Compression and DVT

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Bari, Oct. 9, 2015
No conflict of interest
Acute DVT
- a Cinderella indication?
Happy end with Mr Compression?
Suddenly bad step-mother came back!
Skip the compression stockings following DVT

Although commonly used, compression stockings do not effectively prevent post-thrombotic syndrome.

**PRACTICE CHANGER**

Do not recommend elastic compression stockings (ECS) to decrease the incidence of post-thrombotic syndrome (PTS) after deep vein thrombosis (DVT).¹
Graduated compression stockings to treat acute leg pain associated with proximal DVT
A randomised controlled trial

Susan R. Kahn1; Stan Shapiro1.2; Thierry Ducruet1; Philip S. Wells3; Marc A. Rodger3.4; Michael J. Kovacs5; David Anderson6.7; Vicky Tagalakis1; David R. Morrison1; Susan Solymoss6; Marie-José Miron6; Erik Yeo10; Reginald Smith11; Sam Schulman12.13; Jeannine Kassis14; Clive Kearon12; Isabelle Chagnon15; Turnly Wong16; Christine Demers17; Rajendar Hanmiah18; Scott Kaatz19; Rita Selby20; Suman Rathbun21; Sylvie Desmarais22; Lucie Opatrny23; Thomas L. Ortel24; Jean-Philippe Galanaud25; Jeffrey S. Ginsberg12

Thromb Haemost 112/6 2014

• Subanalysis of the SOX-Study
• No pain relieving effect of compression in acute DVT
• Actually „baseline pain“ was assessed 3 weeks after acute DVT

Letter to the Editor:
Partsch H. Thromb Haemost. 2015 Mar 30;113(4):906-7

• …because the first follow-up assessment occurred at 14 days after randomisation, we were unable to directly evaluate if ECS had a beneficial or detrimental effect on pain before this time point”.

• “Our study design and findings should reassure clinicians that ECS do not have a role in the management of acute pain associated with DVT.”
2-3 weeks AFTER acute DVT

- Pain has disappeared,
- Patient has missed the beneficial experience of good compression in the initial stage
- Patient is poorly motivated to continue with compression
- This is the reason for ongoing poor compliance
Clinical severity after DVT is a risk factor for PTS

- PTS starts with acute DVT, not 3 months later
- Residual signs and symptoms 1 month after DVT are strongly predictive of PTS
- Less pain and swelling after acute DVT: less severe PTS

Reduction of Leg swelling

• Most impressive effect of compression:
• -not considered in SOX-Study and in subsequent publication

6 mm Hg
Aim of compression therapy

1. Reduction of pain and swelling in acute DVT

2. Reduction of PTS
Recommendation 4.1.
In patients with acute symptomatic DVT of the leg, we suggest the use of compression stockings (Grade 2B).
Compression in acute DVT (Patient orientated outcome)

- Reduces swelling
- Reduces pain
- Improves QOL
- Facilitates immediate ambulation

Blättler W, Partsch H. Int Angiol. 2003 Dec;22(4):393-400
**Bed Rest versus Early Ambulation**

Liu Z et al.


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**PAIN (VAS-CHANGE)**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Mean</th>
<th>SD</th>
<th>Total</th>
<th>Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>IV, Fixed, 95% CI</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aschwanden 2001</td>
<td>0.64</td>
<td>0.44</td>
<td>69</td>
<td>0.946</td>
<td>0.616</td>
<td>60</td>
<td>29.5%</td>
<td>-0.57 [-0.93, -0.22]</td>
<td></td>
</tr>
<tr>
<td>Blattler 2003</td>
<td>64.75</td>
<td>27.32</td>
<td>36</td>
<td>50.82</td>
<td>23.85</td>
<td>17</td>
<td>10.7%</td>
<td>0.52 [-0.06, 1.11]</td>
<td></td>
</tr>
<tr>
<td>Feng 2011</td>
<td>4.9</td>
<td>1.3</td>
<td>15</td>
<td>2.7</td>
<td>2.8</td>
<td>17</td>
<td>6.7%</td>
<td>0.96 [0.22, 1.70]</td>
<td></td>
</tr>
<tr>
<td>Huang 2010</td>
<td>39</td>
<td>13</td>
<td>20</td>
<td>30</td>
<td>15</td>
<td>20</td>
<td>9.1%</td>
<td>0.63 [-0.01, 1.27]</td>
<td></td>
</tr>
<tr>
<td>Junger 2006</td>
<td>25.9</td>
<td>36.8</td>
<td>52</td>
<td>23.6</td>
<td>30.8</td>
<td>49</td>
<td>24.1%</td>
<td>0.07 [-0.32, 0.46]</td>
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<tr>
<td>Liu 2013</td>
<td>2.86</td>
<td>0.38</td>
<td>30</td>
<td>2.59</td>
<td>1.1</td>
<td>30</td>
<td>14.2%</td>
<td>0.32 [-0.19, 0.83]</td>
<td></td>
</tr>
<tr>
<td>Rahman 2009</td>
<td>6.71</td>
<td>1.72</td>
<td>12</td>
<td>6.33</td>
<td>1.71</td>
<td>12</td>
<td>5.7%</td>
<td>0.21 [-0.59, 1.02]</td>
<td></td>
</tr>
</tbody>
</table>

