Grupo Investigación en Técnicas Mínimamente Invasivas

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Inferior vena cava filters

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Summary

- Introduction
- Relevance and importance of the topic
- Ideal Filter
- Types of filter
- Indications and contraindicatios
- Complications
- Tips and Considerations
- Research and future

Retrievable Inferior Vena Cava Filters

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Relevance and importance of the topic

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Retrievable IVC Filters: Expanding Indications, Retrievable Rates and Other Contemporary Issues
Anne Roberts MD. UC San Diego California

THE 25th Annual INTERNATIONAL SYMPOSIUM ON ENDOVASCULAR THERAPY

ISET Endovascular Therapy

JANUARY 19-23, 2013
FONTAINEBLEAU MIAMI BEACH

12 *ISET Today:* Tuesday, January 22, 2013

IVC Filter Evaluation is Underway

Inferior vena cava filters (IVCFs) sentatives from the Society of In- may not necessarily require a ran- to keeping track of patients with

In 2010, more than 200,000 IVCFs were implanted in patients,

the majority of these placements prone to those AEs? What are the most common she said. Physicians and institutions need to dedicate resources charge or are we going off on our own way?"

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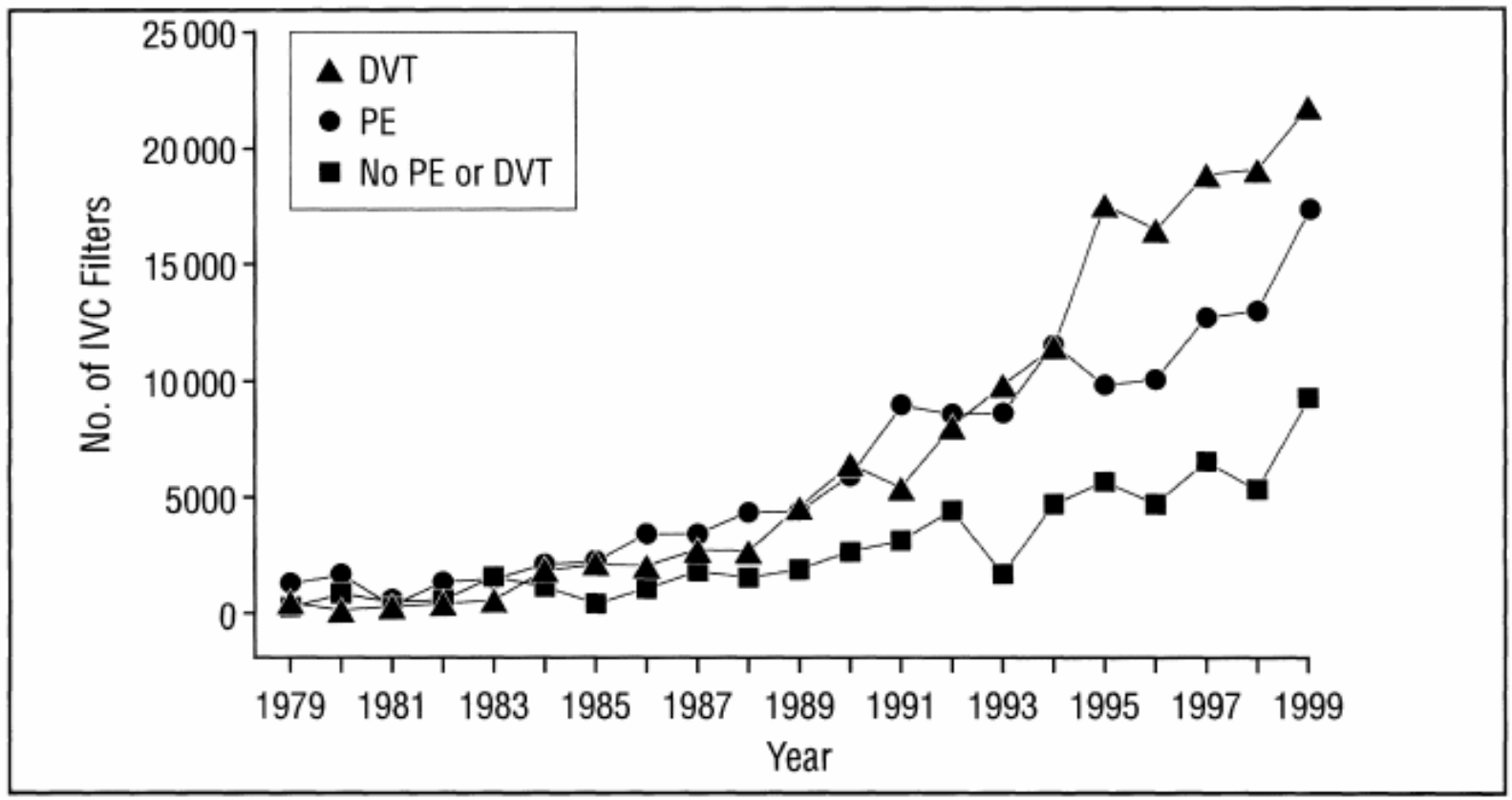
Retrievable IVC Filters: A Decision Matrix for Appropriate Utilization

