Session on Varicose Veins:
SPECIAL CONSIDERATION
Peri-Treatment Medical Management

Neil Khilnani, M.D.
Associate Professor of Clinical Radiology
Division of Interventional Radiology
New York Presbyterian Hospital-Weill Cornell Medical Center

Relevant Disclosures

- None

Medical management
Venous procedures

- Low risk procedures
  - Low anesthetic needs
- Very few medical concerns
- Managing peri-procedural anticoagulation

Medical management
Venous procedures

- Low risk procedures
  - Low anesthetic needs
- Very few medical concerns

Medical management
peri-procedural anticoagulation (AC)

- Indications for AC
  - Prosthetic valves*, any mitral valve*, atrial fibrillation*, VTE (< 3m*), stroke (<6m*)
  - High risk for interruption *
  - Hypercoagulable conditions

- Challenging
  - Interrupting AC transiently increases risk of thrombosis/embolism
    - Decisions in a risk benefit decision
    - Clotting
      - Bleeding during/after the procedure

- Recommendations
  - Evidence based
  - Opinion

*Lip GYH UpToDate 2015: Perioperative management of patients receiving anticoagulants
Choices in anticoagulated (AC) patients

- Stop AC and do procedure, then restart
  - In some high risk to clot patients on VKA
    - Bridge with LMWH until INR reached
  - Drawbacks
    - Risk
      - Thrombosis
      - Embolus
    - Inconvenient and resource intensive
      - VKA
        - Takes several days to
          - Stop (hold five doses)
          - Reestablish (usually 12-24h post procedure, takes 5-10d to get back up)
          - Average 7 to 10 sub-therapeutic
        - More frequent VKA clinic visits and blood draws
- Perform procedure on AC

Bridging indications:

Lip UpToDate 2015

Two Burning questions
Endovenous Thermal Ablation (EVTA) On Anticoagulation (AC)

- Can we safely treat AC patients with EVTA?
- Will EVTA be as successful in AC patients?

New oral anticoagulants and thermal ablation

- No data
  - Skipping a DOAC is less disruptive than with VKA
    - Shorter half-life
  - Risk of bleeding is unknown
    - No reversal agents available
- ABS ablation guidelines
  - Uninterrupted VKA
    - No difference in bleeding complications
    - UFH and with ACT 350-450 sec
  - Skipping DOAC 12-24 h before, and restarting in RR with ASA
    - No difference in bleeding complications
    - UFH and with ACT 350-450 sec
- Opinion:
  - For EVTA, stop DOAC
  - Restart after procedure

EVTA in anticoagulated (AC) patients

Choices

- Stop AC and do procedure, then restart
  - In some patients on VKA
    - Bridge with LMWH until INR reached
  - Drawbacks
    - Risk
      - Thrombosis
      - Embolus
    - Inconvenient and resource intensive
      - VKA
        - Takes several days to
          - Stop (hold five doses)
          - Reestablish (usually 12-24h post procedure, takes 5-10d to get back up)
          - Average 7 to 10 sub-therapeutic
        - More frequent VKA clinic visits and blood draws

Question 1: Is EVTA safe in patients on Vitamin K antagonists (VKA)

<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>Study design</th>
<th>MAJOR BLEED</th>
<th>MINOR BLEED</th>
<th>INR</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theakosumar EVS 2009</td>
<td>Retrospective GSV</td>
<td>0%</td>
<td>0%</td>
<td>2.3-4.1</td>
<td>800 Bare fiber ELA</td>
</tr>
<tr>
<td>Delaney Phleb 2012</td>
<td>15 GSV</td>
<td>0%</td>
<td>1/15 hematoma</td>
<td>1.8-2.5</td>
<td>1470 Radial ELA</td>
</tr>
<tr>
<td>Sharif AVS 2011</td>
<td>Prospective Consecutive GSV (post EVTA bandaging)</td>
<td>0%</td>
<td>&gt;10min comp (all &lt; 6hrs)</td>
<td>2.4 +/- 0.4</td>
<td>Minor bleeding in patients on &quot;triple Rx&quot; VKA + ASA + platelet inhibitors or ticlodipine</td>
</tr>
</tbody>
</table>

Circ Arrhythm Electrophysiol 2013 DOI: 10.1161/CIRCEP.113.000320

Lip GYH UpToDate 2015: Perioperative management of patients receiving anticoagulants
Question 2: Is EVTA effective on warfarin (VKA)?