**Total (95% CI)**

234

Heterogeneity: $\chi^2 = 24.71$, df = 6 ($P = 0.0004$); $I^2 = 76$

Test for overall effect: $Z = 0.84$ ($P = 0.40$)

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Fig 6. Meta-analysis of VAS change. In this figure, the data in “Mean” and “SD” column is the mean change of VAS rather than initial mean VAS.

*Favours early ambulation + compression*
Compression in DVT - a European Tradition

92% Home therapy with compression  
GERMANY

Arpaia G et al.: 1931 DVT (Hospital):
67% Stockings at dismission  
ITALY

Ouvry P et al.: 761 Vascular specialists:
94% Compression in DVT  
FRANCE
- 57% Stockings (64% 15-20 mmHg)
- 36% Bandages

Roche-Nagle G et al: 225 clinicians, 150 DVT- Patients
67% Compression after DVT  
IRELAND
- 75% Senior staff
- 21% Junior staff

Eur J Vasc Endovasc Surg 2005; 30, 319–324
J Thromb Thrombolysis; 2009 Nov; 28(4): 389-93
J Mal Vasc; 2012 Jun; 37(3): 140-5
Phlebology 2010 Apr; 25(2): 72-8
Canadian emergency medicine staff physicians and residents \((n=471)\) to investigate their attitudes toward the prescription of ECS post-diagnosis of DVT.

Although all patients noted symptomatic relief with ECS, only 50% were prescribed stockings by an emergency or family doctor, and 69% of those patients wore the stockings on a daily basis.
Aim of compression therapy

1. Reduction of pain and swelling in acute DVT

2. Reduction of PTS
We suggest compression stockings to prevent the postthrombotic syndrome (Grade 2B).

Remarks: Compression stockings should be worn for 2 years, and we suggest beyond that if patients have developed PTS and find the stockings helpful.
Medical compression stockings prevent PTS

Kanaan AO et al. Thrombosis 2012.
Compression stockings to prevent post-thrombotic syndrome: a randomised placebo-controlled trial. (SOX-trial)

Kahn S et al

THE LANCET

Outcome

<table>
<thead>
<tr>
<th></th>
<th>PTS after 2 y</th>
<th>ECS N= 409</th>
<th>Plac N=394</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ginsberg</td>
<td>14,2%</td>
<td>12,7%</td>
<td></td>
</tr>
<tr>
<td>Villalta &gt;5</td>
<td>51,3%</td>
<td>51,4%</td>
<td></td>
</tr>
<tr>
<td>Ulcers 1 month</td>
<td>17 (4,2%)</td>
<td>16 (4,1%)</td>
<td></td>
</tr>
</tbody>
</table>
Some problems with SOX

- Villalta and Ginsberg scales are non-specific, subjective outcome parameters
  - no CEAP, VCSS, no objective measurements
- Stockings (ECS) sent by mail
  - Start of compression > 2 weeks after DVT
  - Questionable advice how to apply ECS (30-40 mmHg!)
- Compliance
  - 55,6% used ECS > 3 times /week after 2 y
  - 59% of ECS users were uncertain wearing ECS

2-3 weeks AFTER acute DVT

• Pain has disappeared,
• Patient has missed the beneficial experience of good compression in the initial stage
• is poorly motivated to continue with compression
• This is the reason for poor compliance
Conclusions

• PTS = Inflammatory disease of vein wall starting in acute DVT
• Compression reduces pain and swelling in acute DVT = antiinflammatory effect, more related to vein wall than to the clot
• Ongoing compression to maintain these effects
• Start with compression + mobilization during acute phase of DVT is essential
Make Cinderella smile again!

- DVT is a rewarding indication for compression
- Satisfied patients
  - Less pain
  - Less swelling
  - Improved walking
  - Better QOL
More details on compression:

www.icc-compressionclub.com

Thank you!