Anthony J. Comerota, MD, *Toledo, Ohio*

Pers Vasc Surg Endovasc Ther 18:11-18, 2006.



Stein PD, Kayali F, Olson RE. Twenty-one-year trends in the use of inferior vena cava filters. Arch Intern Med 2004;164:1541-45.

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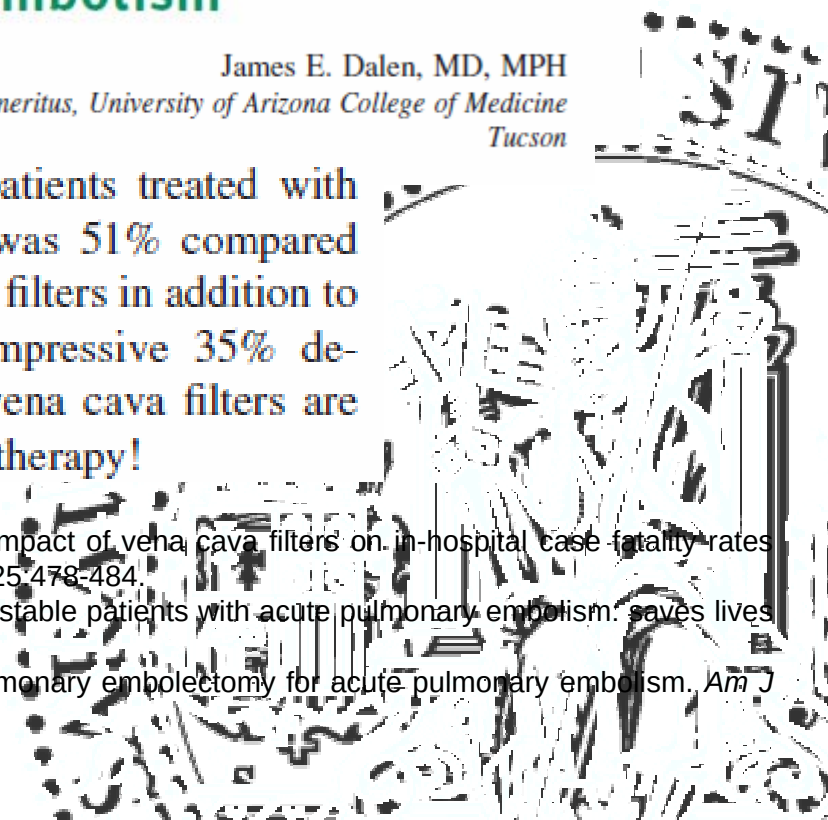
THE AMERICAN JOURNAL of MEDICINE®

Thrombolytics and Vena Cava Filters Decrease Mortality in Patients with Unstable Pulmonary Embolism

SEE RELATED ARTICLES pp. 465, 471, and 478.

James E. Dalen, MD, MPH
Dean Emeritus, University of Arizona College of Medicine
Tucson

The mortality in 38,000 unstable patients treated with standard anticoagulant therapy alone was 51% compared with 33% in 12,850 who had vena cava filters in addition to anticoagulants.[4] This represents an impressive 35% decrease in the case fatality rate when vena cava filters are combined with standard anticoagulant therapy!



