Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?

John Blebea MD MBA
Professor of Surgery
Department of Surgery
University of Oklahoma
College of Medicine
Tulsa, Oklahoma

Perforator Incompetence in CVI Patients

Perforator Sclerotherapy

Perforator Ablation for C3 or C4
What is the Evidence?
Less Severe Disease

Swollen Leg
C3

Skin Changes
C4

Should perforators be treated?

Prospective clinical study
Single institution
60 patients / 67 perforators

Laser PV ablation + saphenous vein ablation or phlebectomy


Patients

<table>
<thead>
<tr>
<th>Patients’ Characteristics and CEAP Classification of Treated Legs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perforator location</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Number of patients</td>
</tr>
<tr>
<td>Age (years), median (range)</td>
</tr>
<tr>
<td>BMI (kg/m²), median (range)</td>
</tr>
<tr>
<td>Female sex (%)</td>
</tr>
<tr>
<td>Number of limbs</td>
</tr>
<tr>
<td>CEAP (classification %)</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>C3</td>
</tr>
<tr>
<td>C4</td>
</tr>
<tr>
<td>C6</td>
</tr>
</tbody>
</table>

All had varicose veins (C2)
Others mostly C3


Results

Diameters decreased after laser
All perforators except one occluded
Feasible and safe …..but helpful?


Randomized Clinical Trial Comparing Two Methods for Endovenous Laser Ablation of Incompetent Perforator Veins in Thigh and Great Saphenous Vein Without Evidence of Saphenofemoral Reflux

Prospective randomized trial
Single institution
69 consecutive patients
C2 and C3 disease
No sapheno-femoral reflux

EVA laser IPV + distal GSV vs GSV


Clinical Results

- Similar clinical outcomes
- Not necessary to ablate incompetent perforator

The Effect of Endovenous Laser Ablation of Incompetent Perforating Veins and the Great Saphenous Vein in Patients with Primary Venous Disease

Retrospective clinical study
Single institution
311 patients / 376 limbs
C2 – C6 disease
Superficial GSV EVA 810 nm laser
+ perforator laser ablation

Perforator Treatment

Table 1. Results of perforator veins using Superpulseollow-up at 1 year follow-up (GV = great saphenous vein, P = perforator)

<table>
<thead>
<tr>
<th>GV</th>
<th>Perforator</th>
<th>Post L/R</th>
<th>GV + P</th>
<th>Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>21</td>
<td>48</td>
<td>26</td>
<td>30%</td>
</tr>
<tr>
<td>C3</td>
<td>11</td>
<td>26</td>
<td>37</td>
<td>65%</td>
</tr>
<tr>
<td>C4</td>
<td>21</td>
<td>51</td>
<td>72</td>
<td>30%</td>
</tr>
<tr>
<td>C5</td>
<td>11</td>
<td>26</td>
<td>37</td>
<td>65%</td>
</tr>
</tbody>
</table>


Clinical Challenge

> 150 perforator veins in leg
Thigh 60
Knee 8
Leg 55
Foot 28

Without an ulcer or superficial reflux, which perforator to ablate?
No way to know

Limburgh J van. Folia Angiol 1961;8:240-57
Limburgh J van. Zbl Phlebol 1965;4:268-71

Clinical Outcome

- No difference in VCSS scores between those with/without perforator ablation (all groups)
- No clinical benefit in perforator ablation


Conclusions

- Insufficient data to justify perforator ablation in C3 or C4 disease
- Available data suggests no clinical benefit
- Not recommended at this time