Calf Vein DVT: What to do about it
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Current ACCP guidelines for treatment of isolated symptomatic calf vein DVT is:

- a. Compression stockings alone
- b. Serial imaging for 10-14 days
- c. Systemic thrombolytic therapy followed by one week anticoagulation
- d. Two to four weeks anticoagulation with low molecular weight heparin
- e. Six weeks to three months anticoagulation

Grade of current ACCP recommendation for treatment of isolated calf vein DVT is:

- a. 1A (strong recommendation, high quality evidence)
- b. 1B (strong recommendation, moderate quality evidence)
- c. 1C (strong recommendation, low quality evidence)
- d. 2A (weak recommendation, high quality evidence)
- e. 2B (weak recommendation, moderate quality evidence)
- f. 2C (weak recommendation, low quality evidence)
Calf Vein DVT

- Traditional Management Options
  - Serial ultrasound examinations for 10-14 days
  - Anticoagulation for 6 weeks to 3 months

Calf Vein DVT: Case for treatment

- Considering the accuracy of US diagnosis, natural history, and risks of treatment with new anticoagulants, treatment of symptomatic axial and muscular calf vein DVT is favored unless contraindicated
  - No randomized trials are available
  - Not everyone will agree

Calf Vein DVT: Determinants of Management

- Accuracy of Diagnosis
  - Natural history
    - proximal propagation
    - PE/recurrent VTE
    - post thrombotic syndrome
  - Provoked or Idiopathic
  - Symptomatic vs Asymptomatic
  - Axial vs Muscular calf vein (gastrosoleal) DVT
  - Risk of treatment

Calf Vein DVT: Perceptions

- Favorable natural history
- Risk and trouble of treatment not worth it
- Serial exams to assess for progression or diagnosis is preferred.
Calf Vein DVT: Early natural history studies

- Radiolabeled $^{125}$I fibrinogen scanning
- Asymptomatic, post-operative patients
- Frequently nonocclusive compared to symptomatic thrombi
- Low incidence of complications, favorable natural history
- Likely not comparable to symptomatic calf DVT detected with ultrasound

Modern Ultrasound Diagnosis Calf DVT

- Technically adequate exams in >90% cases
- Sensitivity: 95%
- Specificity: 100%
- 12% to 33% of symptomatic DVT detected by ultrasound are isolated to calf veins.

Distribution of isolated calf DVT

<table>
<thead>
<tr>
<th>Location of Calf DVT</th>
<th>Location of isolated calf DVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peroneal 41%</td>
<td>Soleal 20%</td>
</tr>
<tr>
<td>Soleal 39%</td>
<td>Gastrocnemial 17%</td>
</tr>
<tr>
<td>Posterior Tibial 37%</td>
<td>Peroneal 15%</td>
</tr>
<tr>
<td>Gastrocnemial 28%</td>
<td>Posterior Tibial 12%</td>
</tr>
<tr>
<td></td>
<td>Total 64%</td>
</tr>
</tbody>
</table>

Labropoulos, JVS, 1999

Natural history of calf vein DVT
Clot Propagation

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Anticoagulation</th>
<th>Control</th>
<th>Total</th>
<th>Events</th>
<th>Total</th>
<th>Weight</th>
<th>Petri Odds Ratio</th>
<th>Petri, Fixed, 95% CI</th>
<th>Petri Odds Ratio</th>
<th>Petri, Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sips 1992</td>
<td>3</td>
<td>13</td>
<td>2</td>
<td>25</td>
<td>14.8%</td>
<td>8.8 (0.51 to 25.56)</td>
<td></td>
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<tr>
<td>Sahdev 2005</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>65</td>
<td>0.8%</td>
<td>0.23 (0.09 to 0.57)</td>
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<tr>
<td>Peligrino 2005</td>
<td>0</td>
<td>12</td>
<td>4</td>
<td>16</td>
<td>12.9%</td>
<td>0.11 (0.01 to 0.90)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Masuda 1997</td>
<td>0</td>
<td>20</td>
<td>2</td>
<td>26</td>
<td>7.1%</td>
<td>0.14 (0.01 to 2.77)</td>
<td></td>
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</tr>
<tr>
<td>Levi 1995</td>
<td>0</td>
<td>23</td>
<td>3</td>
<td>169</td>
<td>47.6%</td>
<td>0.24 (0.08 to 0.73)</td>
<td></td>
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</tr>
<tr>
<td>Lagerstedt 1985</td>
<td>0</td>
<td>23</td>
<td>5</td>
<td>28</td>
<td>16.8%</td>
<td>0.14 (0.02 to 0.87)</td>
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</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td>93</td>
<td>326</td>
<td>1</td>
<td>100</td>
<td>0.29</td>
<td>[0.14, 0.62]</td>
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</tr>
</tbody>
</table>

**Masuda, JVS, 2012

Pulmonary Embolism

- Up to 33% with routine V/Q scans*
- 0-6% based on clinical suspicion and supplemental tests**

**Masuda, JVS, 2012

Post-Thrombotic Syndrome

- Reflux in 24-50% in 1-5 yrs. *
- Mild to moderate PTS in 38% at median 3.4 yrs.**
- 21% mild and 5% severe PTS at a mean of 45 months.***
- Rare venous ulcers


VTE recurrence

- In uncontrolled case series 5-20%
- Single randomized trial (3 months warfarin vs placebo), 4% treatment vs 32% placebo*

* Lagerstedt, Lancet, 1985;2: 515-8
Bleeding Risk

The New Anticoagulants and Venous Thrombosis

**Drug**
- Dabigatran: Equal
- Rivaroxaban: Equal
- Apixaban: Better

**Thrombosis**
- Dabigatran: Equal
- Rivaroxaban: Equal
- Apixaban: Better

**Bleeding**
- Dabigatran: Equal
- Rivaroxaban: Equal/Better
- Apixaban: Better

Apixaban and VTE: Primary Endpoint


Apixaban and VTE: Major Bleeding Complications

**What Calf DVT are “High Risk”**

**High Risk**
- Malignancy
- Continued risk (immobility)
- Bilateral or multiple calf DVT
- Calf vein diameter > 8mm
- Idiopathic DVT
  - Thrombophilia

**Low Risk**
- Recent surgery
- Trauma
- Estrogen use

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**What about gastrosoleal DVT?**

- Data mixed but overall seems to have similar risk as axial vein calf DVT
- Gillet, JVS, 2007: 7% PE at baseline
  - 18.8% symptomatic recurrence
- Sales, JVS, 2010: DVT progression not different in anticoagulated (33%) vs non-anticoagulated (28%) patients

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**2012 Chest Guidelines**

2.3.2. **In patients with acute isolated distal DVT of the leg and severe symptoms or risk factors for extension (see text), we suggest initial anticoagulation over serial imaging of the deep veins (Grade 2C).**

*Remarks: Patients at high risk for bleeding are more likely to benefit from serial imaging. Patients who place a high value on avoiding the inconvenience of repeat imaging and a low value on the inconvenience of treatment and on the potential for bleeding are likely to choose initial anticoagulation over serial imaging.*

*Chest 2012;141:420S*

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**Summary**

- Serial imaging for management of calf vein DVT grew out of the combination of older natural history studies and calf vein imaging with outdated technology without color ultrasound imaging.
- The combination of modern ultrasound technology, more recent natural history studies and the new oral Xa inhibitors make treatment of calf vein thrombosis likely preferred over serial imaging studies.
Recommendations

• Follow the 2012 Chest Guidelines for management of isolated calf vein DVT

• Applies to axial and muscular vein calf vein DVT