-Stein PD, Matta F, Keyes DC, Willyerd GL. Impact of vena cava filters on in-hospital case fatality rates from pulmonary embolism. *Am J Med.* 2012;125:478-484.
-Stein PD, Matta F. Thrombolytic therapy in unstable patients with acute pulmonary embolism: saves lives but underused. *Am J Med.* 2012;125:465-470.
-Stein PD, Matta F. Case fatality rate with pulmonary embolectomy for acute pulmonary embolism. *Am J Med. 2012;125:471-477.*

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The New England Journal of Medicine

VOLUME 338 FEBRUARY 12, 1998 NUMBER 7

1998

A CLINICAL TRIAL OF VENA CAVAL FILTERS IN THE PREVENTION OF PULMONARY EMBOLISM IN PATIENTS WITH PROXIMAL DEEP-VEIN THROMBOSIS

HERVÉ DECOUSUS, M.D., ALAIN LEIZOROVICZ, M.D., FLORENCE PARENT, M.D., YVES PAGE, M.D., BERNARD TARDY, M.D., PHILIPPE GIRARD, M.D., SILVY LAPORTE, B.S., RENÉ FAIVRE, M.D., BERNARD CHARBONNIER, M.D., FABRICE-GUY BARRAL, M.D., YANN HUET, M.D., AND GÉRALD SIMONNEAU, M.D., FOR THE PRÉVENTION DU RISQUE D'EMBOLIE PULMONAIRE PAR INTERRUPTION CAVE STUDY GROUP*

Randomized study 400 pac. with DVT with or without PE
200 Filter and 200 No Filter in addition to standard anticoagulant treatment.

Results	PE		DVT		Death	
	Filter	**NO**	**Filter**	**NO**	**Filter**	**NO**
12 d	2 (1%)	9 (5%)	N/A	N/A	5 (2,5%)	5 (2,5%)
2 y	6 (3,4%)	12(6,3%)	37(21%)	21(12%)	43 (21%)	40 (20%)

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Eight-Year Follow-Up of Patients With Permanent Vena Cava Filters in the Prevention of Pulmonary Embolism

The PREPIC (Prévention du Risque d'Embolie Pulmonaire par Interruption Cave) Randomized Study

The PREPIC Study Group*

2005

Conclusions: VCFs

Reduced the risk of pulmonary embolism.
Increased that of deep vein thrombosis.
No effect on survival.
May be beneficial at patients at high risk of PE.
Systematic use in general population with VTE NOT recommended.

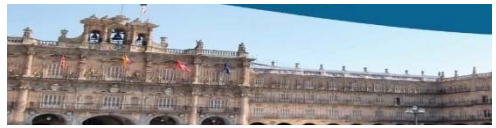
Conclusions—At 8 years, vena cava filters reduced the risk of pulmonary embolism but increased that of deep-vein thrombosis and had no effect on survival. Although their use may be beneficial in patients at high risk of pulmonary embolism, systematic use in the general population with venous thromboembolism is not recommended. (*Circulation.* 2005;112:416-422.)

Ideal filter

- Small calibre, flexible delivery device
- High efficacy in trapping emboli, without impeding blood flow.
- Secure deployment and fixation, without injuring vessel wall.
- Not tilt.
- Suitable to use in all diameters of vena cava.
- Short vertical height.
- **Repositioning/removal possible.**
- MR compatible
- Low cost
- Nonthrombogenic
- No associated mortality, minimal morbidity

Millward SF et al.Vena caval filters: Continuing development for an ideal device. Journal Vasc Interv Radiol.2005; 16:1439-1445

Retrievable Inferior Vena Cava Filters



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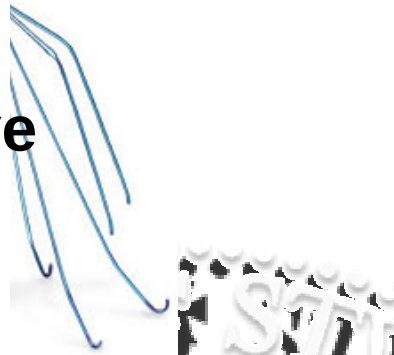
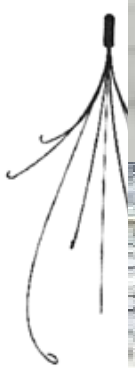
=DA)

Gunther

The market is very attractive and lucrative



y filter G2



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Indications VCF

Absolute indications

Presence of DVT or PE with any of the following conditions:

- Contraindication to anticoagulation[
- Recurrent PE in spite of anticoagulation
- Anticoagulation-related complication
- Massive PE with residual DVT and risk for further PE

Relative indications

- Free-floating thrombus in IVC or ileo femoral segments
- PE and limited cardiac reserve
- Prophylactic in patients with severe trauma, spinal cord injury, or paraplegia
- As a prophylactic before surgery (in patients with DVT)
- Poor compliance with anticoagulation
- Protection during DVT thrombolysis

Caplin DM,et al; Society of Interventional Radiology Standards of Practice Committee. Quality improvement guidelines for the performance of inferior vena cava filter placement for the prevention of pulmonary embolism. J Vasc Interv Radiol. 2011 22(11):1499-506.