<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>Study design</th>
<th>6-72H</th>
<th>2-year DUS closure rate</th>
<th>INR</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gabriel Annals Vasc Surg 2012</td>
<td>Retrospective</td>
<td>100% GSV/SSV</td>
<td>Not assessed</td>
<td>Not checked</td>
<td>VKA STOPPED 2 days before surgery, restarted on POD 1</td>
</tr>
<tr>
<td>Thermavascular JVEVS 2009</td>
<td>Matched controls</td>
<td>24 GSV on VKA, 24 GSV on non-VKA</td>
<td>83% on 96% NS</td>
<td>2.3-4.1</td>
<td>RFA Bare fiber</td>
</tr>
<tr>
<td>Delaney Phleb 2012</td>
<td>Case series</td>
<td>15 GSV</td>
<td>Not assessed</td>
<td>1.8-2.5</td>
<td>1470 Radial ELA</td>
</tr>
<tr>
<td>Sharifi JVS 2011</td>
<td>Case series</td>
<td>88 on VKA, 92 no VKA</td>
<td>100% with &amp; without VKA</td>
<td>2.4+/0.4</td>
<td>40% on antiplatelet drug as well</td>
</tr>
</tbody>
</table>

Non-thermal (NT) ablation on AC

- No data for foam, MOCA, and glue
- Opinion:
  - Very safe
  - Foam possibly less successful
  - Lower success treating pathological perforators with foam on VKA*
- Opinion:
  - Would not stop AC for NT ablation
  - Consider using a thermal approach

Ambulatory phlebectomy (AP) on AC patients?

- No evidence
  - Anecdotal
    - Described on either VKA or antiplatelet drugs
  - Case report
    - Posterior superficial compartment syndrome on VKA
- Opinion:
  - Prefer to use sclerotherapy if patient on AC
    - Safe
    - Effective
    - Discourage AP on AC
      - If you do AP, suggest:
        - Sutures
        - Good compression
        - Early follow-up

Deep vein interventions

Opinions

- Venous lysis
  - Done on AC
  - No need to reverse when removing sheaths
- Stenting and IVC filter placement and retrievals
  - Maintain the AC (LMWH, VKA)
  - Hold one dose DOAC
  - For large sheaths, consider puncture closure device

Femoral vein puncture

- Femoral vein closure:
  - Vascade (Cardiva Medical): 7-10 F
## Thrombophilia

### Thrombophilia: Opinion

<table>
<thead>
<tr>
<th>Type</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High risk</td>
<td>- AT III deficiency&lt;br&gt;- Homozygous Factor V Leiden&lt;br&gt;- Homozygous prothrombin gene (PTG)&lt;br&gt;- Double mutations (PTG G20210A and FVL)</td>
</tr>
<tr>
<td>Intermediate risk</td>
<td>- Protein C deficiency&lt;br&gt;- High Factor VIII</td>
</tr>
<tr>
<td>Lower risk</td>
<td>- Heterozygous FVL&lt;br&gt;- Heterozygous PTG&lt;br&gt;- Protein S def</td>
</tr>
</tbody>
</table>

### Function

- Risk following vein not well characterized
- Routine screening not justified

- Hamel-Desnos
Phlebology 2003

### Venous Stenting

- Routinely done on AC patients
  - Small rates of hematoma in series
  - Nearly all of puncture sites
  - Mid-high stone highest
  - Popliteal and jugular safest
- Usually bridged to VKA
- AC maintained after the procedures in post thrombotic lesions
- Not aware of evaluation of treatment on DOAC

### Ablation and Venous leg ulcers

- Ablate candidates with superficial reflux to the ulcer bed (O)
  - No need to wait for ulcer to heal first
  - Wound care can be done simultaneously
- If cellulitis is present (O)
  - Treat with antibiotics
  - Wait for erythema/edema to clear
- Especially before phlebectomy
- Always do ABI (Strong guideline recommendation)
  - Arterial revascularization first for ABI <= 0.5
  - Careful compression for ABI 0.5-0.8
Summary:
Is EVTA safe on anti-coagulated patients

- Yes, it is safe with VKA +/- ASA
  - INR up to the 2.5-3.0 range
  - Increased minor puncture site bleeding with "triple Rx"
    - Try to withdraw one antiplatelet
  - LOE: 2C "reasonable" to treat

- No data with DOAC
  - Conservative recommendation: hold doses
  - Although Afib ablation data suggests safety c/w VKA

Summary:
Is ablation effective on anti-coagulated patients

- Thermal closure is probably as successful with and without VKA
  - or possibly modestly less
  - No data of thermal ablation success with DOAC
  - LOE: 2C "may be reasonable to expect" success on VKA

- Non thermal ablation success on AC
  - No data

Thank you for your attention