

**VEITH SYMPOSIUM**  
Connecting The Vascular Community

**Stenting across the IVC Filter is a safe and effective alternative to complex retrieval**

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**Disclosures**

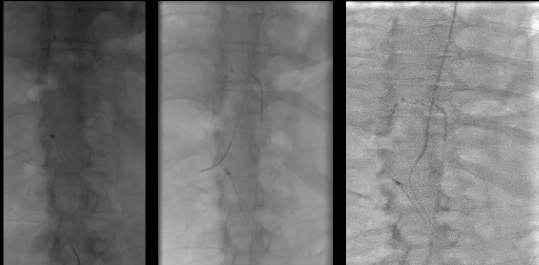
Speakers Bureau: BD Medical, Boston Scientific, Medtronic, Gore Medical, INARI Medical, Philips, Bentley

Consulting: BD Medical, Think Sono, Shuttle Catheters


55 y.o. male massive PE  
Planned IVC Retrieval  
3 months later



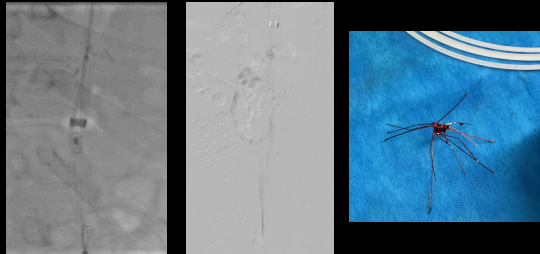
Access from above and below



Loop snare technique



Double Snare assisted extraction



### I Do Perform Advanced Filter Retrieval Techniques

### I Did have ONCE A MAJOR Complication

Caval disruption  
Massive bleeding  
Open Surgery  
Kidney removal  
One month ICU stay

### Filters need to be removed – No Doubt

**Costs and complications of endovascular inferior vena cava filter retrieval**

Anand Brahmandam, MD<sup>1</sup>, Laura Skrip, MPH, PhD<sup>2</sup>, Hamid Mojibian, MD<sup>1</sup>, John Arony, MD<sup>1</sup>, Bauer Sumpio, MD, PhD<sup>3</sup>, Alan Dardik, MD, PhD<sup>4</sup>, Timur Sarac, MD<sup>5</sup>, and Cassius Lyad Ochoa Chara, MD, MS<sup>6</sup>  
New Haven, Conn, Monroe, Liberia and Columbus, Ohio  
J Vasc Surg Venous Lymph 2019

Retrieval complications	SR (n = 157)	AER (n = 34)	P value
	No. (%)	No. (%)	
Extravasation	2 (1.29)	1 (2.94)	.447
Access hematoma	1 (0.64)	0 (0.00)	.999
Dissection	2 (1.29)	1 (2.94)	.447
IVC stenosis	2 (1.29)	3 (8.82)	.040
Strut fracture and migration	1 (0.64)	1 (2.94)	.325
Emergent open surgery	0 (0.00)	1 (2.94)	.180
All morbidity	8 (5.13)	7 (20.58)	.006

AER, Advanced endovascular retrieval; SR, standard retrieval.

Advanced filter retrievals come at a higher complication and cost rate

### Filters need to be removed – No Doubt

#### Late Complications

IVC thrombosis	2-9.5%
IVC Penetration	4.4%
Migration	1-18%
Filter Embolization	2-5%
Filter Fracture	2-10%
Recurrent PE	1.3%
Recurrent DVT	6-36%

### Single-session inferior vena cava filter removal, recanalization, and endovenous reconstruction for chronic ilio caval thrombosis

Kush R. Desai, MD,<sup>1</sup> Nicholas Xiao, MD,<sup>2</sup> Jennifer Karp, RN,<sup>1</sup> Riad Salem, MD, MBA,<sup>3</sup> Heron Rodriguez, MD,<sup>4</sup> Mark Eskandari, MD,<sup>5</sup> Omar M. Uddin, MD,<sup>6</sup> and Robert J. Lewandowski, MD,<sup>7</sup> Chicago, Ill

### Dwell time is a negative predictor of retrieval

#### Technical and Patient-related Characteristics Associated with Challenging Retrieval of Inferior Vena Cava Filters

E.D. Avgerinos, J. Bath, J. Stevens, B. McDaniel, L. Marone, E. Dillavou, J.S. Cho, M.S. Makaroun, R.A. Chaer<sup>1</sup>  
Division of Vascular Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA  
Eur J Vasc Endovasc Surg 2013

- 2004-2009
- 400 Patients
- Filter retrieval can be challenging or fail when the dwell time is >50 days and >90 days

### Dwell time is a negative predictor of retrieval

**Defining Prolonged Dwell Time: When Are Advanced Inferior Vena Cava Filter Retrieval Techniques Necessary? An Analysis in 762 Procedures**

Kash R. Desai, MD, James L. Laws, BS, Rial Salem, MD, MBA, Sandeep K. Mooli, MD, Martin F. Errea, BS, Jennifer K. Karp, RN, Yihe Yang, MD, Robert K. Rysu, MD, Robert J. Lewandowski, MD

After 7 months the risk of failure with standard techniques 41%

Circ Cardiovasc Intervent 2017

### Is it appropriate to overstent?

### Is it appropriate to overstent?

Decreased patency of the stents (?)  
Remnant device may cause clinical symptoms (?)  
Unwanted erosion of adjacent structures (?)

### Stenting of chronically obstructed inferior vena cava filters

Peter Neglén, MD, PhD,\* Mathew Oglesbee, BS,\* Jake Olivier, PhD,<sup>†</sup> and Seshadri Raja, MD,\* *Flomood, Miss, and Sydney, Australia*

J Vasc Surg 2011

Factor	Df	$\chi^2$ Statistic	P value
Presence of IVCF filter	3	2.0040	.5523
Occlusive disease	1	29.3990	<.0001
Gender	1	0.8368	.3653
Sickness	1	1.2493	.2637
Age	2	7.0355	0.297
Gender/sickness	1	6.0653	0.188
Gender/age	2	5.3381	0.093

No adverse events related to IVCF overstenting

### Stenting across inferior vena cava filters can be a safe and effective alternative to complex retrieval

Patrick Cherfan, MD, Mohamed S. Zaghloul, MD, Othman M. Abdul-Malak, MD, Zein Saadeddin, MD, Catherine Co, MD, Eric Hager, MD, Rabih A. Chaer, MD, and Efthymios D. Avgerinos, MD, Pittsburgh, PA

71 consecutive patients who underwent ilio caval stenting at UPMC  
15 Overstented IVC Filter vs 56 No IVC Filter (stent below the IVCF or no filter)

Variable	Non-overstented (n = 56)	Overstented (n = 15)	Total (n = 71)
Venous occlusion type			
Acute occlusion	29 (51.8)	4 (26.7)	33 (46.5)
Chronic occlusion	18 (32.1)	8 (53.3)	26 (36.6)
Nonocclusive	9 (16.1)	3 (20)	12 (16.9)

### No Patency Difference

Predictors of Patency Loss	HR	P-Value
Stenting across the IVC Filter	0.8	0.82
Age	0.9	0.08
Number of Stents	4.3	0.06

Log Rank P=0.78

## Conclusions

- IVC filters can/should be removed by high volume experts
  - The benefit against overstenting is unclear
  - Complications and higher costs should be anticipated
- If filter is not affecting/penetrating adjacent structures it can be safely overstented