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Caval Filter Retrieval

Author	Year	Filter	Removed (%)	Mean duration (days)	Technical success (%)
Ponchon[10]	1999	G-T	80	12	88
Millward[8]	2001	G-T	49	9	98
Offner[11]	2003	G-T	84	14	97
Asch[12]	2002	Recovery	75	53	100
Pieri[13]	2003	ALN	39	63	100
Morris[14]	2004	Various	11	19	93
Rosenthal[9]	2005	Various	43	19	100

G-T, Gunther-Tulip filter.

Comerota A. Pers Vasc Surg Endovasc Ther 18:11-18, 2006.

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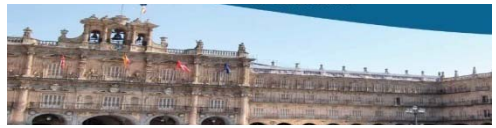
Lee M et al. CIRSE Barcelona 2013 Caval Filter Retrieval Registry

# 648 patients	n	%
Indication: Absolute	274	41
Relative	200	31
Prophylactic	174	27
Filters types: Celect	184	28,3
Optease	165	25,4
ALN	126	19,4
GT	101	15,5
Others	6	0.9
Technical success	597	92
Complications: Major	2	0,3
Minor	14	2,1
Filter dwell-time	0-499 days (median 5 days)	



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Retrieval of Günther Tulip Optional Vena Cava Filters 30 Days after Implantation: A Prospective Clinical Study

J Vasc Interv Radiol 2006; 17:1781–1789

Miguel Angel De Gregorio, PhD, MD, Pablo Gamboa, MD, Diana L. Bonilla, PhD, Maitane Sanchez, DVM, Maria T. Higuera, DVM, PhD, Jokin Medrano, MD, Antonio Mainar, MD, PhD, Fernando Lostalé, MD, PhD, and Alicia Laborda, DVM

Table 4
Degree of Difficulty in Filter Removal (n = 32)

Grade/Degree of Difficulty	No. of Patients
N (no difficulty, force 0–4.41 N)	25 (79)
M (moderate difficulty, force 4.41–5.88 N)	4 (13)
G (great difficulty, force 5.88–9.8 N)	2 (6)
U (inability to remove, force >9.8 N)	1 (2)

Note.—Values in parentheses are percentages.

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Systematic Review of the Use of Retrievable Inferior Vena Cava Filters

Luis F. Angel, MD, Victor Tapson, MD, Richard E. Galgon, MD, MS, Marcos I. Restrepo, MD, MS, and John Kaufman, MD

J Vasc Interv Radiol 2011; 22:1522–1530

Table 6. Retrievable Inferior Vena Cava Filters: Retrieval Rates and Retrieval Complications (Literature Review)

Filter	No. Filters	Total No. Removed	% Filter Removed	Filters with Substantial Clot	Unable to Remove	Reason for Failure to Remove		
						Embedded	Tilting	Clots
ALN	738	191	26	7 (3.7)	3	2	1	0
Celect	283	127	45	10 (7.9)	7	4	1	2
G2	1,517	416	27	16 (3.8)	28	0	17	11
Optease	662	246	37	16 (6.5)	5	1	3	1
Option	100	36	36	0	3	2	1	0
Recovery	143	17	12	1 (5.9)	3	1	2	0
Tulip	1,600	682	43	25 (3.7)	51	29	18	4
Total	**5,043**	**1,715**	**34**	**75 (4.3)**	**100**	**39**	**43**	**18**

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Tips and personal considerations

- The filter is a thrombogenic device
- Remove the filter as soon as possible
- Despite the difficulties we must try to always take it
  (There are many techniques and tools for it)
- If finally is impossible to recover, you can open with a stent
- The presence of thrombus suggests trapped in the filter
  If the filter caught a an emboli or a thrombus originated?
- There is some controversy on what to do when there are large trapped thrombus or thrombosis of the IVC
- If the filter is maintained permanently is required anticoagulat

Kaufman JA invited comemmentary. J Vasc Interv Radiol. 2011;22(11):1520-1.

