time from insertion increased. The first retrieval attempt success rate was 93% with a range of 1 to 3 attempts per patient.

Endpoint	Retrieved	Abandoned	Multivariate analysis	
			Hazard ratio (95% conf interval)	p-value
Recurrent DVT	8.1%	11.9%	0.65 (0.42 to 1.00)	0.05
Recurrent PE	5.2%	7.1%	0.70 (0.41 to 1.18)	0.18
All-Cause Mortality	8.8%	28.9%	0.50 (0.35 to 0.70)	<0.001



Baseline Characteristics

Characteristic	Retrieved	Abandoned	p-value
Sample size (n)	629	478	
Age (years), mean \pm SD	60.8 \pm 12.7	69.3 \pm 14.9	<0.001
Body mass index, \pm SD	34.6 \pm 9.4	31.9 \pm 8.7	0.001
White race	91.3%	89.1%	0.23
Male gender	51.0%	46.9%	0.17
History of smoking	52.2%	55.4%	0.40
Hypertension	50.4%	61.7%	<0.0001
Diabetes mellitus	20.1%	25.1%	0.05
Coronary artery disease	14.2%	22.4%	<0.0001
Stroke	4.4%	3.7%	0.54
Peripheral vascular disease	11.8%	15.5%	0.075
Heart failure	5.6%	15.1%	<0.0001
Chronic kidney disease	11.3%	18.4%	0.001
Thrombophilic disorder	4.1%	4.8%	0.59
Prior deep vein thrombosis (DVT)	18.3%	16.9%	0.55
Prior pulmonary embolism (PE)	23%	23%	0.99
Indication for IVCF placement			
Acute DVT/PE	80.8%	81.8%	0.69
Anticoagulation for prior DVT/PE held	10.0%	9.0%	
Other prophylactic use	9.2%	9.2%	

Discussion and Conclusion

IVCF abandonment was associated with a significantly increased rate of recurrent DVT and all-cause death. However, true cause and effect of filter placement on mortality cannot be certain. It is suspected that patients who did not undergo retrieval were high risk for retrieval or near death which may have dissuaded operators from removing the filter. Patients in the abandoned group were on average, approximately 10 years older and had higher incidences of comorbid conditions.