Why Temporary Filters are not Removed: Clinical Predictors in more than 1000 consecutive cases

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Disclosures
Speaker Fees
WL Gore

Strong believer in the value of temporary IVC filters

Temporary IVCF that become permanent

Temporary IVCF that become permanent

POOR LONG TERM PERFORMERS
Northwestern Experience

- Retrospective review
- Two separate prospective databases from 2008 to 2013
- Protocol:
  - Each filter is evaluated and scheduled for removal

Removal Protocol

- Local anesthesia, transjugular approach, outpatient

Removal

Wire manipulation in case of angulation

Removal

Endoforceps
Removal

• Excimer laser in severe attachment to caval wall

Results

• 1021 filters were implanted from 2008-2013
  - Removal attempted (60%)
  - Removal not attempted (40%)

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Results

• 1021 filters were implanted from 2008-2013

  - Most were lost to follow-up
  - Advised not to be removed
  - Transferred to other hospitals
  - Died

Results

• 40% of temporary filters were not removed despite
  – Protocols and personal dedicated to remove IVC filters
  – 95% Technical success
### Literature

<table>
<thead>
<tr>
<th>Author</th>
<th>Removal %</th>
<th>Publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarosiek, et al</td>
<td>58/679</td>
<td>JAMA 2013</td>
</tr>
<tr>
<td>Augerinos et al</td>
<td>237/401</td>
<td>Eur J Endovasc Surg 2013</td>
</tr>
<tr>
<td>Current</td>
<td>588/1021</td>
<td>(60%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor/Group</th>
<th>Group A Group B</th>
<th>Odds Ratio (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (%)</td>
<td>270 (44)</td>
<td>225 (62)</td>
<td>1.609 (1.25-2.070)</td>
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<tr>
<td>History of VTE (%)</td>
<td>351 (57)</td>
<td>273 (67)</td>
<td>1.591 (1.226-2.068)</td>
</tr>
<tr>
<td>Cancer (%)</td>
<td>153 (25)</td>
<td>200 (49)</td>
<td>2.971 (2.274-3.891)</td>
</tr>
<tr>
<td>Neurologic disease (CVA, dementia, paralysis) (%)</td>
<td>24 (4)</td>
<td>35 (8)</td>
<td>2.351 (1.377-4.017)</td>
</tr>
<tr>
<td>VTE + contraindication to AC (%)</td>
<td>250 (47)</td>
<td>283 (70)</td>
<td>3.602 (2.036-6.365)</td>
</tr>
<tr>
<td>VTE + complication after AC (%)</td>
<td>25 (4)</td>
<td>49 (12)</td>
<td>2.79 (1.980-5.460)</td>
</tr>
<tr>
<td>VTE + failure of AC (%)</td>
<td>13 (4)</td>
<td>13 (4)</td>
<td>2.251 (0.954-5.212)</td>
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<tr>
<td>VTE + High risk (%)</td>
<td>20 (5)</td>
<td>20 (5)</td>
<td>0.460 (0.273-0.773)</td>
</tr>
<tr>
<td>Prophylactic</td>
<td>39 (10)</td>
<td>39 (10)</td>
<td>0.173 (0.119-0.255)</td>
</tr>
</tbody>
</table>

### Conclusion

- The use of snares, endoforceps and laser allow for removal of 95% of temporary filters
- Despite this high technical success, 40% of temporary filters were never removed
- Common causes are lost to follow up and conversion to permanent
- This is associated to advanced age, cancer and neurologic diseases

### Conclusion

- The presence of risk factors (age, cancer, neurologic disease) should alert physicians against the use of temporary filters that will never be removed and instead using a permanent one