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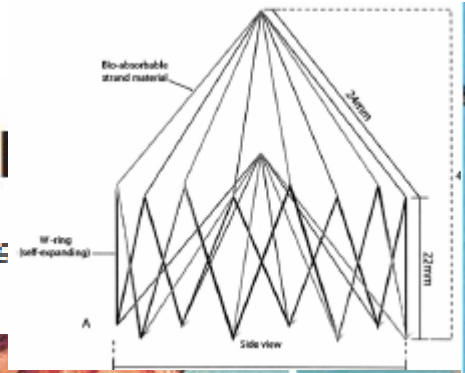

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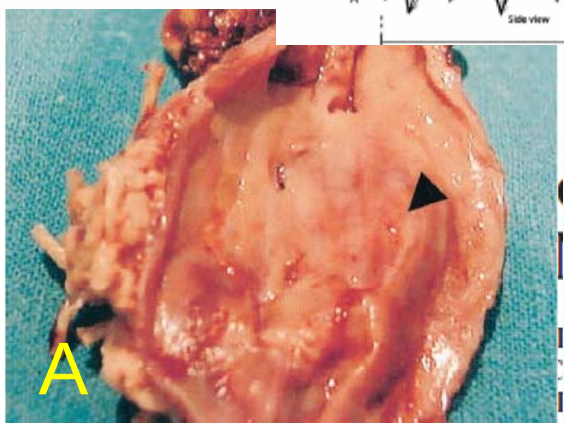

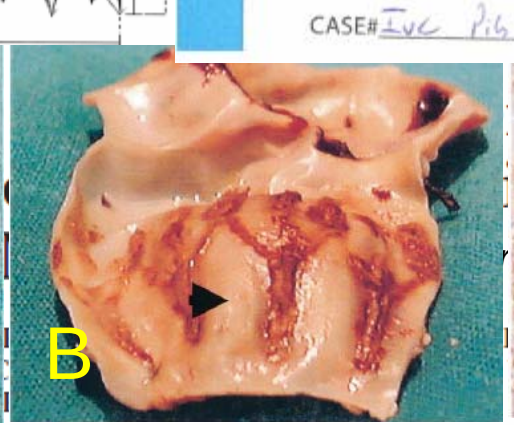

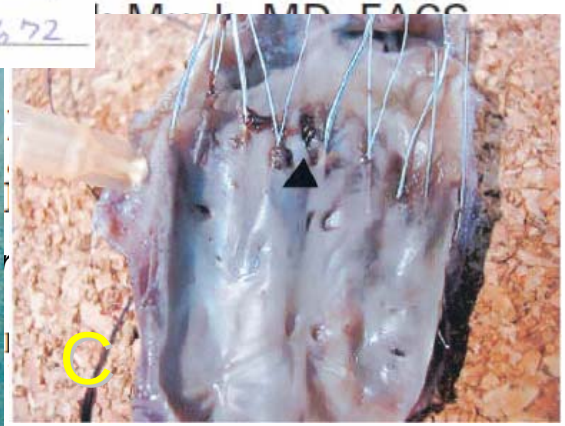

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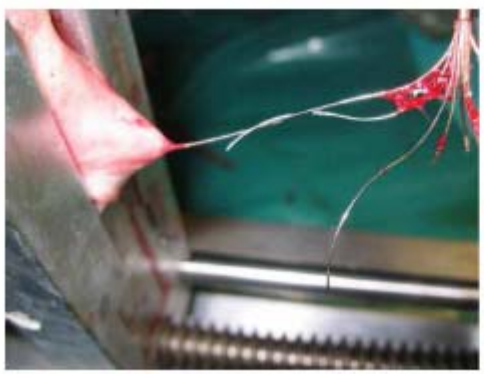

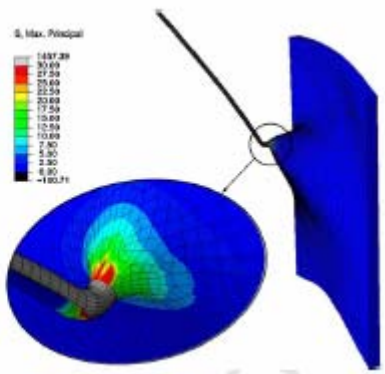

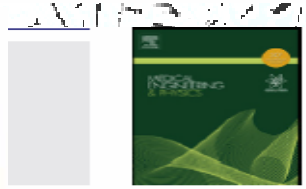

Grupo Mínin A. García[a,b], S. Lerga[a] Martínez[a,b]

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Gracias por su atención